Summary

Introduction

Because of the sudden decline of sugar industry since the1970s, the abandoned sugarcane plantations operated by the CEA (Concejo Estatal del Azúcar) increased year by year. Many plantation workers consequently lost their jobs which, in turn, put them in poverty. In order to develop these former sugarcane plantations, the Government of Dominican Republic requested the Government of Japan to conduct the development study to formulate the integrated rural development plan of the former sugarcane plantation areas, which includes not only agricultural development, but also social development, together with the model development in La Luisa area, in June 2000. In 1998, the Government of the Dominican Republic issued the free land transfer measures of the former sugarcane plantation areas in La Luisa for Japanese immigrants. Both governments confirmed the implementation of the rural development for the area as a symbol of friendship between the two countries, which benefits the local residents as well as the Japanese immigrants. The Government of Japan dispatched the JICA Preparatory Study Team (S/W mission) in November, 2000, and it was decided that the Study included not only the model development of the La Luisa Area but also to formulate a Master Plan for 55 former sugarcane plantation areas throughout the country. The Study Team started its works from February 2001 and finished the last field work in July 2003, and prepared this Final Report.

Opportunities of Poverty Eradication in Rural Area

The total area distributed by IAD (Instituto Agrario Dominicano) under the land reform program amounts to 638,757 ha (10,155,125 tarea) with 102,852 farmers of total beneficiaries, which corresponds to about 25 % of total farm land including pasture land in the Dominican Republic. The Study Area comprises 64,299 ha (1,022,249 tarea) of the sugarcane plantation areas with 13,694 farmers, about ten percent of the total area distributed by IAD. Most of these lands were transferred from the CEA to IAD. The proposed development plan for the former sugarcane plantation areas in this study would be a model of the rural development in other land reform areas, hence, IAD regard the plan as important. Although the process has not yet finished, it is expected that IAD would transform to the new institute for rural development.

In the latter half of the 1990s, the economy of the Dominican Republic performed well with an average GDP growth rate of 4.2%, and during a five-year period from 1995 to 2000, the average of annual economy growth rate showed over 7%. The population ratio who live under the poverty line of US$2 per day decreased to 37 % as of 1996, while about 85 % of total families remain under the poverty line in rural area. In the model areas in this study, a higher poverty incidence occurs with about 89 % of total families. The former sugarcane plantation areas should be prioritized in the national program of poverty alleviation in rural areas.

The Study Area and Four Model Areas

Establishment of the 56 settlements, the Study Area, was launched from 1964, and the majority of the

settlements were established after the 1970s. About 23 % of the Study Area has relatively good land conditions. However, the remaining area has inferior land conditions, including the land where sugarcane had never been planted. Recently the size of distributed lands conditions decreased to 1.8 ha (30 tarea). The 56 settlements were classified into ten sub-groups according to nine indices from the four kinds of data. Moreover, the ten sub-groups were reclassified into four groups (A, B, C and D) according to two factors, annual rainfall and land classification.

The settlements, which belong to Group A, have high precipitation and crops are possible to grow under rain-fed conditions. They are located in the interior area of the central and east regions with a lot of limitedly arable land, and are not far from large cities. Most settlements which belong to Group B are located in the further inner areas in the same regions of Group A, and they are adjacent to the mountainous areas, with hilly and undulating terrains. The settlements of Group C have annual rainfall of less than 1,000 mm. Therefore irrigation is important for stable crop production in the areas. The settlements of Group D have more dry climate, where crops could not be grown without irrigation. Four settlements are selected as the model areas, which are representative of each group. In each model area, the development plan was formulated according to the analysis of the present conditions and field survey results. Based on the plan, pilot projects were planned and implemented.

Framework of the Master Plan

In the development framework of the Master Plan, the overall goal was set as “Settlers have stable life with necessary and sufficient living conditions. Under the goal, two program targets, “Settlers increase their income” and “Settlers improve living conditions”, were set as shown below.

Overall Goal	Program Target	Program Approach	
Settlers have stable life with necessary and sufficient living conditions.	1. Settlers increase their incomes.	1-1	Development of Agricultural Infrastructure
		1-2	Improvement of Farmland
		1-3	Raising Crop Production Efficiency
		1-4	Raising Livestock Production Efficiency
		1-5	Improvement of Agricultural Marketing and Processing
		1-6	Development of Micro-enterprise
	2. Settlers improve living conditions.	2-1	Improvement of Domestic Water Supply
		2-2	Improvement of Public Health
		2-3	Improvement of Education
		2-4	Improvement of Roads and Transportation
		2-5	Improvement of Electrification and Telecommunication
		2-6	Improvement of Culture and Community Center
		2-7	Improvement of Housing

Based on this framework, the Master Plan for the former sugarcane plantation areas was formulated for the short, medium and long terms. For the programs of “1-1 Development of Agricultural Infrastructure”, “1-2 Improvement of Farmland” and “1-3 Raising Crop Production Efficiency” the development plans were formulated by the settlement group. The development plan were formulated, not by each group but for all the settlements, for the programs of “1-4 Raising Livestock Production Efficiency ”and “1-5 Improvement of

Agricultural Marketing and Processing". For the programs of "1-6 Development of Micro-enterprise" and the programs of living condition (2-1 to 2-7), the development plans were formulated based on the two settlement groups of "neighboring villages" and "remote villages" according to the distance (time) to the nearby city with population of more than 50,000.

Lessons Learned from the Pilot Projects

The Pilot Projects were the prioritized projects in the four model area development plans and aimed to gain lessons and recommendations through the process of planning, implementation, monitoring and evaluation and to reflect them to the Master Plan. More specifically, their purpose was to verify strategies, methods, organizations, and mechanisms for materializing the Master Plan. Therefore, the pilot projects in the Study were designed and verified as the entry for vertical and horizontal extension.

- Vertical extension: Direct beneficiaries use the lessons learned in a project to launch another project or a new development process.
- Horizontal extension: Beneficiaries from the same area or another see a project and start a similar project with their own initiative.

As for the vertical extension, an analysis of success elements was made for the Domestic Water Supply Project in La Luisa. It reveals that the project was evaluated positively for the following items: 1) high incentives for the beneficiaries to participate to the project; 2) balanced cost and benefit among the beneficiaries; 3) a little difference or partiality of responsibility among the members regarding to cost sharing, operation and maintenance, and others; 4) clear rules of collective operation and management, 6) participation of active members; and 5) strong ownership with clear rule of cost sharing.

The horizontal extension of the Pilot Projects was evaluated in terms of replicability of the project by IAD , as shown below。

(1) Level 1: Technicians of the IAD can implement the project- "Capacity Strengthening of Marketing Activities"

(2) Level 2: Directors of the IAD needs to make decisions, and other institutions also need to cooperate – "Agricultural Infrastructure Improvement", "Land Use Planning Support", "Small Animal Raising", "Domestic Water Supply", "Health Education" and "Training of Sewing"

(3) Level 3: Input required for the project is large, and a large sum of fund is necessary in addition to – "Training of Computer", "Training of Cooking" and "Business Transport"

The conventional project achievement was evaluated according to the five-grade system in four items: 1) efficiency or input to output; 2) attainment of project purpose; 3) justification of project purpose; and 4) sustainability. Most projects achieved their purposed while the "Training of Computer" had low rate.

Institutional Set-up and Implementation of the Master Plan

For the Master Plan implementation, a project should not be operated to attain only its single project but be managed in a projects cycle in an area development plan which is formulated with horizontal extension viewpoint. Thus the experiences or the lessons learned from one project could be reflected to other projects systematically. IAD Central Office formulates an area development plan of each settlement area working together with the regional office according to the Master Plan and control the development of the 56 settlements as a whole. The regional offices operate projects of the settlement areas with people. They manage all the projects as a whole, not separately, with the horizontal extension viewpoint. In other words, a project is managed in a view that it will be carried out in other settlement areas.

Lessons learned in each project are collected in a regional office and then sent to the central office. The IAD Central Office utilizes the lessons and recommendations obtained through the projects for future projects. In this way, it is possible to realize horizontal extension among settlements within a regional office, and then expands nationally with the IAD Central Office. IAD plans to establish an operational unit, which will have about 12 to 15 members from the counterparts of this Study and also the representatives of all the departments of the IAD. It will continue monitoring and evaluation of the Pilot Projects and also start studying the feasibility of the new projects and making a budget.

Conclusion

This Study concludes that a rural development depends on participatory development with the committed involvement of the stakeholders, which could be the core of rural development aimed at increasing income and improving living conditions and thereby reducing rural poverty in the Study area. Therefore, the Government of Dominican Republic should embark, at her own cost or together with assistance from donor countries, on implementing the integrated rural development plan in the former sugarcane plantation areas as presented in the Master Plan.

Recommendations

1. Recommendations to materialize the Master Plan

(1) It is required to coordinate the roles and development targets between IAD and the national/local governmental organizations concerned.

(2) A n entry project is necessary for vertical and horizontal extensions.

(3) Precise surveys are indispensable to make a development plan of each settlement.

(4) It is fundamentally required to coordinate people’s needs and administrative development priorities.

(5) It needs to provide effective technical extension services to farmers in agricultural development

2. Recommendations for project implementation

(1) It is important for participatory development to balance the input with obligation.

(2) Decision making of project design is indispensable to secure participation in.

(3) Clear definition of direct beneficiaries / target group is necessary.

(4) Project management workshops are necessary to strengthen leaderships of farmers.

(5) It needs to change peoples' perspectives.

3. Recommendations on technical aspects

(1) Level of agricultural infrastructure development should be suitable to the technology level of beneficiaries.

(2) To promote farmers' participation, clear benefits should be included.

(3) It needs to prepare land suitability map by crop type and guidelines for land use improvement.

4. Recommendations toward participatory development

(1) Institutional development is vital for participatory development by committed involvement of all the stakeholders.

(2) Farmers' participation is fundamental in income generation typed projects.

(3) It is necessary to have close coordination among implementation, monitoring and evaluation to respond farmers' needs flexibly.

(4) A project should be an opportunity for development of all the stakeholders.

(5) Close coordination is for the implementation, monitoring and evaluation of projects.

ABBREVIATIONS AND UNITS

BID	Banco Interamericano de Desarrolo
CEA	Consejo Estatal del Azúcar
CEDOPEX	Centro Dominicano de Promoción de Exportaciones
IAD	Instituto Agrario Dominicano
IDIAF	Instituto Nacional de Investigación Agropecuaria y Forestal
INAPA	Instituto Nacional de Aguas Potables y Alcantarillados
INDRHI	Instituto Nacional de Recursos Hidraulicos
INESPRE	Instituto Nacional de Estabilizatión de Precios
INFOTEP	Instituto Nacional de Formación Técnico
INVI	Instituto Nacional de la Vivienda
JAD	Junta Agroempresarial Dominicana,Inc.
JICA	Japan International Cooperation Agency
Lb	Libra (pound), 100lbs.=1 quintal
ONAPLAN	Oficina Nacional de Planificaficación
ONE	Oficina Nacional de Estadística
PRODEFRUD	Programa Especial de Desarrollo de La Fruticultura Dominicana
PROMESE	Programa Medicamentos Esenciales
Quintal	QQ= 100 lbs= 45.36 kg
RD$	Dominican Peso: 1US$=25.35RD$ (16/05/2003)
SEA	Secretaría de Estado de Agricultura
SEE	Secretaría de Estado de Educación
SEOPC	Secretaría de Estado de Obras Publicos y Comunicación
SESPAS	Secretaría de Estado de Salud Publica y Asistencia Social
STP	Secretaríado Técnico de la Presidencia
Tarea	1 tarea = 629 sq.m
UEAR	Unidad Ejectora de Acueductos Rurales

Composition of Reports
Master Plan
Appendix

CONTENTS

CHAPTER 5 IMPLEMENTATION AND EVALUATION OF PILOT PROJECTS 5-1

LIST OF TABLES

LIST OF FIGURES

CHAPTER 1

Background and Objectives of the Study

CHAPTER 1 BACKGROUND AND OBJECTIVES OF THE STUDY

1.1 Background of the Study

1.1.1 Transition in Sugarcane Plantation and Sugar Industry

Since 1493 when the sugarcane was first planted in the Dominican Republic by the Spanish, the sugar industry has developed to reach a peak production of 1.3 million tons of crude sugar in 1976. The development of the sugar industry in recent years was related to the increase in allotment in purchase of sugar by USA (quota). However, the quota was decreased drastically from 460,996 tons in 1989 to 184,794 tons in 2000. The average price of crude sugar for the quota in 1999 and 2000 was US$ 0.18/lb, while the international export price was about US$ 0.11/lb. The decease of the quota price affected severely the sugar industry, which caused large-scale abandonment of sugarcane plantations. The total harvested area of sugarcane was 197,000 ha (3,125,000 tareas) in 1998, where the share of the National Sugar Authority (CEA: Consejo Estatal de Azúcar) accounts for 15 % of the total area.

As of 1992, the CEA owned 255,000 ha of sugarcane plantation (directly administrated by CEA), that included pasture. A large area of the land decreased because these lands were sold or rented out to private farmers. The total harvested area of sugarcane in 1998-99 was 58,000 ha (922,000 tareas), with about half of the total farmlands owned by CEA, 133,000 ha (2,114,000 tareas). It is planned that about 6,000 ha (100,000 tarea) in Barahona and 15,000 ha (250,000 tareas) in Monte Plata will be newly transferred to IAD.

1.1.2 Development Policy of the Former Sugarcane Plantation Areas

It is observed that the former sugarcane plantation areas include unsuitable land even for planting sugarcane and the pastureland that was used to graze draft animals for sugarcane cultivation. These lands are not also suitable to grow most of diversified crops.

It was also found that the size of distributed land ranged from 20 to 40 tareas, which was significantly smaller than the overall average distributed land of 90 tareas. Because of the smaller size in the recent land distribution, most of the beneficiary farmers need intensification of land use. Under these conditions, IAD is now trying to support the farmers. The present administration started in August 2000 and put the priority on agricultural and rural development.

IAD collaborates with SEA in the formulation of a development project for the former sugarcane plantation in Barahona. According to the report of the plan, the project aims to create job opportunities and improve the living standards of landless farmers in the area through ensuring self-sufficiency, promoting cash crops like fruits and vegetables, and developing agro-industry. The project components include development of agricultural infrastructure, strengthening extension services, and providing agricultural credits.

Until the 1970s, the sugarcane production and its export were the major industry supporting the national

economy. Large-scale sugarcane plantations developed in the southern and eastern regions of the country had created plenty of employment opportunities. The clusters of residences of the plantation workers were formulated in surrounding areas of plantations and many people relied upon the income earned from the sugarcane industries.

Because of the sudden drop of the international price of sugar during the 1970s, many sugarcane plantation areas started to be abandoned year by year. Many plantation workers lost their jobs around the sugarcane plantation areas, which in turn put them in poverty. Their poverty has been a major social issue for the country.

CEA transferred the abandoned plantation areas to IAD that aims to develop these areas as the integrated rural development areas.

1.1.3 Background of the Study

In 1998, the Government of the Dominican Republic (GDR) issued the free land transfer measures of the former sugarcane plantation areas in La Luisa for Japanese immigrants. The GDR confirmed the implementation of the rural development for the area, which will benefit the local residents as well as the Japanese immigrants. The GDR, furthermore, requested the Government of Japan in June 2000 to conduct a study on the integrated rural development of the La Luisa area as a pilot model project.

As a result of the discussions between the GDR and the Preparatory Study Team of Japan International Cooperation Agency (JICA), the Study will be carried out not only for the development of the La Luisa Area but also to formulate a master plan study for 55 former sugarcane plantation areas throughout the country. The Study will classify the said 55 plantation areas, and then implement the pilot projects in La Luisa and other three areas. The pilot projects would be implemented with the close participation of beneficiaries. The results and experiences gained from the implementation of the pilot projects would be fed back to the formulation of the master plan for the integrated rural development of the former sugarcane plantation areas.

1.2 Objectives and Scope of the Study

1.2.1 Objectives of the Study

The objectives of the Study are as follows:

- To formulate a master plan on the integrated rural development of former sugarcane plantation area;
- To implement a pilot project on the integrated rural development in La Luisa in order to verify the methodology proposed in the master plan ; and
- To develop and strengthen the technical capacity of the Dominican counterpart personnel through the process of the Study.

1.2.2 Study Area

The Study areas are the 55 former sugarcane plantation areas located in the areas from Cibao to the central and the east region as well as to Barahona, the south region and La Luisa.

1.2.3 Basic Approach of the Study

The 55 former sugarcane plantation areas shall be categorized for the formulation of the master plan on the development of the former sugarcane plantation areas. Then the development plan will be formulated for the model projects areas including the La Luisa area and other three representative plantation areas. The results of pilot project areas will be monitored and evaluated, the results of which will be reflected in the formulation of the master plan.

1.3 Structure of the Study

The integrated rural development of former sugarcane plantation area needs to be achieved by the farmers themselves to eradicate poverty and to achieve sustainable rural development. Rural development by government offices and donors from the beginning to the end must be avoided. Conventional project approach to realize pre-set objectives with certain input within certain period may be able to prolong the impacts of the project but development cannot be really sustainable that way. So that, in this study, the following four principles will be applied to realize sustainable and integrated rural development.

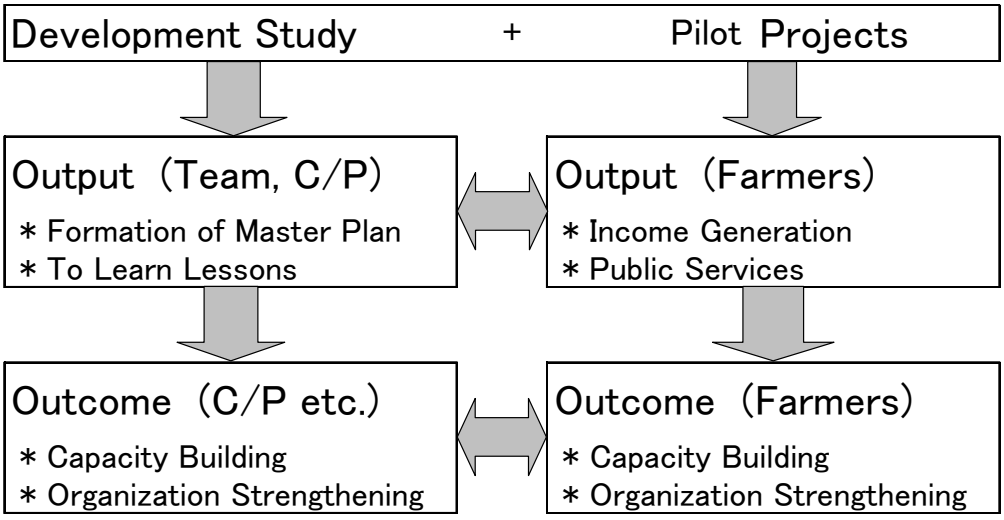
1) Master Plan as a system: Master plan in this study is not just a beautiful and unrealistic drawing. Master plan means a system including organizations and mechanism to materialize the objectives in the master plan.

2) Outcome oriented projects: Achievement of the direct outputs of projects is not good enough for the real rural development of the areas. A system and mechanism need to be formulated so that second and third generation projects will be initiated by the outcome of the projects.

3) Program approach for areal extension: A project is not an independent project only for limited beneficiaries in a limited place. To extend the outcome of the projects for the development of the whole area, the projects are necessary to be managed as an integrated program.

4) Systematic extension by the participation of all the stakeholders: Participation does not necessary mean participation of the farmers. Participation of governments, NGOs and other interest groups or persons is also important. A participatory system and mechanism is necessary for areal extension of the projects.

To materialize these principles, not only direct objectives such as drawing the master plan and implementing development projects are required, but capacity building and organization strengthening of all the stakeholders for drawing and revising the master plan, and for extending the outcome of the projects in a sustainable way.



Therefore, the pilot projects in the Study are not conventional and are designed and verified as the entry for vertical and horizontal extension.

1) Vertical extension: Outcome and impact on the direct beneficiaries of the pilot projects. How can they learn from the pilot projects and apply the lessons for the future?

2) Horizontal extension: Outcome and impact on the farmers in the surrounding areas or in the other former sugar cane areas. How can the pilot projects extend to the other areas?

As the Study went by, the definition of the direct beneficiaries of a pilot project and the mechanism for areal extension of the pilot projects were necessary to be reconsidered.

1) Different direct beneficiaries for agricultural and social development projects: In an integrated rural development program or an areal development plan, the direct beneficiaries of agricultural development and social development can be considered as common. In the Study, however, farmers do not live in the settlement area in all of the four model areas. Places of residence and places of cultivation are different so that it is difficult to think about a simultaneous integrated rural development program with both agricultural and social development projects.

   a) Parts of former sugarcane plantation area in La Luisa were transferred to Japanese immigrants but not yet for the residents of La Luisa. Also Japanese immigrants had not settled in the area.

   b) In Tamayo, the residence of the settlers is far from the settlement area. Not all of the settlers live

in a same village either.

c) The settlers of Esperanza III are from many villages. Some of them live so far away that they stay in the farm on weekdays and go back home during the weekend.

d) The settlers of Los Hatillos live in a village with the settlers of other settlement areas. The model area is one of the settlements in the area. Also the settlers were forced relocation from a national park.

In categorization of the 55 former plantation areas and La Luisa, natural conditions and social conditions were dealt independently.

2) Organized extension work for integrated rural development: Farmer-to-farmer extension is usually very effective in integrated rural development, but is not so effective if the settlement areas are scattered. Therefore, IAD headquarters need to play a major role for organized extension through the network with regional offices, project offices, other government institutions and NGOs.

CHAPTER 2

Opportunities of Poverty Eradication in Rural Areas

CHAPTER 2 OPPORTUNITIES OF POVERTY ERADICATION IN RURAL AREAS

2.1 Socioeconomic Conditions of the Dominican Republic

2.1.1 Population

The population in 1993, when the last census was conducted, was about 7.3 million and increased to 860 million in 2000. The annual growth rate during this period was 2.30% and still considered very high. From the figure of 2.31% during the 1980s, growth rate has remained relatively the same. The share of the urban population continued to rise from 35% in 1965 to 56.1 in 1993 and to 65.0% in 2000.

2.1.2 Economy and Industry

In the latter half of the 1990s, partially influenced by the economic boom in the United States, the Dominican economy performed well. Although it recorded an average GDP growth rate of 4.2% in the early 1990s, the rate fluctuated widely, and the economy even shrank in 1990. However, during a five-year period from 1995 to 2000, the economy constantly showed a strong growth rate of over 7% and grew rapidly at an average annual growth rate of 7.7%. The inflation rate had risen to an extreme extent during the 1980s and recorded even 59.5% in 1990. Between 1996 and 2000, however, the inflation rate was stabilized and kept relatively lower at 7.5% on average.

According to a survey by the Central Bank, the unemployment rate in 1998 was 14.7 for a country as a whole, whereas it was 9.2% for male and 23.9% for female, which implied far more severe employment conditions for women.

During the last half of the 1990s, perhaps speeded up by the better macroeconomic performance, there was a continuous trend of a change in the industrial structure, which had already started earlier. Table 2.1 shows the industrial structure in 1995 and 2000 in terms of the share of each sector in the total GDP.

During this period, the sectors that performed better included construction, tourism-related industry like hotels, and public utilities, such as transport, communications, and electricity and water. In the late 1990s, foreign direct investment poured into the public utilities sector, and US$14 billion was invested in privatizing a power company in 1999.

However, agricultural sector grew below the average rate of the whole economy (7.7%). The share of this sector in the total GDP has continually declined, accounting for one-third in 1969, 25.9% in 1969, 19% in 1974, 17% in 1981, and 11.1% in 2000. The share of employment in agriculture, forestry, and fishing accounts for 16.7% for male, 1.4% for female, and 8.9% as a whole. Although these figures do not really imply the importance of this sector, in rural areas, the sector provides 44% of jobs. Despite the decreasing rural population, many rural residents still depend on agriculture. Moreover, 60% of raw materials for agro-processing industries come from domestic producers, and the majority of staples are produced

domestically (80% for rice and 70% for red beans). Although the significance of agriculture in the national economy tends to decline, it is still important in providing employment opportunities in rural areas and producing staples and raw materials.

Table 2.1 GDP by Sector and its Share

(RD$ millions, 1970 constant price)

Sector	1995		2000		Growth rate (%) 1995-2000
	GDP	Share (%)	GDP	Share (%)	
Agriculture	276.7	6.0%	343.9	5.2%	4.5%
Livestock	276.8	6.0%	360.9	5.5%	5.5%
Forestry & Fishing	23.4	0.5%	50.0	0.8%	17.7%
Mining	125.6	2.7%	124.4	1.9%	0.3%
Manufacturing	831.7	18.2%	1,110.8	16.8%	6.0%
Construction	442.3	9.7%	872.8	13.2%	14.7%
Wholesale & retail trade	554.8	12.1%	875.8	13.2%	9.6%
Hotels, bars, & restaurants	259.4	5.7%	450.0	6.8%	11.7%
Transport	310.6	6.8%	449.1	6.8%	7.7%
Communications	159.7	3.5%	355.7	5.4%	17.4%
Electricity & water	87.3	1.9%	139.5	2.1%	9.9%
Financial services	224.6	4.9%	264.4	4.0%	3.3%
Real estate	238.2	5.2%	266.4	4.0%	2.3%
Government services	387.7	8.5%	478.4	7.2%	4.3%
Other services	380.5	8.3%	469.2	7.1%	4.3%
Total	4,579.4	100.0%	6,611.3	100.0%	7.7%

Source: Banco Central. Informe de la Economia Dominicana: Enero-Deciembre 2003.

The external sector of the economy shows a mixed performance. The balance of trade in goods continued to be in deficit even in the 1990s. It recorded a deficit of as much as US$3.7 billion in 2000, which rose by 30% from the previous year. Nevertheless, the economy had a positive invisible trade balance of US$2.7 billion in 2000, due to increased revenue from tourism and remittances from overseas Dominican workers. As a result, the balance of payment was kept at US$1 billion in deficit in 2000. Despite the chronic deficit in the balance of payment, the foreign exchange rate against the US dollar was relatively stable, though devaluing. The official rate in 2000 was RD$16.18 for the dollar and devalued by about 2.2% from the previous year.

For many years, agriculture has been contributing to a large portion of the total exports and earned foreign currencies. In 1980, about 60% of the total value of exports was accounted for by the traditional agricultural products, namely sugar, coffee, cocoa, and tobaccos, which had played an important role for a long time. Table 2.2 shows the shares of these traditional agricultural products in the total value of exports in the late-1990s, which suddenly declined in 1999. One of the reasons was the Hurricane George in 1998 where the CEA, for example, was unable to repair the damages due to the financial shortage and dropped production. In the case of tobaccos, there was an additional reason for a sharp fall in the export volume. It was caused by conflict between producers and exporters. Price drops and fluctuations led to lower productions and values of cocoa and coffee.

Table 2.2 Values of Principal Exports and their Shares in the Total Exports of Domestic Industries

(US$ million)

	1995	1996	1997	1998	1999	2000
Traditional Agricultural Products	303.8	352.3	423.8	362.2	191.9	193.4
	40.0%	42.2%	44.2%	46.4%	23.8%	20.0%
Sugar	132.0	171.7	203.8	142.2	89.6	89.6
	17.4%	20.5%	21.3%	18.2%	11.1%	9.3%
Cocoa	59.5	64.7	61.0	87.1	23.8	33.0
	7.8%	7.7%	6.4%	11.2%	3.0%	3.4%
Coffee	81.9	64.1	67.8	66.7	24.7	26.1
	10.8%	7.7%	7.1%	8.6%	3.1%	2.7%
Tobacco	30.4	51.8	91.2	66.2	53.8	44.7
	4.0%	6.2%	9.5%	8.5%	6.7%	4.6%
Ferro-nickel	242.2	218.8	216.5	132.1	143.9	237.4
	31.9%	26.2%	22.6%	16.9%	17.9%	24.6%
Exports by Domestic Industries (excluding Free Zones)	759.7	835.7	958.2	780.0	805.2	966.1

Source: Banco Central.

2.1.3 Outline of the State Government

The executive branch (*Poder Ejectivo*) of the Dominican Republic is divided into the following five strata, as shown in Figure 2.1. The organization chart of the present administration has not yet been published.

i) Supreme Level; composed of *Presidencia*, *Vice-presidentia*, *Consejo Nacional de Desarrolo* and *Consejo de Gobierno.*

ii) Deliberative and Advisory Level; composed of various National Commissions and Councils, and Specialized Advisory Offices. *Programa de Medicamentos Esenciales (PROMESE)*, which delivers medicines over the country, is placed at this level although it has functions of implementing organization.

iii) Administrative and Strategic Level; composed of *Secretatiado Técnico de la Presidencia (STP)*, *Secretaría de Estado de la Presidencia*, *Contraloria General de la República*, *Procuradoria General de la República* and *Secretatiado Administratiivo de la Presidencia*, and Offices, an authority and National Directorates. Some Offices, an authority and National Directorates provide public services as implementing entities.

iv) State Secretary Level; composed of 12 Sector State Secretariats, such as Agriculture, Public Works and Communications, Education, Public Health & Social Assistance, etc. This level discharge major regulatory functions of public administration, as well as executing functions of some sectors, such as education or public health, where decentralization has yet to be realized.

v) Decentralized Organization Level; composed of various institutions, corporations and centers, that provides public services as decentralized implementing units. *Instituto Agrario Dominicano (IAD), Instituto Nacional de Recoursos Hidraulicos (INDRHI), Instituto Nacional de Aguas Potables y Alcantarillado (INAPA), Instituto de Estabilización de Precios (INESPRE), Centro Domonicano de Promoción de Exportaciones (CODEPEX)* belong to this level. This level undertakes major executing functions of some sectors. Besides, *Secreataría Estado de Agricultura*, for example, has *Instituto del Tabaco*, *Oficina Nacional de Meteorologia* and *Centro de Ventas de Materiales Agropecuriarios* within the Secretariat. Criteria for establishment of "decentralized" units seem unclear.

The number of public employees reached 370,000 in 2001. In June 2001, the new administration released a policy for a drastic cut of recurrent costs of the government by reducing salaries of the civil servants. Nearly 80% of the public employees works at the central government (level i to iv of the above classification), despite a rapid increase in municipal level activities that occurred between 1998 and 1999, which shows that public administration of Dominican Republic is still highly centralized. The increase in personnel occurred between 1999 and 2000 is accounted largely by the increase in State Secretariat of Education and President's Office.

Table 2.3 Number of Public Employees

	1998	1999		2000*		
	(Persons)	(Persons)	Increase	(Persons)	Participation	Increase
Total Employee	307,520	317,095	3.1%	330,592	100%	4.3%
Central government	245,032	249,854	2.0%	260,800	79%	4.4%
Decentralized and autonomous institutions	38,871	39,174	0.8%	40,617	12%	3.7%
Municipality	23,167	28,067	21.2%	29,175	9%	3.9%

(*Note: Preliminary figures)
(Source: Informe de la Econimia Dominicana 2000, Banco Central)

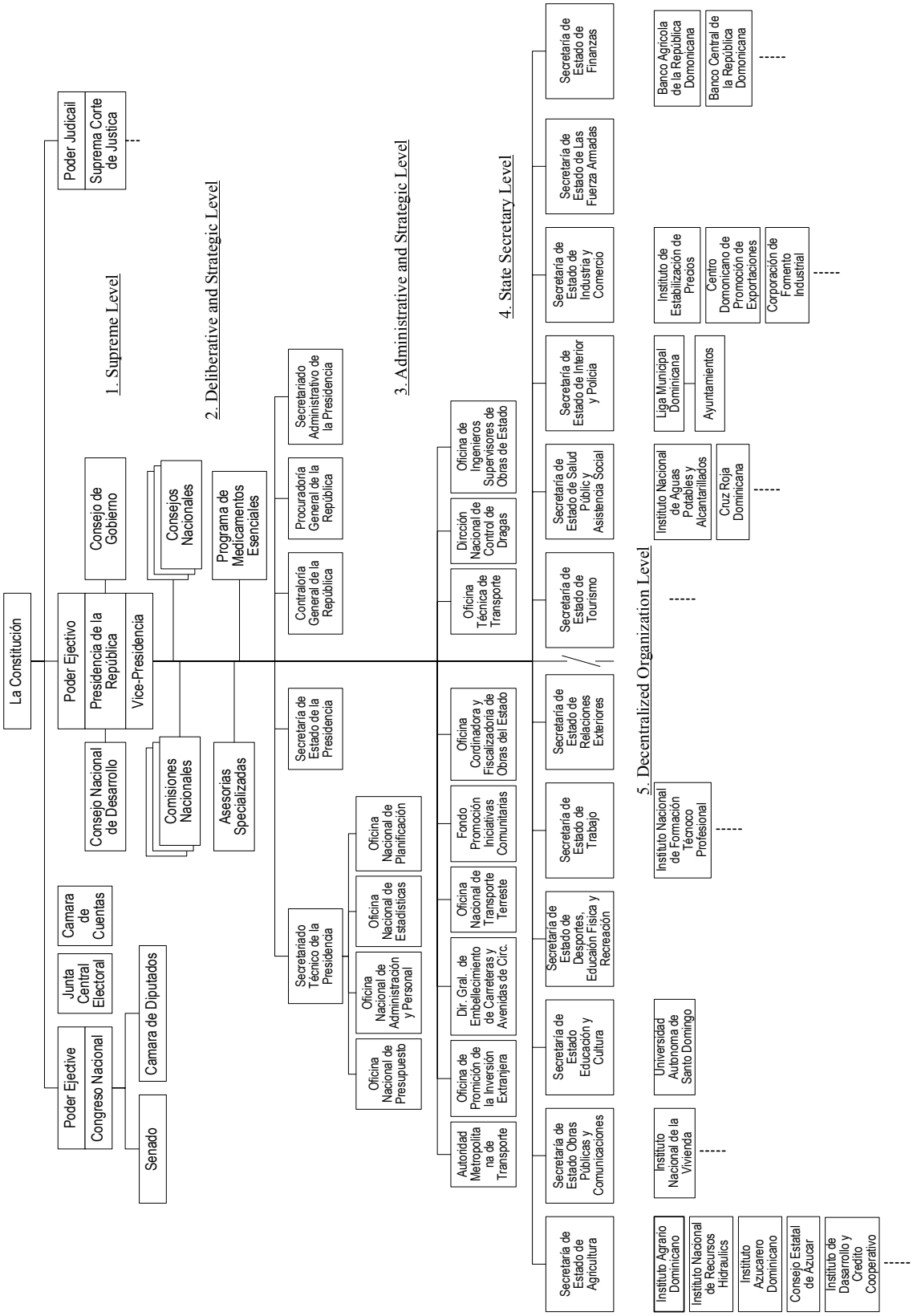


Figure 2.1 Organization of the State

The budget of the state accounts for 17% and 14% of the GDP in 1999 and 2000, respectively.

Table 2.4 Budget of the State

(RD$ millons)

	1999		2000		
	Planned	Executed	Budget	Participation	Increasing Rate*
Revenues	**44,671**	**46,225**	**50,366**	**100%**	**9%**
I. General Revenues	43,227	42,285	46,490	92%	10%
A. Tax Revenues	42,338	41,289	45,294	90%	10%
1. Tax	40,968	39,865	43,549	86%	9%
2. Interest	1,370	1,424	1,745	3%	23%
B. Non-Tax	889	996	1,196	2%	20%
II. Special Revenues	343	1,504	144	0%	-90%
III. External Resources	1,101	2,436	3,732	7%	53%
Expences and Financing	**44,672**	**46,279**	**50,366**	**100%**	**1%**
101. Congreso Nacional	577	577	647	1%	12%
201. Presidencia de la República	4,731	7,777	6,596	13%	-25%
202. Interior y Policía	2,954	2,879	3,707	7%	29%
203. Fuerzas Armadas	2,661	2,806	3,675	7%	31%
204. Relaciones Exteriores	288	371	409	1%	10%
205. Finanzas	11,702	9,063	7,096	14%	-22%
206. Educación y Cultura	6,618	6,981	8,164	16%	17%
207. Salud Pública	4,736	4,664	7,963	16%	71%
208. Desportes	476	405	810	2%	100%
209. Trabajo	76	319	214	0%	-33%
210. Agricultura	3,874	3,612	4,044	8%	12%
211. Obras Públicas	3,978	4,975	4,250	8%	-15%
212. Industria y Comercio	440	294	476	1%	62%
213. Tirismo	255	129	280	1%	117%
214. Purocuraduía General	200	189	450	1%	138%
215. Secretaría de Estado de Mujeres	-	-	60	0%	-
301. Poder Judicial	640	668	714	2%	7%
401. Junta Central Electoral	436	544	777	2%	43%
402. Camara de Cuentas	30	26	34	0%	31%

(Note: * Increasing Rate is calculated by comparing the budget in 2000 with the executed in 1999.)
(Source: "Informe de Ejecón Presupuestaría-1999" y "Puesupuesto Gobierno Central-2000", Oficina Nacional de Presupuesto)

A substantial amount increase in budget allocation took place in 1999/2000 in sectors of public health and education, which may show a recent emphasis on human resource investment by the government, or efforts to recover from the past practice of neglecting the social sectors.

2.2 Natural Conditions of the Dominican Republic

2.2.1 Topography and Geology

The Dominican Republic, situated in longitude 68°20'W and 72°00'W and latitude 17°30'N and 20°00'N, occupies the eastern two-thirds of Hispaniola Island in the northern Caribbean Sea. The country, which is 48,442 sq.km, is bounded on the west by the Republic of Haiti and touches the Atlantic Ocean on the north

and east and the Caribbean Sea on the south. The West of the country is mountainous, while the East side is almost flat. In the center of the country rise the Central Mountains, consisting of many high peaks over 2,000m in altitude and ranging from northwest to southeast. Among them, Mt. Pico Duarte with an altitude of 3,175m is the highest in the country. The Northern Mountains, the Neiba Mountains and the Baoruco Mountains are situated north, south and southwest of the Central Mountains, respectively. Rivers start to flow to the north and the south with these mountains as watersheds, and then fertile farmlands spread out in these river basins. Stretching between the Central Mountains and the Northern Mountains, a granary valley contains rich soils carried by Yaque del Norte River. The valley is called Cibao, a major production center of rice, vegetables, and fruits.

The Central Mountains consist of igneous rocks, volcanic-sedimentary rocks and tonalite. Other mountains are composed mainly of limestone in the Tertiary. The coasts mostly consist of limestone and conglomerates in the Tertiary and the Quaternary.

2.2.2 Climate

The Dominican Republic has primarily a tropical climate, with more daily and local variations in temperature than seasonal ones, and with seasonal variability in the abundance of rainfall. The average annual temperature is 25 °C, ranging from 18 °C at an altitude of over 1,200 meters to 28 °C at an altitude of 10 meters.

The so-called cool season is from November to April, with relatively low humidity and low precipitation. On the coast, the temperature constantly goes up around 29 °C during the day and drops to around a comfortable 20 °C at night. However, in the mountainous regions of the interior the weather is always considerably cooler, and on the highest peak, Pico Duarte, snow can be seen.

The hot season is from May to October. The average temperature rises to 31 °C during the daytime and drops to about 22 °C at night. However, with the accompanying high humidity that is more common during this season, it usually feels much hotter. It does rain a bit more often during this season, especially from May to August, but usually this turns out to be tropical shower. There are usually also some brief rainy periods during the months of November and December.

However, rainfall pattern varies in region. Along the northern coast, the rainy season lasts from November through January. In the rest of the country, it runs from May through November with May as the wettest month. The dry season lasts from November through April with March as the driest month. The average annual rainfall for the country as a whole is 1500-mm. This varies, however, from region to region, and ranges from 600-mm (Neiba) to 2,500-mm (Cordillera Oriental). In general, the western part of the country, including the interior valleys, receives the least rain.

Hurricanes occur on the average of once every two years in the Dominican Republic. Over 65 percent of the storms strike the southern part of the country. The season for hurricanes period is from the beginning of June

to the end of November. Though some hurricanes occur in May and December, most take place in September and October. Hurricanes usually occur from August through October. They may produce winds greater than 200-km per hour and rainfall greater than 500-mm in 24-hour.

2.2.3 Soils in the Dominican Republic

Based on the study done by SEA (Estudio de Zonificacion de Cultivos Segun la Capacidad Productiva de los Suelos En Republica Dominicana, Sep. 1999), the soils in the Dominican Republic are classified into eight classes according to the production capacity determined by nine factors (rainfall, temperature, humidity, wind, elevation, daily hours of sunshine, soil, pH, organic contents). The major characteristics and distributions of these soil classes are shown in the table below.

Table 2.5 Soils in the Dominican Republic

Soil Class	Major Characteristics	Distribution
Class 1	Highly arable: Productivity is very high without irrigation. Lands are basically flat. All kinds of crops can be cultivated intensively.	Occupies about 53,000 ha (1.2 % of the national land). Most of the soil is distributed in the Cibao region.
Class 2	Moderately arable and capable for irrigation: Productivity is high with moderately intensive farm management. Short duration crops are highly recommendable.	Represents 5.6 % of the country surface with 245,000 ha. The dominant regions are Northeast, Southwest and Central.
Class 3	Arable and capable for irrigation: Because the soil has some limitations for agriculture such as low fertility, stony, excessive drainage, thin soil depth, saline and aridity, it is productive only with intensive management.	Represents 7.6 % of the country surface with 335,000 ha. The East, Southwest and Central Regions are main areas for this soil class.
Class 4	Limited arable and not capable for irrigation: Soil has severe restrictive factors for cultivation so the productivity is medium to low. Soil conservation practices and fertilizers are commonly necessary.	9 % of the national land (400,000 ha) correspond to this soil class. Three major areas are East, Northwest and Central Regions.
Class 5	Not arable but capable for pasture: Soil has severe restrictive factors but has medium productivity only for improved pasture and rice in some areas with intensive farming management.	Occupies about 700,000 ha (15.8 % of the national land). The East Region has the largest distribution of this soil followed by the Central and Northwest Regions.
Class 6	Not arable except for forest and pasture: The soil is shallow, rocky and prone to erosion. Topography is also steep so soil conservation practices are necessary.	Represents 8.5 % of the national surface (375,000 ha). Mainly distributed around Northern Mountain ranges and the mountains near Neyba and Bahoruco.
Class 7	Not arable, only for forest: The land is basically mountainous and rocky so the soil layer is thin.	49.5 % of the country surface corresponds to this soil class and it is typically found in the Central and Northern mountains, Bahoruco, Neyba and Seybo.
Class 8	Not arable: Only for national parks, wild animal areas, recreational zones or protected areas for water resources.	Occupies 2.9 % of the national land with 126,000 ha. This soil is distributed all around the country.

Source: SEA (Estudio de Zonificacion de Cultivos Segun la Capacidad Productiva de los Suelos En Republica Dominicana, Sep. 1999)

2.3 Land Use and Land Tenure

The total agricultural land in the Dominican Republic is estimated at 2.6 million ha (41.0 million tareas), which comprised of 1.3 million (20.8 million tareas) of cultivated land, and 1.3 million (20.2 million tareas) of pasture land. About 78 percent of the pastureland are utilized less intensively. The size of agricultural land per capita in the Dominican Republic is about half of that in Mexico and most of the Caribbean countries. Compared to most of major South American countries, the size is even one-third. Although the sugarcane plantation area covers about 28 percent of the total cultivated land, the area has significantly decreased each year due to the fall in the sugar industry. Large areas of the sugarcane plantation were converted to other crops or were left abandoned. (See Table 2.6)

Table 2.6 Land Use in the Dominican Republic

Land Category	Area		
	(tarea)	(ha)	(%)
1. Total	76,669,062	4,822,484	100.0
2. Non – Forest Area	55,578,362	3,495,879	72.5
(1) Farm Land	40,943,323	2,575,335	53.4
- Paddy Field	3,112,051	195,748	4.1
- Intensive Upland	6,391,940	402,053	8.3
- Sugarcane Land	5,853,577	368,190	7.6
- Intensive Pasture	4,191,176	263,625	5.5
- African Palm Land	74,642	4,695	0.1
- Coconut Land	516,582	32,493	0.7
- Coffee and Cacao Land	4,836,900	304,241	6.3
- Extensive Upland or Extensive Pasture	15,966,455	1,004,290	20.8
(2) Shrubs , Grasses and Others	13,222,146	831,673	17.2
(3) Water Land	787,075	49,507	1.0
(4) Residential	625,819	39,364	0.8
3. Forest Land	21,090,700	1,326,605	27.5

Source:Subsecretaria de Recursos Naturales,DRENA,2000

According to a study on the tenure status of agricultural land in the late 1980s, about 80 percent of agricultural land are owned by less than two percent of total landowners, which shows a polarization of few large-scale landowners and a large number of small or landless farmers. Under these conditions, there are many potential beneficiaries of land reform.

Table 2.7 Pattern of Land Tenure

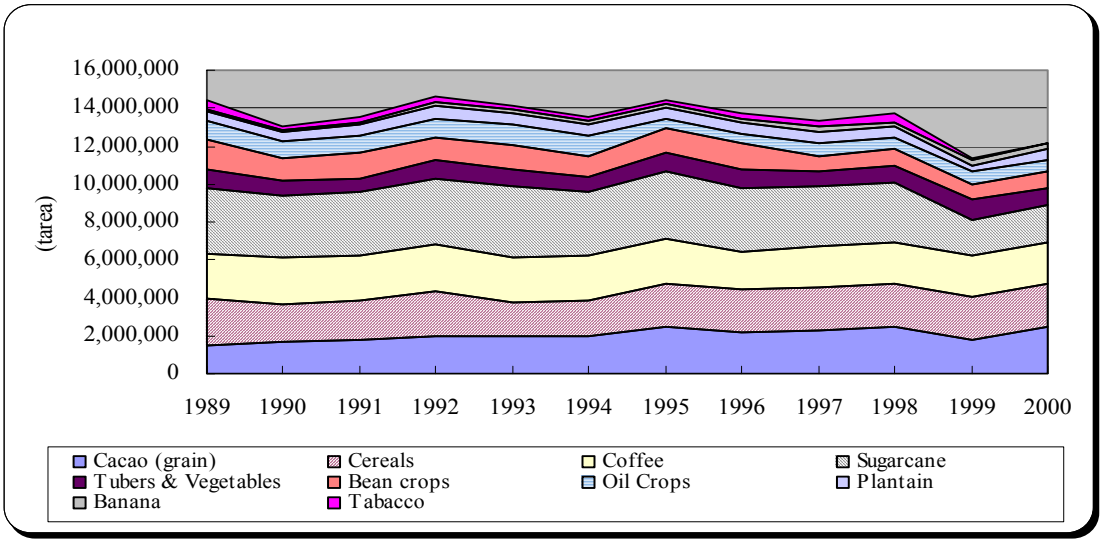
Scale of Land Owned	Share of Land Owners (%)	Share of Area Owned (%)
Large(over 1,000ha)	0.04	22.5
Medium (50～1,000ha)	1.80	55.2
Small medium (5～50ha)	17.16	10.1
Small (less than 5ha)	81.00	12.2
Total	100.00	100.0

Source：Dotzaurer,1993

2.4 Agricultural Production and Trade

2.4.1 Agricultural Production

Based on the report published by SEA (Diagnostico del Sector Agropecuario 2000), recent situations of agricultural production in the country were analyzed. The total harvested area of major 27 crops ranged between 13 and 15 million tareas from 1998 to 1989. However, the area dropped drastically to 11.4 million tareas in 1999, 17-percent lower than the previous year. This drop is mainly caused by the decrease of sugarcane cultivation, from 3.1 million tareas in 1998 to 1.9 million tareas in 1999. The hurricane (codenamed George) that hit the Dominican Republic in September 1998, contributed to the sharp decline of the harvested area in 1999. In 2000, cacao has the largest harvested area, 2.4 million tareas, among the 27 major crops followed by coffee, rice and sugarcane. These top four crops represent 70-percent of the total harvested area. (See Figure 2.2.)



Source: Diagnostico del Sector Agropecuario 2000, SEA

Figure 2.2 Changes of Harvested Area by Crop (1989-2000)

Under the initiatives of INDRHI, the national government has promoted construction of irrigation facilities but irrigated farmlands are still minimal. The ratio of the irrigated land to the harvested areas of 27 crops has been relatively low since 1992, about 15.0 - 27.9 %, as irrigated area has not increased since 1992. However the role of irrigated lands in food production is very important since their yield levels are very high compared to the yields of non-irrigated lands. For instance, the yield level of pigeon peas in irrigated land in 2001 is assumed to be 2.83 quintals/tarea, 67 % more than the yield of non-irrigated pigeon peas, 1.69 quintals/tarea. The yield level differences are especially significant among vegetable crops. (See Table 2.8.)

Table 2.8 Comparison between Total Irrigated Area and Total Harvested Area since 1992

(Unit: 1,000 tareas)

Year	1992	1993	1994	1995	1996	1997	1998	1999	2000
Total Irrigated Area	2,493	3,940	3,995	4,120	2,072	2,447	2,677	2,921	2,833
Total Harvested Area of 27 Crops	14,580	14,112	13,556	14,466	13,775	13,303	13,722	11,407	12,128
Percentage of Irrigated Area	17.1%	27.9%	29.5%	28.5%	15.0%	18.4%	19.5%	25.6%	23.4%

Source: Diagnostico del Sector Agropecuario 2000, SEA

The production of sugarcane has stagnated since 1993. From 1989 the maximum production recorded was 162 million quintals in 1993. However, the production level decreased to less than 100 million quintals in 1999 and 2000. On the other hand, the production of banana rapidly increased from 9 million bunches in 1991 to 17 million bunches in 1992. Since then banana production ranged between 12 and 18 million bunches. Also the production of tomato for processing increased to 5.4 million quintals in 1997, 4.6 times larger than the production in 1996, although the harvested area is relatively smaller. The production of rice has also gradually increased since 1994 and has reached 8 million quintals in 2000 for the first time in 8 years.

2.4.2 Agricultural Trade

Although the exportation of traditional farm produce such as sugar and sugar products, coffee, tobacco and cacao are decreasing, it still plays important role in trade. The average FOB export value of sugar and its products from 1992 to 2001 is recorded at US$ 133 million. (See Table 2.9)

Table 2.9 Changes of FOB Export Value of Traditional Farm Produce (1992-2001)

(Unit: US$)

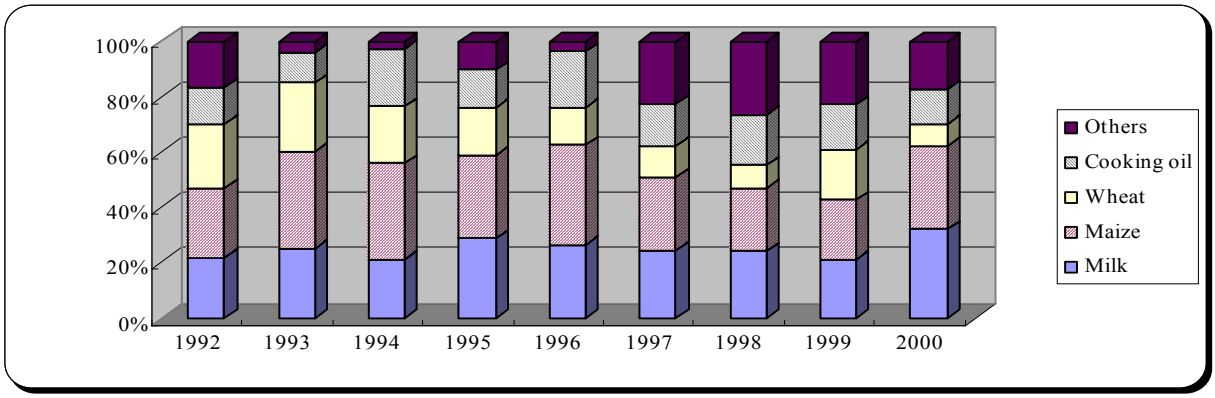
Year	Sugar and its products	Crude cacao	Coffee beans	Tobacco leaves
1992	156,043,546	33,236,207	26,395,173	8,569,990
1993	143,155,619	33,885,265	25,600,661	12,841,523
1994	141,003,042	51,380,994	62,431,932	11,497,600
1995	125,100,000	59,256,406	81,071,895	15,500,000
1996	166,700,999	57,714,131	61,781,853	22,916,714
1997	188,402,661	55,565,597	67,039,605	22,735,346
1998	141,642,241	78,144,190	63,499,681	19,175,900
1999	89,852,141	20,393,563	15,801,872	18,931,666
2000	92,577,483	20,887,914	12,311,765	12,168,825
2001*	86,851,779	38,812,347	10,259,603	12,390,000
Average	133,132,951.1	44,927,661.4	42,619,404.0	15,672,756.4

Note: 2001*- preliminary figures
Source: Diagnostico del Sector Agropecuario 2000, SEA

Since 1998, the exportation of non-traditional farm products, particularly fruits, has been increasing. In 2001, the FOB exportation value of fruits (banana, avocado, plantain, papaya, citrus, pineapple, melon and mango) amounted to more than US$ 55 million. This figure even exceeded some traditional exporting crops of the Dominican Republic such as cacao, coffee and tobacco.

On the other hand, several agricultural products have been constantly imported. Four major imported products

in terms of value are milk, maize, wheat and cooking oil. In 2000, 20 agricultural products were imported that amounted to US$ 314 million. About 32 and 30 % of the total value counted to milk and maize, respectively. If wheat and cooking oil are included, the total imported value would total to about 83 % of the total imported value. (See Figure 2.3.)



Source: Diagnostico del Sector Agropecuario 2000, SEA

Figure 2.3 Percentage of Agricultural Product Import by Item (1992-2000)

2.5 Social Conditions in Rural Areas

2.5.1 Poverty Incidence

According to the survey conducted by the Central Bank in 1998, the economic boom in the 1990s reduced the number of the poor from 31.2% in 1992 to 25.8% in 1998. According to "Action Plan on Dominican Social Policy, Presidential Office", households with income level below US$1 accounts for 18.5% and those with less than US$2 consists of about 37.2%. Most of families below the poverty line reside in the rural area in the Dominican Republic.

Table 2.10 Number of Population under Poverty Line (1996)

(Unit:%)

Area	Total Family	Poverty –I	Poverty –II	Total
Urban	61.0	6.7	30.4	37.1
Rural	39.0	37.3	48.1	85.3
Total	100.0	18.5	37.2	55.7

Note: Poverty –I---Population who have income less than 42.9US$/month per capita
Poverty-II---Population who have income from 42.9 to 85.3 US$/month per capita
Source: "Action Plan, Social Policy, ONAPLAN (Estimated from ENDESA data, 1996)"

As shown in Table 2.11, household with lower income generally tends to have a larger household size, live in rural areas, have less accessibility to running water, and have a lower level of education.

Table 2.11 Distribution of Household Characteristics across Income Quintiles, 1998

	1st quintile	2nd quintile	3rd quintile	4th quintile	5th quintile
Number of household members	5.1	4.7	4.3	3.8	3.3
Rural resident	51.4%	39.4%	30.8%	26.1%	14.3%
Female head of household	32.9%	29.2%	28.7%	27.6%	24.8%
Indoor running water	25.6%	41.6%	44.2%	57.9%	75.6%
Outdoor running water	50.7%	38.7%	39.7%	32.3%	17.9%
Indoor sanitation	18.7%	32.1%	39.9%	55.9%	76.2%
Education					
No schooling	28.8%	18.8%	14.6%	10.8%	6.0%
Primary incomplete	54.7%	56.8%	55.1%	46.4%	29.5%
Primary completed	4.5%	6.4%	8.0%	8.3%	6.3%
Secondary incomplete	7.4%	12.5%	10.3%	13.2%	11.5%
Secondary completed	3.2%	3.6%	6.5%	10.4%	12.5%
University	1.5%	1.9%	5.6%	10.9%	34.3%

Source: Banco Central

2.5.2 Public Health System

The whole territory of the country is divided into eight health regions with the regions further divided into provincial level. A unit of primary attention should be established in a health sector, which should cover 500-700 families (2,500-3500 inhabitants). Hierarchy of medical care is illustrated in Figure 2.4. Recently, the *Secretaía Estado de Salud Públic y Atención Social* (*SESPAS*) is organizing a new public heath model, giving emphasis on i) decentralization, ii) health promotion and preventive activities, iii) involvement of local communities and NGOs.

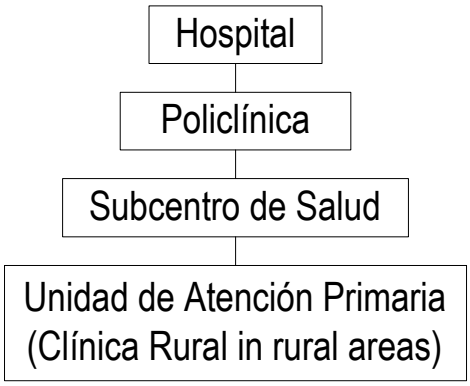


Figure 2.4 Hierarchy of Medical Establishment

Executive Commission for Health Sector Reform was established and is currently implementing a project of "Provincial Health Service" with World Bank to enhance the management at provincial level and to strengthen administrative capability of provincial offices of SESPAS.

2.5.3 Education System

Structure of education in Dominican Republic is shown below. The Constitution of the Republic stipulates that the State is obliged to provide Basic Education (*Educación Básica*) for all nation of the age. Five years ago, *pre-escuela* (*Nivel Inicial*) became obligatory. For the purpose of educational administration, the country is divided into 17 regions, and each educational region is further divided into several districts. Monte Plata region was created as 17th educational region. In Dominican Republic a school term starts September and ends in June every year, while vacation extends from June to August.

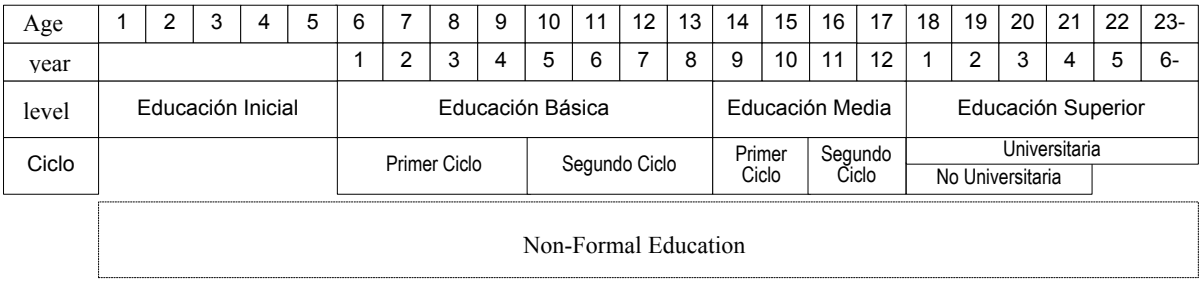


Figure 2.5 Structure of Education in Dominican Republic

Portion of executed budget for the educational sector (not only for SEE) to the total has been substantially increasing, 9.9% in 1990 to 15.6% in 1998. In 1998 executed budget for the educational sector accounted for 2.5% of the GDP of the year, while that in 1990 was only 1.2% of the GDP at that time. Due to the increased budget allocation, enrollment rate at basic educational level had increased since 1989/90 school year.

Table 2.12 Enrollment Rate at Basic Education Level

Age	1989/90			1998/99		
	Population	Student	Rate	Population	Student	Rate
6	183,487	52,853	28.8%	196,931	152,880	77.6%
7	179,732	123,691	68.8%	196,520	172,166	87.6%
8	175,886	126,288	71.8%	195,893	186,751	95.3%
9	172,040	125,660	73.0%	194,984	179,679	92.2%
10	168,118	132,325	78.7%	193,937	174,474	90.0%
11	164,046	126,816	77.3%	192,899	163,190	84.6%
12	160,757	134,356	83.6%	190,737	163,414	85.7%
13	158,672	128,952	81.3%	186,954	149,138	79.8%
14	157,386	122,410	77.8%	182,123	140,803	77.3%
Total	1,520,124	1,073,351	70.6%	1,730,978	1,482,495	85.6%

(Source: "Síntesis de la Evaluación a Mrdio Término del Plan Decenad de Educación, Aug. 2000, SEE)

With quantitative expansion, quality improvement has been realized. In the basic level education, rate of promoted students had increased from 62% in 1990/91 to 80% in 1997/98. Gender discrimination in enrollment can hardly be seen in urban areas, although little fewer girls are enrolled in rural areas. Girl students attain slightly higher achievement than boy students both in urban and rural areas. Substantial gaps in educational performance exist between urban and rural areas even at the basic education level.

Table 2.13 Enrollment at Basic Education Level by Sex at the Beginning of 1999/2000 School Year (Public Sector)

	Total	%	Man	%	Women	%	Women/Total
Total	1,311,455		671,141		640,314		48.8%
Urban	708,408	100%	351,821	100%	356,587	100%	50.3%
New	99,716	14%	52,271	15%	47,445	13%	47.6%
Promoted	570,421	81%	276,869	79%	293,552	82%	51.5%
Repeater	32,036	5%	19,418	6%	12,618	4%	39.4%
Re-entry	6,235	1%	3,263	1%	2,972	1%	47.7%
Rural	583,740	100%	309,452	100%	274,288	100%	47.0%
New	106,994	18%	57,728	19%	49,266	18%	46.0%
Promoted	426,960	73%	220,327	71%	206,633	75%	48.4%
Repeater	38,450	7%	24,678	8%	13,772	5%	35.8%
Re-entry	11,336	2%	6,719	2%	4,617	2%	40.7%
Other	19,307	-	9,868	-	9,439	-	48.9%

(Source: SEE)

Since SEE guides for schools not to let pupils at the first and second grade of the basic level repeat the same grade except extreme cases, a little portion of the pupils at those grade repeats, causing substantial portion of repeaters at the third grade. The ratio of number of fourth and eighth grade students to those at the first grade was in 7% and 66% in urban areas in 1999/2000, respectively, while the ratios in rural areas were as low as 73% and 46%, respectively for the same year. These figures may lower retention in rural areas even at the basic level education or widen the gap between urban and rural areas in performance of basic education.(refer to Table 2.14)

Table 2.14 Enrollment at Basic Education Level by Grade at the Beginning of 1999/2000 School Year

Grade	1		2		3		4		5		6		7		8	
Total	219,461		209,641		217,215		184,809		150,210		122,530		101,446		86,836	
Urban	103,630	100%	105,226	100%	112,322	100%	100,692	100%	88,029	100%	75,140	100%	65,281	100%	58,088	100%
New	99,716	96%	0	0%	0	0%	0	0%	0	0%	0	0%	0	0%	0	0%
Promoted	0	0%	101,375	96%	99,429	89%	94,650	94%	83,864	95%	71,874	96%	62,781	96%	56,448	97%
Repeater	2,193	2%	2,666	3%	12,026	11%	5,371	5%	3,566	4%	2,745	4%	2,120	3%	1,349	2%
Re-entry	1,721	2%	1,185	1%	867	1%	671	1%	599	1%	521	1%	380	1%	291	1%
Rural	115,831	100%	104,415	100%	104,893	100%	84,117	100%	62,181	100%	47,390	100%	36,165	100%	28,748	100%
New	106,994	92%	0	0%	0	0%	0	0%	0	0%	0	0%	0	0%	0	0%
Promoted	0	0%	97,233	93%	88,013	84%	76,822	91%	57,827	93%	44,762	94%	34,506	95%	27,797	97%
Repeater	4,502	4%	4,535	4%	15,262	15%	6,182	7%	3,706	6%	2,184	5%	1,391	4%	688	2%
Re-entry	4,335	4%	2,647	3%	1,618	2%	1,113	1%	648	1%	444	1%	268	1%	263	1%

As can be seen in the above three tables, age of entry of students to a class are not always same, repeaters still prevail, and some students reenter to some grade after some periods of being out of school. Actual classes are composed of students with various ages as shown in the figure below.

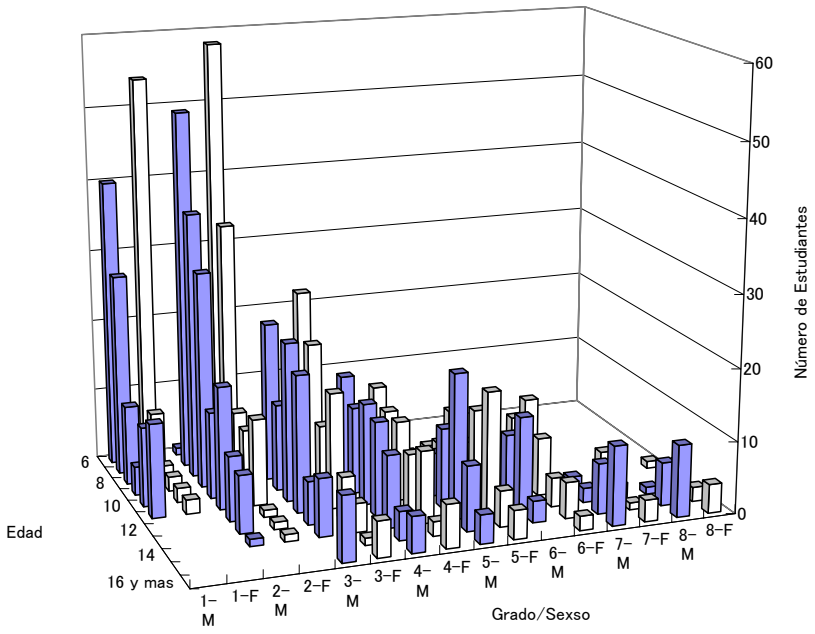


Figure 2.6 Example of Age Distribution by Grade/Sex in Basic Education

2.6 Opportunities of Poverty Eradication in Rural Area

2.6.1 History of IAD Establishment, Goals and Organization

The IAD was established in 1962 with the enactment of land reform law with the objectives of acquiring land, distributing it to landless farmers, and providing necessary support to beneficiary farmers to become self-sustainable. The central IAD consists of a Planning Office, International Cooperation Office, Department of Land Acquisition, Land Distribution, Social Development, Production, Maintenance/Repair, Computer Center and other offices. The IAD has 13 regional management offices (Gerencias) and 11 project offices with the total personnel of about 4,700. Present Conditions of Social Development Department.(refer to Figure 2.7)

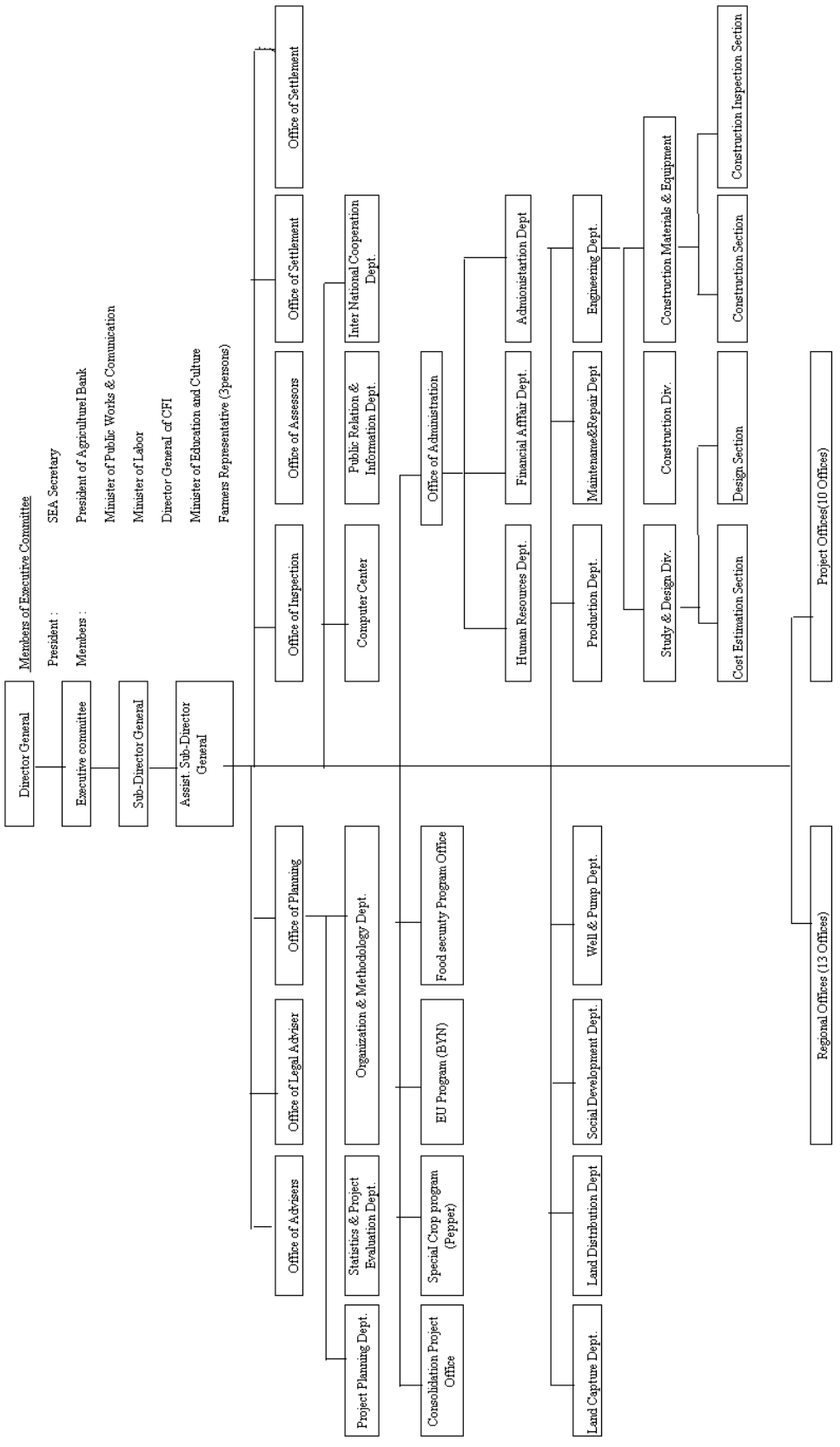
As shown in Figure 2.8, Department of Social Development at the IAD headquarter consists of three divisions and nine sections. In addition, each regional management office (Gerencia) and project office (Proyecto Descentralizado) has a social development officer. The Department at headquarter is mainly responsible for investigations, programming, and planning, and each local office actually carries out plans. The Division of Capacity Building and Investigation (Division de Capacitacion e Investigacion) consists of Section of Investigation, which identifies problems and needs of settlers; Section of Capacity Building, which plans and programs public meetings and training programs; and Section of Audiovisual Resources, which has stopped its activities in practice due to the lack of resources. Highest demands for types of meetings and training

programs can be found in resolving disputes among the settlers, followed by training programs for agricultural technology and practice. Demands of settlers are often brought directly to local offices without passing through the Section of Investigation.

In response to the needs identified by the Section mentioned above and direct requests from settlers, the Division of Organization and Social Promotion (Division de Organizacion y Promocion Social) provides a wide range of programs and activities, including technical training programs, assistance for organizing settlers, medical services, literacy education, cultural activities, and sports events. However, the Division itself does not necessarily possess all the necessary technical capabilities or resources to carry out these activities, especially for those under the jurisdictions of other agencies and ministries like education or health programs. Thus, it often plays a role in linking settlers with specific demands to the agencies or ministries in charge.

The Division of Cooperative Promotion (Division de Fomento Cooperativo) is a relatively new organization, established in 1996. Its main activity is to promote or help organize cooperatives within settlements. In cooperation with the IDECOP, for example, it designs programs for creating a cooperative and hosts workshops for one or two days where they explain the concepts and purposes of cooperatives and help identify members for a new organization.

According to the Operational Plan 2001 (Plan Operativo 2001), the budget appropriated for the Department is about RD$16 million, which accounts for only 2% of the total budget of the IAD (RD$834 million). Table 2.15 shows the actual records of the activities from January to June 2000.



Source : IAD

Figure 2.7 Organization of IAD

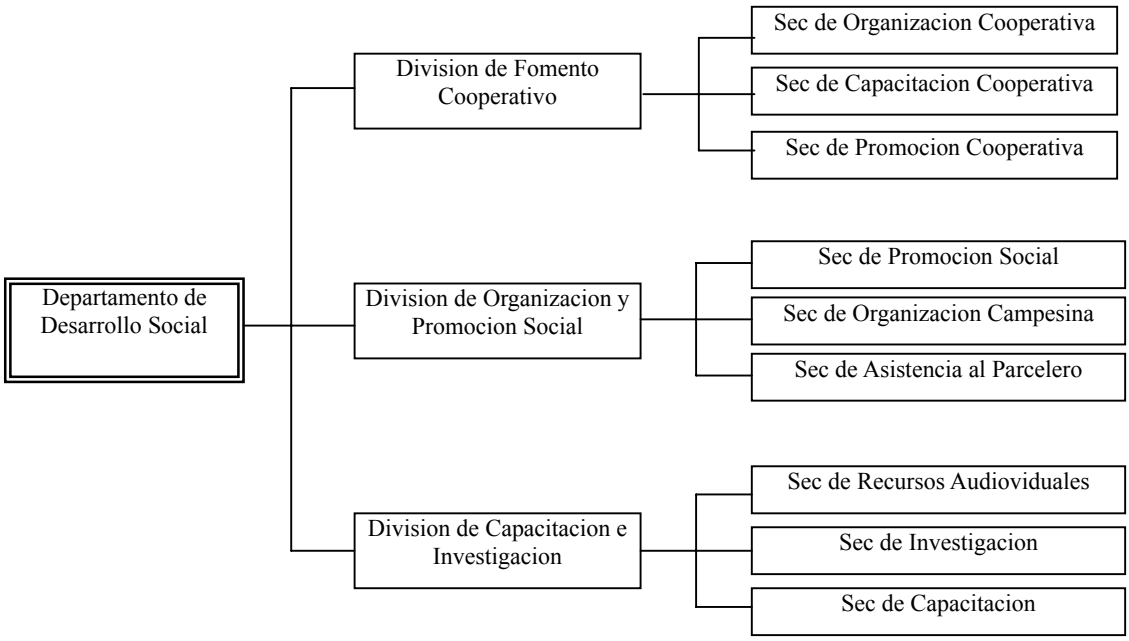


Figure 2.8 Organization of Social Development Department

Table 2.15 Records of Activities by Social Development Department (January to June 2000)

Activity type	Participants	Amount (RD$)	Main activities
Organization	39,846	171,808	Meetings, workshops, etc.
Investigation	21,121	20,221	Investigations, analysis, interviews, etc.
Capacity Building	11,190	237,228	Courses, workshops, seminars, field trips, discussions, etc.
Social Promotion	23,100	752,808	Census, field surveys, assistance to settlers, culinary art, etc.

Source: Memoria 2000

2.6.2 Land Distribution and Settlement

In the Dominican Republic, most of the rural households are either small farmers or landless farm laborers. Under these conditions, the land reform contributed significantly to creating land-owning farmers. It is reported that more than 65 percent of land-owning farmers now are the beneficiaries of the land reform. The total area distributed by IAD amounted to 10,155,125 tareas (638,757 ha) as of December 2000. The number of beneficiaries is 111,673 farmers with an average size of the distributed land per farmer at 91 tareas (5.7ha). However, the average size of the distributed land in 2000 was lesser, at 38 tareas (2.3 ha). In the

distributed land, 495 settlement areas (asentamientos) were established by IAD. IAD now reserves 10,356,173 tareas (651,403ha) for further distribution as of December 2000. The lands subjected to land reform is limited to governmental land like governmental restoration land, procurement land and the transferred land between governmental agencies.(refer to Table 2.16 and Table 2.17)

Table 2.16 Source of Land for Land Distribution in Land Reform

Source	Area		Share
	(tarea)	(ha)	(%)
Governmental procurement land	2,821,725	177,487	27.2
Governmental restoration land	6,545,461	411,709	63.2
Donated land	354,914	22,324	3.4
Transferred land	634,073	39,883	6.1
Total	10,356,173	651,403	100.0

Note: Most of transferred lands are from CEA.
Source: IAD December 2000

Table 2.17 Distributed Area and Beneficiary Farmers of Land Reform

Year	Distributed Area (tarea)	No. of Beneficiaries	No. of Family Members	No. of Settlement
1961	2,238,396	11,451	73,075	40
1962	61,188	833	5,321	4
1963	63,358	719	4,722	11
1964	183,386	2,214	14,425	8
1965	-	-	-	-
1966	39,696	321	1,640	5
1967	155,865	1,901	12,215	8
1968	109,757	1,447	9,298	6
1969	155,273	1,057	14,030	12
1970	81,783	1,345	9,457	13
1971	378,536	3,621	23,238	6
1972	593,921	6,498	41,580	16
1973	643,197	8,362	55,423	18
1974	144,774	1,800	11,834	4
1975	151,419	1,930	13,003	4
1976	176,461	3,162	20,728	5
1977	7,074	139	889	3
1978	165,793	2,634	15,537	13
1979	132,004	1,962	12,349	3
1980	125,187	1,961	12,460	12
1981	237,787	3,244	20,739	27
1982	81,859	1,556	9,665	17
1983	162,236	2,464	14,210	20
1984	105,085	2,871	10,668	16
1985	158,453	3,474	19,204	29
1986	60,805	1,689	8,826	9
1987	102,580	2,280	10,848	14
1988	69,509	703	4,158	6
1989	25,653	746	4,237	3
1990	90,340	2,551	15,131	18
1991	45,836	1,914	10,485	10
1992	50,964	11,730	9,239	11
1993	315,663	6,693	37,226	40
1994	470,977	3,439	18,901	12
1995	1,385,750	4,504	24,813	11
1996	43,684	2,004	11,019	11
1997	247,099	375	2,061	3
1998	731,592	1,696	9,049	6
1999	33,033	1,005	5,627	5
2000	129,152	3,378	18,527	36
Total(tarea)	10,155,125	111,673	615,857	495
Total(ha)	638,757			

Source: Boletin Esatistico IAD, 2000 Vol.26

In 2000, 4.69 million tareas, 46.4 % of the total distributed land, are cropped. Major crops in the distributed land are paddy rice, pigeonpeas, maize, cassava and plantain. The shares of the harvested areas for these crops at the national total are 43.8 %, 14.6%, 26.1%, 22.9% and 29.2%, respectively. This means that the production from the distributed land significantly contributes to the supply of food to the nation (refer to Table 2.18).

Table 2.18 Share of Crop Harvested Area in IAD Settlement Area (2000)

Crop	IAD Settlement Area		National Total		Share
	(tarea)	(ha)	(tarea)	(ha)	(%)
1. Paddy Rice	861,238	54,172	1,967,644	123,765	43.8
2. Plantain	163,608	10,291	560,341	35,245	29.2
3. Beans	117,970	7,420	491,501	30,915	23.0
4. Coffee	104,790	6,573	2,216,023	139,388	4.7
5. Maize	80,390	5,056	308,119	19,381	26.1
6. Cassava	69,671	4,382	304,166	19,132	22.9
7. Pigeonpea	58,660	3,690	402,278	25,299	14.6
8. Banana	50,072	3,150	236,343	14,866	21.2
9. Tomato Industrial	40,045	2,519	150,000	9,435	26.7
10. Taro	26,201	1,648	98,258	6,180	26.7
11. Sweet Potato	19.417	1,211	96,665	6,080	20.0
12. Chilly	15,781	993	46,534	2,927	33.9
13. Pumpkin	14,407	906	89,207	5,611	16.2
14. Sugarcane	9,558	601	1,893,308	119,089	0.5
15. Onion	6,912	434	43,559	2,740	15.8
16. Tobacco	5,238	332	24,300	1,528	21.7

Source: IAD Boletin Estatistico, 2000 Vol.26

2.6.3 Opportunities of Poverty Eradication in the Rural Areas

The study areas are located in the former CEA sugarcane plantation areas or the surrounding areas, where there are plenty of poor unemployed person due to due to close-down of the sugarcane plantation. Generally most of settlers in the former sugarcane plantation areas were the workers of CEA sugarcane farmers who were landless without any experience on farm management as well as any technology on cultivation

The data on the number of families under poverty line in the Study areas show that high incidence of poverty are observed as shown below, in particular, a large number of families are under Poverty-1 in the areas of Tamayo and Los Hatillos.

Table 2.19 Number of Population under Poverty Line in the Related Provinces to Model Area (1993)

(Unit:%)

Model Area	Related Region	Poverty-I	Poverty-II	Total
Tamayo	Enriquillo	48.7	39.3	88.0
Esperanza III	Cibao Occidental	40.3	47.6	87.9
Los Hatillos I	Yuna	51.4	44.3	95.7
La Luisa	Resto Valdesia	28.9	53.4	82.3
Average		42.3	46.2	88.5

Source: "Action Plan, Social Policy ,ONAPLAN(Estimated from ENDESA data,1996)"

There is a higher incidence of poverty in the study area because it was severely affected by downfall of the sugar industry. These former sugarcane plantation areas should be the target areas for poverty alleviation in the rural areas.

CHAPTER 3

Categorization of 56 Former Sugarcane Plantation Areas

CHAPTER 3 CATEGORIZATION OF 56 FOMER SUGARCANE PLANTATION AREAS

3.1 Current Status of 56 Former Sugarcane Plantation Areas

3.1.1 Description of 56 Former Sugarcane Plantation Areas

The production of sugarcane began to decrease from the mid-1980s, which resulted in a sudden drop in the production by the CEA. Land owned by the CEA was transferred to private hands or the IAD. 51% of the total land acquired by the IAD in 2000 (January-October) came from the CEA. The 56 former sugarcane plantation areas, the target of this Study, are listed in Table 3.1.1. Projects were launched immediately after the establishment of the IAD, in 1964, and some of them passed 37 years. There were 15 projects in the 1960s and 1970s, 13 in the 1980s, 9 between 1990 and 1992, and 18 in 1993. (refer to Table 3.1)

In terms of surface area, El Peñón is the largest with 100,000 tareas. Many of the settlements established in the 1960s and 1970s have over 20,000 tareas. The average surface area is about 10,000 tareas, and La Luisa has an average surface area. The smallest settlement is Tamayo with the area of 1,160 tareas. There are 13 sugar refinery factories in Esperanza, 12 in Rio Haina, and 11 in Catarey, which account for 65%, followed by Quisqueya, Barahona, Provenir in smaller numbers. In terms of location, there are more settlements in the Santo Domingo metropolitan area than in any other regions, and other major regions are the northwest and the east. In terms of province, Monte Plata, to which La Luisa belongs, has the largest number of settlements, and in recent years, particularly, most settlements have been founded in Monte Plata.

3.1.2 Production in Former Sugarcane Plantation Areas

The IAD formulates production plans for each regional management office (Gerencia) every year and measures the achievement of the plans. However, it is not clear how the IAD uses the results. In particular, each regional office consolidates such data on settlements, which do not always reach the central office. This Study has recalculated cultivated areas, harvested areas, irrigated areas, and production volumes by regional office and crop type and made the following observations (See Table 3.2).

1) Land productivity (T) is measured as the production volume divided by settlement surface area. Labor productivity (L) is the production volume divided by the number of settlers (B). “Good farms” are defined as having the T of over RD$1,000/tarea and L over RD$20,000/B, and “poor farms” as having T less than RD$100/tarea and L less than RD$5,000/B. In total, 13 are found to be good farms, and 18 as poor farms.

2) Those settlements established in the 1990s onwards have more likelihood to be rated as poor. Although it is true that they have not taken enough time to be productive, but there seem to be a tendency that they were located on more unproductive lands.

3) The larger the surface area, the more likely it is that the settlement is poor.

Table 3.1 List of Former Sugarcane Plantation Areas

	No.	Settlement	Tarea	Benefi-ciaries	Sugar Refinery	Region	Province	Established
1	AC-013	Cabreto	12,449	69	Rio Haina	Central	Distrito Nacional	1964/7/13
2	AC-016	Cumayasa	68,343	1,032	Porvenir	Este	La Romana	1971/2/27
3	AC-027	El Peñón	100,000	508	Porvenir	Este	La Altagracia	1971/6/15
4	AC-030	Sonador	22,603	138	Catarey	Norcentral	Monseñor Nouel	1970/1/17
5	AC-038	Las Guaranas	33,859	600	Esperanza	Nordeste	San Fco. De Macorís	1964/11/15
6	AC-041	Maizal	8,558	140	Esperanza	Noroeste	Valverde	1966/6/12
7	AC-042	Piedra Blanca	76,267	724	Catarey	Norcentral	Monseñor Nouel	1971/12/12
8	AC-045	Esperanza	46,945	795	Esperanza	Noroeste	Valverde	1967/5/20
9	AC-047	Cristóbal	95,288	72	Barahona	Sur	Independencia	1967/10/21
10	AC-056	Caño Hondo	10,644	175	Consuelo	Este	Hato Mayor	1968/9/14
11	AC-122	Rio Verde	85,000	714	Catarey	Central	Yamasá	1971/6/26
12	AC-145	El Puerto	37,378	400	Catarey	Este	San Pedro de Macorís	1973/6/17
13	AC-154	Banega	16,184	500	Esperanza	Norte	Santiago	1974/7/3
14	AC-161	Yanigua	38,462	330	Consuelo	Este	Hato Mayor	1978/3/25
15	AC-168	Duqueza	5,516	88	Rio Haina	Central	Distrito Nacional	1978/11/7
16	AC-177	Maimón I	4,700	70	Catarey	Norcentral	Monseñor Nouel	1980/6/13
17	AC-193	Ondina	5,680	111	Santa Fe	Este	Hato Mayor	1981/4/21
18	AC-198	Hato Nuevo	3,994	194	Rio Haina	Central	Distrito Nacional	1981/6/19
19	AC-222	Payabo	10,000	218	Rio Haina	Central	Monte Plata	1982/8/6
20	AC-307	La Tranca	6,600	110	Quisqueya	Este	San Pedro de Macorís	1987/4/26
21	AC-309	Caballona	2,790	93	Rio Haina	Central	Distrito Nacional	1987/5/3
22	AC-312	La Yabocoa	6,131	137	Ozama	Norcentral	Monseñor Nouel	1987/5/24
23	AC-313	Amina I	12,195	349	Esperanza	Noroeste	Valverde	1987/6/1
24	AC-314	Catarey	11,000	260	Catarey	Central	San Cristóbal	1987/7/26
25	AC-316	Boca de Mao	2,135	61	Esperanza	Noroeste	Valverde	1987/8/8
26	AC-325	Amina II	16,642	210	Esperanza	Noroeste	Valverde	1988/6/4
27	AC-328	Villa Altagracia	13,308	393	Catarey	Central	San Cristóbal	1989/9/16
28	AC-329	Esperanza II	7,060	200	Esperanza	Noroeste	Valverde	1989/9/30
29	AC-333	Mata Santiago I	7,560	230	Quisqueya	Central	Monte Plata	1990/3/10
30	AC-335	San Marcos	6,000	150	Quisqueya	Este	San Pedro de Macorís	1990/3/29
31	AC-336	Esperanza III	6,000	228	Esperanza	Noroeste	Valverde	1990/3/30
32	AC-351	Esperanza IV	7,332	325	Esperanza	Noroeste	Valverde	1991/4/11
33	AC-355	El Capote	1,920	64	Consuelo	Este	Hato Mayor	1991/11/7
34	AC-361	Los Mulos	3,000	57	Catarey	Norcentral	Monseñor Nouel	1992/1/30
35	AC-363	El Cercadillo	4,200	80	Rio Haina	Nordeste	Sánchez Ramírez	1992/4/23
36	AC-366	Rio Chiquito	7,420	178	Consuelo	Este	Hato Mayor	1992/8/6
37	AC-367	Esperanza V	3,139	135	Esperanza	Noroeste	Valverde	1992/8/13
38	AC-374	Mata Santiago II	3,000	123	Quisqueya	Central	Monte Plata	1993/4/15
39	AC-376	La Altagracia	10,000	299	Rio Haina	Nordeste	Duarte	1993/4/15
40	AC-378	El Dean II	3,000	100	Rio Haina	Central	Monte Plata	1993/4/15
41	AC-399	Los tres puentes	2,590	136	Barahona	Sur	Barahona	1993/6/24
42	AC-400	Buena Vista	5,249	119	Rio Haina	Central	Monte Plata	1993/7/22
43	AC-403	Los Hatillos	8,770	179	Consuelo	Este	Hato Mayor	1993/9/16
44	AC-406	Placer Bonito	2,550	71	Porvenir	Este	La Romana	1993/11/11
45	AC-408	Nava	3,132	97	Esperanza	Norte	Puerto Plata	1993/11/18
46	AC-410	La Barranquita	4,598	159	Esperanza	Noroeste	Valverde	1993/11/18
47	AC-420	Pino Herrado	36,600	295	Catarey	Central	San Cristóbal	1993/12/23
48	AC-422	Tamayo	1,160	58	Barahona	Sur	Independencia	1994/2/24
49	AC-426	Mata Santiago III	3,308	126	Quisqueya	Central	Monte Plata	1994/4/13
50	AC-427	Carmen Celia Balaguer	48,742	624	Catarey	Central	Monte Plata	1994/4/13
51	AC-428	San Vicente	7,005	263	Catarey	Central	Monte Plata	1996/6/13
52	AC-430	Los Hatillos II	14,632	338	Consuelo	Central	Monte Plata	1994/9/8
53	AC-435	Juan Sanchez	27,103	425	Rio Haina	Central	Monte Plata	1995/2/2
54	AC-458	Don Juan I	7,294	75	Rio Haina	Central	Yamasá	1998/4/24
55	AC-459	Don Juan II	3,647	42	Rio Haina	Central	Yamasá	1998/4/24
56		La Luisa	24,167	27	Rio Haina	Central	Monte Plata	
		Total	1,022,849	13,694				

Source: IAD

Table 3.2 Productivity of Settlements

	No.	Settlement	Irrigated	Coopera-tives	T	L	Good Farm/Products		Poor Farm/Products	
							1st	2nd	1st	2nd
1	AC-013	Cabreto			93.6	16.9				
2	AC-016	Cumayasa		O	30.3	2.0			Lechoza	Yuca
3	AC-027	El Peñón			0.0					
4	AC-030	Sonador	O		131.8	21.6				
5	AC-038	Las Guaranas	OO	O	4146.6	234.0	Arroz	Platano		
6	AC-041	Maizal	OO		1919.1	111.0	Arroz	Tabaco		
7	AC-042	Piedra Blanca	O		76.5	8.1			Coco	Café
8	AC-045	Esperanza	O	O	210.7	12.4				
9	AC-047	Cristóbal	O		7.9	10.6			Arroz	Tomate
10	AC-056	Caño Hondo		O	0.0					
11	AC-122	Rio Verde	O		157.4	18.7				
12	AC-145	El Puerto			89.5	8.4				
13	AC-154	Banega	OO	O	2288.3	74.1	Tabaco	Arroz		
14	AC-161	Yanigua		O	34.8	4.1			Yuca	Name
15	AC-168	Duqueza	O		67.5	4.2			Platano	Habichuela
16	AC-177	Maimón I			69.4	4.7			Auyama	Platano
17	AC-193	Ondina			182.9	9.4				
18	AC-198	Hato Nuevo	OO	O	871.1	17.9				
19	AC-222	Payabo			0.0					
20	AC-307	La Tranca			211.0	13.9				
21	AC-309	Caballona	O	O	94.7	2.8			Lechuga	Batata
22	AC-312	La Yabocoa	O		434.1	19.4				
23	AC-313	Amina I	OO	O	2148.8	75.1	Tabaco	Aji		
24	AC-314	Catarey	O	O	107.3	4.5				
25	AC-316	Boca de Mao	O		1759.5	61.6	Arroz	Tabaco		
26	AC-325	Amina II	O		412.3	32.7	Tabaco	Guineo		
27	AC-328	Villa Altagracia	O	O	151.8	5.1				
28	AC-329	Esperanza II	OO	O	1498.3	52.9	Arroz	Yuca		
29	AC-333	Mata Santiago I		O	61.0	1.4			Maiz	Auyama
30	AC-335	San Marcos			164.4	6.5				
31	AC-336	Esperanza III	O		964.3	25.4	Arroz	Guineo		
32	AC-351	Esperanza IV	OO	O	1747.2	39.9	Arroz	Yuca		
33	AC-355	El Capote			130.5	3.9			Maiz	Yuca
34	AC-361	Los Mulos			276.2	14.5				
35	AC-363	El Cercadillo		O	90.9	4.8			Pina	Arroz
36	AC-366	Rio Chiquito	O		1.2	0.1			Name	Name
37	AC-367	Esperanza V	O		1542.4	35.9	Arroz	Tabaco		
38	AC-374	Mata Santiago II			1089.2	2.7				
39	AC-376	La Altagracia			45.1	1.1			Yautia	Auyama
40	AC-378	El Dean II		O	2045.9	61.4	Yautia	Auyama		
41	AC-399	Los tres puentes			0.0					
42	AC-400	Buena Vista			6.2	0.2			Maiz	
43	AC-403	Los Hatillos			88.6	1.5			Arroz	Molondr
44	AC-406	Placer Bonito			0.0					
45	AC-408	Nava	O		1119.5	36.1	Platano	Café		
46	AC-410	La Barranquita	O		804.0	46.5	Guineo	Tabaco		
47	AC-420	Pino Herrado		O	5.0	0.6				
48	AC-422	Tamayo			0.0					
49	AC-426	Mata Santiago III	O		54.1	1.4			Citrico	Maiz
50	AC-427	Carmen Celia Balaguer	O		34.4	2.7			Pina	Habichuela
51	AC-428	San Vicente			445.0	11.9				
52	AC-430	Los Hatillos II			0.0					
53	AC-435	Juan Sanchez			0.0					
54	AC-458	Don Juan I			41.9	4.1			Platano	Auyama
55	AC-459	Don Juan II	O		79.4	3.4			Platano	Auyama
56		La Luisa								

Note: T: Land productivity. L: Labor productivity. Irrigation: O = irrigated. OO = over 50% of the area is irrigated. Cooperative: O = more than three cooperatives

4) In terms of sugar refinery area, settlements in Esperanza show much better performance, accounting for 12 good farms of 13. In Rio Haina, there is one good farm, but more than a half, or seven, of the settlements are rated as poor.

5) One of the important characteristics good farms is the presence of irrigation. In areas where the precipitation is relatively low, but land conditions are good, irrigation could yield a big profit. The larger number of cooperatives, in general, has a positive correlation with better farm performance.

3.2 Classification of Former Sugarcane Plantation Areas

3.2.1 Methodology

The classification of the IAD's settlement areas, which consist of 56 former sugarcane plantation areas including La Luisa area was made with using two types: real number data such as population, distance and area, and categorical data such as soil type and product type. The categorical data were quantified by "Quantification Theory" so that the quantified categorical data can be analyzed with the real number data. The settlement areas are classified with analyzing both real number data and categorical data by the cluster analysis after the quantification analysis. Therefore, this methodology intended to classify the settlement areas with equal weight on the criteria.

3.2.2 Criteria for Classification

Twelve criteria have been determined, considering three aspects: (1) indicator for obtaining the present socio-economic situation, (2) indicator necessary for agricultural planning and (3) indicator for regional planning. In sum, the twelve criteria cover the four conditions as follows:

- Geographical condition : Location, topography
- Natural condition : Climate, Soil
- Social condition : Regional population, economic level, regional industry, presence of communities
- Settlement condition : Settlement surface area, number of settlers, organization of settlers, representative products

3.2.3 Results of Categorization

The features of each group are summarized in Table 3.3. Groups 1 and 10 are the settlement areas in the suburbs of Santo Domingo, and also have much rainfall with unsuitable land conditions but low poverty. Groups 2, 3, and 4 are the areas with much rainfall and located in the suburbs or middle distance from Santo Domingo, especially in Monte Plata province. This group does not have good conditions for cultivation according to the land classification of SEA. Moreover, ratio of poor families is also high. Groups 6, 7, and 9 are areas located far from Santo Domingo and have a good classification of land for cultivation with low

rainfall and poverty ratio.(refer to Table 3.4 and Figure 3.1)

Table 3.3 Characteristics of Classification

Class	Location	Land Classification by SEA	Rainfall	Size of Settlement Area	Poverty Ration (No. of Areas)	Representative Products
G1	Near	Class 5	Much	Medium to big	High(2),Medium(1)	
G2	Near to medium	Class 7	Much to extremely much		High(2)Medium(5)	Sugarcane
G3	Medium	Class 7	Much to extremely much		High(1),Medium(7)	Vegetables
G4	Near	Class 2-6	Too much		High(4),Medium(7)	
G5	Medium to far	Class 2-6	Little to Much		High(1),Medium(7)	Rice, vegetables
G6	Far	Class 2-3	Little to medium		Medium(9)	Rice
G7	Far	Class 2-4	Little to Much	Big	Medium(2)	

Notes: The rank of criteria is as follows.
Location: near (less than 50km), medium (50-100km), far(100km or more)
Rainfall: few(750mm or less per year), medium(750-1000mm), much(1000-2000mm), extremely much (2000mm or more)
Size: small(5000 or less tareas), medium(5000-10000tarea), and big (10000 or more tareas)
Poverty: low(40% or less), medium(40-80%), high (80% or more

Table 3.4 Result of Classification

Group	No.	Settlement No.	Name	Distance	Rainfall	Land Class	Area	Poverty	Stock Breeding	Sugar-cane	Rice	Vege-tables
1	12	AC-145	El Puerto	Near	3	5	Big	High	0	0	0	1
1	30	AC-335	San Marcos	Near	3	5	Med	High	0	0	0	1
1	56	Luisa	La Luisa	Near	3	5	Big	Med	0	1	0	0
2	29	AC-333	Mata Santiago I	Near	3	7	Med	High	0	1	0	0
2	42	AC-400	Buena Vista	Near	3	7	Med	Med	0	1	0	0
2	51	AC-428	San Vicente	Near	3	7	Med	Med	0	1	0	0
2	38	AC-374	Mata Santiago II	Med	4	7	Small	High	0	1	0	0
2	40	AC-378	El Dean II	Med	4	7	Small	Med	0	1	0	0
2	49	AC-426	Mata Santiago III	Med	4	7	Small	Med	0	1	0	0
2	53	AC-435	Juan Sanchez	Med	4	7	Big	Med	0	1	0	0
3	52	AC-430	Los Hatillos II	Med	3	7	Big	Med	0	1	0	0
3	17	AC-193	Ondina	Med	3	7	Med	Med	0	0	0	1
3	20	AC-307	La Tranca	Med	3	7	Med	Med	0	0	0	1
3	33	AC-355	El Capote	Med	3	7	Small	Med	0	0	0	1
3	43	AC-403	Los Hatillos	Med	3	7	Med	Med	0	0	0	1
3	10	AC-056	Caño Hondo	Med	4	7	Big	Med	0	0	0	1
3	14	AC-161	Yanigua	Med	4	7	Big	Med	0	0	0	1
3	36	AC-366	Rio Chiquito	Med	4	7	Med	High	0	0	0	1
4	35	AC-363	El Cercadillo	Med	3	2	Small	High	0	0	0	1
4	54	AC-458	Don Juan I	Near	4	3	Med	High	0	0	0	1
4	55	AC-459	Don Juan II	Near	4	3	Small	High	0	0	0	1
4	39	AC-376	La Altagracia	Near	4	3	Med	Med	0	0	0	0
4	24	AC-314	Catarey	Near	4	4	Big	Med	0	0	0	0
4	27	AC-328	Villa Altagracia	Near	4	4	Big	Med	0	0	0	0
4	47	AC-420	Pino Herrado	Near	4	4	Big	Med	0	0	0	0
4	19	AC-222	Payabo	Near	4	6	Med	High	0	0	0	0
5	48	AC-422	Tamayo	Far	1	3	Small	High	0	0	0	0
5	41	AC-399	Los tres puentes	Far	2	4	Small	Med	0	1	0	0
5	44	AC-406	Placer Bonito	Med	3	3	Small	Med	0	1	0	1
5	45	AC-408	Nava	Far	3	6	Small	Med	0	0	0	1
5	4	AC-030	Sonador	Med	4	2	Big	Med	0	0	1	1
5	16	AC-177	Maimón I	Med	4	2	Small	Med	0	0	1	1
5	22	AC-312	Yabacoa	Med	4	2	Med	Med	0	0	1	1
5	34	AC-361	Los Mulos	Med	4	2	Small	Med	0	0	1	1
6	6	AC-041	Maizal	Far	1	2	Med	Med	0	0	1	1
6	28	AC-329	Esperanza II	Far	1	2	Med	Med	0	0	1	0
6	46	AC-410	La Barranquita	Far	1	2	Small	Med	0	0	1	0
6	23	AC-313	Amina I	Far	2	2	Big	Med	0	0	1	0
6	25	AC-316	Boca de Mao	Far	2	2	Small	Med	0	0	1	0
6	26	AC-325	Amina II	Far	2	2	Big	Med	0	0	1	0
6	31	AC-336	Esperanza III	Far	2	3	Med	Med	0	0	1	0
6	32	AC-351	Esperanza IV	Far	2	2	Med	Med	0	0	1	0
6	37	AC-367	Esperanza V	Far	2	2	Small	Med	0	0	1	0
7	9	AC-047	Cristóbal	Far	1	4	Big	Med	0	0	0	1
7	3	AC-027	El Peñón	Far	3	2	Big	Med	1	0	0	0
8	11	AC-122	Rio Verde	Near	4	3	Big	High	0	0	0	1
8	50	AC-427	Carmen Celia Balaguer	Near	4	6	Big	High	0	0	0	0
9	8	AC-045	Esperanza	Far	1	2	Big	Med	0	0	1	0
9	13	AC-154	Banegas	Far	2	2	Big	Med	0	0	1	1
9	2	AC-016	Cumayasa	Med	2	3	Big	Med	0	1	0	0
9	5	AC-038	Las Guaranas	Med	3	3	Big	Med	0	0	0	0
9	7	AC-042	Piedra Blanca	Med	4	2	Big	Med	0	0	1	1
10	1	AC-013	Cabreto	Near	3	5	Big	Low	1	0	0	0
10	15	AC-168	Duqueza	Near	3	5	Med	Low	0	0	0	0
10	18	AC-198	Hato Nuevo	Near	3	5	Small	Low	0	1	0	0
10	21	AC-309	Caballona	Near	3	5	Small	Low	0	0	0	0

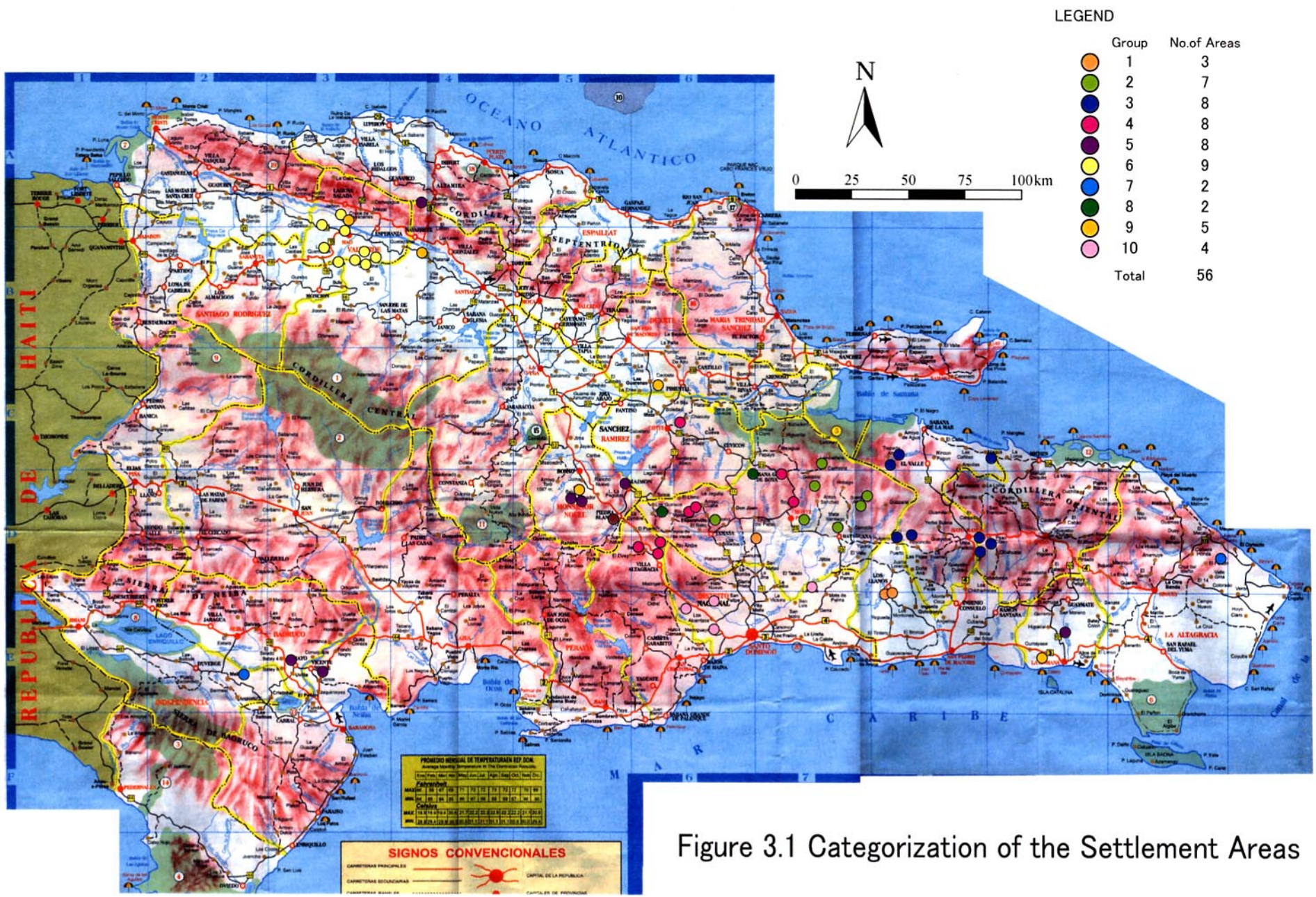


Figure 3.1 Categorization of the Settlement Areas

3.3 Selection of Group Representative Settlements

As a result of the categorization discussed in the previous sections, it has been proposed that the settlements be grouped into ten. This section will attempt to select a representative settlement from each group. These representative settlements will be subjected to field survey where household surveys are conducted, and data are collected as the basis for formulating the Master Plan. Special attention should be considered in choosing representatives since they will be used as models to determine the direction of development for each categorized group.

Criteria for selection are the following seven.

1) Agricultural conditions such as climate and land.

2) Artificial conditions such as irrigation

3) Evaluation of productivity

4) Local culture

5) Stage of economic development

6) Institutional conditions such as land ownership

7) Significance as representatives for integrated rural development

Using the results of productivity analysis similar to what is described in Section 3.1, the selection has been cautiously made not to put too many in one side of the quadrant, high productivity group or low productivity group. Local culture, stage of economic development, and land ownership often measure the same subject as agricultural conditions, but representatives are selected from as many regions as possible (refer to Table 3.5).

Table 3.5 Representative Settlement Areas by Group

No.	Settlement No.	Name	Region	HQ No.	Province	Municipality	Group
12	AC-145	El Puerto	Cibao	9	San Pedro de Macorís	San José de los Llanos	1
30	AC-335	San Marcos	Sur Este	5	San Pedro de Macorís	San José de los Llanos	1
56	**Luisa**	**La Luisa**	**Sur Este**	**13**	**Monte Plata**	**Monte Plata**	**1**
29	AC-333	Mata Santiago I	Sur Este	13	Monte Plata	Bayaguana	2
38	AC-374	Mata Santiago II	Sur Este	13	Monte Plata	Bayaguana	2
40	**AC-378**	**El Dean II**	**Sur Este**	**13**	**Monte Plata**	**Monte Plata**	**2**
42	AC-400	Buena Vista	Sur Este	13	Monte Plata	Monte Plata	2
49	AC-426	Mata Santiago III	Sur Este	13	Monte Plata	Monte Plata	2
51	AC-428	San Vicente	Sur Este	13	Monte Plata	Monte Plata	2
53	AC-435	Juan Sanchez	Sur Este	13	Monte Plata	Monte Plata	2
10	AC-056	Caño Hondo	Sur Este	5	Hato Mayor	Sabana de la Mar	3
14	AC-161	Yanigua	Sur Este	5	Hato Mayor	Sab. De la Mar	3
17	AC-193	Ondina	Sur Este	5	Hato Mayor	Hato Mayor	3
20	AC-307	La Tranca	Sur Este	5	San Pedro de Macorís	San Pedro de Macorís	3
33	AC-355	El Capote	Sur Este	5	Hato Mayor	Hato Mayor	3
36	AC-366	Rio Chiquito	Sur Este	5	Hato Mayor	El Valle	3
43	**AC-403**	**Los Hatillos**	**Sur Este**	**5**	**Hato Mayor**	**Hato Mayor**	**3**
52	AC-430	Los Hatillos II	Sur Este	5	Monte Plata	Hato Mayor	3
19	AC-222	Payabo	Sur Este	13	Monte Plata	Sab. Grande de Boyá	4
24	**AC-314**	**Catarey**	**Sur Este**	**1**	**San Cristóbal**	**Villa Altagracia**	**4**
27	AC-328	Villa Altagracia	Sur Este	1	San Cristóbal	Villa Altagracia	4
35	AC-363	El Cercadillo	Cibao	11	Sánchez Ramírez	Cotuí	4
39	AC-376	La Altagracia	Sur Este	13	Monte Plata	Sabana Grande	4
47	AC-420	Pino Herrado	Sur Este	1	San Cristóbal	Villa Altagracia	4
54	AC-458	Don Juan I	Sur Este	13	Monte Plata	Yamasá	4
55	AC-459	Don Juan II	Sur Este	13	Monte Plata	Yamasá	4
4	AC-030	Sonador	Cibao	10	Monseñor Nouel	Bonao	5
16	AC-177	Maimón I	Cibao	10	Monseñor Nouel	Maimón	5
22	AC-312	Yabacoa	Cibao	10	Monseñor Nouel	Bonao	5
34	AC-361	Los Mulos	Cibao	10	Monseñor Nouel	Bonao	5
41	AC-399	Los tres puentes	Sur Oeste	6	Barahona	Barahona	5
44	AC-406	Placer Bonito	Sur Este	5	La Romana	La Romana	5
45	AC-408	Nava	Cibao	8	Puerto Plata	Puerto Plata	5
48	**AC-422**	**Tamayo**	**Sur Oeste**	**6**	**Bahoruco**	**Tamayo**	**5**
6	AC-041	Maizal	Cibao	8	Valverde	Esperanza	6
23	AC-313	Amina I	Cibao	8	Valverde	Esperanza	6
25	AC-316	Boca de Mao	Cibao	9	Valverde	Esperanza	6
26	AC-325	Amina II	Cibao	8	Valverde	Mao	6
28	AC-329	Esperanza II	Cibao	8	Valverde	Esperanza	6
31	**AC-336**	**Esperanza III**	**Cibao**	**8**	**Valverde**	**Esperanza**	**6**
32	AC-351	Esperanza IV	Cibao	8	Valverde	Esperanza	6
37	AC-367	Esperanza V	Cibao	8	Valverde	Mao	6
46	AC-410	La Barranquita	Cibao	8	Valverde	Mao	6
3	**AC-027**	**El Peñón**	**Sur Este**	**5**	**La Altagracia**	**Higuey**	**7**
9	AC-047	Cristóbal	Sur Oeste	6	Independencia	Duvergé	7
11	AC-122	Rio Verde	Sur Este	13	Monte Plata	Yamasá	8
50	**AC-427**	**Carmen Celia Balaguer**	**Sur Este**	**13**	**Monte Plata**	**Sabana Grande de Boyá**	**8**
2	**AC-016**	**Cumayasa**	**Sur Este**	**5**	**La Romana**	**La Romana**	**9**
5	AC-038	Las Guaranas	Cibao	2	Duarte	San Fco. Macorís	9
7	AC-042	Piedra Blanca	Cibao	10	Monseñor Nouel	Bonao	9
8	AC-045	Esperanza	Cibao	8	Valverde	Esperanza	9
13	AC-154	Banegas	Cibao	9	Santiago	Santiago	9
1	AC-013	Cabreto	Sur Este	1	Distrito Nacional	Distrito Nacional	10
15	AC-168	Duqueza	Sur Este	1	Distrito Nacional	Distrito Nacional	10
18	**AC-198**	**Hato Nuevo**	**Sur Este**	**1**	**Distrito Nacional**	**Distrito Nacional**	**10**
21	AC-309	Caballona	Sur Este	1	Distrito Nacional	Distrito Nacional	10

Note: The settlement areas in bold figures show the representative areas in each group of classification. The settlement areas underlined show the selected model areas.

3.4 Selection of Model Areas and Their Placement of Different Categories

The three areas of AC-422 Tamayo, AC-336 Esperanza III and AC-403 Los Hatillos I were selected from representative areas of ten groups as model areas together with La Luisa area in the meeting with the inter-institutional committee. The criteria I selection of model areas are as follows;

- High priority areas shall be selected in terms of the development in the former sugarcane plantation areas,
- Typical model areas shall be selected as model areas for the formulation of master plan.

In order to select the typical model areas among the representative settlement areas of the groups, the agricultural factors of climate and land are considered, which correspond to annual rainfall and land class in SEA land classification as follows (refer to Table 3.6);

1. Groups of high precipitation (humid climate) areas
   - Limited arable or non arable lands are mostly included : **G1**,G4,G10
   - Land suited only to pasture and forest are mostly included : G2,**G3**,G8
2. Groups of low precipitation (dry climate) areas
   - Moderately arable land : **G6**,G9
   - Limited arable land : **G5**,G7

Note: The groups in bold letters are the selected four groups.

Because the scale of SEA land classification is too small to identify the land class in each settlement areas, not only the identified land class shows just general class. The four model areas are the representative of the selected groups, which are also selected as high priority areas by IAD and they area. The four model areas are placed as the models of different categories in term of two major agricultural conditions. Therefore, it could be explained as the four model areas in the formulation of master plan.

Table 3.6 Reclassification of Representative Groups and Selection of Model Areas

High Precipitation (Range of Annual Rainfall:3-4)			Low Precipitation (Range of Annual Rainfall:1-2)		
Group	Group/Representative Settlement Area	Land Class (SEA)	Group	Group/Representative Settlement Area	Land Class (SEA)
A	**G1** : 056 La Luisa	5	C	**G6** : 336 Esperanza III	2-3
	G4 : 314 Catarey	2-6		G9 : 016 Cumayasa	2-3
	G10: 198 Hato Nuevo	5			
B	G2 : 378 El Dean	7	D	**G5** : 422 Tamayo	2-4
	G3 :403 Los Hatillos I	7		G7 : 016 El Peñon	2-4
	G8:427 Carmen Celia Balaguer	3-6			

Note: The settlement areas in bold figures show the selected model areas.

CHAPTER 4

Master Plan

CHAPTER 4 MASTER PLAN

4.1 Constraints of Development

The development constraints of the former sugarcane plantation areas are identified as shown below.

1) Worse Conditions of Distributed Lands

Recently the size of distributed lands has decreased from 100 tareas (6ha) to 20-30 tareas (1.3 to 1.9ha). Also lands distributed to the settlers are marginal lands not very suitable for cultivation. CEA transferred large areas to IAD but these were never cultivated with sugarcane since the soils were not unsuitable for sugarcane cropping, and were instead used as pastureland for raising draft animals for sugar production. These lands are located in hilly and sloping areas, and have been deteriorated due to soil erosion, hence, have low productivity. These conditions of distributed land differ from settlement to settlement and even within the same settlement area.

2) Inadequate Survey on Efficient Land Use

Very limited technical support is provided to the farmers for the utilization of the distributed land which have the above land conditions. No soil and land classification survey was done for the settlement areas.

3) Limited Development of Agricultural Infrastructure

Generally the distributed land in the former sugarcane plantation area has minimal infrastructure like roads. The inadequate agricultural infrastructure for irrigation, drainage, farm roads and others causes unstable farm management.

4) Limited Development on Social Infrastructure

In general, social infrastructure facilities and services such as domestic water supply, primary health care, basic education, transportation, rural electrification, communication, etc. are not properly prepared.

5) Weak Social Bonds Resulted from Various Settlers' Background

There are three types of settlement in the former sugarcane plantation areas as follows.

- Settlers were selected from the communities near the settlement area.
- Settlers were selected from different communities that are located far from the settlement area.
- Settlers were relocated from other areas due to the establishment of national parks.

Particularly, in the settlements where the settlers were selected from different remote communities, the farmers have limited motivation on participation for self-development group.

6) Most of the settlers worked for CEA sugarcane plantation as laborers who had no experiences and

technology on farm management with limited literacy as well as financial capacity.

4.2 Strategy of Development

Under these conditions of the former sugarcane plantation areas, there is no single solution to solve the various problems in the area. Therefore it is proposed to apply an integrated rural development approach, which is composed of two program approaches, namely "approach on income generation" and "approach on improvement of living conditions". The integrated rural development shall have the following three phases of development in terms of time period.

1. Short-term development plan (first five years) : preparatory development on eradication of poverty
2. Medium-term development plan (next five years) : alleviation of rural poverty
3. Long-term development plan (succeeding five years) : establishment of the basis of sustainable self-development

It is proposed that the farmers in the former sugarcane plantation areas will pursue self-development. Presently the farmers have inadequate capacity for self-development. Although most farmers are strongly dependent on IAD and other institutions for their community development, the government organizations including IAD have a few experiences on the rural development. For the integrated rural development, all stakeholders including farmers' groups have to participate in the project planning, implementation, monitoring and evaluation, seriously. Therefore the master plan for integrated rural development includes not only the formulation of development plans, but also one more component "capacity building of the stakeholders for implementation of development plans". The details of "capacity building of stakeholder for implementation of development plans" are described in the Chapter 5 of this report, but the capacity building of the stakeholders has been sought in the course of various implementation stages of Pilot projects during the whole study period.

4.3 Framework of the Master Plan for the Former Sugarcane Plantation Area

For the formulation of the development framework, the overall goal is set as "Settlers have stable life with necessary and sufficient living conditions" and the master plan framework for the former sugarcane plantation areas is tabulated as shown below. Each program approach means the measure to attain the related targets and goals, which would contribute to improve higher goals. Generally, each one includes various project components. (See Table 4.1.)

Table 4.1 Framework for the Master Plan for the Former Sugarcane Plantation Areas

Overall Goal	Program Target	Program Approach	
Settlers have stable life with necessary and sufficient living conditions.	1. Settlers increase their incomes.	1-1	Development of Agricultural Infrastructure
		1-2	Improvement of Farmland
		1-3	Raising Crop Production Efficiency
		1-4	Raising Livestock Production Efficiency
		1-5	Improvement of Agricultural Marketing and Processing
		1-6	Development of Micro-enterprise
	2. Settlers improve living conditions.	2-1	Improvement of Domestic Water Supply
		2-2	Improvement of Public Health
		2-3	Improvement of Education
		2-4	Improvement of Roads and Transportation
		2-5	Improvement of Electrification and Telecommunication
		2-6	Improvement of Culture and Community Center
		2-7	Improvement of Housing

As the above table indicated, the master plan consists of thirteen kinds of programs, six programs for income generation and seven programs for living condition improvement. The increase of income will be achieved through increasing of both farm and non-farm incomes. The living condition improvement will be mainly attained by development of various public services. A combination of these programs will be properly selected in different categories of settlements in the different time scales: short, medium and long terms (See Table 4.2).

The development framework does not mean that all the same program approaches/components are always applicable to the development of each settlement area. It is necessary to choose applicable program approaches/components, which shall be identified through formulation of area development plans with participatory planning by all stakeholders. (See Figure 4.1.)

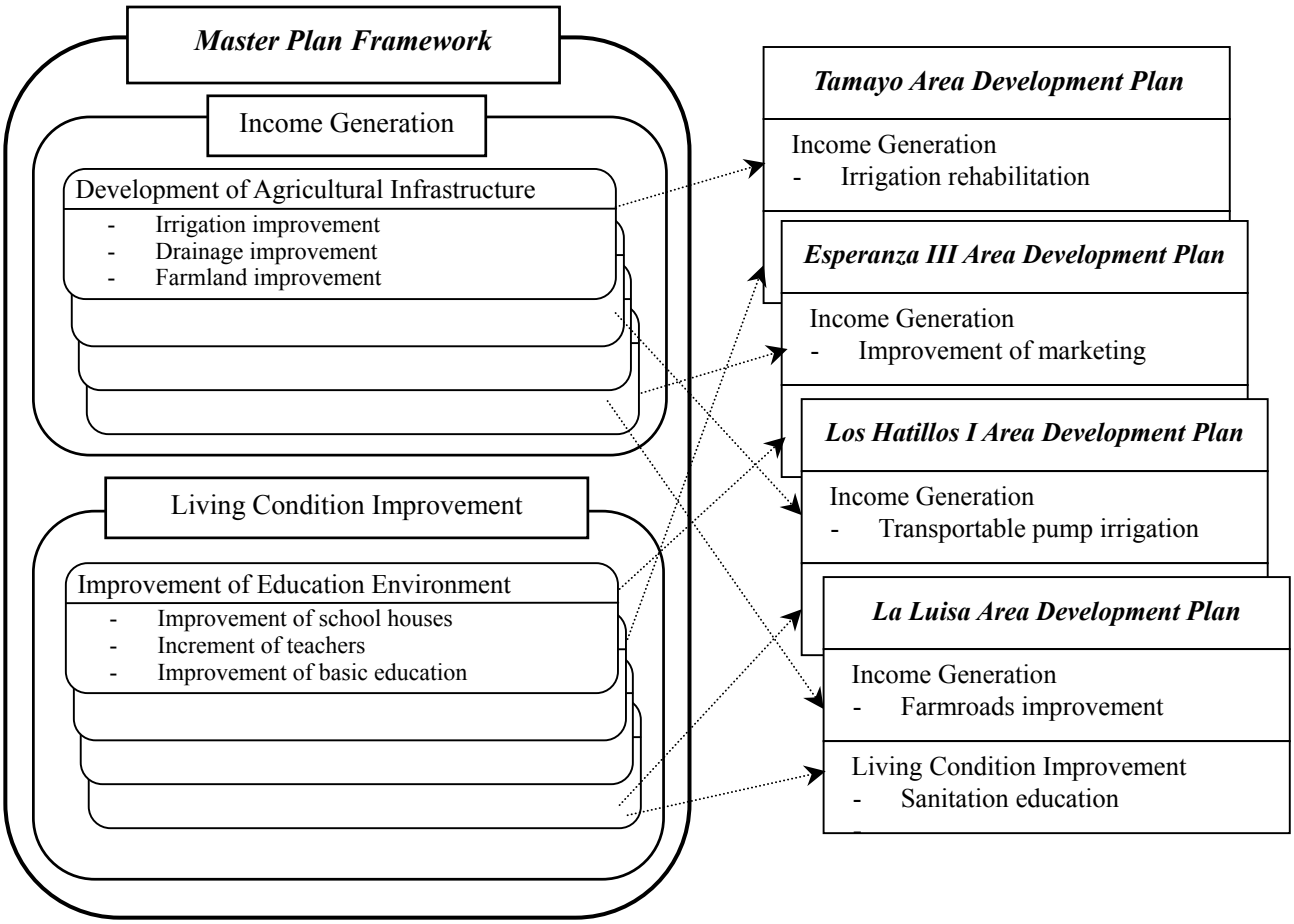


Figure 4.1 Relation between the Master Plan Framework and Area Development Plan

Each program approach is summarized hereinafter.

Target 1: Settlers increase their incomes

1-1 Development of Agricultural Infrastructure

The development of agricultural infrastructures like irrigation/drainage facilities and farm roads plays significant roles to increase the agricultural production and also to raise production efficiency. According to the settlement conditions on possibilities of the agricultural infrastructure development (for instance, the terrain, the existence of water resources, etc.), the kind and the level of development varies. If the settlement area has potentials of development of inland fishery, the infrastructure for inland fishery can be developed.

Examples: Development and rehabilitation of irrigation and drainage facilities, and improvement of farm roads

1-2 Improvement of Farmland

To raise land use efficiency, data preparation on efficient land use based on soil survey is recommended. Land

improvement like land leveling in the gravity irrigation area, elimination of gravel in the farmland, sub-soiling in the orchard is also important.

Examples: Land use improvement based on soil survey, farm lands improvement by drainage improvement at farm plot level and land leveling in gravity irrigation area.

1-3 Raising Crop Production Efficiency

To improve crop productivity with high quality, agricultural extension should be strengthened to provide appropriate technology with dissemination of good quality seeds and seedlings according to production conditions.

Examples: Training of IAD technical officers and farmers' leaders, coordination with other related agencies like SEA, study tour of farmers' groups to advanced areas, introduction of group activity in agricultural machinery

1-4 Raising Livestock Production Efficiency

To improve livestock farming, appropriate production technology should be extended together with quality seeds of improved pasture varieties and better livestock breeds. IAD technical officers and leaders of farmers' groups should be trained to extend market-oriented livestock production.

Examples: Training of IAD technical officers and farmers' leaders, introduction of quality seeds of improved pasture varieties and better livestock breeds

1-5 Improvement of Agricultural Marketing and Processing

Presently middlemen dominate agricultural marketing. With assistance to settlers in group marketing activities, the marketing of product could be improved to increase farmers' income. Also more value could be added to farm produce to increase farmers' income through introduction of agricultural processing.

Examples: Assistance for group marketing activities, development of appropriate processing technologies for farm produce

1-6 Development of Micro-enterprise

To increase farm income not only from farming but also non-farming activities, like increase of non-farm employment opportunities through development of micro-enterprise.

Example: Development of micro-enterprise through vocational training and assistance for creation of micro-enterprises.

Target 2: Settlers improve living conditions

2-1 Improvement of Domestic Water Supply

To secure basic human needs, settlers should be provided with safe drinking water and other domestic water needs.

Examples: Improvement of hand dug-wells. Construction of deepwells and financial support of settlers to develop staged water supply system development.

2-2 Improvement of Public Health

Health and sanitation conditions shall be improved through improvement of public health and sanitation facilities.

Examples: Enhancement of health promotion activities by the community (ex. improvement of water use), improvement of facilities, equipment and materials in rural clinics, and improvement of popular pharmacies

2-3 Improvement of Education

The full development of basic education and adult education, and support to the education of settlers' children shall be improved through development of facilities like day care center, school buildings and sport parks.

Example: Assistance in the expansion of day care center, primary school building and sport parks, Assistance in adult education, and support to the attendance to medium education.

2-4 Improvement of Roads and Transportation

Roads of community and access from trunk roads shall be improved together with transportation to improve rural life and traffic safety.

Examples: Improvement of community roads and their maintenance, and installment of roads for school and safety facilities.

2-5 Improvement of Electrification and Telecommunication

The private sector plays a primary role in the distribution of electricity and telecommunication, as it is not BHN. Financial sustainability should be secured or the beneficiaries should pay the cost. However in order to secure minimum communication means, at least one public telephone should be provided in each village.

Examples: Extension of electric grid with payment of electricity cost, installment of home solar energy system, extension of public telephone system, and spread of internet connection.

2-6 Improvement of Culture and Community Center

Culture and community activities together with sport activities of youth are also important to the overall improvement of life, although it is difficult for the public sector to provide the facilities.

Example: Provision and improvement of community center and sport facilities.

2-7 Improvement of Housing

It is proposed that the housing conditions shall be developed to improve rural life of settlers privately, not by public sector through promotion of mutual aid system.

Example: Promotion of mutual aid system for improvement of housing.

4.4 Grouping of Settlements for the Master Plan

(1) Program Approach on Income Generation

Except for the development of micro-enterprise sub-program, development plans for this program approach are formulated by four groups as shown below. The groups are categorized by the two basic factors for agriculture, climate and land conditions. The characteristics of each group are indicated in the table below.

Group of Settlements	Sub-group	Characteristics of Group
A	G1,G4 and G10	Limited arable land with high precipitation. Near capital or not far from the capital
B	G2,G3 and G8	Suitable for pasture and forest with high precipitation.
C	G6 and G9	Moderately arable with low precipitation.
D	G5 and G7	Limited arable land with low precipitation. Far from the capital.

For the two programs, raising livestock production efficiency and improvement of agricultural marketing and processing, development plans are formulated as a whole not individually because the above categorization is not very suitable for them.

(2) Program Approach on Improvement of Living Conditions

For this program approach, the development plans are classified into the following 2 categories based on travel time going to the major city (population of over 50,000) by truck.

- Neighboring village: under 30 minutes to reach a city with population of over 50,000 by truck (Representative settlements: La Luisa (G1), Esperanza (Damajagua) (G6), Los Hatillos (G3), Hato Nuevo (G10), Catarey(G4))
- Remote village: more than 30 minutes to reach a city with population of over 50,000 by truck (Tamayo (Los Conuquitos) (G5), Los Mulos (G5), El Dean (G2), Cumayasa (G9), El Peñon (G7), Carmen Celia Balaguer (G8))

Development of micro-enterprise sub-program, one of the income generation program approaches, is also formulated under this categorization.

Table 4.2 Master Plan and Area Development Plan

1. Program Approach on Income Generation

Programs		Projects	Group	A			B			C			D		
			Sub-group	1,4,10			2,3,8			6,9			5,7		
			Model Areas	AC-471			AC-403			AC-336			AC-422		
				La Luisa			Los Hatillos I			Esperanza III			Tamayo		
			Characteristics of the Group	High precipitation with moderate to low land class			High precipitation with low land class			Low precipitation with high to moderate land class			Low precipitation with low land class		
			Development Phase	Short	Med.	Long	Short	Med.	Long	Short	Med.	Long	Short	Med.	Long
1-1	Development of Agricultural Infrastructure	(1) Improvement of existing canal system								○	○		●	○	○
		(2) Construction of irrigation system					○	○	○				○	○	○
		(3) Training on O&M of irrigation facilities	○	○	○								○		
		(4) Improvement of drainage system								○	○	○	○	○	○
		(5) Improvement of farm roads	●			○	○		○	○		○	○		
1-2	Improvement of Farmland	(1) Land reclamation							○	○		○	○		
		(2) Improvement of farm land drainage	○	○		○	○								
		(3) Farmland conservation				○	○		○	○		○	○		
1-3	Raising Crop Production Efficiency	(1) Strengthening of technical services in IAD	○	○		○	○		○	○		○	○		
		(2) Provision of technical services to settlers	○	○	○	○	○	○	○	○	○	○	○	○	○
		(3) Selection of proper crops according to land conditions	○			●			○			○			
		(4) Better management of irrigation water			○			○	○	○		○	○		
1-4	Raising Livestock Production Efficiency	(1) Strengthening of technical services in IAD	○	○		○	○		○	○		○	○		
		(2) Pasture improvement	○	○		○	○		○	○		○	○		
		(3) Facility development and machinery services, and assistance to credit	○	○		○	○		○	○		○	○		
		(4) Introduction of new breeds			○			○			○				○
1-5	Improvement of Agricultural Marketing and Processing	(1) Strengthening of technical services in IAD	○	○		○	○		○	○		○	○		
		(2) Provision of workshops/seminars on marketing	○	○		○	○		●	○		○	○		
		(3) Promotion of cooperative works		○	○		○	○		○	○		○	○	○
		(4) Provision of workshops/seminars on processing		○	○		○	○		○	○		○	○	○

Programs		Projects	Distance (more than 30 min. to city with 50,000 pop.)			Distance (less than 30 min. to city with 50,000 pop.)		
			Short	Med.	Long	Short	Med.	Long
1-6	Development of Micro-enterprise	(1) Vocational training	○	○	○	●	○	○
		(2) Establishment of micro enterprises	●	○	○	●	○	○

Note: ● - Pilot Project, ○ – Projects for each term

2. Program Approach on Improvement of Living Conditions

Programs		Projects	Distance (more than 30 min. to city with 50,000 pop.)			Distance (less than 30 min. to city with 50,000 pop.)		
			Short	Med.	Long	Short	Med.	Long
2-1	Improvement of Domestic Water Supply	(1) Promotion and establishment of water associations	○	○	○	○	○	○
		(2) Improvement of hand-dug wells	○			○	○	
		(3) Provision of deep wells	●	○	○	○	○	○
		(4) Preparation of water supply system			○			
2-2	Improvement of Public Health	(1) Establishment and improvement of rural clinic	○	○	○			
		(2) Periodic medical visitation/consultation				○	○	○
		(3) Provision of supply of essential medicines	○	○	○	○	○	○
		(4) Health promotion activities	○	○	○	○	○	○
		(5) Health promotion in school	○	○	○	○	○	○
		(6) Improvement of water use	●	○	○	○	○	○
		(7) Spread of latrines	○			○	○	
		(8) Promotion of flush toilet with septic tank	○	○	○			○
		(9) Collection and sanitary disposal service of waste	○	○	○			○
2-3	Improvement of Education	(1) Increase in classes of basic education	○	○	○	○	○	○
		(2) Improvement in materials for basic education	○	○	○	○	○	○
		(3) Promotion of mutual edification of teachers among school	○	○	○	○	○	○
		(4) Support for attendance to basic education				○	○	○
		(5) Invigoration of PTA activities	○	○	○	○	○	○
		(6) Support for attendance to medium education	○	○		○	○	○
		(7) Expansion and improvement of medium education	○	○	○			○
		(8) Improvement of adult education	○	○	○	○	○	○
2-4	Improvement of Roads and Transportation	(1) Improvement of community roads	●	○	○	○	○	○
		(2) Improvement of access roads	○	○	○	○	○	○
		(3) Improvement of trunk roads	○	○	○			○
		(4) Strengthening of traffic safety	○	○	○	○	○	○
		(5) Strengthening of public transport, taxi service	○	○	○			○
2-5	Improvement of Electrification and Telecommunication	(1) Extension of electricity grid	○	○	○			○
		(2) Promotion of home solar system	○			○	○	
		(3) Spread of public telephone at each village	○			○		
		(4) Extension of telephone system		○	○			
		(5) Spread of mobile phone system	○	○	○		○	○
		(6) Strengthening of broadcast and information sharing	○			○		
		(7) Spread of internet connection			○			
2-6	Improvement of Culture and Community Center	(4) Provision and improvement of sports facilities			○			
		(5) Provision and improvement of community center	○	○	○			○
		(6) Provision and improvement of park		○	○			○
		(7) Provision of library			○			
2-7	Improvement of Housing Conditions	(1) Promotion of mutual aid system for house improvement	○	○	○	○	○	○
		(2) Improvement of carpentry training	○	○	○	○	○	○

Note: ● - Pilot Project, ○ – Projects for each term

4.5 Program Approach on Income Generation by Group

In the program approach of income generation, the priority shall be given to increase farm income. Agricultural development in the distributed land needs the programs of agricultural infrastructure development and improvement, raising crop production efficiency, livestock production efficiency and improvement of agricultural marketing and processing. However, there are many settlers with unproductive lands and the less land were distributed in the recent land reform. Efficient use of labor including women labor becomes necessary to increase family income in rural areas. The program approach income generation shall include the development of micro-enterprise to increase employment opportunities.

4.5.1 Agricultural Infrastructure Development and Improvement of Farm Land

(1) Present Conditions

The master plan on agricultural infrastructure development and improvement of land use efficiency is formulated for four groups as follows.

1) Group A

The settlement areas, which belong to Group A are located in the central and east regions. In these ares, there are a few irrigation systems because of hilly terrain and scarcity of water resources. The settlers grow crops without irrigation or utilize the distributed land as pasture. However, irrigation is needed especially during dry seasons for the settlers that grow such crops as paddy rice and vegetables especially in areas where the annual rainfall is less than 1,500 mm. The land of group A has moderate to low land class, IV to V classes in the SEA land classification.

2) Group B

The settlements of group B are mostly located in the more inner areas of the central and east regions, which area closed to mountainous land. The Type B has lower class than class of VI as compared with the land of Type A, land lower than class IV. It was observed that many settlers of Group B cultivate the land with thin topsoil in the hilly sloping areas. The soils have low productivity due to soil erosion. Generally the farmland of the Group B would require drainage improvement to get high production.

3) Group C

The annual rainfall is less than 1,000mm in the settlements of C and D Groups, where irrigation is indispensable to grow crops. The Group C is prevvalen in the areas of the former Esperanza sugar factory or the lands located along the seashore in the east region. Esperanza III, which is one of settlements in the Group C was once under the former Esperanza sugar factory area. The land is a part of irrigation service area of “the National Yaque Del Norte Irrigation System”. About 94 thousand ha (about 150 thousand tareas) of the Yaque Del Norte Irrigation System has the irrigation water source supplied by the reservoir in

the vicinity of Santiago city. The upstream irrigation systems like Esperanza III area have sufficient irrigation water. However, the improvement of water management at on-farm level is required as it is in other national irrigation systems to supply enough irrigation water in the downstream areas. "The National Water Management Improvement Project", which is funded by the Banco Interamericano de Desarollo (BID), are implemented by the Utah University for 40 irrigation sub-systems (about 80 thousand ha, about 1,270 thousand tareas) until year of 2004. The Esperanza III settlement is included in the national water management improvement project area. Because the National Water Management Improvement Project does not cover the whole national irrigation system, the improvement of the nation-wide irrigation systems is commenced by INDRHI in March 2002 with a technical cooperation project by Japanese government.

In the settlement areas along seashore in the east region, where there is no water source for river irrigation system, the farmers have unstable crop production. Only few farmers irrigate the land by privately digging open wells or deep wells. The land of Group C is classified into moderate land class (higher than class III) in SEA land classification. Most of irrigated land of the Group C leaves room for increase of irrigation efficiency as well as for increase in crop production yield with farmland improvement by land leveling. Some farmland in the hilly area has an obstacle to cultivate the land due to stone and gravel in the topsoil.

4) Group D

Most of the Group D settlements are distributed in the areas covered by the Barahona sugar factory, while some settlements are included in the former Esperanza sugar factory in the former time. "The National Yaque Del Norte Irrigation System" covers the settlement areas of the Barahona sugar factory. The National Yaque Del Sur Irrigation System has about 36 thousand ha (about 573 thousand tareas) of irrigation service area, having two irrigation systems of Barahona irrigation system and YSURA irrigation system area in Azua area. Water shortage is common in the Barahona system due to inefficient water management especially at on-farm farm level. For instance, in the Tamayo model area, which is the downstream of one sub-system in Barahona, the farmers suffer from severe water shortage. In that area crops are grown in only less than 50 % of the settlement area due to poor irrigation systems at on-farm level with very unsustainable production of crops. There are two settlements in the surrounding areas of Tamayo model area. These settlements have similar irrigation conditions as Tamayo area. Moreover, the soil salinity worsens crop production, which requires sub-surface drainage system.

The land classes of the Group D are lower than class IV, inferior land to the land of Type C. There are many settlers who cannot cultivate the land with crops and have no way except for using the land as pasture. One settlement, the El Peñón, has very thin soils, and is devoted to pasture without irrigation. In the settlements like Tamayo area, which are of alluvial soils in the elevated areas, some farms can not cultivate their lands due to stone and gravel in the topsoil.

(2) Development Strategies

Generally, agricultural infrastructure development would include improvement and/or expansion of existing irrigation system, and construction of new irrigation system according to the conditions of climate and land in each settlement. It shall include also the improvement of water management accompanied with development of on-farm irrigation system and operation and management, the improvement of drainage system and the development of farm road with the purpose of the access to the plots as well as raising efficiency in transportation of farm inputs and outputs. Specifically, the Group A and Group B shall have drainage improvement to raise land use efficiency and also land conservation. For Group C and Group D, irrigation improvement shall be made together with raising irrigation efficiency through improvement of water management and leveling of farmland. In such settlements as AC-399 Los Tres Puentes, adjacent to Tamayo area, the water logging shall be controlled with provision of sub-surface drainage system.

(3) Development Plan

1) Group A

For Group A areas, agricultural infrastructure shall have a priority in the development / improvement of farm roads, for betterment of access to plots as well as transportation of farm inputs and outputs and also for drainage improvement. Generally, there is no irrigation system in the settlements of this group. However in the settlements, which have existing irrigation like AC-198, Hato Nuevo, the improvement of main and on-farm irrigation system is required together with rehabilitation of irrigation systems and also improvement of water management. Moreover, the improvement of drainage system at on-farm level is required to have stable crop production and to diversify the crops in these existing irrigation areas. In settlements with hilly and sloping areas, farmland improvement shall have soil conservation measures to minimize soil erosion and improvement of drainage conditions at on-farm level to raise crop production efficiency and also to have sustaining productivity. The plan on agriculture infrastructure development and improvement of farmland in the Group A is shown below.

Table 4.3 Agricultural Infrastructure and Farmland Improvement Program - Group A

Category	Main Implementer	Sub-group		
		G1	G4	G10
1.Agriculture infrastructure				
1) Existing irrigation system	INDRHI	None	None	None
2) Expansion and development of irrigation system	INDRHI	None	Introduction of mini dam, pumping irrigation by deep wells with pipeline system	None
3) Improvement of water management and operation and maintenance	INDRHI	None	None	None
4) Improvement of drainage system	INDRHI IAD	Development of drainage system, dredging of creeks, training of farmers	None	None
5) Development of farm roads	IAD	Newly construction of farm roads	Improvement of existing farm roads	Improvement of existing farm roads
2. Farmland improvement				
1) Improvement of farmland	IAD	None	None	None
2) Drainage improvement of farm plots	IAD	Breaking of sub-soils and hard pans	None	None
3) Conservation of farmland	IAD	Training of farmers on contour cultivation, submergible irrigation, and mulching etc.	None	Training of farmers on contour cultivation, submergible irrigation, and mulching etc.

2) Group B

The proposed plan of agriculture infrastructure development in Group B settlement is almost the same as that of Group A. However, small scale pumping irrigation systems shall be developed in the hilly areas using water from the river in the hilly areas because these settlements cannot be irrigated by gravity system. The sustainable crop production in the hilly areas shall be promoted with soil conservation of the farmland and through drainage improvement of farmland. The plan on agriculture infrastructure development and improvement of farmland in the Group B is shown below.

Table 4.4 Agricultural Infrastructure and Farmland Improvement Program - Group B

Category	Main Implementer	Sub-group		
		G2	G3	G8
1.Agriculture infrastructure				
1) Existing irrigation system	INDRHI	None	None	None
2) Expansion and development of irrigation system	INDRHI	Introduction of mini dam, pumping irrigation by deep wells with pipeline system	Introduction of mini dam, pumping irrigation by deep wells with pipeline system	None
3) Improvement of water management and operation and maintenance	INDRHI	None	None	None
4) Improvement of drainage system	INDRHI IAD	None	None	None
5) Development of farm roads	IAD	Construction of new farm roads	Improvement of existing farm roads	Improvement of existing farm roads
2. Farmland improvement				
1) Improvement of farmland	IAD	None	None	None
2) Drainage improvement of farm plots	IAD	None	Breaking of sub-soils and hard pans	None
3) Conservation of farmland	IAD	None	Training of farmers on contour cultivation, submergible irrigation, and mulching etc.	Training of farmers on contour cultivation, submergible irrigation, and mulching etc.

3) Group C

The development plan for Group C settlement areas shall include the improvement of existing irrigation system, improvement of water management and operation of maintenance of on-farm irrigation system, development of farm roads for intensified cultivation as well as for the improvement of quality of crop production. Farmland improvement shall be made through removal of stones and gravel, land leveling, and sub-surface drainage for efficient land use. The agriculture infrastructure development and improvement of land use efficiency in the Group C are shown below.

Table 4.5 Agricultural Infrastructure and Farmland Improvement Program - Group C

Category	Main Implementer	Sub-group	
		G6	G9
1.Agriculture infrastructure			
1) Existing irrigation system	INDRHI	Rehabilitation of secondary canal	None
2) Expansion and development of irrigation system	INDRHI	None	Introduction of mini dam, pumping irrigation by deep wells with pipeline system
3) Improvement of water management and operation and maintenance	INDRHI	Training of farmers on water management	None
4) Improvement of drainage system	INDRHI IAD	None	None
5) Development of farm roads	IAD	Improvement of existing farm roads	Improvement of existing farm roads
2. Farmland improvement			
1) Improvement of farmland	IAD	Improvement of farmland by removal of stones and gravel	Improvement of farmland by removal of stones and gravel
2) Drainage improvement of farm plots	IAD	None	None
3) Conservation of farmland	IAD	Training of farmers on contour cultivation, submergible irrigation, and mulching etc.	None

4) Group D

The proposed plan for the development of Group D settlements is almost the same as that of the Group C. However, a small-scaleed pumping irrigation systems shall be developed in the highland, like in the elevated farm land of the Tamayo area, since gravity system of irrigation is not possible. The sustainable crop production in the hilly areas shall be promoted with soil conservation of the farmland and drainage conditions of farmland.

Table 4.6 Agricultural Infrastructure and Farmland Improvement Program - Group D

Category	Main Implementer	Sub-Group	
		G5	G7
1. Agriculture infrastructure			
1) Existing irrigation system	INDRHI	Improvement of intake, main canal, diversion works, secondary canals	None
2)Expansion and development Of irrigation system	INDRHI	Introduction of pumping irrigation from main canals	None
3) Improvement of water management and operation and maintenance	INDRHI	Training of farmers on water management	None
4) Improvement of drainage system	INDRHI IAD	Improvement of drainage system and training of farmers on drainage	None
5) Development of farm roads	IAD	Construction of new farm roads and/or improvement of existing farm roads	Improvement of existing farm roads
2. Farmland improvement			
1) Improvement of farmland	IAD	Improvement of farmland by logging bushes, firing logs, removing roots, and removing stones and gravel	None
2) Drainage improvement of farm plots	IAD	None	None
3) Conservation of farmland	IAD	Training of farmers on contour cultivation, submergible irrigation, and mulching etc.	Training of farmers on contour cultivation, submergible irrigation, and mulching etc.

5) The Staged Development of Agriculture Infrastructure and Improvement of Farm Land

Agriculture infrastructure development that includes improvement of existing irrigation systems, improvement of water management in the existing irrigation areas and improvement of farm roads shall be covered under the short and medium term plan. The development of new irrigation project and the improvement of water management at the whole irrigation system level shall be included in the medium to long term plans, while the improvement of farm land shall be covered under short to medium term plans.

4.5.2 Raising Crop Production Efficiency

(1) Present Conditions

IAD has crop production data for most of settlements. In June 2002, the Study Team got the latest data on production (January – December 2000) by settlement from the Statistic Section, IAD. According to the data obtained, the production data are available for 41 settlements out of 55. The analysis presented here is based

on these data including existing area, planted area, harvested area, irrigated area, production, yield and production value by crop. La Luisa is excluded from the analysis since there is neither production nor settlers living there.

In the Study Area, a wide variety of crops including 45 crops are harvested in 2000. Rice has the most harvested area of 63,000 tareas followed by cacao with 56,000 tareas, plantain with 19,000 tareas, cassava with 12,000 tareas and pigeon peas with 10,000 tareas. Since pasture is not included in the data of harvested area, it is impossible to compare the existing area of pasture directly. However, there exists 66,000 tareas of pastureland, which means that pasture represents large areas in the 41 settlements. In terms of production value, black sugarcane (for fresh consumption) earns most with RD$ 1.1 million. The second crop is papaya with RD$ 930,000. These are followed by packed coriander, rice and banana with RD$413,000, RD$ 392,000 and RD$ 285,000, respectively. (Refer to Table 4.7)

Table 4.7 Area Data and Production Value by Crop Type in the Study Area

Crop Type	Area Data (tarea)				Production value (RD$)
	Irrigated area	Planted area	Harvested area	Existing area	
Cereals	49,723	55,915	69,592	18,552	409,760
Roots & tubers	7,032	13,657	16,470	22,220	146,800
Beans	6,021	8,626	11,021	10,300	18,940
Oil crops	-	387	453	3,119	320
Vegetables	4,204	10,379	11,173	10,650	129,910
Fruits	8,828	13,521	34,598	45,896	1,319,740
Export crops	1,790	2,878	61,759	37,458	12,370
Forest products	105	1,600	1,084	27,717	9,060
Others	237	1,194	4,773	7,699	1,477,710
Pasture	752	1,052	-	66,309	-
TOTAL	78,692	109,209	210,923	249,920	3,524,590

Source: Statistic Section, IAD

Present yields of major crops calculated from the data are compared with the data of SEA as shown in Table 4.8.

Table 4.8 Yield Data of Major Crops in the Study Area

Crop	Rice	Sweet potato	Cassava	Pigeon peas	Chili	Cucumber	Banana	Plantain	Papaya	Cacao
Unit (/tarea)	QQ	QQ	QQ	QQ	QQ	QQ	bunches	1000	units	QQ
Settlements in the Study Area, 2000 (41 settlements)										
(1) with irrigation	4.00	9.71	10.92	2.44	8.95	9.19	66.92	2.32	510.03	-
(2) without irrigation	3.69	6.29	6.30	1.29	3.20	8.85	39.96	1.09	393.32	0.87
(3) with irrigation	100%	100%	100%	100%	100%	100%	100%	100%	100%	-
(4) without irrigation	92%	65%	58%	53%	36%	96%	60%	47%	77%	-
SEA national data used to forecast the production in 2001										
(5) with irrigation	4.56	10.08	13.33	2.83	12.71	19.62	70.54	2.66	4.53	-
(6) without irrigation	1.59	8.53	8.64	1.69	7.61	7.11	55.36	1.63	2.83	0.73
(7) with irrigation	88%	96%	82%	86%	70%	47%	95%	87%	-	-
(8) without irrigation	232%	74%	73%	76%	42%	124%	72%	67%	-	119%

Note: (3)=(1)/(1)x100, (4)=(2)/(1)x100, (7)=(1)/(5)x100, (8)=(2)/(6)x100
For the IAD data, the average yields are calculated from at least three settlements.
The unit of papaya yield of IAD is different from that of SEA.
Source: Statistic Section, IAD; Resumen del Plan Operative Sectorial Agropecuario 2001, SEA Jan. 2001

It is clear that all IAD yield data without irrigation were less than those with irrigation. If the data are compared with the SEA data, most of the IAD yields are lesser. In particular, the IAD yield levels without irrigation are mostly less than 75% of SEA data although the yield levels with irrigation range around 90% of SEA yields.

(2) Development Strategies

To improve crop production efficiency, extension of appropriate farming technology is vital. Therefore IAD firstly needs to strengthen its technical support services. At IAD headquarters, Production Department has about 50 staff and there is also many staff in local IAD offices. The department has its 4 major works indicated below.

- To coordinate activities related to technical assistance services
- To arrange necessary resources to develop and execute the activities
- To supervise and control the agricultural program activities under the department
- To execute training for the people with low technology

Under the general director, there are 5 divisions and 12 sections according to specialty as shown in Figure 4.2.

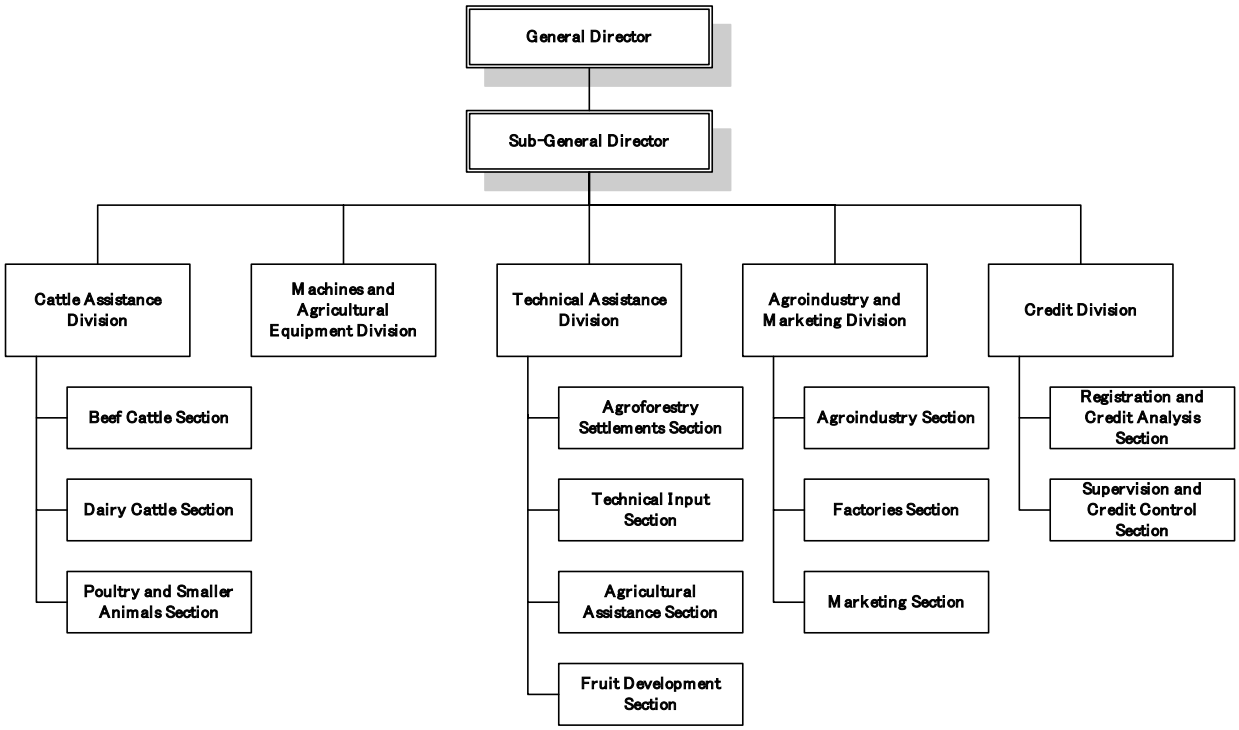


Figure 4.2 Organization Chart of Production Department, IAD

The technical assistance division is the responsible unit for the improvement of crop production efficiency because it mainly works for the provision of agricultural technical support services. If technicians under this

section are provided with sufficient knowledge on various technologies and field situations, the staff can extend/transfer the technology to settlers and also consult them about their problems in the fields. Therefore, IAD needs to reinforce initially this technical assistance division.

The technology/knowledge urgently necessary in the field are shown below.

- Appropriate crop/varieties and land use combinations
- Appropriate crop/varieties cultivation technology
- Efficient use of limited water resources (water saved irrigation)

The first two topics came from the result of field observation. In one of the model areas, Los Hatillos I, IAD distributed land to settlers but, because they came from outside the area, they were not familiar with the conditions of the area and what kinds of crops were suitable for farming in the area. In the end, many farm plots have been fallow or left only for grazing for long time. To solve the problem there, the Study Team has implemented a pilot project to support land use planning. This matter may relate to the fact that large areas are left as pasture land in the Study Area. Moreover some other more subjects such as (a) efficient use of fertilizer and agricultural chemicals and (b) proper management of pests and diseases are also important to improve crop productivity. Together with the strengthening of technicians, workshops, seminars and training courses on farming technologies for farmers should be implemented. Field schools, where technicians go to the field sites to provide training group of farmers, are also used in other countries.

Because the research activities are under the control of SEA, IAD cannot develop specific farming technologies appropriate to specific crops/conditions of settlements by itself. Therefore constant and close contact to SEA and other research institutions is indispensable to obtain up-to-date technologies and exchange information. Moreover IAD should promote settlers to participate in projects by SEA. According to the Plan Operativo 2002, SEA has many special projects from year 2002, including 7 projects with foreign donors and its own 39 projects.

(3) Development Plan

Development plan is formulated based on four categorized groups.

1) Group A

The major land utilization of this group is pasture, which represents 63% of the existing farmland. However, cereal production (30% of the harvested area and common in all sub-groups), fresh sugarcane production (23% of the harvested area and common in sub-group 10) and vegetable production (12% of the harvested area and common in the sub-group 4) are also important. Other crops are also planted in this group areas and fruit and root/tuber crops production are substantial in terms of production value. Irrigation facilities have been developed mainly for paddy rice (the ratio of irrigated area to harvested area is 82%) but not for other crops.

One recommendation for the development of crop production is to take advantage of its proximity to Santo Domingo. Since transportation is rather easy, the group could be a fresh-food (particularly perishable vegetables) supply area for the people living in the capital area. It is necessary to establish a production system that can deal with various market demands of the capital. Although various crops have been already cultivated in each settlement, most production system relies on rainwater except for paddy rice and some fruit trees. In the future, development of small-scale irrigation facilities is necessary for the establishment of stable production system and yield improvement. In addition, income increase through quality improvement is important.

2) Group B

The settlements in this group are distributed in the provinces of Monte Plata and Hato Mayor. Although the distance from the capital is not very far, soil conditions are not so good or terrain is undulated in many settlements. There is relatively abundant rainfall. Due to its rainy climate and undulated land conditions, irrigation facilities were not developed in this group. In the sub-group 8, cacao is the major crop that represents 79% of the harvested area. Cacao occupies 64% of the harvested area even in the whole Group B. Therefore, for the improvement of the crop production in this group; IAD needs to provide assistance for cacao production. The area for forestry product, which does not include cacao, is also quite large (24% of the existing farmland area), but with no production value. Consequently it is necessary to utilize the area for commercial forestry production. Vegetable and rice production is also important, which counts 33% and 16% of the total production value in this Group, respectively.

To increase production efficiency in this group, IAD should take the initiatives to renew the old cacao trees. At present, cacao becomes an important exporting crop mainly for U.S. but replanting of old trees has not been programmed and undertaken. The IAD data indicated that no trees had been re-planted in 2000. Among the 4 cacao projects by SEA, two of are special projects for renovation or rehabilitation of cacao plantations (Producción Material de Siembra y Renovación Cacaotalera, Rehabilitación de Plantaciones Cacaotaleras). IAD should take actions together with the Cacao Department, SEA, to let the settlers participate in these projects.

For the development of this group, IAD should put emphasis on appropriate crop/varieties and land use combinations. Since the land conditions vary significantly in each settlement, proper crop selection is vital to raise production efficiency. Land conservation is also an important component for the farming of this group. Surface soil is precious resource for crop production but it is apt to get lost by abundant rainfall and subsequent soil erosion on sloping lands. Once surface soil is lost, agricultural production considerably decreases and recovery to the original situation is almost impossible.

3) Group C

For the Group C, paddy rice and irrigation water management technologies should be prioritized because

56% of the harvested area corresponds to cereals (rice comprises 95%) and 90% of total paddy rice fields of the total 41 settlements are situated in the settlements of Group C, mostly distributed in Cibao. Therefore this group has a high irrigation rate, 70% to the harvested area of Group C, and in sub-group 6, it reaches to 84%. Generally soil conditions are better than other groups and many settlements have good access to Santiago or Santo Domingo owing to National Highway No. 1. Thus the settlements in this group are relatively in better conditions as compared to the other groups. Yield levels of rice, cassava, corn, cucumber and plantain in the irrigated fields are higher than other groups. Several important subjects for the improvement of production efficiency in this group are as follows.

- Improvement of on-farm irrigation water management
- Appropriate crop selection according to the farmland conditions (mostly with irrigation) and market situations

The first target for the settlements in the group is to catch up the national average yield levels through the provision of technical assistance by IAD or SEA.

4) Group D

For the development of this group, IAD should emphasize fruits and cereal crop cultivation. Because many settlements in this group are located far from Santo Domingo, the largest market in the Dominican Republic, cereals and fruit including export crops (cacao and coffee) are more common than other crops. More than 70% of existing area is planted with these crops according to the data. Also 72% correspond to the cereals and fruit crops based on the harvested area.

As for irrigation, there is a big difference between sub-group 5 and 7. In the settlements of sub-group 5, the ratio of irrigated area to harvested area is only 15% as compared to 52% in the settlements of sub-group 7. Hence, farming technologies to be extended will differ.

For fruit production, SEA launched a 4-year special project called PRODEFRUD (PROGRAMA ESPECIAL DE DESARROLLO DE LA FRUTICULTURA DOMINICANA) last year. It contains technical assistance, credit arrangement and information dissemination. There are also 4 projects for cacao and 5 for coffee. Since IAD has no similar special projects by crop, it should contact related SEA departments and sections to involve settlers within these projects.

4.5.3 Raising Livestock Production Efficiency

(1) Present Conditions

Livestock is an important activity in many settlements. Based on the analysis of the 41 settlements, 21 settlements have existing pastureland (7 in Group A, 3 in Group B, 10 in Group C and 1 in Group D). Among them, there are seven settlements where more than 20% of distributed land is represented by pastureland. The major settlements for livestock are shown in Table 4.9.

Table 4.9 Major Livestock Farming Settlements in the Study Area

Group	Settlement Name	Existing Pasture (tareas) /A	Total Distributed Land (tareas) /B	A/B (%)
C	AC- 325 AMINA II	11,997	16,642	72.1
	AC- 045 ESPERANZA I	3,856	46,945	8.2
	AC- 041 MAIZAL	1,770	8,558	20.7
	AC- 313 AMINA I	1,470	12,195	12.1
	AC- 154 BANEGAS	834	16,184	5.2
	AC- 367 ESPERANZA V	680	3,139	21.7
A	AC- 420 PINO HERRADO	28,265	36,600	77.2
	AC- 013 EL CABRETO	6,669	12,449	53.6
	AC- 314 CATAREY	2,860	11,000	26.0
B	AC- 309 CABALLONA	1,450	2,790	52.0
	AC- 161 YANICUA	4,000	38,462	10.4

Source: Statistic Section, IAD

Apart from the settlements in the table above, there seems to be some other settlements that livestock plays an important role in their economy according to field observation. For instance, the major livelihood of the settlers in AC- 027 EL PENON, which corresponds to Group A, is livestock although there is no official data. In EL PENON, surface soil is very thin and calcareous base rock is frequently observed so that crop production is practically impossible. Also in Los Hatillos I, some of the distributed lands are undulated and irrigation is not available due to its geographical conditions so that settlers use the land for livestock.

Generally, there are three types of livestock production system: grazing, semi-intensive and intensive. Grazing system is traditionally practiced in many areas. Normally animals feed on only natural pasture. In the intensive production system, animals are kept in the stable where farmers feed them. This system needs a high level of investment and also both technology and labor forces. Semi-intensive production system is the intermediate between grazing and intensive systems. The animals feed on improved pasture with some complemented concentrate. Clearly, productivity is low in the grazing system but high in the intensive system. In the Dominican Republic, majority of cattle are kept for dual-purpose, both milk and meat.

(2) Development Strategies

In the IAD settlements, grazing system is most common. Since this system depends upon natural pasture, production fluctuates according to rainfall. For instance, monthly milk production generally increases in April, May and June. This means that the price of milk tends to drop in these months. To improve the productivity of livestock in the settlements, the following measures are recommended to be implemented immediately.

- Pasture improvement
- Facility development and machinery services
- Arrangement of credit
- Introduction of improved breeds

For the implementation of the activities, Cattle Assistance Division under the Production Department, IAD, should take initiatives to make plans and organize activities. Moreover it is desirable to collaborate with SEA since it has 10 livestock related projects from 2002.

(3) Development Plan

Livestock farming is not practiced in all the settlements because many settlements in Cibao are basically suitable for arable farming. In addition, there are no tendencies or characteristics on livestock production according to each Group. As a result, for the livestock productivity improvement, it is reasonable to provide recommendations or measures to be implemented not by the Group but as a whole. One matter that needs attention is that stable electricity supply is indispensable if milk production increases because, without enough storage facilities, increased produce will be spoiled.

As for the pasture improvement, introduction of improved grass varieties (such as Pangola: *Digitaria decumbens*, Bermuda: *Cynodon dactylon*, King Grass: *Pennisetum purpureum* x *Pennisetum americanum* and Merker: *Pennisetum purpureum*, African Star and Melao: *Melinis minutiflora*) is recommended to be implemented as soon as possible. Some can be propagated by stolon so that once the grasses are established, it is easy to extend to the surrounding areas. SEA implements the 4-year nationwide project from 2002 to renew the pastureland (Plan Nacional de Fomento, Renovacion y Conservacion de Pastos y Forrajes). IAD should arrange the participation of settlers in this kind of SEA projects, particularly in Group C and D where large pastureland exists.

Facility development and credit arrangements are recommended to be implemented in the short and medium range terms. If IAD can provide some machinery, simple facilities such as water feeding ponds are possible to be developed to improve productivity. Credit assistance should be made available to farmers to invest for future production. However, special measures such as a long grace period of payment are necessary to be arranged because, in case of livestock, the return from the investment comes later than that of annual crops. For the introduction of new breeds, IAD needs to ask SEA's assistance to implement activities. At present, the criollo breed is popular and it is often crossed breed with Brahman, Brown Swiss and Holstein. Since genetic improvements are normally achieved by artificial insemination, it needs some technology. SEA has a project to improve dairy and beef production (National Program for Artificial Insemination) and it is desirable for IAD to work together with this program.

4.5.4 Improvement of Agricultural Marketing and Processing

(1) Present Conditions

Based on the field survey, intermediaries and traders normally control agricultural marketing from farm gate to markets and almost all farm produce is sold to them at the field immediately after harvesting without any processing. In several settlements such as Los Hatillos I, which is near the provincial capital, some settlers

bring their farm produce themselves to the city market. Very few farmers can directly sell their produce to retail customers because farmers normally have no channels with customers. If there is a trunk road nearby the settlement, direct sales along the road are sometimes observed. Typical market channels are shown in Figure 4.3.

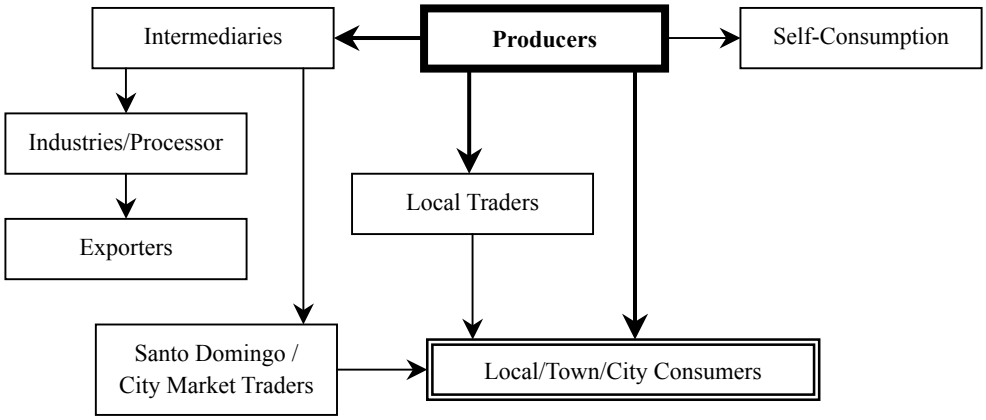


Figure 4.3 Typical Market Channels for Farm Produce in the Study Area

Although intermediaries have important roles to distribute food - the necessities of existence - from agricultural areas where less people live to cities/towns where more people live, it is often told that middlemen make better profits than producers. It is also a fact that farmers cannot transport their farm produce by themselves since the quantity and volume of their produce are normally very large.

As for processing, it was observed that several small-scale factories are located around the settlements. Since economic infrastructure is not good in most rural areas (electricity supply is unstable and transportation conditions are not good), the operation of medium- to large-scale factories using farm produce is difficult without a large investment project. However, even if one company makes a huge plantation for export, it is not sure that the business would be successful. An example was the case of DOLE, which operated a big pineapple plantation with juice factories from 1987 to 1997 near Don Juan, Monte Plata.

(2) Development Strategies

To improve the agricultural marketing activities, there are several things that settlers should know as follows.

- Information is vital for marketing.
- There are many buyers and markets.
- Working as a group helps to save costs.

In general, the fluctuation of prices of agricultural produce is bigger than that of industrial products. This mainly comes from the seasonality of farm produce. Consequently collection of price information is essential when settlers sell their produce.

Traders and intermediaries normally have much information on crop prices than settlers do. To get more

profits from the farm produce, settlers need to collect price information as much as possible. If settlers have much market information on a crop, they can choose who is the best buyer for them.

It is plausible that some of the settlers cannot produce enough amounts to sell to traders/intermediaries because of the limitation of their farm plot size. In this case, they can collect their produce together in order to get enough amounts for a profitable deal. It is quite often that amount of produce influences the farm gate price.

As for the improvement of processing of agricultural product, both skills and some initial investment are indispensable. There is a wide range of technologies: from simple juice making like squeezing oranges to industrial manufacturing factories for concentrated juice. In the IAD settlements, extension of simple skills should be prioritized because simple ones normally need less capital and are suitable to start in rural areas. Even with simple skills or techniques, they work to add value to the farm produce and make settlers get more profits.

(3) Development Plan

IAD has Marketing Section under the Production Department and its tasks are as follows.

- To offer facilities to the settlers for the commercialization of the agricultural produce
- To give settlers information on national and international marketing channels as well as land reform
- To give settlers information on the agricultural product prices and the government agricultural policies
- To coordinate training program with other IAD departments and other institutions in order to qualify both settlers and field technicians for such topics as conservation, classification, packing, weighs and measures, transportation

The settlers have limited market information. If the Marketing Section of the IAD provides these services properly, settlers can access more marketing information. However, the section has no local offices so that the personnel at the central office cannot disseminate the information in each of the settlement area.

Firstly, IAD needs to strengthen the Marketing Section to vitalize its services. Given the services, settlers can get knowledge about these questions: ”What crop has a better price than other crops?” “What season is high price for his crop?” and “Which market has higher price for his crop?” The pilot project in Esperanza III tries to improve the knowledge about not only about marketing but also farm accounting through seminars, in order to strengthen marketing activities of farmers.

Although it is not an easy task, one way to improve marketing is to organize settlersto form cooperative or association and let it have sales/purchase power in trading. Generally, agricultural marketing is a real business that needs both investment and personal connections. In other words, intermediaries and traders have both of them. For the individual settler who has small capital, it is impossible to entry into a competitive existing

market without them. However, if settlers can organize an association or a cooperative that all members work together for their own purposes (cooperative transportation, purchase, machinery use, etc.) and can get personal connections in the markets, they could save some commissions paid to intermediaries in the past. In this Study, one pilot project is ongoing in Tamayo based on this understanding.

In terms of agricultural processing, promotion of household or backyard industry is recommended. Examples of household industries observed during the field survey are shown below.

1) Sweets making (Fábrica de dulce)
   Using farm produce such as orange, guava, cashew nuts, coconut and sweet potato together with milk and sugar, sweets are made after boiling them. Sophisticated machines are not necessary.
2) Fried cassava (Bollito)
   Sales of fried cassava only after cooking in the kitchen - no special tools are necessary.
3) Traditional drink production (Fábrica de Mabí)
   Traditional drinks are made with plant materials such as lemon, tamarind and 'bejuco'. It needs a plastic container and clean water.
4) Pork crackling (Fábrica de chicharrones)
   Same as fried cassava, only cooking utensils are necessary.
5) Others
   Some settlers do business of beekeeping in the backyard and of saddlery in the house.

Initial capital is frequently a problem to start these small businesses. In addition, a series of knowledge or technologies are important to produce marketable goods. Therefore it is desirable to provide some kind of vocational training together with credit arrangement. Agroindustry Section, Production Department, IAD, is in charge of this field so that strengthening of the section staff and seminars/workshops on household industry are recommended to be implemented as soon as possible.

4.5.5 Development Plan of Micro Enterprise

(1) Present Conditions

1) Current Employment Condition

The recent economy of the Dominican Republic continues to grow as shown by the increasing rate of Gross Domestic Product (GDP) of 6% per year in 2002. However the rate of unemployment of the country increased from 13.8% in year 1999 to 15.6% and 16.1% in 2001 and 2002, respectively. The unemployment rate in 2002 shows big difference between men and women unemployment rate. The women's unemployment rate of 26.6% is higher than men's one of 9.5%. (Dominican Central Bank)

2) Free Zone

Free zone is one of the large employment opportunities in the Dominican Republic. Free zones are located in many provinces and absorbs labors of urban and suburban areas. In 2002, there are 542 enterprises and 175 thousand employees are working in the free zones. The amount of free zone export has increased 80% in these 8 years (From RD$2.5 billion of year 1993 to RD$4.5 billion of year 2001).

3) Current Micro-enterprise

Micro enterprise can be defined as an enterprise with employees of less than 15 and with equity of less than RD$15,000. Micro and small enterprises have important role such as the employment of around 30% of total number of workers in the Dominican Republic and a share of 23% of Gross Domestic Product.

4) Informal Sector

More than half, about 55% of all employees in the Dominican Republic are from the informal sector. One of the reasons is that the industry is under developing. It can be recognized that the informal sector has very important position. However, there exists big difference on the wage level per hour between the formal and informal sector as RD$38 and RD $27, respectively.

(2) Planning Policy

1) Policy Position

They say that all of the nation are fighting with the poverty. Although poverty exists in urban areas, in general, poverty in rural areas is more serious. One of the reasons is that in rural areas there is no opportunity to work and get income except in the agriculture sector.

The meaning of the development of micro-enterprises in rural areas is not only the creation of non agricultural job opportunities, but also that the development of other industry sectors. The development of rural economy can be improved with the dynamic development of micro-enterprise and increasing of job opportunity as its effect.

The most important thing is that people can gain their self-confidence and recover their dignity of the man by means of their own ability and labour even if the scale of business is small. In the course of the Study, vocational training and micro-enterprise creation as a pilot project were conducted. As a result of the project, women participants, who had passed idle time without chance to work, changed their expressions and bihaviors with the self-confidence and pleasure baced on the facts that they could sell such products as clothes and cakes. This chage could be recognized as the human reform. The people themselves could fight poverty by initiating such kind reforms.

2) General Policy

a) Vocational Training

In general there are rare chance to gain a skill to work in rural areas, where there are a little industries and the governmental institutes such as INFOTEP, which provide do not have a specific programs of vocational training. Therefore a system to provide vocational training in rural area should be created.

b) Support to women

There is a big difference in the unemployment rate between men and women in general and there is more significant difference in the rural areas. Therefore the support to women to get jobs is important and urgent.

c) Support to young generation

Because of limited opportunities to get job in the rural areas, young generation people go to urban areas. However, without sufficient basic education or skill it becomes difficult for them to get jobs. Even if they opt to live in the rural areas, without any job and nothing to do, they become delinquent. Therefore it is necessary to provide basic knowledge such as computer operation and to provide opportunities to acquire skills to be able to get work.

d) Micro-enterprise development

In rural areas there are few industries that can provide job opportunities. It is better to provide job opportunities by people themselves. Micro-enterprise creation is one of the principal solutions.

e) Organization

The support of organizations based in the communities is necessary for the creation and operation of micro-enterprises. On the other hand, an organization itself can be involved to create and operate a micro-enterprise. In the case of La Luisa the associations themselves,provided vocational training, which were principally engaged for the creation and operation of business. In La Luisa a development committee which covers whole La Luisa community was established as the integration of associations concerned, and the committee is trying to follow up the Pilot projects. In Los Conuquitos a similar development committee was established for the development of the whole community. These kinds of committee receive support from government institutes and NGOs and to transfer them to micro-enterprises.

f) Basic infrastructure development

Generally, it is necessary to have basic infrastructures, for example, electricity for dressmaking, water supply for cooking, and electricity and telecommunication for computer in the creation of micro-enterprise. In La Luisa the lack of basic infrastructure caused many problems for the implementation of the Projects. Even in the rural areas, the government should arrange such kind of infrastructure.

g) Preparation of the space for the training

Classroom buildings were constructed in the communities in La Luisa for the conduct of vocational training such as dress making and cooking. Before the completion of the construction the houses or the warehouse in the communities were rented for classrooms. After the completion the buildings have been used by participants not only for the training but also for the creation and operation of micro-enterprise. In every settlement needs such kinds of buildings called community centers or multi-use centers.

h) Credit system development

To create and operate a micro-enterprise the credit support is essential. There is Dominican Agricultural Bank for farmers, but its system is not much convenient for a micro-enterprise. Even farmers need to present official land titles to the bank to get credit. This means that without land titles can not avail of credits. Recently a credit system for micro enterprises, "Promipyme" (Programa de Promocion y Apoyo Para la Micro, Pequeña y Mediana Empresa), was created with the cooperation of the Spanish Government. Such kinds of credit support should be prepared more by the government.

On the other hand some NGOs have their own credit systems. In the case of micro-enterprise in La Luisa, some women availed credit from an NGO. Another NGO provided credit to an association for a transport business project in Los Conuquitos. It is recommended that the government study credit system through NGO.

i) Support system development

It is necessary to support the creation of job and micro-enterprise from NGO, local government, central government, etc.

2) Policy by Categorized Region

The categorization of farms divided into two classes such as suburban area and rural agricultural area can adapted in this section.

It is important to use the advantage of location and characteristics of the community.

a) Suburban type area

Micro enterprise related urban industry: In big cities there are many kind of urban type industry, however, in suburban type areas people can create micro-enterprises, which offer sub-contracts with enterprises in urban area.

Labor oriented industry: The advantage of people in suburban area is to gather people who have enough time to work. Creation of micro-enterprise should choose the labor-oriented industry.

Trasport related industry : The transport related industry could be an alternative in the creation of micro-enterprise in suburban areas where traffic demand is high.

b) Rural type area

Agriculture related industry: Manufacturing related to the processing of agricultural products could be considered in the settlement areas.

Livestock related industry: The Study has one project component of small animal raising conducted by women in Los Conuquitos. There are opportunities to create some micro-enterprises of animal raising or products processing such as cheese, ham and leather articles.

Distribution related industry: Consumers in urban areas want to buy fresh and reliable agricultural products. It is recommended to create some micro-enterprise to connect farmers and consumers directly. There are also chances to create micro-enterprise related to milk, butter and cheese to connect between producers and consumers.

Tourism related industry: If the settlement site is located close to tourist area, there are chances to create tourism-related industry, for example, souvenir manufacturing, small restaurant etc. Other types of industries can be considered as "green tourism". Special farms can be developed for visitors from urban areas to enjoy the farm life as tourism farm.

(3) Development Plan

Plan should be prepared by phase such as short term, middle term and long term.

1) Short term plans

The short-term target is to develop minimum conditions for creation of micro-enterprises. It is recommended to put emphasis on following items.

a) Vocational training

Since vocational training is the base of getting job or creating micro-enterprise, it should be developed urgently. Also the preparation of a space or a building for training in each community is necessary. The selection of training courses is important according to the analysis of marketing and demand.

b) Credit

Development of credit is an essential condition for the creation and operation of micro-enterprise in the rural areas. It is better to start the adaptation of existing credit systems for rural industry development, because the institutional arrangement of credit take time. Examples of ideas for creation of micro-enterprise in short terms are presented in c) and d).

c) Construction work

Construction work is a huge market of labor. Therefore farmers should enter into this market, but they should prepare well. Important thing is to organize a small but strong band that consists of semi-skilled workers headed by a smart capatas (well skilled chief). Also marketing and advertisement are important.

d) Woman labor oriented business

The solution of unemployment of women is important and urgent. It is important to create micro-enterprises for use of women labor. Dressmaking and needlework may offer opportunities for rural women to work. Small restaurants can be organized by women themselves

2) Middle term plan

The middle term target is to establish a basis for development of micro-enterprises.

a) Infrastructure development

It is necessary to start the development of infrastructure related to creation and operation of micro-enterprise.

b) Development of supporting system

Supporting systems of government and NGO including credit system and incentive system should be developed.

c) Improvement of technique

Even in the matter of rural industry sanitary condition and product quality should be guaranteed. It is necessary to support technical improvement including administration and marketing. Examples of ideas for creation micro enterprise in middle term are in e) and f).

e) Market creation

Along or close to a highway there are chances to create a new type of market. Some times it is useful to prepare some special events to invite people.

f) Garden plant

In near future the demand of decorative plants for domestics and offices will increase rapidly. It is recommended to create micro-enterprise related to this field.

3) Long term plan

As a long-term plan it is proposed not only to develop rural micro-enterprises but also to arrange regional

development gap. Therefore it is necessary to attempt a balanced development by regional industry. Examples of ideas for the creation of micro-enterprise are in a) and b).

a) Tourism development

The tourism industry can offer a large labor market as the Dominican Republic has many tourism resources and potentials. Some parts of the inland area, Northwest area and Southwest area can be developed as tourist areas. Tourism development should be studied and promoted at the regional and provincial level.

b) Manufacturing development

Once factories are established at the suburban or rural area, it can create many jobs. Even in rural area there are opportunities to invite the establishment of factories, if there are good conditions to establish some kinds of manufacturing establishments, for example available lands along the highways. The central government should consider and make a policy to relocate industry in the rural areas.

4.6 Program Approach on Improvement of Living Conditions by Group

4.6.1 Location of 'Remote' and 'Neighboring' Villages

In the long-term, achievement on improvement of living conditions would be in accordance to scale and density of villages. It is difficult to provide sophisticated services in areas where the houses are dispersed as in remote areas. On the other hand, higher services should be sought for large villages and urbanized villages (increasing population and density). The villages near a large city have close relation and connection with the city in various aspects and could enjoy the services and opportunities of the city in public services, employment, market etc. Generally speaking, the size of the village is large and developing. Transportation is developed. Even if the village itself is small, when grouping is made with related villages and towns, the size will expand. The villages are classified into following 2 categories based on the time of going to a major city (population of over 50,000) by truck. If the condition of the road is bad, it will take time. The scale of the city is set from the viewpoint of market, employment and public services.

- Neighboring village (under 30 minutes to reach a city with population of over 50,000 by truck)

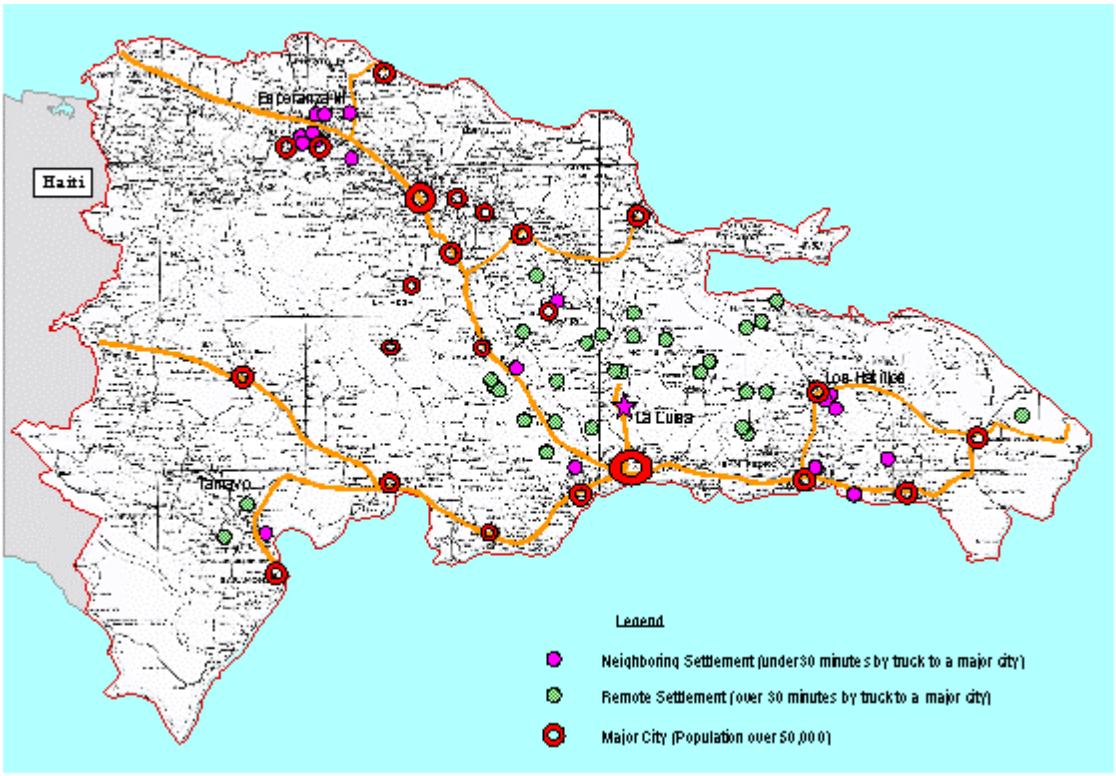
e.g. La Luisa, Esperanza (Damajagua), Los Hatillos, Hato Nuevo, Catarey

- Remote village (more than 30 minutes to reach a city with population of over 50,000 by truck)

e.g. Tamayo (Los Conuquitos), Los Mulos, El Dean, Cumayasa, El Peñon

The location of the villages of the above category is shown in Figure 4.4.

Figure 4.4 Location of 'Remote' and 'Neighboring' Villages



4.6.2 Structure of Living Condition Improvement Program

The table for chronological programs of living condition improvement is presented below, showing the major projects/programs by category and by short-, mid- and long-term.

Table 4.10 Summary Table of Living Condition Improvement Program

Program Approach	*Project/Program*	**Indicator**	**Implementation**
1. Improvement of Domestic Water Supply		Potable water: 40 - 60 lit/day/capita	
- Secure universal safe water supply	Promotion of participation of water association for the construction and maintenance of the water supply facilities	Associations will cover all areas.	Com, NGO, IAD, INAPA
	Improvement of hand-dug wells	All hand-dug well improved	Com, NGO, IAD
	Provision of deep wells	Distance to well: 200m、max.500m	Com, NGO, IAD, INAPA
	Preparation of water supply system	Safe water supply from taps in house	INAPA(Com, NGO, IAD)
2. Improvement of Health and Sanitation		People in the areas are healthy.	

- Promote health, provide proper prevention and treatment, and improve sanitation	Establishment and improvement of Rural Clinic	People can receive adequate primary health care.	SESPAS
	Introduction and Enhancement of doctor's round and emergent medical services.	People can receive periodical doctor's round and emergent medical services.	SESPAS
	Improvement in supply of essential medicines	All households can get essential medicines nearby.	PROMESE, NGO, IAD.
	Health promotion activities	People enjoy healthy life.	Com., NGO, SESPAS promoters, IAD
	Health promotion in school	All children grow well.	SESPAS, SEE, Com., NGO
	Improvement of water use	Water-related diseases are reduced.	Comm., INAPA, SESPAS Promoter, NGO, IAD
	Spread of latrines	A latrine is attached to each house.	NGO, Com
	Promotion of flush toilet with septic tank, and of sewerage	Flush toilets and Sewerage will prevail.	INAPA, Com
	Collection and sanitary disposal service of waste	Wastes are treated and disposed adequately.	Municipality, NGO, Com
3. Improvement of Education		People in the area have proper education to participate in social and economic development.	
- Achieve universal basic education	Increase in Classes of basic education	More than one class for 72 persons. Within defined distance.	SEE, PROCOM, IAD, Com.
	Improvement in materials for basic education	All pupils have textbook of every subject.	SEE, teachers, Com.
	Promotion of Information Exchange and Mutual Edification Activities.	Teachers have inter- school meetings at least once a month.	SEE, teachers
	Support for attendance to basic education	Pupils who live in more than the defined distance has support.	Com., Presidensia, IAD
	Invigoration of PTA activities	All PTA have positive activities.	Teachers, Com., IAD
- Promotion of medium education	Support for attendance to medium education	Students who take more than 1 hour will have support.	Com., Presidensia
	Improvement of adult education	Adult education is extended and improved.	SEE, NGO, Com., IAD
4. Improvement of Roads and Transportation			
- Secure access to facilities and improve transportation	Improvement of community roads	Passable all season	SEOPC, IAD, Com
	Improvement of access road from trunk road	All season passable 2 lane roads	SEOPC, IAD, Com
	Improvement of trunk roads	2 lane paved roads	SEOPC

	Strengthening of traffic safety; Provision of traffic safety facilities	School ways and roads for children are safe against traffic accident.	SEOPC, NGO, Com
	Strengthening of public transport, taxi service	Transport service will be improved.	Private, SEOPC
5. Improvement of Electrification and Telecommunication			
- Spread electricity and improve telecommunication	Extension of electricity grid and increase of connection to household	Number of electrified house will increase.	Electricity company
	Promotion of home solar system	All off-grid villages will have home solar system.	NGO, Com, Private
	Spread of public telephone at each village	Each village will have public telephone.	CODETEL
	Extension of telephone system	Telephone coverage will expand.	CODETEL
	Spread of mobile phone system	Coverage of mobile phone will expand.	Private Company
	Strengthening of agricultural broadcast and spread of information sharing in village	Broadcast on agricultural information will be improved.	INESPRE, NGO, Com
	Spread of internet connection	Internet connection will be improved.	Private
6. Improvement of Culture and Community Facilities			
- Provide cultural and community facilities to activate the activities	Provision and improvement of sports facilities (baseball field, basketball-volleyball court)	Neighboring villages will have sports facilities.	NGO, Com, SEOPC
	Provision and improvement of community center	Each village will have a community center (multi-purpose)	NGO, Com, SEOPC
	Provision and improvement of park	Densely populated villages will have park.	NGO, Com, SEOPC
	Provision of library	Densely populated villages will have library.	NGO, Com, SEE
7. Improvement of Housing			
- Facilitate securing housing and improve safe and healthy houses	Improvement of housing loan system	Housing loan is readily available.	INVI, Bank
	Promotion of mutual aid system for house improvement and training of carpentry	Mutual aid system for housing will become operational and functional.	NGO, Com

4.6.3 Development Plan of Domestic Water Supply

(1) Present Conditions

Responsibility for the construction of water supply and sewage system in the Dominican Republic is a shared responsibility of the corporations of water-and-sewage systems in main 5 cities such as Santo Domingo and

Santiago, and INAPA. INAPA takes charge of the other whole local cities and rural area. According to the statistics investigation of INAPA in 1998, about 2.3 millions or 40% of urban population and about 1.9 million or 95% of rural population, a total of 4.2 million inhabitants are served with water supply and sewerage system under the jurisdiction of INAPA. The coverage of potable water within 500m from the housing is 83% in local cities and only 50.3% in rural area.

During site investigations, it was observed that most communities had some water supply facilities, however, they were operated only a few days on a week or not functioned well over a long period due to the shortage of electricity supply and/or the lack of maintenance system. The water supply facilities only cover in the central part of a community, and then inhabitants in small-scale colony living away from the center have troubles for the access to potable water. According to the data in 2001 of UEAR of INAPA, the coverage of potable water within 500m from the housing is only 53.9% of the inhabitants living in rural community with a population of less than 2,000. The problem in the existing water supply system in rural area is the low rate of collection of the maintenance fees, so maintenance for the facilities does not functioned well. Since water meters are not fixed to each house in rural area, INAPA is collecting the fixed amount charge of 10 – 20 pesos/month/household from inhabitants. However the rate of collection is low. The users blame for unreliable water supply as a reason for nonpayment. That is a vicious circle.

According to interviews conducted in the area and results of workshops in the target communities, almost all residents have purchased the bottled potable water at 22 pesos for 5 gallons. No inhabitants in La Luisa and Los Hatillos drink the water supplied from the facilities constructed by INAPA. As expenses for drinking water in housekeeping which amount for 100 – 300 pesos in La Luisa and for 200 – 500 pesos in Los Hatillos are a heavy burden for them. The present condition of the water supply facilities constructed by INAPA is only being used for washing and shower etc. Most inhabitants in La Luisa area drink the water from hand-dug shallow wells constructed by NGOs. Well user's associations, which are organized in the community, have perfectly carried out the operation and maintenance for the facilities by themselves for more than three years. This shows that they have a sufficient capability for the operation and maintenance to the matter that safe drinking water is constantly supplied.

For the solution of present difficult conditions, UEAR set forth a new approach on water supply as part of a decentralization policy, that ASOCARs organized by beneficiaries have all responsibilities for the operation and maintenance on water supply facility newly constructed including collection of maintenance fees. Thus, UEAR will carry out only the monitoring for ASOCARs and will support for the technical problems of the facilities. Since the facilities are maintained by beneficiaries themselves, it is expected that they enhance the ownership to the facilities.

In the construction of deep well facilities in the pilot project, the inhabitants agreed to pay 5 to 20 pesos of maintenance fee per month and also all members of the association paid 500 pesos at the beginning (a kind of cost-sharing). Considering that bottled drinking water is sold wherever even at little shop of a quite small

community, it is said that inhabitants have high consciousness for safe potable water. Moreover, it was observed that some association highly depended on a leader. This shows that the association is not well organized because it took only one month since the establishment of an association to the commencement of the project and there was no enough time to strengthen the organization. The establishment and strengthening of a association is most important for sustainable maintenance of water supply facility, therefore, it is necessary to take more time, a minimum of three months, to strengthen the organization before the construction of facilities. This is one of the lessons learned from the pilot project.

(2) Development Strategies

Potable water is essential for a daily life, therefore, it is very important for domestic water supply project to operate and maintain the water supply facilities in order to supply potable water constantly. In order to supply safe and clean water continuously, it is very important that the beneficiaries themselves are concerned with operation and maintenance. Although the deep wells equipped with a hand pump were constructed in the pilot project, in order to raise the ownership of the inhabitants to water supply facilities, while 500 pesos per member of the well user's association were collected for a kind of cost-sharing for construction cost, operation and maintenance of the facility constructed were carried out by the association. Six wells were constructed by mid-March in 2002. Except for one place, five wells have been well maintained by the associations for four months after construction, and they have been used for many inhabitants. In the workshop, the priority of a water supply project is as eager as the high community for the establishment of the association, and also all the money for cost sharing was collected by the date fixed.

Based on the lesson learned by the pilot project, basic strategies for domestic water supply program are as follows:

- **Giving priority to development of drinking water in domestic water supply**
- **Giving priority to deep wells**
- **Establishment of association for water and strengthening of their organization**
- **Strengthening of the support system of IAD to water supply program**
- **Strengthening coordination of INAPA and IAD**
- **Positive participation of NGOs to water supply program**

Hand-dug wells and surface water will be used with appropriate care and treatment until deep wells or treated water supply will be provided.

The following is the goal for the service level:

Goals for service level	Remote Village			Neighboring Village		
	short	mid	long	short	mid	long
Minimum quantity of potable water (litter/day/capita)	20 - 40	60	60	40 - 60	60	150
Maximum distance to a deep well (meter)	500	500	200	500	500	200
Water supply to each household	-	-	-	-	-	attain

- : Only for the area where the conditions are arranged and water associations have responsibility

(3) Development Plan

1) Promotion of participation of water association for construction and maintenance of water supply facilities

After the construction of a water supply facility, the well user's association organized by the beneficiary has all responsibilities for operation and maintenance on the facility. Since a water supply program, which is extremely adapted for basic human needs, is essential for inhabitants as public service, the cost sharing of construction costs for the water supply facility may be 5 - 10% in consideration of the degree of poverty of a community. It is expected that the ownership of the facilities belong to inhabitants is raised by the cost sharing. For that purpose the program enables the association to participate in the beginning of the planning stage. Moreover, construction of the facility should not be conducted until all the cash of cost sharing is collected. Since the association itself carries out the maintenance of the facility, INAPA should provide the association with useful information on construction and maintenance costs of various kinds of facilities such as shallow well, deep well and water supply system. It proposes that the association itself makes the final decision on selection of various kinds of the facilities.

In order to support the establishment of the association and to strengthen its organization, NGOs should be positively adapted to a water supply program so that the member of association can learn how to maintain the facility and how to collect the maintenance fees. The managing staff of the association should be replaced in every one or two years in order to strengthen an organization and to share the responsibility with all the members. It is expected that all of them learn the management method of an organization and enhance their responsibility. It is important that INAPA and IAD periodically monitor and support the associations and also advise to the technical problem of the facility.

Since Dominica has a rather heavy rainfall, the possibility of groundwater development is high. Therefore, it proposes to focus on well construction for a water supply program considering that the construction is completed in a short period. The residents of settlement have the high degree of poverty, so that IAD should prepare a drilling-rig to construct wells directly in order to minimize the cost sharing for them.

IAD should positively cooperate in the program for the small-scale community with a population of less than 2,000 supporting the shortage of INAPA.

2) Improvement of hand-dug wells

Hand-dug wells are popular because of cheaper and easier construction, however they have problem of contamination of water quality. Improvement of hand-dug wells should be carried out, keeping the environment around the well clean and providing adequate drainage and so on.

3) Provision of deep wells

According to the strategy, provision of deep wells should be promoted in line with the above 1).

4) Preparation of water supply system

Potable water supply from taps in each house is a final goal. Preparation of water supply system should be

promoted in large and urbanizing villages in long-term, while the existing systems should be improved to supply safe and reliable water continuously.

4.6.4 Improvement of Public Health

(1) Present Conditions

A rural clinic is to be established in an area with population of 2,500-3,500 or in a Section according to the standard set by SESPAS. This standard is generally satisfied. In rural clinics, however, qualified medical doctors are scarce and medical facilities and materials are not sufficiently supplied. Almost all doctors working in rural clinics are so called "Pasantes", probationary doctors, because doctors rarely want to work in rural areas and working in a rural clinic is a condition for graduates of medical courses in universities to get the license. All rural clinics visited by the Team lack some medical equipment, medicines, or materials compared to the standards set by SESPAS. Boticas Populares, or popular pharmacies are established by PROMESE (Programa de Medicamentos Esenciales) in most of the villages which have rural clinics with some exceptions. Many small villages without a popular pharmacy have communal pharmacy supported by NGOs. Many houses in rural areas plant and use medical herbs or trees.

Health promotion activities are to be promoted by SEAPAS promoters according to the policy of SESPAS. Their activities, however, often limited to assistance for implementation of vaccination program or to investigation of health censuses. Many health promoters of NGOs, frequently religious ones, carry out health promotion activities in villages. Morbidity data in rural show that water-related diseases are the most frequent or secondly frequent next to cold. To prevent water-related diseases, improvement of water use in houses and public facilities, such as water treatment, hygienic store and use of water, is necessary in addition to construction, operation and maintenance of water supply facilities, especially where water is supplied with public taps. Most of rural families have communal or individual latrines constructed by themselves or with assistance of NGOs.

(2) Development Strategy

Health of the peoples is essential for social and economic development of villages. Health promotion is attained by providing public services by government organizations, such as construction of medical facilities, provision of medicines, water supply and sewerage services, waste collection and disposal services, as well as by health promotion activities by communities. Although programs for both measures are defined separately below, the programs should be managed consistently with interactions between governmental agencies and communities as well as among programs to effectively promote the health of the people in the villages.

Governmental services should be provided in accordance with standards and criteria set by relevant authorities. Programs or projects for the services are planned to satisfy the standards/criteria following the policies of the authorities. Principally, standard level of service must be assured for all the people. There must be no

difference in level of service between remote villages and suburban villages. The principles of 'universal service', where the entire nation can receive the same level of services, are applied as the most important strategy. Practically, it is not possible to provide the health services to all people in the same way. Efficiency should also be sought by devising ways to provide the services corresponding to the scale of the village and distance from large/medium/small cities.

Community activities for heal promotion should be done with the initiative of each community. To make these activities effective, however, supports and assistance of experts, such as staff of SESPAS including doctors, nurses and health promoters, NGOs, as well as staff of IAD, is helpful and necessary.

(3) Development Plan

The development plan for public health improvement is as follows:

1) Establishment and Improvement of Rural Clinics

Additional rural clinics should be established according to the SESPAS standards. Medical facilities and materials should also be provided to satisfy the standards. Regarding the staffing, deployment of qualified doctors is very difficult. Instead, employment of nurses with abundant experiences, well understanding of local conditions and reliable to the people in the villages should be planned. To achieve the employment, in-service training and supports the nurses working in the area should be enhanced.

2) Introduction and Improvement of System of Doctor's Round

To establish rural clinics in all villages is almost impossible and unfeasible. Establishment of small villages in remote village is not recommendable with exception in villages of center of Sections. The doctor and nurse of the relevant clinic should carry out periodical visiting consultations, once or twice in certain days of the week. Monitoring, discussions or guidance on communal activities for health promotion are preferably conducted at times of the consultations.

3) Improvement in Supply of Essential Medicines

Even in some villages with rural clinic, popular pharmacies are not established. In these villages, establishment of popular pharmacies should be urged.

In small villages without rural clinics, communal supply of essential medicines, such as management of revolving funds for the supply, should be promoted to store and distribute those medicines with less costs compared to the private pharmacies in towns. These communal pharmacies may preferably procure the medicines from the nearest popular pharmacies. PROMESE, doubts the procurement to the communal pharmacies, fearing inadequate storing and distribution of the medicines. Considering the aim of the program of popular pharmacies, however, supports to the communal pharmacies are proper things to do. Training of managers of communal pharmacies should be conducted for adequate storing and distribution.

Invitation of the managers to pre-service training for storekeepers of the popular pharmacies should be encouraged. Communal pharmacies should avoid free distribution in any way to attain proper use of medicines as well as proper management of the funds.

Use of traditional medical herbs should be promoted by communal activities with assistance of NGO and medical staff of the clinics. Spread of adequate use of the traditional medicines is one of good topics of the health promotion activities.

4) Health Promotion Activities

Establishment of health committees should be encouraged. Health promotion activities by rural clinics, focusing those for prevention of diseases, should be promoted with tying-up of health promoters and committees of the communities. Assistances by NGOs and IAD are preferable and are encouraged. There are many subjects to be dealt in health promotion activities. Preventive care and health promotion, such as improvement in water use and nutrition, reproductive health/rights, control of sexually transmitted diseases, family planning, should be the main topics. Spread of modern and traditional medicines and promotion of proper first aids are also important subjects. Subjects should be selected and activities should be undertaken according to the health conditions of the locality as well as to the capacity of health organization and available resources of the community.

5) Introduction, Expansion and Enhancement of Health Promotion Activities in Schools

School-based activities will be effective and efficient for health promotion of children. Recommendable activities are i) vaccination programs, ii) health education to children as well as iii) periodic measurement of height and weight and health examination of children. Joint operation and coordination between the clinics and schools are required. Measures for children not enrolled should be taken. Health promotion activities in schools may preferably be started in villages with rural clinics. With the lessons and learning obtained from the experiences, the activities can be expanded gradually

6) Improvement in Water Use

In villages where water is supplied with public taps, especially, improvement in water use is inevitable to assure the benefits of the water supply. Improvements in treatment and storing water in houses, bathing and washing with good quality of water should be promoted by community organizations. Supports from NGOs, INAPA as well as IAD will be helpful.

7) Spread of Latrines

In remote and small villages, spread of latrines should be continues in short- or mid-terms rather than spread of flush toilets and introduction and spread of septic tanks or sewerage services.

The NGOs have made effort that latrines should come to wide use in rural area in the viewpoint of

sanitation, but still it is far from the condition that one latrine is attached to each house. A latrine will be full in several years and another one will need to be made. Provision of latrines should be continuously promoted with sanitary care and attention.

8) Spread of Flush Toilets, Septic Tanks and Sewerage System

With the development of concentration of houses in villages, spread of flush toilets and septic tanks, and construction of sewerage system by INAPA will be necessary. Installation of flush toilets and septic tanks should be done principally by each households with their owns costs. Subsidies or loans for the promotion, however, might be necessary. Regarding cost recovery for construction of sewer and treatment facilities, charge collection should preferably done at least to recover operation and maintenance costs.

9) Improvement in Waste Collection and Disposal

Even in small villages, communal waste disposal should be introduced corresponding to the concentration of houses. Construction of communal disposal site and sanitary disposal should be promoted by communities themselves and local government. Special care should be taken how to dispose waste not to contaminate the environment. For villages near the cities, waste collection services by the municipality should be expanded to those villages. Charging for the services should accompany.

4.6.5 Improvement of Education

(1) Present Conditions

State Secretariat of Education (SEE) set two types of standards for the establishment of schools of the basic education; one is number of population for a class and the other is maximum distance to nearest school for initial education (pre-school level), primary and secondary cycle of basic education. There are little cases that both of these standards are satisfied in rural areas. Smaller portions of the teachers do not finish university courses to get entitled for teaching. It appears that less portion of teachers are entitled in remote or small villages.

In little cases, textbooks of every subject are distributed to all pupils. Teachers collect the used textbooks from pupils of the previous year and distribute to the pupils. Textbooks used in the class are often damaged and sometimes missing pages. In many cases, some pupils have to share a textbook with others or have to learn without the textbook. There is little type of standard teaching materials or aids and teachers prepare by themselves. Performance in basic education looks worse in schools of smaller number of classes. The primary reasons may be less number of entitled teachers. The other important reason seems less chances of mutual edification among teachers. Most of schools of basic education have each association of parents and friends of the school. Activities of the associations vary and most of them are those for minor repair of schools. Attendant rates look low. There were many cases, when visited, that only half of enrolled pupils attend in the class in small-scaled schools.

As far as in villages visited, in rural area there is little school of middle level education. Only limited number of children promote to medium education. Most of schools of medium level have only general courses and are not specialized. It seems that schools of medium education is just recognized as the midway or the preparatory course to universities. SEE provides substantial number of classes for adult educations where attendants can learn curriculum of basic education in five years. The courses are often held at night. Informal literacy education for adults is offered by NGOs. They are, however, less popular than formal one.

(2) Development Strategy

Education is a base for the people to participate social and economic development. All of the nation shall be accessible to basic education. In the education sector, same as in the health sector, the principles of 'universal service' are applied as the basic strategy. Efficiency should also be sought by devising ways to provide the services corresponding to the scale of the village and distance from large/medium/small cities. Medium level education is quite limited in rural areas compared to urban areas, and its expansion is of keen necessity. Medium education is placed in midway as preparatory course to superior education although very limited numbers of people go to university. Practical courses of medium education, such as agricultural, industrial or commercial ones, should be planned since majority students of medium education end the educational career at this level. To establish many courses, however, may induce quality deterioration due to scattered resource allocation. Introduction and enhancement of supports for attendance to medium education, such as providing subsidy for commuting and scholarship, are to be encouraged. Provision of adult education is the duty for the government to give opportunities for basic education to people could not have chances in the past at the age.

Activities of community organization, such as those by the association, are important. Activities to raise attendance and enrollment rates are recommendable other than those to repair facilities.

(3) Development Plan

1) Increase in Classes of Basic Education

Standards for number of classes (teachers and class rooms) and maximum attending distance should be satisfied for all villages, i.e., more than one class for 72 people in 2 shifts/day, and within less than 500m for initial level, 1 km for first cycle and 2 km for secondary cycle of basic education.

2) Improvement in Teaching Materials

Textbooks of every subject should be distributed to all pupils. Under this condition, teacher can give homework or instruct preparation and review. More standards teaching materials should developed, prepared and distributed for even teachers without title to give lessons of sufficient level. Teaching aids for mathematics should be developed to remedy low performance of the subject. The associations of parents and friends can offer actual pr practical materials of natural and social sciences. Teaching guides

should be distributed for even teachers without title to improve teaching.

3) Promotion of Mutual Edification of Teachers among Schools

Mutual edification activities among teachers are essential to grade-up knowledge and skills of teachers and to raise the level of performance of education. In large scale schools, meetings are held mainly by principals or vice-principal to discuss on various issues. By extending the range of these activities to neighboring small schools, such as Section areas, exchanges of information and experiences among teachers can be promoted by establishing a kind of committee. Preferably, those should be carried out that mutual consultation as well as discussion for improvement instruction methods and for preparation teaching aids, etc. Incentives are necessary to promote the activities. Additional rewards according to performance of committee members may contribute to the promotion.

4) Support for Attendance to Basic Education

In cases of scattered households or very small villages with less than ten families, it is almost impossible to meet the two standards even those are for the basic education. Supporting activities for children to commute to schools mainly by the associations or organizations of neighbors.

5) Organization Strengthening of PTA (Parents and Teachers Association)

Invigoration of activities of the associations is necessary. In addition to repairs of school buildings, water supply facilities or toilets, activities for raising attendance rates should be encouraged through supporting road crossing, precautions to children who do not attend the school at school times, consultation with close cooperation of teachers and the associations. Encouragement by NGOs of IAD staff should be promoted.

6) Support for Attendance to Medium Education

Remote villages from cities are often small and establishment of schools of medium education will occur with a little chance in these villages in short or medium terms. Supporting activities for attending should be encouraged by the initiative of community organizations or the associations through lending bicycles or motor bicycles and helmets or other activities. It is necessary to take measure to avoid abuse or misappropriation, such as uniform paint of the motor cycles/bicycles or self payment for fuel. A supporting program is under planning in President Office. In case the plan is approved, the application and adoption will be helpful.

7) Improvement of Adult Education

Adult education for basic education level should be expanded by applying courses prepared by SEE, and by utilizing existing building and teachers. Mid- to long-term education other than basic education such as specialized vocational and cultural courses should be encouraged.

4.6.6 Improvement of Roads and Transportation

(1) Present Conditions

The roads for rural communities are largely classified into the following (as shown in the end note A), having requirement for improvement respectively:

Road	Problem	Potential	Necessary improvement
Community road	Largely surface condition is rough.	Improvement and maintenance by community	Road improvement with promotion of community involvement
Access road from trunk road to community	Surface condition is bad, which causes loss of cost and time of transportation	Improvement and maintenance by community	Road improvement with promotion of community involvement
Trunk road	Some parts are still left damaged. Traffic accidents occur on the part of the community.	Improved cost and time for transportation to large market	Promotion of improvement to complete the network; Strengthening of maintenance. Traffic safety measures on the part of the community.

(2) Development Strategy

The roads are public infrastructure. In this sense, cooperation and activities of SEOPC are indispensable. On the other hand, in order to meet and realize communities urgent needs, the priority would be put on commitment and cooperation of community:

- **Initiative and Cooperation of Community**
- **Strengthening Cooperation with SEOPC and related organizations**

(3) Development Plan

1) Improvement of community roads with association

Most community roads are in bad condition and improvement is necessary. But the parts and length are so large and dispersed, and SEOPC and the local government cannot afford to repair them. The pilot project made it clear that the community association for improvement of the community road could decide the repair parts with coordination and that they cooperated for the improvement work. The resources of IAD are limited and transport of the equipment is not easy. It is proposed for IAD to promote the following activities:

- Form a group for community road improvement in IAD
- Promote association of community road improvement (together with other promotion activities)
- Coordinate schedule of mobilization of equipment based on urgency and geography - location
- Implement improvement of the roads in cooperation with community
- Handover of road repair sets/materials; Simple maintenance by community

2) Improvement of access roads from trunk roads

The access roads from the trunk roads to the village are generally for public use and are important as a life line. The roads should be passable in all season and be 2 lane wide (more than 5m). Usually it requires larger work than community roads. If the whole village could form a unanimous group for the road, the same approach as the community road could be taken. Or as the trunk road, it would require cooperation of SEOPC and the local government.

3) Improvement of trunk road

The trunk roads that connect major cities and towns should be 2 lane paved roads (6m or more width). The roads affect the cost and time of transportation to cities and market. The work of SEOPC should be strengthened.

4) Strengthening of traffic safety

Traffic accidents bring serious loss and damages to human life and economy. Magnitude of traffic accidents has got even larger according to the road improvement and higher speed of vehicles. The life of people is precious and irreplaceable. Traffic safety should be strengthened nationwide.

In and around the villages, at least the safety of school ways should be secured. The parts of the roads where children usually use should be safe against traffic accidents.

The projects and programs will be as follows:

- Provision of traffic safety facilities on school ways (humps, traffic signs, markings, etc.) (SEOPC)
- Strengthening of regulation against driving manners (Police)
- Education for traffic safety (NGO, Community, School)

5) Strengthening of public transport and taxi service

The villages near large cities and on trunk roads have public transport service (bus) and taxi services. The services should be improved in a sustainable manner such as

- Increase frequency of the trips
- Extension of the final destination to the center of the city
- Expansion of bus service routes
- Provision of bus stop with roofs
- Provision of public telephone at the station of taxis

4.6.7 Improvement of Electrification and Telecommunication

(1) Present Conditions

1) Electricity

According to ONE (1993), the household that lack electricity was 20% in national average. In rural area, the condition is worse. For example, the percentage in Hato Mayor Province was 53%.

Electricity is distributed by 3 electricity companies; EDENORTE (northern area), EDESUR (southern area) and AES (National District area). The power supply is neither stable nor reliable. Water supply is sometimes stopped because of occasional breakdown. Electricity plays an important role in enhancement of quality of life and increase of income. The basic use is lighting, and it is necessary for computer and batteries of mobile phones.

2) Telecommunication

Wired telephone system managed by CODETEL is developed only in urban areas. The service area of mobile phone is extending by 3 companies; CODETEL, Tricom and Orange. Still the service area in rural zone is limited. Internet connection is limited by wired telephone system in large cities.

(2) Development Strategies

1) Electricity

The private sector plays a primary role in distribution of electricity. Financial sustainability should be secured or the beneficiaries should pay the cost. NGO's support is necessary in remote areas and less profitable areas.

- Extend the power grid to rural area and increase connection to household
- Promote Home Solar System to remote rural area

2) Telecommunication

Information and communication become more and more important. Basically telephone service is left to profitability of telephone companies. Telephone service has got lower priorities in infrastructure of rural area, as it is not BHN. It has not been spread in rural areas because of inefficiency of investment. However telephone service would save the cost and time for transportation to communicate, contributing to emergency call for rescue. It would improve communication of people and group. It is also expected to improve the income accessing to real time market information.

The developer of the system will be private sector, but public sector should play the role of facilitation and promotion.

The following is proposed to enhance the quality of life and potential for income:

- Provide minimum access to communication in each village
- Promote association for common use of mobile phone (and radio, television and computer)
- Expedite expansion of use of mobile phone

(3) Development Plan

The development plan for electrification and telecommunication is as follows:

1) Extension of electricity grid

Where the demand and location meets, electricity grid and connection to household should be extended by relevant electricity companies.

2) Promotion of home solar system

Home solar system should be promoted in off-grid rural areas through sound competition of private companies. Cooperation on NGOs is necessary in less profitable areas.

3) Spread of public telephone in each village

In order to secure minimum communication means, at least one public telephone should be provided in each village.

4) Extension of telephone system

In the long-term, telephone system should be expanded in rural areas together with Internet connection.

5) Spread of mobile phone system

In rural areas, extension of mobile phone service may be easier than telephone system. The service area of mobile phone should be extended by the private companies.

6) Strengthening of agricultural broadcast and spread of information sharing in village

In order to have better profit in selling agricultural products, adequate and rapid market information is necessary. Hearing from a radio of broadcasting program is an easy way. Operation of proper market information program will be required.

7) Improvement of Internet connection

Internet is most worldwide and rapid information system. Provision of Internet access in every association and school is a future goal.

4.6.8 Improvement of Culture and Community Activities

(1) Present Condition

The facilities for the base of culture and community activities are generally insufficient. In the 10 representative areas, there are 6 community centers, 3 baseball fields, 4 basketball courts, 1 park and 1 library (in a school).

(2) Development Strategies

Although culture and community activities are important not only in themselves but also for overall improvement, it is difficult to provide the facilities by public side by schedule. For example, community center will be necessary for meetings and through the meetings improvement works of the community will be decided. But it should be scrutinized if the meeting would be possible in an existing facility such as classrooms. The community initiative should be promoted aiming introduction of finance from PROCOMUNIDAD, international aid through NGO etc., while it will invigorate the activities.

- Promote community initiative for provision of culture/community facilities

(3) Development Plan

The development plan for improvement of culture and community facilities is as follows:

1) Provision and improvement of sports facilities (baseball field, basketball-volleyball court)

Popular sport facilities are basketball court and baseball field. Sports will give children/youth fun and health for both body and mind. All neighboring villages should have them in long term.

2) Provision and improvement of community center

Community centers are required for community activities and various promotion activities. Each village should have a community center or equivalent.

3) Provision and improvement of park

Densely populated villages should have a park or playground in long term.

4) Provision of library

Library will be a future goal to enhance cultural life and opportunity of improvement of efficiency.

4.6.9 Improvement of Housing

(1) Present Condition

Most housing in rural area are simple wooden houses with galvanized iron sheet roof. Reinforced concrete and block structure is minor. The houses built by CEA or IAD are reinforced concrete structure. Most houses are owned by the users, while rent houses are minor. Considering tropical weather condition, the problem seems to be drainage, floor sanitation and roof.

(2) Development Strategies

Housing is physical base or shelter for daily life, and is basically for private use. Construction of low cost housing in urban area by public sector has failed in many cases, due to resale, distortion of housing market,

financial unsustainability and bad influence to private sector. Thus 'site and service' was developed preparing housing lots, only kitchen and toilet, water supply and roads. The houses were completed by individual. In rural area, public investment to housing is difficult except for compensation of resettlement.

The following soft measures are proposed:

- Promotion for securing housing through improved housing loan
- Promotion for improvement of housing inside community by themselves

(3) Development Plan

1) Improvement of housing loan system

Rather large amount of money for individual will be required for construction of house. Housing loan would provide the fund by his own responsibility. So housing loan system should be improved making it easier to use.

2) Promotion of mutual aid system for house improvement and training of carpentry

For example, in Japan we traditionally had mutual aid system in community for replacing large straw-thatched roofs in rural areas. The old thatched roof was periodically replaced in turn by cooperation of all villagers. It is proposed to promote mutual aid system for house improvement in community. The promoter should be formed in public side (maybe in IAD), visit villages, advise know-how, point out the parts to be improved from safety and sanitary point of view, support for provision of materials and so on. Training program of carpentry should be implemented to make it possible to do the work by them.

4.7 Improvement of Information System and Equipment of IAD

4.7.1 Improvement of Information System

(1) Present Conditions

The IAD's information management system has the following issues neccessary for improvement:

- Manual operation to compile information
- No database to storage information
- No standard for evaluation of project progress
- Headquarters doesn't know reason of low productivity

The evaluation of productivity in each settlement area shall be made to implement master plan. There is a reason for low productivity in settlement area, respectively. The reasons can be divided into two groups: common reason being seen any settlement area such as low quality of soil, proper products are not cultivated in soil and financial problems, etc. and reason peculiar to an area such as storm damage. The problem is that these reasons depend on the judgment of persons in charge of an area. The headquarters should make effort to

establish the system to collect information and to analyze the data with standard of evaluation of the project progress in order to obtain the situation of the settlement projects in each local area.

(2) Development Strategy

In order to have a future image of the information system that will be needed for IAD, and to design the system, it is necessary to consider the original function of IAD itself. The functions of IAD can be divided into three parts: prepare settlement plans and strategy; to prepare regional plans and to supervise, manage and monitor settlement projects. The following information systems will be required for each function.

1. Information system for settlement planning project
2. Information system for settlement regional plan
3. Information system for management of settlement

The strategies to introduce information systems include the following four points. 1) A database that works as a core of the information system is the most important. 2) The next point is the introduction of a network which works to connect regional management offices scattering in the whole country, and to make the management of the information systems easy and effectively. 3) On the other hand, the information technology in the world is progressing every day represented by the Internet and new technology is produced day by day. Under such condition, it is meaningless to propose the fixed system based on the current technology. Therefore, we will apply the idea of the stage development; the proposed system have been revised and improved according to the latest technology at the each phase. 4) For this purpose, it is necessary to train engineers who can not only operate the system but also re-design the system.

(3) Development Plan

The development plan is divided into three stages as shown in the followings.

Phase 1 (Short Term)

- Effective use of the existing computer shall be carried out. A personal computer shall be introduced in the management office or departments in the headquarters where a computer is not yet introduced, and access to the Internet shall be enabled by dialup. A microcomputer as a client machine shall be introduced at the planning office, and a server computer at the computer center.
- The production control system for the management of settlement shall be built in this phase.
- The Internet shall be used for connection between the headquarters and regional management offices. The computers introduced in the departments at the headquarters, shall be connected by LAN.
- A server system shall not be built in IAD. An external hosting service provided by a telecommunication company will be used to built a database server.

- To build the information management system, IAD shall mobilize the experts from outside of IAD, and train the engineers in IAD computer center.

Phase 2 (Mid-term)

- A new computer set shall be introduced into both all departments and the regional management offices. Moreover, the hardware (a digitizer, a plotter, scanner, etc.) for inputting geographical information to a computer and a work station shall be introduced into the planning office.
- The settlement development planning system for settlement regional plan shall be developed.
- The Internet shall be used for the connection. WEB will be built with using the server machine in the computer center in this phase. Therefore, direct access to the database of headquarters will be attained from a management office through the Internet.
- It is desirable that all systems will be designed and developed by the engineer inside IAD.

Phase 3 (Long Term)

- A computer is introduced and connected by network in all sub management offices and a project office.
- The national land use system shall be developed.
- An exclusive connection shall be introduced for the network of IAD.

The outline of the information system for long term is shown in the following figures.

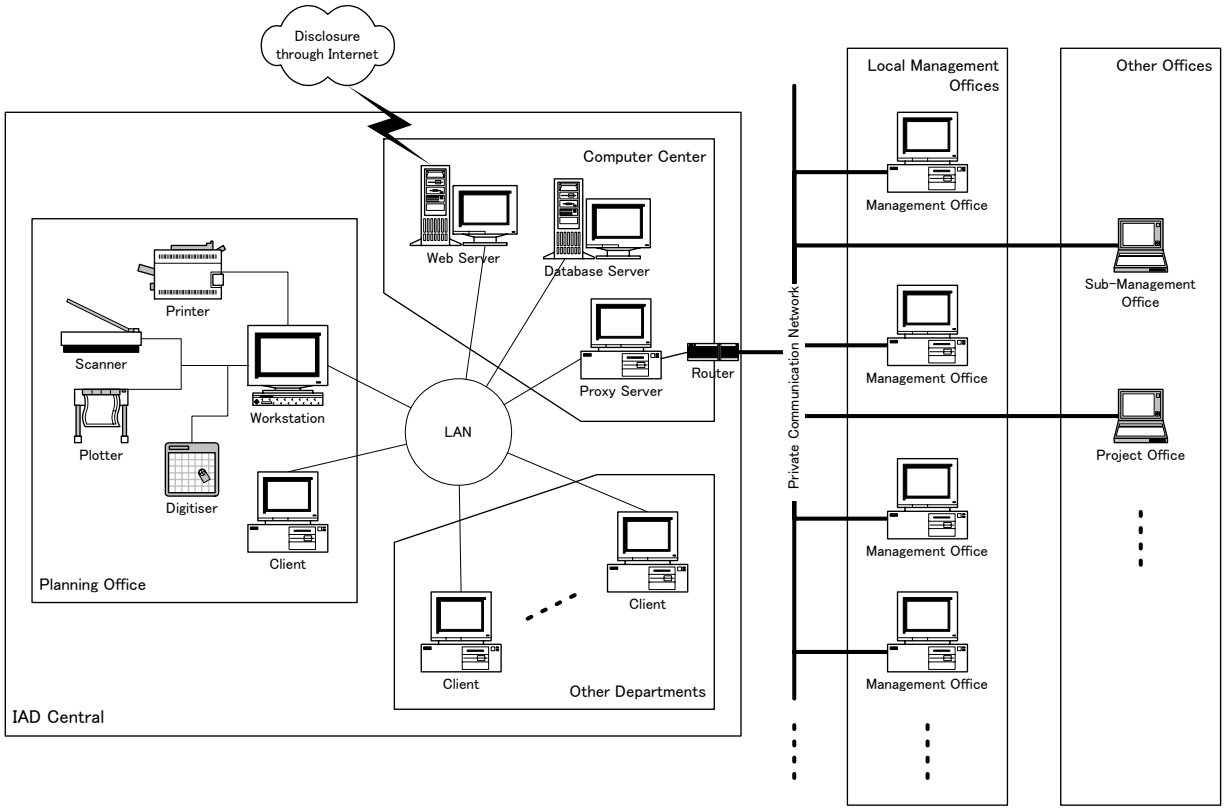


Figure 4.5 Outline of Information Management System (Long Term)

4.7.2 Operation & Maintenance of Heavy and Agricultural Equipment

(1) Improvement on Daily Checkup

IAD own 12 construction equipment and 5 agricultural equipment including tractor's implements. There is only single form for the checkup system for these equipment. It is necessary to check the equipment with different kinds of forms. A small group may be formed by the related department to prepare or revise the checkup form referring to the manual on operation and maintenance prepared by equipment manufacturer Checkup form shall be revised through evaluation on the operation in the preceding projects. The collected data including the data on the damage and repair of the equipment shall be recorded into the computer. It will take about five years to improve daily working records.

(2) Improvement of Periodic Checkup

The system of periodical checkup was introduced for certainequipments by a senior volunteer in Japanese Grant Aid project. This kind of periodic checkup covers all kinds of equipments. A working groups which will be formed by the Engineering Department, Production Department, Maintenance Department and Administration Department shall prepare or revise the form of periodic checkup based on the operation and maintenance manuals of the manufacturers. Improvement of periodic checkup system will take 10 years in short to medium terms.

(3) Training of Operators

The leveling up of the operators' skill is necessary to maintain the durability of equipments. Although some operators have long experience, if they would operates differents equipments, they would be the persons who have less experience for the specific equipments. Operators and assistants have to be classified according to the operation period and their operational abilities by a kind of equipment. Also existing damages and defects of equipments shall be classified to obtain what kinds of skill will be required in the operation. Training programs for each kind of equipment shall be prepared, taking into account operator's experience and abilities, etc. It will take five years (short term) to improve training of operators.

(4) Improvement of Parts Management

Once a computer system was provided for the management of parts stock under the Japanese Grant Aid project. However, after the computer operator resigned, the management of the system has not been operationalized. The computerized parts management shall be restored. It will take 5-8 years in short to medium terms to undertake this activity.

(5) Formulation of Operation Plans

Presently operation plan is formulated in the head office based on the request of the Gerencia offices. However, there is no clear or concrete procedure on the formulation of the operation plan. It is then proposed to formulate an operation plan for the implementation of the master plan. The formulation of the operation plan shall be made in the medium and long terms of development plan, which may be accomplished only after the successfully attainment of above said improvement in (1) to (4) applying the following procedures.

- The location maps of resettlements shall be prepared with site development plans related to the master plan.
- Operation works to be required in the site development plan shall be classified. Cost estimation for the operation works in new site development plans shall be made based on the criteria and standard on cost estimation, which will be prepared with reference to the results of the preceding development projects.
- The operation criteria or standards shall be made through evaluation of operation records in the preceding projects. Participatory workshops in the communities shall be held to estimate the amount of cost share in the development cost. .
- Monitoring and evaluation on the operation of equipment shall be carried out during the implementation.
- Based on the above evaluation, operation criteria and standards of equipment shall be revised for the following development plans.