Chapter 8 DEVELOPMENT STRATEGY BY SECTOR

Under the basic strategy for the Eastern Region development established in Section 3.3, development strategies by sector are presented. The sector-specific background related to existing conditions and problems/constraints are outlined to guide the strategy presentation. For most sectors, the strategy focuses more on the short to the medium terms. Specific measures under the strategy are presented in Chapter 9, and the phasing of implementation is indicated.

8.1 Economic Development

8.1.1 Strategy for agricultural development

(1) Factors for decline of agriculture in El Salvador

The GDP of El Salvador increased steadily during the 1970's, supported by the sound growth of the agricultural sector, led by the production and export of traditional goods such as coffee, sugar, cotton and shrimps. The Salvadoran economy started to deteriorate with the intensification of the civil war in 1979, and the agricultural sector was the hardest hit. The per capita GDP decreased by one third only in five years from the peak attained in 1978, due mainly to the decline in agricultural production as rural areas became main battlefields.

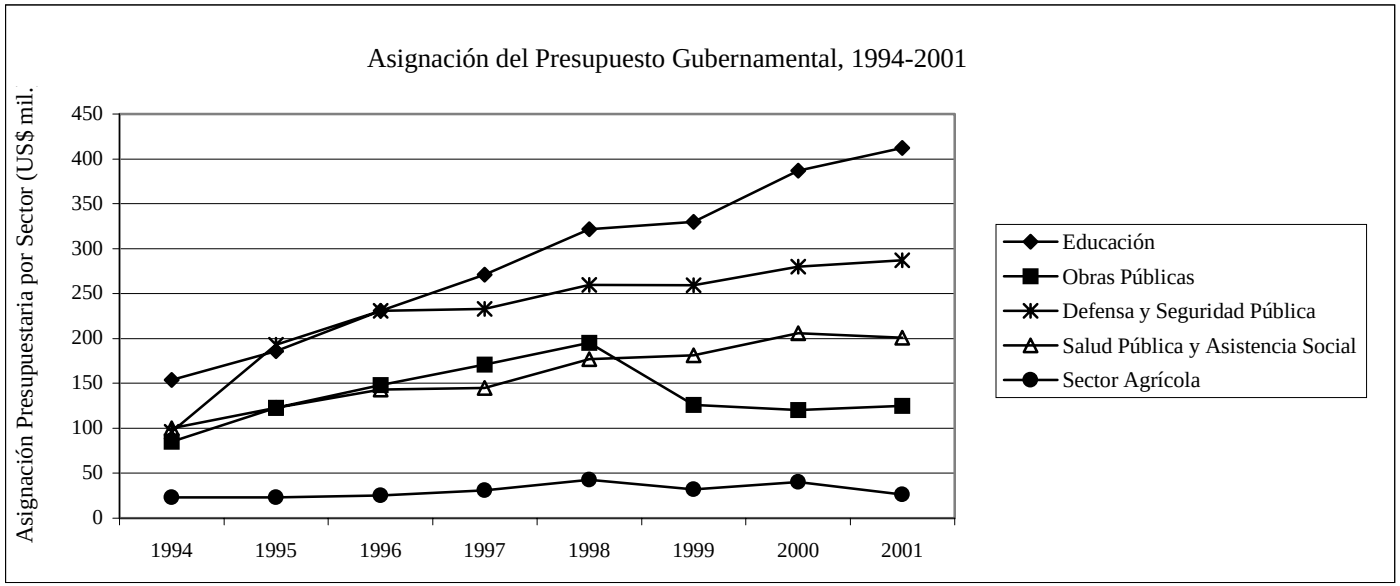
While the GDP recovered to the prewar level by 1990, its structure changed drastically. The share of agriculture in the GDP declined from close to 40% in late 1970's to less than 20% by 1990. The per capita GDP recovered the pre-war level by 1994, but the agricultural GDP decreased its share further to 14%. The agricultural sector claimed only a 10% share in the GDP in 2001. More indisputable and influential factors for the decline of agriculture in El Salvador are described.

Lack of investments and neglect

Access to basic infrastructure and services was reduced during the years of the civil war, and many of the existing facilities were destroyed particularly in rural areas. The post-war economic policy and public investment, however, have continued to favor urban areas. While the government budget increased rapidly through 1990's, its allocation to the agricultural sector did not increase significantly. The share of the agricultural sector in the government ordinary budget decreased from 5.0% in 1994 to 2.5% in 2001 (Table 8.1). Generally, budget allocation to the agricultural sector in El Salvador is comparatively smaller than in neighboring countries (Table 8.2). Moreover, the share of agriculture in the government total budget has been declining consistently since 1990.

Table 8.1. Allocation of Government Ordinary Budget by Sector

Año	1994		1995		1996		1997		1998		1999		2000		2001	
Sector	US$10^6	% del presupuesto	US$10^6	% del presupuesto	US$10^6	% del presupuesto	US$10^6	% del presupuesto	US$10^6	% del presupuesto	US$10^6	% del presupuesto	US$10^6	% del presupuesto	US$10^6	% del presupuesto
Educación	154	33.6	186	28.7	231	29.7	271	31.8	322	32.3	330	35.6	387	37.5	412	39.2
Obras Públicas	85	18.6	123	19.0	148	19.0	171	20.1	195	19.6	126	13.6	120	11.6	125	11.9
Defensa y Seguridad Pública	96	21.0	193	29.8	231	29.7	233	27.4	260	26.1	259	27.9	280	27.1	287	27.3
Salud Pública y Asistencia Social	100	21.8	123	19.0	143	18.4	145	17.0	177	17.8	181	19.5	206	19.9	201	19.1
Sector Agrícola	23	5.0	23	3.5	25	3.2	31	3.6	43	4.3	32	3.4	40	3.9	26	2.5
Total	458	100.0	648	100.0	778	100.0	851	100.0	997	100.0	928	100.0	1,033	100.0	1,051	100.0



Fuente: Banco Central de Reserva de El Salvador.

Table 8.2. Budget Allocation to the Agricultural Sector in Central American Countries

(Unit: %)

Country	1980	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998
Costa Rica	8.3	12.5	13.1	13.3	9.7	9.7	8.8	7.0	14.2	19.4	11.1	6.4	4.5		
El Salvador	5.8	6.7	9.7	7.8	4.2	4.6	5.2	4.4	2.9	2.4	2.0	1.7	1.6	1.7	1.9
Guatemala	6.3	2.9	3.5	3.9	4.8	4.5	3.7	3.1	2.7	3.3	3.9	2.8	2.2	2.0	2.4
Honduras	15.1	23.5	15.6	18.0	14.5	11.3	11.1	10.1	9.0	14.4					
Nicaragua	5.5	5.0	3.8	2.2	2.1	1.9	1.8	2.4	4.4	4.8	2.7	1.8			
Panama	3.5	3.1	2.8	2.2	3.6	3.2	2.7	2.0	2.5	2.5	2.0	1.8	1.5	1.5	1.8
Dominican Republic	8.8	10.8	9.0	7.2	6.1	4.4	3.9	3.6	2.2	4.0	3.7	3.1	3.4	4.0	7.6
Mexico	13.2	9.6	10.0	8.2	6.1	5.7	5.7	5.5	5.5	5.1	6.6	8.0	8.1	7.0	6.0

Source: CEPAL, 1999.

Table 8.3. Provision of Loans to the Agriculture and Livestock Sectors

(Unit: ¢10^6)

Category	1980	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998
Agriculture and livestock	505	976	908	1,070	938	1,303	1,434	1,951	2,878	3,290	1,997	2,154	3,270	3,259	2,639
Agriculture	500	849	782	962	821	1,151	1,309	1,827	2,650	3,047	1,764	1,945	2,957	2,911	2,286
Export crops	452	799	710	879	735	1,053	1,204	1,710	2,487	2,944	1,697	1,882	2,850	2,844	2,114
Cotton	142	96	66	59	73	63	49	31	47	43	77	5	3	2	5
Coffee	291	652	610	782	592	907	1,031	1,438	1,977	2,404	1,290	1,520	2,474	2,505	1,764
Sugarcane	19	50	34	38	70	83	124	242	463	497	329	357	373	337	345
National consumption crops	25	21	30	33	30	38	37	41	46	28	18	16	44	22	20
Rice	6	6	7	7	8	14	10	19	23	10	6	5	6	15	29
Bean	1	2	2	2	2	2	3	1	1	1	1	0	1	1	1
Corn	17	12	21	23	21	22	24	21	22	17	11	10	37	21	19
Others	23	30	41	50	56	59	68	76	118	75	49	47	64	30	123
Cattle	3	58	89	64	43	36	19	32	26	32	45	45	66	64	52
Poultry	1	50	23	29	41	75	70	77	185	176	159	133	182	241	260
Fishery, apiculture, others	1	18	14	15	33	42	36	15	17	35	28	31	65	43	41
Total (above + other)	1,971	6,407	7,073	6,520	8,212	10,756	10,391	9,110	16,082	18,934	18,912	21,910	33,574	35,271	35,558

Currency appreciation

Since the Government fixed the exchange rate in 1993, a considerable real appreciation of the currency has occurred. The real effective exchange rate increased from a 1990 base of 100 to 135.7 by 1995, and further to 154.3 in the middle of 1999. A leading factor for this is increasing remittances corresponding to 11-14% of the GDP during this period.

Also accountable is the trade liberalization with the reduction of tariffs starting in 1989 and step-wise withdrawal of state interventions in the economy. The average nominal tariffs for agricultural products were reduced from 39.0% in 1988 to 10.7% by January 1995 (World Bank, "El Salvador: Rural development Study", 1998). The liberalization process included also the elimination of price and market interventions for more than 200 products, and the introduction of a value added tax (VAT) in 1993. Agricultural products, however, were excluded from the VAT system, resulting in a lower effective protection rate in this sector.

Financial liberalization

Financial liberalization took effect in the early 1990's, including the privatization of banks, and the liberalization of interest rates and foreign transactions. The Government abandoned traditional credit targeting, and the credit allocation started to follow basically market forces. Under the unfavorable macroeconomic environment, the share of credit to the agricultural sector from commercial banks and other financiers fell rapidly. The share of loans to the agriculture and livestock sector in the total amount of bank loans decreased consistently from 21.4% in 1991 to 7.4% in 1998 (Table 8.3).

Access to credit services is very limited in rural areas. The 1998 World Bank study (op. cit.) reports that in 1996 scarcely 20% of the rural households had outstanding debt balances from formal or informal sources. The study attributes this lack of financial development to (i) underdeveloped institutional infrastructure, (ii) government interventions that crowded out private lenders by allowing weak public sector institutions to lend with low interest rates and poor recovery rates, (iii) credibility problems created by debt-forgiveness programs, (iv) previous interventions in agricultural marketing such as crop purchase credit that prevented the development of informal financing, and (v) recent conflicts and the resulting insecurity in rural areas.

Adverse weather conditions

The weather conditions have been particularly damaging in El Salvador in recent years as a consequence of El Niño and the hurricane Mitch. In the 1997-98 agricultural year, almost all crops were affected by the adverse weather conditions associated with El Niño. Coffee production fell by 8.8% from the previous year, sugarcane by 9.1%, and maize by 19.4%. Average yields of beans and rice were also reduced, while planted areas increased. Small producers were particularly hard hit as significant reduction in maize yields occurred just after

the area cultivated to this crop was increased. El Niño also affected fishing activities, mostly undertaken by artisan fishermen, resulting in the fall in the fishery GDP due especially to shrimps.

(2) Constraints to agricultural development in the Eastern Region

The Eastern Region suffers more seriously from the factors described above for the decline of agriculture in El Salvador. Agricultural and rural infrastructure facilities destroyed during the civil war have not been recovered fully due to limited public and private investments. The largest irrigation scheme in the Eastern Region, the Lempa-Ahuachapan area with some 1,400ha, for instance, has been largely neglected. While the FOVIAL has been successfully operated to improve and maintain trunk roads under the jurisdiction of MOP, and municipal roads have been improved by mobilizing voluntary workers, rural roads are still inadequate in serving remote areas.

Access to rural credit is more limited in the Eastern Region. According to the rural socio-economic survey for 19 municipalities in the Region, only 4% of surveyed families had outstanding loans (JICA Study Team, 2003). Agricultural extension does not reach regions effectively; the same survey found 93% of families responding did not receive technical assistance from any source.

The Eastern Region suffers more severely from adverse weather conditions, not only occasional calamities such as El Niño and the hurricane Mitch but also habitual floods and droughts. A large flood-prone area exists along the middle and lower reaches of Rio Grande de San Miguel, and a small area in the midstream of the Lempa river is also vulnerable to floods. The major drought of 2001 struck 61 out of 87 municipalities in the Region, affecting nearly 37,000 families or 184,728 people (MAG). The estimated loss of crops due to the drought is summarized below.

(Unit: %)

Department	Maize	Beans	Sorghum	Watermelon
Usulutan	98	100	98	82
Morazan	77	87	23	88
La Union	71	75	85	0
San Miguel	64	88	0	0

Sources: Magaixa, Rene, FUNDE 2001.

Most farmers in the Eastern Region lack incentives to enhance agricultural productivity due to (1) availability of imported agro-products in the open economy, and (2) reliance on overseas remittance. Limited marketing opportunities and/or limited access to market information also constrain farmers to undertake non-traditional agricultural activities. This lack of incentives is reflected in the delay in irrigation development and farm mechanization for enhancing agricultural productivity.

More specific constraints to some subsector activities include the following:

1) degrading soil conditions for maize produced in marginal lands, under rainfed conditions, and without adequate fertilization;
2) limited processing capacity within the Region for sugarcane;
3) fall in international market prices of coffee and resultant neglect causing damages by insects and diseases;
4) lack of focus on the Eastern Region for the national fruits and vegetables development program;
5) shortages of feed and sometimes water for cattle;
6) dependence on feed and medicine suppliers for technical assistance for swine; and
7) dominance of small units for poultry.

(3) Constraints to fishery development in the Eastern Region

Rapid surveys were conducted at 49 fishing communities throughout the Eastern Region to examine the existing conditions and identify constraints. Covered by the surveys were 14 marine fishing communities, four inland fishing communities, five inland aquaculture projects, and 26 associated with marine aquaculture. The following common constraints are identified:

1) insufficient dissemination and enforcement of the new fishery law that went into effect in January 2001;
2) lack of surveillance to control illegal fishing activities;
3) lack of training and technical assistance;
4) marketing problems;
5) insufficient social and economic infrastructure represented by high costs and poor quality of electricity, lack or poor quality of potable water, and lack of daycare and other community facilities;
6) weak fishermen's organizations;
7) lack of other employment/livelihood opportunities; and
8) limited access to credit due to high interest rates and/or guarantee requirements.

Other constraints faced by different subsectors are as follows.

Small-scale marine fishery

- FOVIAL tax on fuel for boats undermining profitability,
- difficulty in obtaining fuel for boats,
- lack of ice plant and refrigerated storage and the resultant control of fish prices by ice suppliers,
- conflicts with industrial fishery,
- lack of artificial reefs, and
- illegal fishing practices.

Marine aquaculture

- insufficient post-larvae production and distribution,
- lack of access during winter (access only by lancha), and
- water contamination.

Inland aquaculture

- deforestation,
- sedimentation in reservoirs,
- insufficient production and distribution of fries, and
- low productivity due to insufficient nutrients/feed.

Olomega (inland fishery)

- problems with wastewater and solid wastes,
- lack of storage and transport facilities,
- lack of capacity to adapt to fishery regulations,
- lack of access to the lagoon by some communities,
- poor drainage as well as flooding, and
- lack of recreation plan consistent with fishing activities.

(4) Strategy for agricultural development in El Salvador focusing on the Eastern Region.

General

Clear and strong agricultural and rural development policies should be established with two basic objectives: (i) enhancement of competitiveness in agriculture and (ii) alleviation of rural poverty. These objectives are complementary, and can be attained only through significant increase in private investments and enhanced people's participation in all aspects of the development. The Government's role is to facilitate these through the provision of sound macroeconomic environment, adequate and transparent institutional and legal frameworks, improved infrastructure, and measures to ensure higher levels of human capital, as described in different sections of the Report.

Under such policies, key public agencies should be identified for different aspects of agricultural and rural development, and their functions streamlined to avoid duplication of efforts and to focus on most promising areas and activities. In particular, functions to be performed in regions need to be clarified in line with the decentralization policy, including agricultural planning and extension, and provision of market information. Ongoing efforts to establish an intermediate level of development administration between the Central Government and municipalities would allow the transfer of these functions to this level to serve local people through several municipalities together more effectively. This may be combined with a new participatory mechanism at the municipality level to attain maximum effects with limited resources.

Farmers organizing and participation

Fragmentation of farm units and the lack of experience in non-traditional agro-products are among the major constraints to enhancing agricultural productivity and competitiveness. Farmer organizing is essential to produce any agro-products in marketable quantity. Organized farmers would undertake joint procurement of farm input and joint marketing of their products for cost-effectiveness. Agricultural extension may be provided more effectively through organized farmers.

The new T&V system for agricultural extension suffers from shortages of qualified extension workers and logistic supports. It does not reach effectively in regions remote from San Salvador. As a limited number of extension workers are deployed to those regions, they should work closely with farmers' associations, cooperatives and other community groups. For the existing crops and agricultural activities, lead farmers may be identified and accredited as farmer-extension liaisons.

Research and technology development

To compete successfully in the free trade regime with open economy, introduction of state-of-the-art production technology is a prerequisite. The adequate Government policies as indicated above should allow increasing foreign direct investments in agro-business, which in turn would bring in the production technology. Roles of Government agencies are to facilitate joint venture arrangements with foreign partners and also to make the technology adapt to local conditions. The presence of organized farmers would be essential to conclude joint venture arrangements in better terms for local people. The Government, therefore, should support farmer organizing and provide extension and other support measures only to organized farmers.

Agricultural R&D activities should be streamlined, focusing on more promising areas. More important subjects for the Eastern Region development include the following:

1) cropping cycles under irrigation (vegetables, maize, beans, improved pasture, etc.);
2) processing of fruits;
3) processing of fiber crops (kenaf, cotton) and products development for kenaf fiber;
4) development of complete cycle processing schemes (sugarcane, cashew);
5) products and market development for indigo;
6) establishment of best feed combinations for livestock (managed pasture, silage, import grains and feed supplements);
7) development of viable integrated farming schemes (goats and cashew trees, apiculture and fruits/flower production, poultry and vegetable production, agro-pisciculture); and
8) market development for dairy and marine products.

R&D results should be disseminated through a computer network linking all agricultural research institutions, public and private, with farmers' associations.

Marketing

A few alternative schemes may be proposed for the establishment of marketable agro-products: (A) creation of specialty products for niche market, (B) production of raw materials for processing, and (C) supply to growing urban markets. Some products, such as indigo, kenaf and cashew, potentially fit to more than one scheme. Sugarcane fits to the second model, but various processing opportunities should be fully utilized. Fruits and vegetables fit particularly to the third scheme.

Entrepreneurship should be promoted among farmers and agro-business to allow them to capture emerging marketing opportunities, especially associated with the La Union port establishment and the accelerating urbanization. Development of farmers' associations and training on business and financial management should be encouraged. Efforts may be focused on agrarian reform beneficiaries for farmer organizing and provision of a comprehensive support package with credit, guarantee and insurance, and technical extension.

Telecommunication facilities should be installed, extending to centers of main production areas for provision of market information and timely trading of agro-products. A network of roads linking production areas to markets should be improved to facilitate transport of input from outside and produce to markets, and to minimize post-harvest losses. Trading places should be constructed in strategic areas at nodal points of the network.

Irrigation and farm mechanization

Irrigation and farm mechanization are least developed in El Salvador largely due to the lack of incentive for farmers to enhance agricultural productivity. Under the adequate Government policies and support measures discussed in this subsection, irrigation and farm mechanization would contribute significantly to increasing agricultural production. In the Eastern Region, supplemental irrigation is to be pursued to bridge dry spells during the rainy season and to extend the cropping season by a few months at most rather than undertaking full-scale irrigation in the middle of the dry season. Various sources of irrigation water may be combined, including small reservoirs and ponds, shallow and deep groundwater, and springs at the foothills of the San Miguel volcano. Some of the small reservoirs and ponds may be interconnected both horizontally by contour canals and vertically by cascades for more effective use of soil and water by an integrated tank system. Organized farmers may construct, operate and maintain such a system as well as allocate water and ensure proper on-farm water management.

Increasing irrigation and farm mechanization would present opportunities to develop agricultural machinery and equipment industry. Existing metal products and machinery industry as well as various workshops provide a base for the development. As the La Union port is established, various parts and raw materials are more easily imported. Therefore, the

agricultural machinery and equipment industry may start with assembly operation in the Eastern Region. Eventually, this industry may specialize in manufacturing small agricultural machinery suited to small plots of farmland and undulating topography not only in El Salvador but also in its neighboring countries.

Environmentally sound production practices

The agricultural sector would play a leading role in realizing sustainable environmental development, contributing to adequate watershed development and management. Alternative farming systems should be developed especially for upland farmers, that would promote environmentally sound farming practices and contribute to localizing agricultural value-added. They include organic farming (e.g., for coffee and cashew), sloping agricultural land technology (SALT), managed pasture, small-scale irrigation by the tank system, and integrated farming of various kinds.

Coffee production in El Salvador should be geared to high value products with brand development such as organic or gourmet coffee. The world demand for quality organic coffee is increasing by over 10% annually in recent years. High elevation coffee areas under shade trees should be protected and enhanced. As they constitute the main portion of the remaining forests, replanting of old coffee plantations should be undertaken as part of reforestation programs. In the Eastern Region, 40% of all the coffee areas are old and at least 4,500ha need replanting. Other support measures for organic coffee promotion include the facilitation for obtaining certification and the establishment of a regional laboratory for coffee quality testing.

Finance

Financial flow to rural areas needs to be expanded significantly, and this may be accomplished only by attracting private investments. Incentives may be provided for private banks to offer financial services in rural areas, but discipline should be enforced to avoid credibility problems. Public financial institutions should enhance their capacity to evaluate loans and guide private financial intermediaries. This may effectively strengthen links between rural finance and technology transfer for agricultural development not only for financial management but also for production technology as a whole. The Government should also improve legal and institutional frameworks of finance for new schemes involved in rural and agricultural development such as usufruct for non-wood forest resources, use right or lease of public land, and joint guarantee as a collateral.

Support for dairy farming

In view of the importance of livestock subsector in the Eastern Region, a comprehensive package of support measures should be taken particularly to promote dairy farming. A prerequisite is to expand and strengthen the existing dairy farmers' associations including small farmers. The associations should establish a system for cost-effective import and distribution of

feed ingredients, and control the quality and prices of cattle feed. They should also establish a system to sell livestock medicines at the village level. To support these initiatives, the Government should continue and expand some successful components of the ongoing PRODERNOR, such as artificial insemination for breed improvement and disease control. New forage species may also be demonstrated and introduced. Municipal governments and the associations may establish a modern regional slaughterhouse through their joint effort.

Fishery development strategy

Constrains to fishery development related to infrastructure and utilities such as water and electricity supply and access roads are expected to be overcome along with their general improvements through the Eastern Region development. The fishery development in the Eastern Region takes a proactive strategy to grow livelihood activities currently suffering from various constraints as identified into viable economic activities by extending ongoing efforts. Also, a few new facilities should be introduced to support new types of fishery activities. Thus, the strategy has the following components:

1) development of aquaculture potentials in the Jiquilisco and the La Union bays, extending the ongoing efforts by CENDEPESCA supported by JICA;
2) promotion of integrated farming such as irrigated agriculture and tilapia aquaculture by pond, and poultry and fishmeal production;
3) innovation of small-scale marine fishery with such technologies as floating cages and artificial reefs, as undertaken recently by CENDEPESCA/AMBIDESSAL supported by the Japanese Government;
4) value-added fish processing such as fish pastes recently supported by JICA and the establishment of fishmeal plants;
5) installation of ice plants and cold storage to be owned by fishermen's organizations;
6) provision of daycare centers and community facilities for cultural/sporting activities, and
7) re-establishment of fishery training facilities and a database to support marine fishery in particular for fishery resources management and regulations, fishing and navigation technologies, and storage and processing.

(5) Main agro-products in the Eastern Region and target markets

Main agro-products that can be produced in the Eastern Region have been identified. Criteria for assessing prospects include (1) land suitability, (2) economy of production based on crop budgets, (3) contribution to related economic activities such as agro-processing industries, and (4) marketing prospects. These agro-products and their target markets are summarized in Table 8.4 though inclusion in the table does not necessarily imply priority in development. For more promising agro-products to be selected on the basis also of the analysis in Chapter 5, pilot projects may be initiated to promote production and processing activities organizing local farmers and entrepreneurs.

Table 8.4. Main Agro-products in the Eastern Region and Their Target Markets

Agro-products	Main production areas	Market*	Possible target markets
Vegetables	- Highland in Morazan and La Union - Rio Grande basin under irrigation	C	- Port city of La Union - San Miguel
Sugarcane	- Lowland in Usulutan and San Miguel	B	- Existing and new processing industries for complete cycle processing
Kenaf	- Basin areas in upland - Coastal lowland	B	- New processing industries (fibers and non-tree paper)
Cotton (sea island long fiber)	- Coastal lowland	B	- New processing industry
Indigo	- Marginal agricultural land in upland (up to 800m el.) and lowland	A, B	- Export as dye - Apparel and handicraft industries
Staple maize	- Existing cultivation areas	C	- Throughout the Region
Green maize	- Existing cultivation areas except marginal agricultural land	B	- Silage production for cattle industry
Rice	- Rio Grande basin under irrigation - Basin areas in combination with kenaf	C	- National market - Expatriate communities
Cashew	- Mid and downstream areas of river basins, including slope land	A, B	- Processing of nuts for export - Processing of apple into wine for national market
Fruits (avocado, citrus, mango, etc.)	- Slope land - Existing low elevation coffee areas	B, C	- La Union and San Miguel - National market - New processing industries
Coffee	- Highland	A, B, C	- Organic/gourmet coffee for export - Expatriate communities
Milk	- Mid and upstream areas of river basins	B, C	- New dairy industry (cheese for export) - La Union and San Miguel
Honey	- Throughout the Region	A, B, C	- Existing processing industries in other regions - New processing industry

*A: Niche markets of specialty products / B: Supply to processing industries / C: Urban markets

Source: JICA Study Team.

8.1.2 Strategy for industrial development

(1) Characteristics of the industry sector in El Salvador and the Eastern Region

El Salvador

The annual growth of the industrial GDP has been consistently higher than the GDP growth since 1995. The real growth rate of the industrial sector was 3.3% per annum during 1995-2001, higher than the GDP growth at 2.7% or even the services sector at 2.8% during the same period. The share of the industrial sector in the GDP increased to 28.5% in 2001. Its share in the total employment was 24.6% in 2000, although 54.9% of the employment in the formal sector was employed in the industrial sector.

The industrial sector attracted by far the largest foreign direct investments (FDIs) since 1997 up to 2002, according to the Central Reserve Bank. The manufacturing subsector alone attracted a cumulative total of US$612 million, including the investments in maquila at US$193 million.

The utility subsector attracted the largest FDI with US$848 million, mainly due to the privatization of public utilities. Contributions of the construction subsector are small, and the mining and quarrying nil.

According to the registration at DIGESTYC, 8,079 firms are registered in the formal sector, and 144,020 firms in the informal sector. Over 99% of firms registered in the informal sector are micro and small enterprises. Over 90% of large enterprises employing over 101 employees and medium enterprises with 51-100 employees are located in the Central region. Large enterprises account for 5.2% of all the enterprises but employ 65.8% of the total employment. Micro enterprises share 67.2% of the total number of enterprises and 8.7% of the total employment.

Table 8.5 shows the subsector structure of manufacturing in El Salvador with respect to the number of establishments and employment. The largest subsector industry is food processing and beverages, accounting for 34.0% of the establishments and 21.7% of employment. Textile is the second largest with 28.0% of the establishments, but contributes to the largest employment with a 45.8% share. These two subsectors combined account for 62.0% of the enterprises and 67.5% of the employment.

Table 8.5. Composition of Manufacturing Companies by Sub-industry

CIIU code	Number of companies (%)					Employment (%)	Major industry
	Large	Medium	Small	Micro	Total		
31	115 (20.3)	82 (24.1)	279 (22.0)	5,955 (35.5)	6,429 (34.0)	65,622 (21.7)	Food processing, beverages, oil and others
32	235 (42.0)	93 (27.3)	263 (20.6)	4,697 (28.1)	5,288 (28.0)	139,058 (45.8)	Textiles, leather and other related productions
33	5 (0.9)	8 (2.4)	78 (6.1)	2,005 (12.0)	2,096 (11.1)	8,082 (2.7)	Wood, palm and others
34	29 (5.2)	20 (5.9)	123 (9.6)	569 (3.4)	741 (3.9)	12,374 (4.1)	Paper, pulp and others
35	98 (17.6)	74 (21.8)	178 (13.9)	164 (1.0)	514 (2.7)	37,360 (12.3)	Chemical, pharmaceutical and petroleum industries
36	19 (3.4)	17 (5.0)	111 (8.7)	838 (5.0)	985 (5.2)	10,165 (3.4)	Glass, ceramic clay and asbestos
37	15 (2.7)	4 (1.2)	5 (0.4)	11 (0.1)	35 (0.2)	3,781 (1.2)	Iron, steel, aluminum and others
38	36 (6.5)	28 (8.2)	206 (16.1)	2,253 (13.5)	2,523 (13.3)	22,768 (7.5)	Construction machinery, electric equip. & accessories
39	8 (1.4)	14 (4.1)	33 (2.6)	240 (1.4)	295 (1.6)	3,872 (1.3)	Other manufacturing industries
Total	556 (100)	340 (100)	1,276 (100)	16,732 (100)	18,906 (100)	303,082 (100)	

Source: DIGESTYC.

The Eastern Region

Of the total establishments of 144,353 in El Salvador, 24,802 or 17.2% are located in the Eastern Region. Of these, 98.1% are micro enterprises employing fewer than 10 employees. Commercial enterprises have the largest share accounting for 63.8% of all the enterprises, followed by services with 25.9% and manufacturing with 10.3%.

In the departments of the Eastern Region, most establishments concentrate in one or two municipalities. In Usulutan with 23 municipalities, 66% are located in the capital city and 6%

in Santiago de Maria. In San Miguel with 20 municipalities, 80% of the establishments are concentrated in the capital city and 4% located in Ciudad de Barrios. In Morazan, 99% of the establishments concentrate in San Francisco Gotera and almost none exist in the remaining 24 municipalities. The establishments in La Union with 18 municipalities concentrate in the capital city with 57% and Santa Rosa de Lima with 38%.

The subsector structure of manufacturing in the Eastern Region is given in Table 8.6. The food industry is the only subsector having larger enterprises. It accounts for 26.9% of all the enterprises, employing in total 36.1% of the total manufacturing employment. Other more important subsector industries are textile, automobile workshops, and construction materials industry producing blocks, bricks and roofing materials. They are all SMEs employing 3.4 employees on average.

Table 8.6. Composition of Manufacturing Companies in the Eastern Region

	Number of companies (%)					Employment	
Type	Large	Medium	Small	Micro	Total	(%)	Major industry
1	3 (100)	3 (60.0)	37 (33.7)	508 (26.3)	551 (26.9)	2,279 (36.1)	Food processing, beverages, oil, and others
2	0	0	6 (5.5)	559 (28.8)	565 (27.6)	1,119 (13.5)	Textiles, leather and other related productions
3	0	0	3 (2.7)	235 (12.2)	238 (11.6)	710 (8.6)	Wood, palm and others
4	0	0	5 (4.5)	38 (2.0)	43 (2.1)	326 (3.9)	Paper, palm and others
5	0	0	7 (6.4)	3 (0.2)	10 (0.5)	174 (2.1)	Chemical, pharmaceutical and petroleum industries
6	0	2 (40.0)	36 (32.7)	201 (10.4)	239 (11.7)	1,623 (19.6)	Glass, ceramic clay and asbestos
7	0	0	0	1 (0.1)	1 (0.0)	4 (0.0)	Iron, steel, aluminum and others
8	0	0	16 (14.6)	347 (18.05)	363 (17.7)	1,274 (15.4)	Construction machinery, electric equipment & accessories
9	0	0	0	39 (2.0)	39 (2.0)	66 (1.9)	Other manufacturing industry
Total	3 (100)	5 (100)	140 (100)	1,931 (100)	2,049 (100)	8,275 (100)	

Source: ibid.

(2) Conditions and perceptions of existing industries in El Salvador

A survey on existing industries was carried out as part of the Study. A total of 203 enterprises were covered, consisting of 14% in the Western region, 49% in the Central region, and 37% in the Eastern Region. Subsector composition was 56 enterprises from the food processing, 49 from the textile and leather, 22 from the wood and palm products, 49 from the jewelry, paper and chemical products, 27 from the machinery and equipment, and 49 from other subsectors. The average number of employees is 51.1 in the Western region, 57.8 in the Central region, and 14.9 in the Eastern Region.

Conditions of existing industries

Average annual sales of all the enterprises surveyed were reduced in 1998 and 2000 in all the three regions. In 2001, they increased in the Central region and stayed at the same level as in 2000 in the Eastern Region.

Most employees (80%) are primary school and high school graduates. The Central region has 79% of university graduates and 63% of vocational institute graduates of the respective total employed by the surveyed enterprises. The average wage of employees is US$179 per month, comparable to the basic salary for operators. Procurement of materials and parts is mostly through third party enterprises, but 51.7% of large enterprises procure their materials and parts through import. In the Eastern Region, 75.9% of materials and parts are procured within the Region.

Food processing industries are mostly micro enterprises, producing mainly bread, pastry, cheese and seafood. Medium scale salt manufacturer and sugar industry exist in the Eastern Region. Main export commodities are coffee, wheat, maize products and snacks. Small amount of rice and beans are exported to the US, while other foods are exported mostly to Central American countries.

Textile industry concentrates in the Central region. Small and micro enterprises in this subsector market their products in the domestic market. Main products of wood industry are furniture, and very small portion of their products are exported to Central America. Enterprises in the machinery and equipment subsector are found throughout the Country. They are mostly micro-scale, producing car repair parts, construction materials, milling machines, etc., for the domestic market. Other products such as industrial machines, car bumpers and water pumps as well as milling machines are exported to Central America.

Perception of existing industries

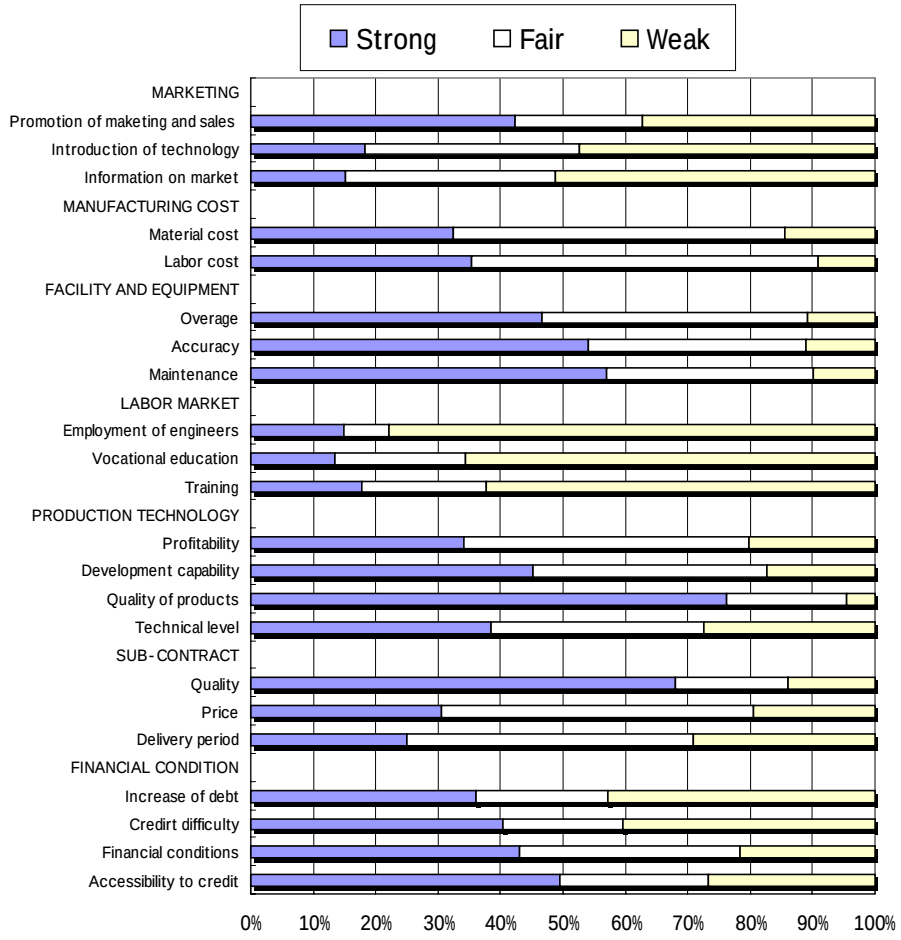
The major constraint to corporate management of surveyed enterprises, according to self-evaluation, is the labor market related to employment of engineers, vocational education and training. Marketing is the second constraint, followed by financial conditions (Figure 8.1). Particularly, the corporate management is evaluated weak in market information.

Most SMEs interviewed expressed difficulties in obtaining credit. Also 40% of surveyed enterprises assessed credit difficulty "strong." Financial conditions were evaluated "strong" by 40% of surveyed enterprises.

Constraints to obtaining business licenses were noted by 70% of small and 45% of micro enterprises, such as difficult procedure, many requirements and slow process. Of the surveyed enterprises, 9% of micro and 5% of small enterprises have not registered. Periodical inspections by the Government are also considered severe burdens by small and medium enterprises for labor verification, environmental compliance, and sanitary and other requirements. Over 60% of large and medium enterprises do not see them as problems.

Most enterprises do not belong to associations, although large enterprises have higher ratios of membership. Many consider that associations work on behalf of limited members.

Figure 8.1. Self-Evaluation of Factors Related to Corporate Management



Source: JICA Study Team, Survey on Existing Industries, 2003.

Most enterprises do not receive any support from the Government. Supports requested for the Government include: I) lower interest rates, ii) provision of training, iii) support to promotion of associations, iv) lower taxes, v) elimination of smuggling, vi) provision of water supply, vii) provision of reliable and strategic information on marketing, and viii) provision of accessible credit.

(3) Strategy for industrial development in the Eastern Region

Almost all the existing industries in the Eastern Region are small, and lack business linkages among themselves, to say nothing of linkages with industries in other regions. SMEs need to be promoted with support measures that would improve business environment for training, technology development, marketing and other infrastructures. However, since most existing industries in the Region are commonly found in other regions and neighboring countries, they have little competitive power against many goods and materials imported from other regions and countries. In order to overcome this situation, the industrial structure needs to be reformed

by creating characteristic industries based on indigenous resources and locational conditions. It would be even better if leading industry could be established. At the same time, corporate management of existing enterprises needs to be improved.

Creation of characteristic industries

Characteristic industries in the Eastern Region may be created utilizing its rich agricultural resources, proximity to Honduras and Nicaragua, and the La Union port. Two promising models and possible industries are as follows.

1) Import of raw materials and intermediate goods for processing into final products:
   - Cement or cement raw materials for cement products,
   - Wood and lumber for plywood/fiberboard,
   - Cotton/silk yarns and textile for clothing,
   - Grains and other feed gradients for mixed feed/feed concentrates, and
   - Steel/steel parts for agricultural machinery and equipment.
2) Establishment of agro-processing plants to attract more raw materials by import:
   - Fruits and vegetables processing,
   - Honey and its derivatives,
   - Non-tree pulp and paper manufacturing, and
   - Power alcohol from molasses.

Another possibility to be strategically pursued is the following:

3) Development of knowledge industry with IT through concerted efforts of the Government and business communities.

To support the creation of new industries, an industrial technology center should be established to serve the Eastern Region. The center would ensure the availability of state-of-the-art technology to support products development as well.

Development of linkages

Linkages with related industries would develop in association with characteristic industries. The leading industry to develop from characteristic industries would allow development of inter-regional linkages. These economic linkages should be reinforced by providing business information and introducing subcontracting system. Diversification of products would also contribute to linkages development. Thus complete cycle processing should be promoted, particularly based on sugarcane and cashew. This would also increase and internalize value-added and minimize leakages and wastes.

Trade and distribution become increasingly an integral part of manufacturing as the free trade is promoted through the La Union port. Business linkages are promoted further by establishing strong logistic functions in the Eastern Region, especially in the La Union-El Amatillo area.

Enterprise reform

At present, NGOs and other institutes provide training for micro enterprises to improve their corporate management. Without proper business information, however, knowledge transferred by such trainings cannot be put to practical use. Micro enterprises should be supported to improve their access to business information through the Internet. For SMEs, formation of business associations should be encouraged for more effective training to modernize corporate management.

Most existing enterprises collect some business information related to production technology and marketing, but they do not have capacities to analyze them for reflection in their business decisions. For integrated training on technological and marketing information, a business center may be established with a regional database, particularly focusing on agro-business.

Human and institutional development

Comprehensive support measures should be taken with the view to fostering the first generation industrialists with a strong entrepreneurship. Technical training and financial supports would be most essential. In addition to measures suggested above, the Eastern Region skill development fund and incubation centers should be established.

El Salvador does not have region-specific incentives for investments. To make most of the opportunities to develop in association with the La Union port, establishment of region-specific incentive system may worth serious consideration. Introduction of differential incentives for the logistic circuits may be justified since other areas in the Eastern Region will be integrated into the main economy of the logistic circuits.

8.1.3 Strategy for tourism development

(1) Characteristics and problems of tourism in El Salvador and the Eastern Region

Characteristics

Tourism in El Salvador is characterized by the following:

1) No outstanding tourism resources exist as compared with neighboring countries;
2) Tourists from Guatemala, Honduras and Nicaragua are dominant;
3) Visitors from the U.S., while largest of all the origin countries, are mostly for temporary visits by overseas Salvadorans;
4) Most tourists, including returned overseas Salvadorans, engage in urban-based tourism and recreation activities; and
5) Domestic tourism is active for all the income classes with low-income people engaging mostly in day trips and middle to high-income people staying in tourism areas.

Tourism in the Eastern Region largely shares the same characteristics as listed above. The Region abounds in various tourism resources including beaches, rural areas, volcanoes and

lakes, forests, and cultural and historical resources. These resources, however, are scattered and road links between them are not well established.

Problems

Tourism in El Salvador suffers mainly from: 1) persistent image of the civil war, 2) poor image of security, and 3) high airfares. The Eastern Region has additional disadvantages for tourism, including: i) limited options for accommodations and restaurants due to lack of accumulations, ii) poor access particularly to northern mountain areas, and iii) lack of capital and experiences for construction and operation of tourism facilities.

(2) Basic strategy for tourism development in El Salvador

The following basic strategy is applicable to tourism development in El Salvador in general.

Promotion of urban-based tourism with artificial attractions

In addition to MICE tourism already being pursued, other forms of urban-based tourism may be developed particularly for foreign tourists by establishing man-made attractions. A theme park, amusement park or aquarium/oceanarium should be planned carefully at the maximum scale at least in Central America.

Continued promotion of the Maya tourism route

El Salvador should take advantage of the Maya tourism route of Central America offering not only additional archeological sites but also the urban-based attractions mentioned above as well as unique facilities and products based on indigo culture.

Diversification of sports and adventure tourism

The next generation of the baby boomers in the U.S. offers potential markets for sports and adventure tourism. Their stays tend to be long, often extending for weeks, and their travel budgets tend to be generous. To attract them, other sporting opportunities should be developed not only for surfing, diving and yacht racing but also land and air based adventures.

Strengthening of hub functions by open air policy

TACA is now able to adopt a so-called open-air policy to lower airfares and increase the number of passengers at will for better financial performance.

Enhancement of securities

To secure safe environment for tourists with full cooperation from the law enforcement and the public is a prerequisite to tourism development in any significant way.

(3) Strategy for tourism development in the Eastern Region

Prospects by market segment

1) Domestic tourists

Tourism demand of the middle-income group will increase as income levels are enhanced along with economic development. This will give opportunities for the Eastern Region to attract wealth accumulated in the capital region. Overseas Salvadorans and their families largely belong to this segment. As the La Union port is established, increasing number of expatriates will live in San Salvador, and most of them will take the similar behavior for domestic tourism. Vacations in April, November and December will make high times for tourism by these people as well as weekend tourism. The extent of expansion of weekend tourism into the Eastern Region is subject to the improvement of some roads. Provision of a range of choice for accommodations and security are also pre-requisites for successful development of this market segment.

2) International visitors for business

The number of business travelers from overseas will continue to increase, although the length of their stays may not much increase. As the peace and security are ensured, more business travelers will attempt short trips to the vicinity of the capital, in most cases day trips. The Eastern Region may not attract good portion of these travelers unless alternative attractions are offered on the way to justify longer journeys.

3) Cruise passengers

As cruise ships make a stop at the La Union port, relatively small but potentially lucrative tourism demand will be generated in the Eastern Region. Major tourism resources in the north may not be incorporated in a tour for the short stop of half a day at most, and beach resorts would not be targets of the tourists in this market segment. Artificial attractions need to be established in the port hinterland together with the improvement of environmental quality.

4) Surfers and windsurfers

Surfers and windsurfers from the U.S. or elsewhere constitute a niche market for tourism. At present Costa del Sol is popular, but the Eastern Region has potentials. Good facilities need to be provided to attract them against traveling time and cost.

5) Visitors from neighboring countries

At present, beach resorts in the west attract visitors from Guatemala, for they are closer from Guatemala City than Guatemalan beaches. Beach resorts in the Eastern Region may be able to attract visitors from inland areas of Honduras. Visitors for shopping from Honduras and Nicaragua should increase in the Eastern Region as urbanization accelerates in San Miguel and

La Union.

6) Visitors from other parts of the world

Europe and Asia are practically undeveloped markets for tourism in El Salvador. Tourism for long stays may have potentials for European tourists. Tourism resources in the Eastern Region may appeal to nature-loving tourists. Some Asian tourists may be attracted to cultural heritage that may be reinforced by restoration efforts and creation of specialty products. Increasing number of visitors from these areas is expected to reduce the airfares significantly.

Short-term strategy

1) Basic strategy

The middle-income group should be targeted for domestic tourism, particularly for longer stays. Additional accommodations and facilities should be concentrated in selected tourism areas to ensure diversity in services, especially for hotels and restaurants. Access improvement is another pre-requisite.

To complement limited tourism resources and enhance the overall attractiveness of the Eastern Region, man-made tourism attractions should be developed. They include not only amusement facilities but also traditional handicrafts, local gourmet, and cultural facilities. To realize regular visits by cruisers, tour itineraries should be prepared with the La Union port as the gateway.

2) Investment promotion

Expansion and concentration of facilities would have to rely largely on foreign investors, as the capital and know-how are lacking in the Eastern Region. To attract foreign investors, incentives need to be offered. While the existing infrastructure and utilities are inadequate, it would make sense to reduce or exempt local taxes. In addition to selective improvement of basic infrastructure and utilities, participation of local communities in various aspects of tourism development, supported by municipalities, should provide good incentives. Community participation with municipal supports would ensure recruitment of better staff and workers for foreign investors, reduced labor disputes, and better security.

3) Tourism products development

The Eastern Region may develop specialization in environment-friendly and health-oriented tourism. One possibility is to develop recipes for healthy dishes by utilizing organic products to be produced in the Region. Existing tourism communities and groups may compete for the recipe development at a contest to be organized by CND/CORSATUR.

Experience-oriented tours may be developed in association with indigenous industries in the Eastern Region. Tours to allow experiences of dyeing may be developed utilizing indigo and

other dyes available in El Salvador. Also indigenous industries may produce attractive handicrafts and other souvenirs. Factory tours and open factories to allow purchase of goods produced at FTZ may also be developed.

Medium to long-term strategy

1) Basic strategy

Establishment of tour circuits should be promoted in line with the commissioning of the La Union port. These circuits should satisfy demands of various business travelers and cruise passengers, not only for tourism for long stay and sports and adventure tourism, but also for tourism to look into history, archeology and geography and for tourism to enjoy local culture and handicrafts. Potentials for the latter are particularly high in the northern area.

To prepare diversified tourism circuits, some of them may start from entrance points to the Eastern Region such as the points on CA-1 and CA-2 over the Lempa river and the La Union port. Alternative modes of transportation may also be incorporated to reduce the travel time and add to the variety, such as helicopters and small aircrafts based on airstrips and small boats along the coast. To ensure effective services along the circuits, functions of tour operation and tourism information need to be enhanced.

2) La Union-based tourism development

A tourism core should establish in La Union city to accommodate foreign tourists. Tour itineraries should be developed jointly with tour operators in Honduras and Nicaragua. This may be part of the on-going initiative by the three countries for environmental monitoring in the Fonseca gulf extending the PROGOLFO initiative.

3) Diversification to tourism access

Charter flights from San Salvador may be operated to destinations in the Eastern Region, and Tamarind may be an initial choice. Operation of boats along the coast may start as regular services for fishery villages as well to ensure the continuity of services. This may justify public supports like the subsidy for diesel fuel enjoyed by private bus operators. The northern longitudinal road should be developed in steps to improve access between tourism resources in the northern part of the Region.

4) Improvement of tour operation

Well-organized cooperatives and associations have conducted tourism promotion in the Eastern Region under the coordination of CND. While this is commendable as a base for effective local operation, strategic alliance with San Salvador-based tour conductors is indispensable to accommodate prospective clients right at the beginning. Proactive promotion campaigns should be conducted for the Eastern Region tourism as the La Union port is established.

8.1.4 Strategy for commerce and services development

(1) Characteristics and problems of commerce and services in El Salvador

Characteristics and problems of commerce

Commerce in El Salvador is characterized by the following:

1) Consumption expenditure with increasing flow of overseas remittance is a driving force for the development;
2) While many traditional retailers dominate the subsector, retail chains by medium scale international capital are evolving rapidly; and
3) Trade and merchandising of many commodities are dominated by a few agents specialized respectively in particular commodities, which may be rectified by competition under the FTA.

Characteristics and problems of services

The following characterize the services subsector of El Salvador:

1) There exist limited number of service establishments requiring high level knowledge, technology and skills, and most of them are small;
2) Some business services exists (e.g., legal services, accounting), but they are mostly small having small shares in the services sector and limited capacity to absorb college graduates;
3) The privatization in 1990's brought large amount of foreign direct investments, but did not lead to continuous inflow of foreign currencies; and
4) Direct financing has not developed much, while in indirect financing, mismatching between lenders and borrowers for domestic loans is a problem.

(2) Directions and prospects for commerce and services development in El Salvador

Positions and roles of commerce and services in economic development of El Salvador

Manufacturing industries may not serve as a main driving force initially for the economic development of El Salvador for the following reasons:

1) Resources-based industries are constrained by small land and limited natural resources;
2) Consumers-oriented industries, including import substitution industries, are constrained by small market even if neighboring countries are included; and
3) Modest locational advantages would not allow processing industries to establish spontaneously overcoming thresholds of production scale.

The initial step for further economic development, therefore, would have to be based on: 1) upgrading and high productivity use of indigenous resources, viz., human and land resources, and 2) improvement of institutions and infrastructure to enhance the utility of these resources in

multiple ways. Land-intensive industries represented by agriculture and human-based industries represented by services should lead the economic development, contributing to the accumulation of capital and expansion of markets. Knowledge, technology and skills would be accumulated through this process to lead to creation of a critical mass for processing industries.

El Salvador has already established high ratings for quality human resources and rational institutions. It is also establishing advantages against its neighboring countries for basic infrastructures oriented to hub functions, such as an international airport, ports, and artery highways. The service-based economic development should make maximum use of these advantages.

Promising services

While the services industry develops basically responding to domestic demand, it should contribute also to improving the consistently negative trade balance of El Salvador. The following services generally contribute to foreign currency earning:

1) Services for foreign individuals or entities in El Salvador such as tourism-related services, and transport and warehousing services;
2) Services that foreign individuals/entities entrust to Salvadorans represented by business process outsourcing (BPO) that consist of back services (e.g., personnel management and accounting), middle services (e.g., dispatching), and front services (e.g., call centers); and
3) Services that Salvadoran individuals/entities provide with foreigners in foreign countries represented by financial, consulting and other knowledge intensive services.

Of these services, those that are less demanding for specialties and less competitive services should be selectively promoted in El Salvador. In view of the existing locational conditions, the following may be targeted.

1) Central American cooperation

   El Salvador may offer consumer-oriented services, specifically trade and distribution, to neighboring countries by effectively utilizing hub functions of the international airport and the La Union port.

2) Proximity to the U.S.

   The U.S. is most advanced in BPO utilization. So far “offshore” operations in India and the Philippines are popular, but “nearshore” operations in Canada, Mexico and other Latin American countries are increasing after 9.11. El Salvador would compete with Mexico, Puerto Rico, Costa Rica and Panama to attract BPO operations. Of the BPO business, back services occupy 70%. These services, being foot loose, would not contribute much to independent, self-sustaining economic development, but generate employment opportunities and allow knowledge and skill accumulation.

El Salvador has advantages in middle and front services as far as Central America is the target market. Specifically, logistic services and CRM including call centers are more promising.

3) Location on the Pacific side

This may not prove to be an advantage for services. As more processing industries are located in El Salvador, however, distribution and processing functions involving the supply from Asia may be promoted.

Services development in El Salvador should be directed to the U.S. and neighboring countries as well as the domestic market, which are inter-related for services related to consumer goods. Services with these two directions should be effectively inter-related by IT to make El Salvador a trade center of Central America providing diversified quality services.

(3) Strategy for commerce and services development in El Salvador

Short-term strategy

Basic needs to be generated by the airport and ports need to be satisfied for both physical distribution and marketing functions. For physical distribution, the trucking and warehousing industries need to be strengthened through organizing for more stable management, cost reduction, expanded information exchange, enhanced capacity for business negotiation, and establishment of integrated system. Consultants to be dispatched by the Ministry of Economy may guide business associations. For marketing, front BPO services, particularly CRM including call centers should be promoted, continuing the ongoing efforts by PROESA, aiming at employment generation, establishment of expertise for organized operations, and strengthening of information processing support services.

Medium-term strategy

Distribution and marketing services should be upgraded with IT, and in the process increasing demand for human resources of high education background for business and IT-related services should be satisfied. For physical distribution, BPO services such as asset-based third party logistics and other consulting services should evolve from the trucking and warehousing industries. Services of supply chain management (SCM) for rapidly evolving retail chains would be particularly effective. For marketing, responding to BPO development by the U.S. and Spain, services should shift to upstream areas. CRM services for Central America, for which El Salvador has an advantage, should be promoted as well as BPO back services that would contribute to employment generation and skills upgrading.

Long-term strategy

Trade services oriented to Central America should be fully developed, including marketing and logistics, by utilizing the strength and experiences of El Salvador as a transshipment and final

consumption area, which will have accumulated.

(4) Strategy for commerce and services development in the Eastern Region

Characteristics and prospects of commerce and services in the Eastern Region

The commerce and services sector in the Eastern Region is dominated by traditional services at small and micro scale. Business services and other specialized services are hardly developed. Community services to satisfy basic needs are insufficient.

A shift from traditional services to modern services will occur starting from retail and regional services. This will induce the enhancement of productivity in the services sector as a whole. As the Eastern Region is a basically agricultural area and constitutes hinterland of the new port, the Region should specialize more in physical distribution services. More promising in the Region are: R&D services to enhance agricultural productivity, marketing services for agro-products, logistics services, distribution and processing services, and CRM services.

Short-term strategy

The sector strategy for short term should aim at viable response to the Central America economic integration and the establishment of locational advantage with the La Union port. The first component calls for the restoration of price competitiveness of agricultural products to be pursued through the following:

1) Modernization of wholesale functions

   Consultants to be dispatched by the Ministry of Economy may guide chambers of commerce and industry.

2) Support to NGOs and other institutes undertaking R&D

   Part of their direct costs may be subsidized through the Ministry of Economy.

3) Introduction of application oriented R&D programs at universities

   Technical faculties of agriculture and engineering should be strengthened, and supported by procurement of R&D services by MAG and government fund for research.

4) Incentives for recruitment of national technical experts by industries

   Tax reduction or exemption may be granted to such industries by MINED.

5) Expansion of financial resources for micro-finance and venture capital

   Innovative methods should be introduced such as credit provision or guarantee by MINED.

To establish locational advantage for the FDI's, training of human resources and establishment of marketing channels for Central America are the two most important components. Marketing channels for Central America may be developed along with the modernization of wholesale functions mentioned above. Distribution of goods from the Eastern Region by land would be the initial step to establish the marketing channels, which would expand raw material supply

from the neighboring countries for export through the La Union port, with or without processing in the Eastern Region.

Medium-term strategy

Accumulation of business service functions should be pursued to support FDI's and other manufacturing industries, and the brand development of the La Union port should take place as a gateway in Central America to retain and attract human resources. As the Eastern Region will not be able to supply sufficient human resources with technical skills and professional knowledge, provision of common services by non-technical manpower would constitute the base for services development.

Those services that can contribute to the improvement of manufacturing productivity should be targeted, in view also of strategic extension of services provision to neighboring countries. They include logistic/distribution center functions based on modernized trade and wholesale systems, and telemarketing/call center functions based on sincerity and hospitality of the people in El Salvador in general and the Eastern Region in particular.

High-grade intelligence services need to be promoted at the same time. This may be mainly supported by procuring human resources from outside, but incentives should be provided for the recruitment of local people, such as tax reduction and subsidies for employment insurance.

Long-term strategy

The commerce and services sector strategy in the long run should contribute to the establishment of the status for El Salvador as a broad-based, human oriented service center. Involvement of the sector in the Eastern Region in innovation processes should be reviewed and commercialization of innovative technologies promoted. High-grade, human oriented services, such as higher education and training would be made into export industries serving other countries in Central America and beyond.

8.2 Infrastructure Development

8.2.1 Strategy for transportation development

(1) Issues for transport development in El Salvador

Multi-modal transport system

The establishment of an effective multi-modal transport system has been pursued worldwide along with containerization of cargoes, and the transport development for El Salvador should constitute an integral part of it. At present, El Salvador has all the potential components of the multi-modal transport system, including roads and highways, railroads, ports, airports and other terminal facilities. The main issue of the transport development in El Salvador is how to integrate these components of different modes, selectively upgrading some facilities, and how

to improve the operation and management of the integrated system, as well as individual components in technical, administrative, legal and institutional aspects.

Despite the presence of different modes of transport facilities, links between them are very limited at present. This is primarily due to insufficient terminal facilities, in terms of both functions and capacities, and network deficiencies in the road system serving as a dominant mode of transportation as well as management problems of some existing facilities.

At present, artery road system is not well established in El Salvador. Especially, access to the northern region is inadequate. The planned northern longitudinal road is expected to solve this deficiency by establishing another east-west artery in addition to the existing Pan-American and Pacific coastal highways. As the territory of El Salvador is narrow along the Pacific coast, the need for a strong north-south artery has not been emphasized. Still, lateral links between the three east-west arteries need to be strengthened selectively. An important consideration is to provide alternative routes to serve La Union as the port is upgraded, and to strengthen the links between them for complementary use to cope with varying traffic conditions.

Export promotion and transport costs

Export promotion is a main theme for the development of the Salvadoran economy. One critical condition is to reduce transportation costs. It is also true that increased export will reduce the unit cost of transportation. Maritime freight costs are generally decreasing in recent years as the trade volume increases. In Table 8.7, typical freight costs of a container filled with selected commodities are compared for transportation from Central America to the south of Florida, the U.S.

Table 8.7. Typical Maritime Freight Costs per Container from Central America to the U.S.

(Unit: US$)

Year	Coffee	Dry merchandize	Refrigerated cargo	Clothing	General merchandize	Home appliances
1991	4,070	3,990	3,370	1,980	2,550	2,350
1992	3,840	3,760	3,180	1,870	2,400	2,220
1993	3,620	3,550	3,000	1,760	2,270	2,090
1997	2,540	3,155	2,350	1,175	1,361	1,511

Source: SIECA, ECAT (*Estudio Centroamericano de Transporte*), February 2001.

At present, there exist significant imbalances between import and export in Central America and trade through Pacific and Atlantic ports. Import and export volume is more balanced at Atlantic ports while at Pacific ports import volume is much larger than export volume (Table 8.8). This affects price setting for cargo transportation. Even for Atlantic ports, the prices of cargoes going south are set lower to attract clients.

Table 8.8. Import and Export Volume at Atlantic and Pacific Ports of Central America, 1999

Country/Port	Coast	Cargo volume (tons) Import	Export	Occupancy (%)
Guatemala				
Santo Tomás de Castilla	Atlantic	4,513,000*		49
Barrios	Atlantic	1,705,000		42
Quetzal	Pacific	4,082,979		81
El Salvador				
Acajutla	Pacific	1,956,228†	522,276†	29
Honduras				
Cortes	Atlantic	4,978,082		60
		1,064,500‡	820,800‡	
Castilla	Atlantic	177,412	342,503	35
San Lorenzo	Pacific	520,963	42,887	17
Nicaragua				
Corinto	Pacific	722,223	191,816	32
Costa Rica				
Limón-Main	Atlantic	3,737,339	3,466,962	Limón 48/Main 68
Caldera	Pacific	1,756,722	56,807	47

*Import and export almost equal / †2001 / ‡Containers and ro/ro of the total
Source: Compiled by JICA Study Team from various sources.

Containerized cargo transport is almost exclusively treated at Atlantic ports. In 1996, the total of containers mobilized for member countries of the Central American Commission for Maritime Transportation (COCATRAM) was 1.7 million TEUs, of which 92% was mobilized by ports of the Atlantic coast. Limon port in Costa Rica handled the largest quantity of 397,000 TEUs while Acajutla in El Salvador and Quetzal in Guatemala on the Pacific coast handled only 28,000 TEUs and 52,000 TEUs, respectively. These conditions will change drastically once the La Union port is upgraded. To what extent transport costs may be reduced, however, would depend also on the management of new facilities and concomitant provision and strengthening of related facilities for an effective multi-modal transport system.

Social and economic costs

The establishment of a multi-modal transport system will involve huge amount of investment. Even the improvement of the Central America road network under the current initiative of the Plan Puebla Panama (PPP) is estimated to cost over US$3,500 million. Including other components, a stage-wise development plan needs to be prepared on the basis of realistic plan for fund raising. Equally important is to consider social effects of such a mega infrastructure development. The PPP aims to reduce poverty and vulnerability to natural disasters, and respect for cultural diversity is among the criteria for selecting eligible projects.

As the inter-territorial traffic increases with heavy vehicles, road conditions will deteriorate faster, and more traffic accidents are prone to occur. This would result in higher social and

economic costs. On the economic side, how to allocate limited fund for road construction and maintenance is an increasingly important issue. Up to now, the FOVIAL has been successfully operated to improve and maintain trunk roads under the jurisdiction of MOP. Mobilization of voluntary workers for the maintenance of municipal roads is also commendable. To cope with increasing demand, however, a major change in public resources allocation may be necessary, including division of works between MOP and municipalities and/or fund allocation.

On the social side, traffic control and law enforcement should be part of maintaining the improved road system. Improvement of bridges on main roads to remove the existing bottlenecks may be taken as an opportunity to install weighbridges. Also portable weighing equipment may be introduced to check an axle load at any place and any time for flexibility and cost-effectiveness.

As inter- and intra-regional arteries are established/upgraded, their links with urban transport systems should be improved. At present, through-traffic passes through built-up areas along the Pan-American highway and part of the coastal highway. As the traffic volume increases, so will both social and economic costs in the form of traffic congestion and accidents. The strengthening of lateral links between the east-west arteries should incorporate the improvement of this situation. At the same time, the development of major urban centers should be planned with such a structure that would link effectively with the artery system.

Environmental consideration

For El Salvador is a calamity-prone country, consideration on environmental aspects is particularly important for the transport development. Road improvements should be planned to reduce affected areas' vulnerability to natural disasters with proper selection of alignment and construction methods as reflected in the PPP mentioned above. Traffic safety and traffic-related pollution are another area of concern.

Another major area for environmental consideration is related to the upgrading of the La Union port. Ensuring navigational safety with significant increase in maritime traffic would pose a major challenge. Also risk of pollution in the Fonseca gulf will increase from oil spills and dumping of waste materials as well as increased discharge of wastewater. Monitoring and control of navigational safety and pollution should be taken as integral part of port operation. To perform this function effectively, tripartite cooperation of three gulf countries and participation of local communities seem to be essential.

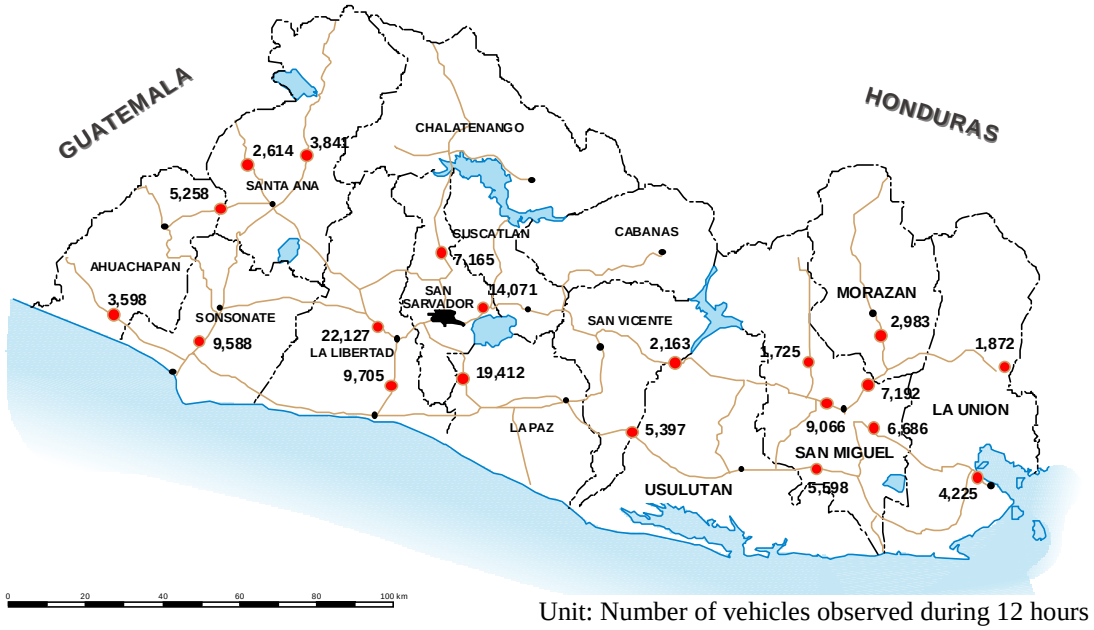
(2) Characteristics of existing traffics

Traffic volume

A traffic count survey and an OD survey were carried out as part of the Study. The traffic volume for 12 hours at 20 selected stations is available for a comparative analysis (Figure 8.2).

The largest traffic concentration is observed at stations around San Salvador for 7,200-22,000 vehicles. The traffic volume on CA-2 leading to Acajutla is 9,600 vehicles, some 30% of which are for cargoes. Of the two entrance points to the Eastern Region, the San Marcos bridge on CA-2 has traffic volume of 5,400 vehicles, more than twice as large as the traffic at the Cuscatlan bridge on CA-1 with 2,200 vehicles.

Figure 8.2. Traffic Volume at 20 Stations



Unit: Number of vehicles observed during 12 hours

Source: JICA Study Team, Traffic and Commodity Flow Survey, 2003.

Within the Eastern Region, the traffic concentrates around San Miguel with 6,700-9,100 vehicles. The traffic leading to San Francisco Gotera, Morazan is 3,000 vehicles, while that to Ciudad Barrios in the northern San Miguel is much smaller at 1,700 vehicles. The traffic near the La Union port is 4,200 vehicles, more or less the average level traffic in the Region at present. The traffic near the border town of El Amatillo on CA-1 is 1,900 vehicles, much smaller than the traffic near the western border with Guatemala.

Vehicle composition

The composition of vehicles for all the 20 stations consists of 26% passenger cars, 16% buses, 37% pickup trucks and 17% cargo trucks including trailers. It is characteristic that in El Salvador, pickup trucks play an important role for cargo as well as passenger transport, reflecting dominance of relatively small consignments. Future increase in cargo traffics would call for more efficient and cost-effective transport means and therefore a stronger artery network.

Traffic flow

The results of the OD survey are summarized in Table 8.9, and illustrated in Figure 8.3. It is clear that the traffic in El Salvador concentrates in and around San Salvador. Traffic flow between San Salvador and La Paz, Cuscatlán and La Libertad is particularly large.

Traffic between El Salvador and neighboring countries is the largest for Guatemala, followed by Honduras, Nicaragua, Mexico, Costa Rica, and Panama. Through-traffic for El Salvador is dominated by those with origin/destination in Guatemala led by traffic for Costa Rica, followed by Nicaragua, Honduras and Panama.

Commodity composition of cargos

Composition of commodities transported at each station is summarized in Table 8.10. It is observed that shares of agricultural commodities are much higher at stations in the Western region than in the Eastern Region. This implies that the Eastern Region is more self-sufficient in basic agricultural commodities, whose markets do not extend much to other departments and regions. Agriculture in the Western region, on the other hand, is more commercialized. Construction materials have very large shares in the Eastern Region as well as miscellaneous (mostly consumer goods), reflecting these are largely brought from other regions. Shares of petroleum are also large in the Eastern Region. It was found also that almost a half of pickups and trucks were not carrying any cargos, and only 27% were at full load, reflecting again small consignments and indicating ineffective transportation. For trailers, 48.5% were at full load and 33% empty.

(3) Strategy for transport development focusing on the Eastern Region

Strategies for transport development addresses to different levels of transport infrastructure: inter-territorial, national, regional and urban, and communities. At each level, a strategy is established responding to the issues identified above. At the inter-territorial level, a multimodal transport system should be pursued, effectively utilizing the PPP initiative, to reduce transportation costs and promote export. At the national level, socioeconomic and territorial integration supported by the transport development will, in turn, contribute to reducing transport costs and export promotion. Social and economic costs associated with the transport development will also be reduced through the improvement of urban transport and traffic management at the regional and urban levels. At the community level, the establishment of coastal shipping routes will complement the improvement of rural roads as part of the socioeconomic and territorial integration.

Establishment of multimodal transport systems with PPP

The economy of El Salvador will be integrated with those of other Central American countries to establish and strengthen their comparative advantages collectively within the globalizing

Table 8.9. Results of OD Survey in the Eastern Region

(Unit: No. of vehicles/12 hours)

Code*	10	20	30	40	50	60	70	80	90	100	200	300	400	500	600	700	800	900	1000	1100	1200	1300	1400	Total
10	3	30	0	34	28	20	0	0	0	16	125	51	0	134	209	9	3	5	4	5	27	3	5	711
20	45	3	0	0	2	0	10	0	0	2	24	22	11	10	113	0	3	4	0	1	28	1	19	298
30	4	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	7
40	65	0	0	0	0	1	8	0	0	0	12	21	0	13	68	2	0	0	0	0	9	2	1	202
50	123	0	0	0	0	0	0	0	0	0	0	2	2	9	44	0	3	0	0	0	10	0	2	195
60	2	0	0	0	0	0	0	0	0	0	0	0	0	0	18	0	0	0	0	3	2	0	5	30
70	0	3	0	4	3	0	0	0	0	0	0	10	0	8	48	0	0	0	0	0	0	0	0	76
80	0	3	0	2	4	4	0	0	0	0	0	0	0	0	3	0	0	4	0	0	4	0	0	24
90	0	0	0	1	0	0	0	0	0	0	4	0	0	0	0	0	0	0	0	0	0	0	0	5
100	11	6	0	0	0	0	0	0	0	33	1,065	702	21	181	371	0	25	0	4	8	22	0	11	2,460
200	152	3	0	6	0	0	9	0	0	787	4,895	205	71	693	1,103	40	128	4	8	12	43	23	23	8,205
300	54	5	0	11	3	0	0	0	0	823	271	5,490	31	869	1,288	27	53	15	14	17	44	13	44	9,072
400	6	19	0	4	0	5	0	0	0	17	56	23	1,320	155	2,662	5	48	14	2	4	18	6	2	4,366
500	124	9	8	8	12	3	0	0	0	195	731	923	167	6,459	4,189	199	539	52	50	93	139	18	61	13,979
600	234	101	8	29	18	8	44	0	0	402	1,165	1,196	2,394	2,676	6,425	1,920	4,657	467	529	843	1,385	257	503	25,261
700	6	1	0	3	0	0	0	0	0	3	30	44	9	93	1,308	5	4	0	6	7	39	17	7	1,582
800	14	7	0	0	0	0	0	0	0	56	165	61	57	462	5,275	8	0	17	84	293	212	45	134	6,890
900	3	0	0	0	0	0	0	0	0	0	11	29	34	65	407	0	5	2	5	2	15	3	6	587
1000	0	3	0	0	0	0	0	0	0	2	3	10	0	25	190	20	72	1	262	155	47	20	26	836
1100	9	3	0	3	0	0	0	0	0	14	32	32	0	85	683	21	290	3	157	12	928	43	83	2,398
1200	13	39	0	9	3	22	0	0	0	26	44	52	5	138	954	29	212	14	73	1100	9,011	2,207	1,709	15,660
1300	0	5	0	0	0	0	0	0	0	0	11	23	0	20	196	10	73	6	25	58	2,483	383	153	3,446
1400	18	34	0	2	2	10	0	0	0	14	102	17	6	41	420	9	168	13	26	123	1,830	124	3,578	6,537
Total	886	274	16	119	75	73	71	0	0	2,390	8,746	8,913	4,128	12,136	25,974	2,304	6,283	621	1,249	2,736	16,296	3,165	6,372	102,827

* Zoning codes as shown in the figure to the right.

Source: op. cit.

Zoning Map

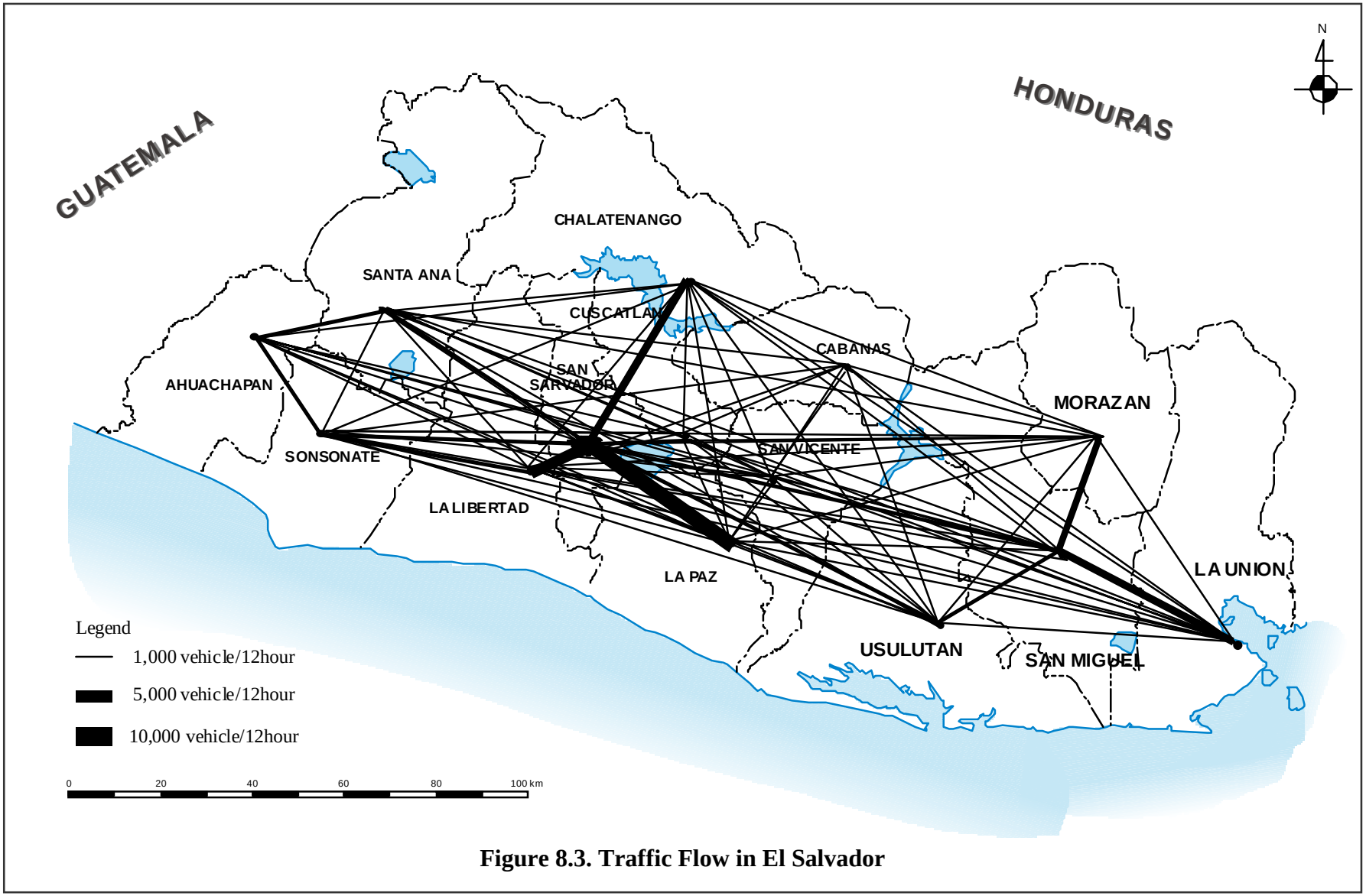


Figure 8.3. Traffic Flow in El Salvador

Source: Table 8.9.

Table 8.10. Composition of Cargoes at Survey Stations

(Unit: %)

Type of commodity	Sta. 1	Sta. 2	Sta. 3	Sta. 4	Sta. 5	Sta. 6	Sta. 7	Sta. 8	Sta. 9	Sta. 10
Agricultural goods	65.9	35.9	39.5	26.2	38.6	13.7	25.7	18.6	25.8	14.7
Forest products	3.2	12.2	6.7	1.6	1.3	1.3	3.1	2.4	9.4	3.5
Marine products	1.4	0.7	0.0	0.1	0.0	0.7	0.4	0.0	0.8	0.7
Mineral products	0.0	0.1	2.3	1.4	0.0	2.3	0.1	1.1	0.7	1.3
Metal & machinery	4.1	17.1	2.4	8.6	2.6	2.5	8.8	1.9	3.2	11.5
Chemical products	4.3	4.1	1.4	1.2	2.0	15.8	3.0	2.0	1.8	5.3
Light industry/electronics	2.1	6.2	3.7	1.8	5.1	7.1	5.2	1.5	13.4	14.2
Miscellaneous goods	0.5	9.0	20.0	8.3	7.7	9.8	13.0	27.8	22.5	24.8
Construction materials	18.2	7.9	23.4	38.1	16.1	14.1	33.0	33.2	12.8	15.7
Others	0.1	6.9	0.4	12.8	26.5	32.6	7.7	11.2	9.5	8.1
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Type of commodity	Sta. 11	Sta. 12	Sta. 13	Sta. 14	Sta. 15	Sta. 16	Sta. 17	Sta. 18	Sta. 19	Sta. 20
Agricultural goods	27.0	16.3	28.9	17.5	9.1	10.8	10.6	8.5	2.5	29.4
Forest products	0.1	0.5	1.0	2.3	0.0	1.2	0.5	6.3	4.3	7.0
Marine products	0.0	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.7	0.2
Mineral products	0.1	4.8	2.9	0.8	3.4	6.7	2.0	0.5	0.2	4.8
Metal & machinery	3.5	4.7	3.9	3.6	0.2	2.7	0.0	0.7	0.6	4.8
Chemical products	10.2	18.9	6.3	7.7	1.6	5.2	1.3	4.2	30.4	7.8
Light industry/electronics	1.5	3.3	0.4	0.3	0.1	0.1	0.0	0.3	0.0	1.5
Miscellaneous goods	35.2	24.2	23.2	26.6	16.3	38.2	10.2	24.0	24.3	36.8
Construction materials	22.3	27.2	33.2	41.2	69.2	35.2	75.4	55.5	36.9	7.2
Others	0.0	0.0	0.1	0.0	0.1	0.0	0.0	0.0	0.0	0.4
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Source: JICA Study Team, Traffic and Commodity Flow Survey, 2003.

economy. Development of transport infrastructure with effective utilization of the La Union port would affect the integration process significantly. Moreover, the development of transport system in El Salvador should be complementary to the development of inter-territorial corridors for the Country to take advantage of its strategic location and contribute to the integration of Central America in line with the PPP initiative.

In addition to the La Union bypass, border facilities at El Amatillo should be improved by the time the La Union port is commissioned, including a new bridge, an access road and a truck yard as well as customs facilities. Artery roads should be strengthened in steps with upgrading, bypasses and new links. Establishment of local airport is a long-term option.

Socioeconomic and territorial integration

Improvement of roads at all the levels would contribute to the internal integration of the Eastern Region. Improvement and maintenance of rural roads should be undertaken consistently by mobilizing self-help efforts of rural communities. North-south links should be strengthened to improve market access from production areas and interlink tourism areas. The northern longitudinal road should be established in steps as the third artery to integrate the northern area

into the main economy of the Region. In addition to FOVIAL, the FISDL fund for social development may be expanded to make use of local contributions to road improvement.

Transport infrastructure would contribute also to integrating the Eastern Region into the national socioeconomic and land development. The Pan American and coastal highways should be upgraded, including the addition of traffic lanes on bridges crossing the Lempa river. The northern longitudinal road and local air services would also contribute to the integration.

Improvement of urban transport and traffic management

The La Union port development would increase inter-regional and international traffic especially of heavy vehicles tremendously. Links between regional and urban transport systems should be improved for more efficient inter-regional and international transportation, on the one hand, and reduced traffic congestion, accidents and pollution on the other. More efficient urban economies would be realized with reduced transaction costs. At the same time, urban traffic management should be improved especially for San Miguel, La Union and Usulutan.

Establishment of coastal shipping routes

Coastal shipping routes serve daily communication needs of coastal communities, including those on islands. They should be selectively strengthened with the view to promoting tourism as well as vitalizing coastal socio-economies. Some of them may be incorporated into tourism circuits for domestic and international tourists.

8.2.2 Strategy for power development

(1) Issues for power development in El Salvador and the Eastern Region

Power development planning and policies

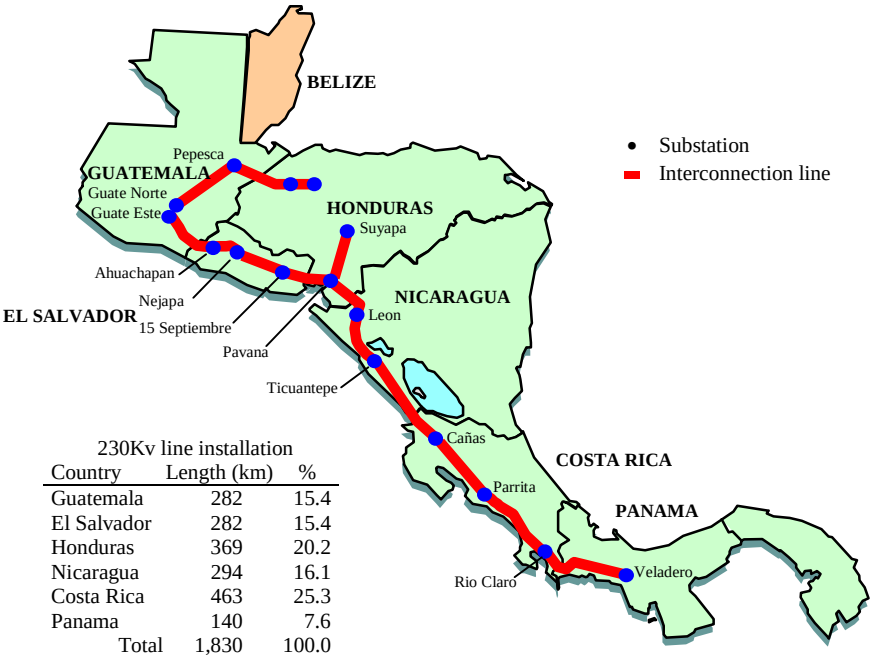
DEE of the Ministry of Economy is responsible for the long-term power development planning. According to a simple load projection conducted as part of the PNODT study, El Salvador may face power shortages in a few years, if no additional plant is built. While export promotion is a main theme for the national economic development, its implications have not been reflected in any power development policies. On the one hand, successful export promotion and associated economic development will increase the power demand at much higher rates than experienced in the recent past. On the other hand, investment in infrastructure to support the export promotion will significantly change the debt position of the Country and may crowd out some power investments or fuel import. A clear policy needs to be established to prioritize the development of domestic energy resources, particularly geothermal power. For further hydropower development, provision should be made for water supply for domestic and irrigation purposes as concerns have been raised over possible water shortages in the long run.

Central American power system integration

The Central American Power Integration System (SIEPAC) has been pursued in line with the PPP initiative. The 1,830km, 230kW transmission line will run through six countries, of which 282km or 15.4% of the total length will be in El Salvador (Figure 8.4). The project is expected to cost US$320 million and due to complete by 2006. El Salvador will be a major beneficiary of this integration as it currently imports power from Honduras and is expected to face power shortages in the near future. This integration will allow installation of larger and more efficient generators to meet the regional demand, facilitate load dispatching with more diversified demand and supply sources, reduce power prices, and thus encourage private investments.

El Salvador can contribute to the integrated power supply system by developing its renewable energy sources. In addition to hydropower development at advanced stage, geothermal potentials may be exploited. Development of these domestic and renewable energy sources would further improve the comparative position of El Salvador for attracting private investments and also for negotiating terms of electricity trade with neighboring countries.

Figure 8.4. SIEPAC Line for Integrated Power System



230Kv line installation

Country	Length (km)	%
Guatemala	282	15.4
El Salvador	282	15.4
Honduras	369	20.2
Nicaragua	294	16.1
Costa Rica	463	25.3
Panama	140	7.6
Total	1,830	100.0

Source: IADB website (http://www.iadb.org/exr/PRENSA/2001/cp21701e.htm).

Rural electrification

While more people live in urban areas in El Salvador, poverty incidence is much higher in rural areas. Consequently, the majority of the poor live in rural areas. Since private power suppliers have no incentives to cover remote rural areas, rural electrification should be a prime concern of the Government. In the Country as a whole, only 55% of the rural households are connected to the power supply network, while the overall electricity coverage is 74%. These ratios are

respectively smaller in the Eastern Region (Table 8.11).

Table 8.11. Electricity Coverage in El Salvador and the Eastern Region, 2000

Department/Region/Country	No. of households covered	% of total no. of households
Morazan	20,277	58.9
Usulutan	9,908	73.1
San Miguel	35,589	76.7
La Union	45,817	82.5
Eastern Region	111,591	72.2
El Salvador	577,208	74.4 (55 Rural)

Source: FINET.

Power supply for La Union port development

The transmission and distribution capacity to serve the La Union area should be expanded by 2007 when the port is commissioned. ETESAL is now allowed to operate beyond its existing system. Private distribution companies have proposed to accommodate the new demand. They should be invited in due time to provide proposals to supply electricity and build a transmission line.

Geothermal exploration

Geothermal generation plays an important role in El Salvador's power sector. Its annual generation of 934.7GWh accounted for 24% of the total electricity generated in the Country in 2002. As of 2003, the installed capacity in the geothermal sub-sector is 151MW. Ahuachapan power station, (2×30MW and 1×35MW), has a total capacity of 95MW, and Berlin 56.2MW (2×28.1MW). In terms of energy generated as a percentage of the national total, El Salvador ranks second (as of 2000) in the world, after the Philippines (Table 8.12).

GESAL, the owner of the two geothermal power stations, is jointly held by CEL with an 88% share and ENEL Green Power of Italy with a 12% share. In early 2003, ENEL Green Power won a bidding against two international competitors and signed an agreement with GESAL that it will explore and develop or expand the geothermal power generation to about 38MW in return for the additional 18% of GESAL's shares. If ENEL succeeds, its share will reach 40% of the total shares in GESAL. This agreement will enable GESAL to avoid the costly risk of drilling for new commercial wells and enjoy the expansion of its generation base. ENEL's exploration activities will be concentrated in Berlin, and also in San Vicente and Chinameca, the two other geothermal areas with commercial potential, 50MW each, in central El Salvador. Assuming GESAL's assets at US$314 millions, or at US$2,000 per kW, a quick calculation shows that GESAL is willing to offer US$1,105 for each kW of the 38MW capacity increased, and assumes that the risk associated with each additional kW of geothermal capacity is worth about US$4,342 (Table 8.13).

Table 8.12. El Salvador's Ranking in Geothermal Generation, 2000

Country	MWe installed	GWh generated	% of natl. capacity	% of natl. energy
Australia	0.17	0.9	n.a.	n.a.
China	29.17	100	n.a.	n.a.
Costa Rica	142.5	592	7.77	10.21
El Salvador	161	800	15.39	20
Ethiopia	8.52	30.05	1.93	1.85
France	4.2	24.6[a]	n.a.	2[b]
Guatemala	33.4	215.9	3.68	3.69
Iceland	170	1,138	13.04	14.73
Indonesia	589.5	4,575	3.04	5.12
Italy	785	4,403	1.03	1.68
Japan	546.9	3,532	0.23	0.36
Kenya	45	366.47	5.29	8.41
Mexico	755	5,681	2.11	3.16
New Zealand	437	2,268	5.11	6.08
Nicaragua	70	583	16.99	17.22
Philippines	1,909	9,181	n.a.	21.52
Portugal	16	94[a]	0.21	n.a.
Russia	23	85	0.01	0.01
Thailand	0.3	1.8[a]	n.a.	n.a.
Turkey	20.4	119.73[a]	n.a.	n.a.
USA	2,228	15,470	0.25	0.4
Total	7,974.06	49,261.45		

[a] Based on 67% utilization estimated. Actual GWh not included in the Country Update Papers.
[b] Total energy generated in Guadeloupe.

Source: International Geothermal Association (http://iga.igg.cnr.it/electricitygeneration.php).

Table 8.13. Fair Market Value Estimates on Geothermal Plants

GESAL fair value calculations			
Site	Increase	Before addition	After addition
Ahuachapan	10	95	105
Berlin	28	62	90
Total generating capacity (MW)	38	157	195
Total asset (US$10^6) at US$2,000/kW		314	390

Costs and benefits for La Geo, S.A. de C.V.				
Shareholder	Share (%)	Amount (US$10^6)	Share (%)	Amount (US$10^6)
CEL	87.5	275	60	234
ENEL Green Power	12.5	39	40	156
Total	100	314	100	390
CEL				-42
ENEL Green Power				118
Total real value for added MWs				165
Cost per kW for La Geo, S.A. de C.V.				1,105
Cost per kW for El Salvador (risk assumed)				4,342

Source: JICA Study Team based on GESAL data.

(2) Power demand projections and power deficit

Both UT and Mercados Energéticos' plans for the PPP expect the annual growth in energy consumption at 5.6%. This implies an average annual GDP growth at 4.3%, given the energy demand elasticity of GDP in El Salvador at 1.3 (Table 8.14). Under the assumed GDP growth at 4% and the assumed population growth at 1.7% per annum according to the national socioeconomic framework in Section 6.1, power demand is projected by two methods. First, by combining GDP driven growth and population driven growth, the average annual growth rate of electricity is calculated at 5.4%. By incorporating historical energy demand growth, the average growth of electricity demand is calculated to be 5.2% per annum. At the growth rate of 5.2% per annum, energy demand may increase from 3,849GWh in 2001 to 9,586GWh in 2019. Applying the present load factor of 38.1%, the power generating capacity needed in 2019 would be 2,872MW as compared to 1,153MW in 2001. The local renewable energy potential, however, is limited in keeping pace with the increasing demand. With all the generation projects in sight, El Salvador will face the deficit of power generating capacity by 687MW in 2019 (Table 8.15).

Table 8.14. Input and Output Relationship Between GDP and Electricity Consumption

	1994	1995	1996	1997	1998	1999	2000	Ave. growth rate	Demand/ GDP
MW (%)	0.00	0.00	11.13	5.95	0.00	4.78	14.27	5.03	1.3
GWh (%)	9.44	5.35	3.73	8.26	4.01	2.80	4.01	5.35	1.4
GDP (%)	6.1	6.4	1.7	4.2	3.7	3.4	2.2	3.9	

Source: JICA Study Team.

Table 8.15. Power Demand and Supply

Generation type	Site	Capacity (MW)	Investment cost ($US\$10^6$)	Expected year of commissioning
Hydro	Chaparral	59	92.5	2006
	La Honda	60	130.7	2007
	Cimarron	243	404.5	2010
	Subtotal	362	627.7	
Geothermal	Berlin	120		2006
	Cuyanasul	30		2007
	San Vicente	50		
	Chinameca	50		
	Subtotal	250		
Thermal	CEL	100	100	2006
	GT	320		2013
	Subtotal	420		
	Total	1,032		

Source: SIGET.

(3) Strategy for power development in El Salvador focusing on the Eastern Region

It is expected that the La Union port revitalization will contribute to the Eastern Region development and also to strengthening the competitiveness of the Salvadoran economy. To support these, power development in El Salvador should take a two-prong strategy focusing on the Eastern Region. First, it should support and take advantage of the SIEPAC. Second, it should contribute to the Eastern Region development through the development of renewable energy in the Region and the accelerated rural electrification. Specific components of the strategy are described.

Promotion of power system integration

There is a plan for interconnection with Honduras to be strengthened with possible support of IDB. A substation on the Honduran side has been expanded for the purpose, but a new substation needs to be constructed on the Salvadoran side. Strengthening of the link with Guatemala is also contemplated, and the viability needs to be established as compared with an alternative line from Panama to Guatemala. These plans should be pursued in view of the SIEPAC since El Salvador is a major beneficiary of such integration as described above.

Exploration of geothermal potentials

Steady efforts have been made for further hydropower development, and the implementation of planned hydropower projects may practically exhaust major potentials of this renewable energy. On the other hand, no systematic exploration has been made for geothermal energy, which may have larger potentials. The existing Berlin geothermal plant should provide a model of environmentally acceptable development that benefits the local community as well, and the model should be replicated at other sites.

GESAL is preparing to study several promising sites in addition to the continued development and/or expansion of the areas already developed. In the Eastern Region, priority should be given to the Conchagua site in view of its proximity to the future port. The development of possibly 10MW in the area, if proved, could contribute to the development of the La Union-Conchagua area with clean and renewable energy. Further development of geothermal potentials would contribute to improving the comparative position of El Salvador within the Central American integrated power system. In the long run, full geothermal development in El Salvador may lead to new industries based on electricity such as manufacturing of hydrogen batteries for export.

Other renewable energy utilization

The Chararell project on the Torola river is a major hydropower development in the Eastern Region. Its early implementation would give a positive sign that the Government is serious about its commitment to the Region, as well as contribute to the well-being of the people.

The Eastern Region has other potentially promising sources of renewable energy. The sugar mill in San Miguel may be used to generate power in small scale. Mini-hydro may be exploited in mountainous areas for rural electrification and pumped irrigation. Solar and wind power in the Fonseca gulf may deserve further exploration. Photovoltaic technology can be applied to rural electrification in general, and for pumping irrigation water and telecommunication purposes among others in particular. As the Eastern Region has high potentials for agricultural and livestock development, increasing amount of plant and animal wastes may be utilized as alternative sources of energy in rural areas.

Rural electrification

Rural electrification should be accelerated throughout the Country, following the master plan prepared with the support of IDB. FINET is implementing a program to expand the electricity coverage to 95% of the households in the Country in three years. Comparatively larger resources need to be allocated to the Eastern Region to attain the same level of coverage as the Region has lower rural electrification ratio and is located further from larger power plants.

8.2.3 Strategy for telecommunications and ICT

(1) Position of El Salvador for telecommunications and ICT-related activities

Competitive position by ICT-related indices

El Salvador is compared in Table 8.16 with selected countries by ICT-related indices. As seen from the table, El Salvador ranks high in mobile phone density, and remains competitive in fixed line penetration and private investment in telecommunications. A large remittance income may also work favorably for ICT-related activities. Higher education in El Salvador is comparatively more focused on engineering and technology, although per capita expenditure on tertiary education as percentage of per capita GDP is low even by the Central American standard. In computer penetration, El Salvador did better than its Central American neighbors, except Costa Rica. The only major disadvantage is its high wage components in the total manufacturing cost of computers (Figure 8.5), for which dollarization may be partly responsible.

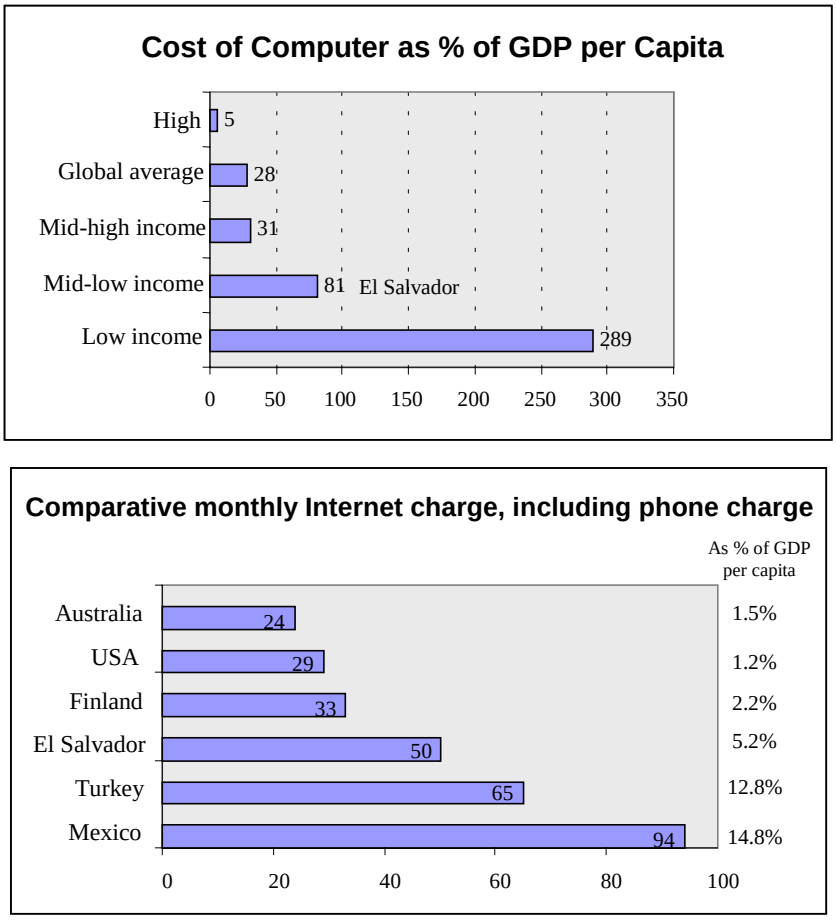
Table 8.16. Comparison of El Salvador with Selected Countries by ICT-related Indices

Country	Mobile phone per 1,000, 2000	Mainline per 1,000, 2000	Internet users % of population, 1999	Private investment in telecom (10^6), 2000	Wages as % of total cost, 2000
Chile	222	221	n.a.	994	20
Costa Rica	52	249	3.9	n.a.	37
El Salvador	118	100	0.7	652	45
Guatemala	61	57	0.3	1,463	n.a.
Honduras	24	46	0.6	38	n.a.
Mexico	142	125	2.6	13,387	n.a.
Nicaragua	18	31	0.4	25	16
Japan	526	586	n.a.	n.a.	n.a.
U.S.	398	700	n.a.	n.a.	8

Country	Remittance (10^6) 2000	Engineering students as % of coll. enroll., 1997	Tertiary school enroll. (gross %), 1997	Illiteracy (%) 2000	Computer per 1,000
Chile	n.a.	42	31	1	82
Costa Rica	106	n.a.	31	2	149
El Salvador	1,751	59	18	12	19
Guatemala	563	n.a.	8	21	11
Honduras	410	n.a.	12	17	11
Mexico	6,573	32	17	3	51
Nicaragua	320	n.a.	12	28	9
Japan	505	n.a.	45	n.a.	315
U.S.	n.a.	n.a.	80	n.a.	585

Source: The World Bank, *World Development Indicators*, 2002.

Figure 8.5. Cost of Computers and Internet Charges



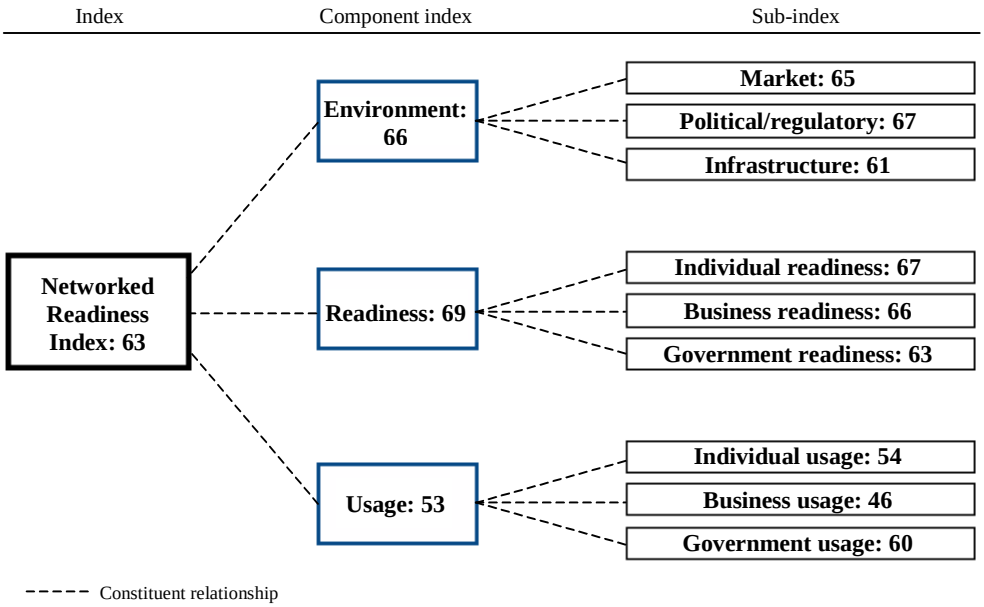
Source: CONACYT.

ICT readiness and usage

The Global Information Technology Report 2002-03 reports a survey of 82 nations to assess the readiness and usage of ICT in the networked world. El Salvador is ranked 63rd, behind several countries in Latin America including Brazil (29th), Chile (35th), Mexico (47th), Costa Rica

(49th), and Panama (61st). El Salvador ranks relatively high (53rd) in usages, especially business usage (46th), but lower in inductive environment (66th) and readiness (69th) (Figure 8.6).

Figure 8.6. Ranking of El Salvador in Networked Readiness Index 2002-2003



Source: INSEAD (as cited in *Global Information Technology Report 2002-2003*).

PPP initiative

The interconnection of the telecommunication services is one of eight initiatives pursued under the PPP. El Salvador is the coordinating country for this initiative. Through early efforts, the PPP has allowed to facilitate dialogues between authorities involved in the sector in the region, provide member governments with basic information on the existing conditions and needs for infrastructure and regulatory frameworks, and obtain agreements among the authorities to attain objectives of the initiative. Consequently, it has been agreed to establish a technical support group, integrating the functions of the Regional Technical Commission of Telecommunications (COMTELCA), ITU and IDB to coordinate studies and works required for decision-making.

Through this mechanism, two major projects have been defined for initial implementation: the Mesoamerican Freeway of the Information (AMI) and the Regional Regulatory Framework. The first project is to install the regional fiber optic network of about 1,500km length, and to improve the access to the information technology. IDB offers US$1.5 million for an initial study. In addition to existing fiber optic lines, it is planned to link Central America with the U.S. through cables on the Atlantic side: Cable Maya, Cable Arcos and Cable SAM-Energía.

The Regional Regulatory Framework project aims to adopt such regulation for information and communication technology that would improve conditions for private investments in the sector.

Areas of technical assistance identified already are: (i) strengthening of processes and institutional structure for formulation of IT development policies, (ii) establishment of harmony between national and regional regulation of telecommunication, and (iii) formulation of regulation in new areas such as consumer protection, intellectual property rights and security. These projects aim at establishing a common market of telecommunications in the region.

In El Salvador, two major companies offer fiber optic circuits. Telecom's 2,000km lines run through much of the southern part of the Country, except the La Union city. Telefónica concentrates its circuits in the western part of the Country.

(2) Ongoing initiatives for ICT development

Infocentro

Infocentro is an NPO established by the Government to function as a virtual academy and a national network of job centers, which would help companies seeking qualified and skilled workers. Initially it was planned to establish a total of 100 Infocentros throughout the Country, but the establishment stopped at 40 for financial reasons. One Infocentro was funded by Salvadorans in the U.S. and the rest funded with a US$10 million loan. The Government intention in establishing Infocentros is to cultivate e-culture in El Salvador, especially for the disadvantaged.

Infocentro helps establish e-government procedure, support small businesses offering virtual offices, and train farmers and students in using the Internet to be well informed. It also allows the Government to focus on training programs in accordance with needs generated by new investments and free trade agreements. Some of Infocentros are franchised to the private sector.

While Infocentro is regarded by the United Nations as a successful model, most of its centers face serious financial problems, unable to cover their operational costs. The national association of Infocentros is now trying to form an alliance with the Ministry of Education to ensure that the 40 existing Infocentros will thrive. Infocentros existing in the Eastern Region are summarized in Table 8.17.

Table 8.17. Infocentros in the Eastern Region

Department	La Union	San Miguel	Usulutan
Location	La Union Santa Rosa de Lima Intipuca	San Miguel No. 1* San Miguel No. 2* Gotera	Santiago de Maria* Usulutan

*Franchised to private operators.
Source: Infocentro.

To improve its financial situation, the association proposed six lines of potential programs that could utilize its comparative advantages. It has signed an agreement with the Ministry of Economy, the National Center for Small and Micro Enterprises, and the Bank for Multi-sector

Investment to 1) set up a development network, using the existing Infocentros as entrepreneur training centers and credit centers to provide loans to the local business people; and 2) set up a program for about 4,000 small and micro enterprises to promote their awareness of the ICT technology, train them to use it, and help them set up websites. The other proposed programs include provision of evaluation for projects and company operations and of guidance to help small and micro enterprises turn into IT based businesses, improvement of their manufacturing processes, and assistance in winning government procurements.

Infocentro is also trying to work with the Ministry of Education in carrying out the program of learning and resources centers (CRAs). The Government's original goal was to establish CRAs in 571 schools, or about 10% of the total schools in El Salvador. Each CRA is supposed to have 20 to 25 computers connected to the Internet. The CRAs program has been delayed, because of the budgetary constraint. Currently, only 200 schools have established CRAs, way below the 10% penetration target. The association is trying to reach an agreement to set up and manage the CRAs, including the training and supporting of CRAs. Initial budget is about US$75,000, with US$45,000 monthly operation costs.

The Infocentro association also works with PROESA to train technicians who may work with call centers and other CRM activities of Oracle, Cisco, and Sun Microsystems. It participates in INSAFORP's projects in preparing courses for potential IT professionals in management system operations, website management, and call center operations.

Poised strategically for the conversion, the association promotes e-government. It has also made an alliance with the private sector to allow them to use Infocentros to disseminate information about their products.

Call centers and BPO

PROESA initiated to attract international call center operators to establish in El Salvador, particularly in free zones. They use trade shows, conferences and other media and opportunities to publicize such advantages in El Salvador as educated labors at reasonable costs, neutral Spanish speaking ability, low international telephone costs, low electricity tariff and relatively low Internet monthly charge. After 14 months of efforts, three international companies have expressed their interest in relocating their call centers to the Country. Telefonica of Spain has inaugurated a state-of-the-art call center initially with some 500 agents. It has a plan to expand to 2,000 agents in 2003. They initially handle calls from El Salvador and other Central American countries and subsequently calls in Spanish from the U.S. Atlas invested US$1.5 million to improve their call center, and a local call center has been operational with small number of agents.

PROESA also promotes BPO. Possibilities are being sought to bring BPO operations of international organizations to El Salvador such as IDB and UN organizations.

IT cluster

The IT cluster in El Salvador was formally launched in June 2003 with the support of the Ministry of Economy and PROESA. The following tasks are set:

1) to establish a database of IT related human resources in El Salvador,
2) to achieve software development standardization,
3) to seek education and training using assistance from international software companies, such as Microsoft, Oracle, and Cisco, and
4) to reach export-oriented cooperation among domestic developers,

Private banks, however, are not much interested in IT-related industry, especially software development firms, as they are usually small without tangible assets. A major source of funding for IT-related small and medium firms is FOEX created by the Ministry of Economy, supported by a World Bank loan. Under FOEX, firms are eligible for up to 50% of reimbursement on their export-related spending, with a US$15,000-20,000 range.

(3) Development strategy for telecommunications and ICT

Policy institutionalization

El Salvador is fairly competitive for ICT-related activities, compared with other Central American countries as seen above. To become a regional ICT powerhouse, however, the Country will have to catch up with Costa Rica and Chile in human resources development, and the Government is well aware of the situation. To pursue this course firmly, the Government policy should be clearly established and institutionalized.

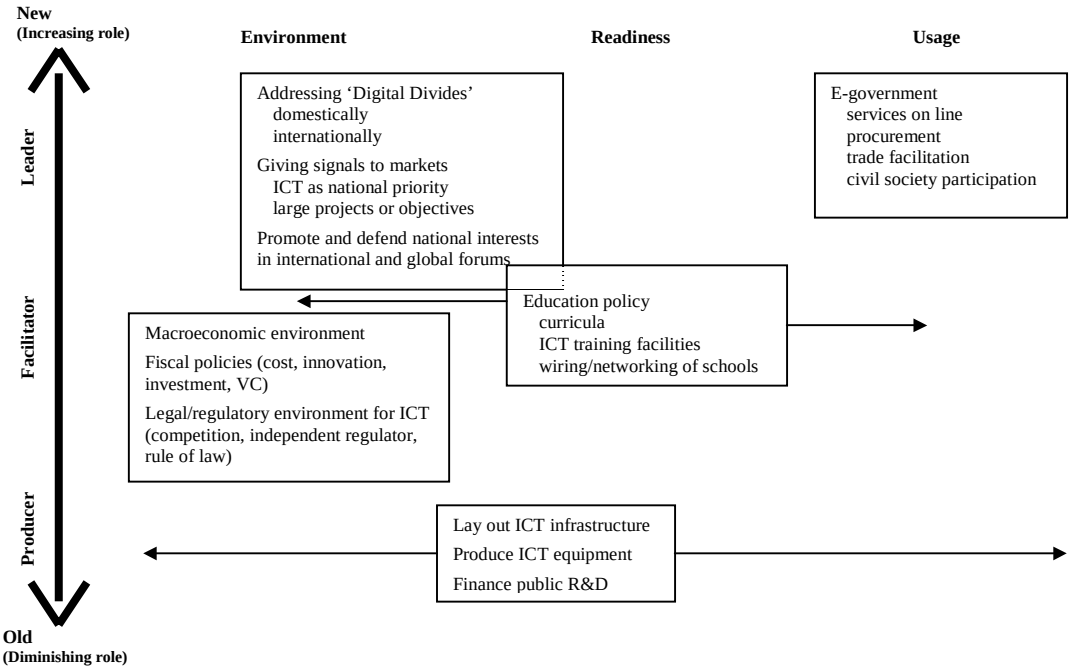
At present, the National Commission on Science and Technology (CONACYT) is responsible for coordinating ICT-related activities in El Salvador. The board of directors of CONACYT is composed of representations from the Ministry of Economy, the Ministry of Education, the Ministry of Foreign Affairs, universities, professional organizations, medium and small enterprises, and the agricultural sector. CONACYT, however, does not have any authority to regulate the activities, but provides advice to the Government through the Ministry of Economy, and facilitates cooperation between international organizations and local institutions, and between business enterprises and universities.

CONACYT has drafted recently the national policy on informatics for approval by the Ministry of Economy. The draft policy concerns the six areas: (i) information management and administration; (ii) education and development of human resources, (iii) informatics applications; (iv) infrastructure, interconnectivity and network; (v) national informatics industry; and (vi) technology and information in economic and social development.

The Government's determination and commitment to make the country a regional ICT powerhouse would make substantive differences as manifested in recent cases in other

developing countries (Box 5). The policy influence on the ICT sector evolves over years as shown in Figure 8.7. A national ICT authority should be established as recommended by a recent study by JBIC, headed by the President's Office with members from the public and private sectors to institutionalize the Government's commitment to the ICT sector.

Figure 8.7. How Governments Make and Influence ICT Decisions



Source: op. cit.

National and regional emphasis

The development of this sector will be pursued on two fronts: (i) using ICT as a tool in delivering various services, and (ii) developing ICT as an engine for export. As a nation, emphasis is placed on attracting foreign investments and export industries. For the Eastern Region, emphasis is placed on improving access to information vital to economic activities and providing better education with IT. Despite the apparent variance in emphasis, these two directions should be pursued in a complementary manner by promoting call centers and BPO operations and establishing/improving education and training facilities with IT technologies as described below.

Promotion of call centers and BPO operations

In developing the IT-related industries, El Salvador's advantages should be effectively utilized, including educated labor force at competitive cost, Spanish speaking ability with neutral accent, low international telephone cost, low electricity tariff, and relatively low Internet service fees among others. Call centers and BPO operations may most effectively utilize these advantages, as their success would depend more on human factors than locational conditions. Firms

Box 5

ICT Development in Developing Countries: Cases of India and Costa Rica

1. India

In 1997 when an Indian executive at General Electric proposed to move the company's call center to the South Asian nation, he was told flatly that it "would never happen." The rebuff was understandable, given India's inadequate infrastructures, including perennial power shortage and lack of telephone service, as well as its bureaucratic red tape; but today India has become the leader among the developing countries in ICT development. The revenues of its software and BPO industries rose from $6.2 billion in 2000 to $7.7 billion in 2001 and $9.5 billion in 2002. In 2003, NASSCOM, an Indian IT trade association, estimated that the industry would grow its revenues to $12 billion.

Anyone who had visited the Indian city Hyderabad a few years ago would have seriously doubted that the city could one day become a major hub in ICT development. Apart from power shortage and other trappings of a poor country, the place did not even have an international airport. Thanks to its government's dogged determination, however, Hyderabad is becoming another Indian success story.

Hyderabad, a city of some 3.6 million, already boasts a number of prominent BPO organizations. One is HSBC Electronic Data Processing. An example of a "captive" business processing facility, HSBC EDP provides data processing and customer service for the overseas operations of London-based financial services company HSBC. Other global players in Hyderabad are Deloitte Consulting, financial transaction processor ADP Wilco, and CapMark Overseas Processing India, which provides back-office work for its parent company, GMAC Commercial Mortgage.

With its BPO business booming, Indian's infrastructure is improving after a four billion-dollar investment in telecommunications, along with laws and regulations that support the export sector. Simply put, before the introduction of ICT export strategy, those problems were not a priority, but to achieve its ambitious development objective, the government has to accommodate the ever demanding IT industry. It has to reform and adapt to the new economy.

2. Costa Rica

Like many other Central and South American countries, Costa Rica has focused on developing its export sector and on increasing foreign direct investment (FDI) as a means of generating employment and foreign exchange. However, instead of concentrating in labor-intensive industries like some of its neighbors, Costa Rica focused its attention on the high-tech sector.

In 1996, faced with declining prices of its primary source of exports and growth, Costa Rica saw the need to develop alternatives to coffee production. The government recognized the potential of the emerging ICT sector and the importance of attracting a global corporation such as Intel to locate in the country. Today, the Costa Rican factory is Intel's second largest for final assembly and testing of computer microprocessor chips. One-third of all Intel microprocessors used in computers around the world come from the Intel plant in Costa Rica.

Costa Rica's location vis-à-vis North and South American markets, its peaceful and stable political environment, the business-friendly policies it adopted in the 1980s, its excellent infrastructure, and its educated and skilled workforce have all made it an attractive location for high-tech, export-oriented firms and other IT-enabled industries. Once the success of Intel in Costa Rica was demonstrated, other major U.S. companies followed, including consumer products maker Procter and Gamble, medical devices manufacturer Abbott Laboratories and money transmitter Western Union.

Costa Rica's export focus is being broadened to include software and IT services exports. Over one hundred software development companies currently operate in Costa Rica, employing more than 1,000 professionals and exporting to countries in Latin America, the Caribbean, North America, South East Asia, Europe and even Africa. The total exports of the six largest software development companies in 1997 surpassed US$25 million. The target for 2001 is to export over US$200 million. According to the Costa Rican government, "software is destined to become in the coming century what coffee represented for the Central American country for over two centuries."

A critical element of Costa Rica's approach has been a focus on education. Not only does Costa Rica have high national standards of education, it has also worked on ensuring that educational institutions produce appropriately skilled workers and professionals. Given the limited number of engineers and technicians, the government has embarked on an aggressive campaign to transform the knowledge base of the country in alignment with the requirements of the high-tech sector. The Instituto Nacional de Aprendizaje (INA), an autonomous institution financed with public resources and private contributions, and the private Instituto Tecnológico de Costa Rica (ITCR) are the main providers of engineering professionals. The Inter-American Development Bank and private investors funding have supported Costa Rica in its efforts to upgrade its educational system.

To encourage demand, computer duties were removed in the 1980s. The falling computer prices stimulated usage and Costa Rica now has one of the highest rates of usage in Latin America.

Intel's impact on the Costa Rican economy is indisputable. The balance of trade turned positive due to the dramatic increase in exports (20% annual increase). Traditional exports, such as bananas and coffee, could not create such a boost in exports and in any case were declining. The gross national product (GNP) also grew by approximately 6.4% and 8% in 1998 and 1999, respectively. In 2000, computer products accounted for 37% of Costa Rica's exports. This is higher than bananas at 10% and coffee at 5%, making the technology free trade zone regime the most important foreign exchange earner for the country.

References:

1. Wharton School of Finance at Univ. of Pennsylvania (http://knowledge.wharton.upenn.edu/article).
2 Accenture, Markle Foundation & UNDP, *Creating a Development Dynamic – Final Report of the Digital Opportunity Initiative*, 2001 (http://www.opt-init.org/framework/pages/2.3.1.html).

establishing call centers train their staff to be operators, telemarketing experts, and other specialists in order to establish their sales bases. Also such firms are expected to promote IT applications more vigorously. Therefore, the establishment of call centers would have multiple effects for IT-related industrialization, contributing to the development of human resources, marketing and technology. The establishment of BPO operations of international organizations would enhance the image and status of El Salvador as a stable and reliable member of international IT communities.

IT-oriented human resources development

With the development of the La Union port and FTZ together with call centers and logistic functions, the Eastern Region is expected to offer high-grade intelligent services for commerce and trade. Under the current planning, a technological institute will be established in La Union, and a high tech park may also develop. To support these prospects, broad-based human resources development should be undertaken for ICT policy makers, software developers and technicians, and ICT users (Section 8.3).

8.2.4 Strategy for water resources development and management

(1) Characteristics of water resources in El Salvador and the Eastern Region

El Salvador is endowed favorably with water resources, receiving the average annual precipitation of 1,800mm. Their distribution in time and space, however, poses constraint to their effective use. Over 90% of the annual rainfall concentrates in the rainy season from May

through October. Also, several areas are in rain shadow with less than 1,400 mm annual precipitation. In the Eastern Region, rain shadow areas are found in the eastern most area around the Fonseca gulf and along the border with Honduras and in the midstream of the Río Grande de San Miguel to the east of the San Miguel volcano.

Even during the rainy season, some areas experience dry spells called "canícula" for 6-30 days. Most part of the Eastern Region experience moderate dry spells, except for the northern part of the Torola river basin and the area of the San Salvador formation. Severe dry spells are experienced along the Pacific coast from the Jiquilisco bay to the La Union bay and the southern part of La Union especially along the border with Honduras.

Runoff coefficients are relatively small for most rivers in El Salvador despite a small area of remaining forest cover and degraded forest resources. Areas underlain by relatively young volcanic rocks function effectively as recharging areas for groundwater. Also heavy rainfalls immediately following dry spells or prolonged drought tend to be absorbed more easily by soil. Relatively high evapotranspiration, ranging 1,400-1,900mm/year as observed, is another factor for the low runoff coefficients. Evapotranspiration is particularly high in the Eastern Region: 1,964mm in San Miguel, 1,944mm in La Union, and 1,986mm in San Francisco Gotera. The runoff coefficients are even lower in the Eastern Region: 23% for the Jiquilisco bay area, 14% for the Rio Grande de San Miguel basin, and 16% for the Goascoran river basin. This implies conversely, even discounting the higher evapotranspiration, groundwater potentials are high in the Eastern Region. However, systematic exploration of groundwater resources has not been conducted.

(2) Problems with water resources and uses in the Eastern Region

Flooding

Not only downstream areas but also some midstream and upstream areas are subject to habitual inundation in El Salvador. While the Country is rarely subject to direct attacks of hurricanes, hurricane-induced rainfalls often cause extensive flooding. In the Eastern Region, extensive lowland areas were inundated by storms caused by the hurricane Mitch from the Lempa downstream, through the Jiquilisco bay area, to the northwestern area of the Olomega lagoon and also in the area around the La Union bay, the southeastern tip around Tamarindo, and a small area along the middle reach of the Lempa river downstream of the September 15 dam.

Water pollution

Contamination of river water is proceeding, mainly associated with larger urban centers throughout the Country. In the Eastern Region, pollution of the Rio Grande de San Miguel by sewage discharge from San Miguel city, and sewage discharge through a few rivers into the La Union Bay are matters of concern. Also some surface water derived from geothermal activities has high temperature and high TDS contents. Shallow groundwater along the middle reach of

the Rio Grande de San Miguel is contaminated by polluted river water. In the Olomega lagoon area, the pollution of both surface water and shallow groundwater poses serious concern. Traces of arsenic are also reported in the area, presumably due to volcanic activities.

Erosion

High erosion areas have been identified in the upper basins of larger rivers and in the basins of small rivers with large riverbed gradients draining the western part of the Country into the Pacific ocean. In the Eastern Region, the Torola river basin, the upper basin of the Rio Grande de San Miguel, and the Goascoran river basin are considered to be high erosion areas. Erosions in these areas are strongly associated with sediment depositions in respective downstream areas causing habitual floods.

Water supply and sanitation

Water supply coverage is only 27% in El Salvador while water supply facilities cover 50% of the households, consisting of 39% by piped systems and 11% by water tanks. The actual service coverage for water supply and sanitation is summarized in Table 8.18 by department. In the Eastern Region, the service coverage for water supply is higher than the national average in Usulutan (55%) and San Miguel (37%), but much lower in Morazan (22%) and La Union (18%). Availability of latrines is extremely low in San Miguel covering only 7% of the households, presumably reflecting the development of urban sewer systems particularly in the capital city. This, however, is the main cause of water pollution in Río Grande de San Miguel by untreated sewage.

Table 8.18. Water Supply and Sanitation Coverage by Department, 2001

(Unit: %)

Department	Water supply	Latrines	Cesspools
Ahuachapán	39	31	11
Cabañas	16	50	5
Chalatenango	30	30	6
Cuscatlán	32	35	18
La Libertad	27	31	16
La Paz	19	39	11
La Union	18	38	7
Morazan	22	47	27
San Miguel	37	7	8
San Salvador	24	28	8
San Vicente	23	69	5
Santa Ana	17	32	4
Sonsonate	23	31	13
Usulutan	55	51	5

Source: *Diagnóstico sobre la situación de agua y saneamiento en El Salvador*, September 2001.

(3) Strategy for water resources development and management in the Eastern Region

The Eastern Region shares with the rest of the Country the common characteristics of water resources and common water-related problems, but both are more conspicuous in the Region. In particular, both floods and droughts are more severe, and the extensive area suffering from dry spells during the rainy season is unfortunately a unique characteristic of the Eastern Region. The Region shares also the erosion and sedimentation problem due to degraded upper basins. Despite the relatively low levels of economic activities and urban development, water pollution is already a serious problem in the Eastern Region due mainly to untreated sewage discharged into rivers. Solid wastes dumped on riverbanks are also commonly observed.

Watershed management

Given these conditions observed in the Eastern Region, the watershed management is of utmost importance for the development of the Region. A river basin is to be taken in its entirety, both quantity and quality aspects treated in an integrated manner, and conjunctive use of surface water and groundwater pursued. The upper basins of the Rio Grande de San Miguel and the Torola river, and the northern part of La Union should be treated particularly carefully by the river basin approach.

A key to the successful watershed management is to enhance the water retention capacity of river basins, particularly in upper and middle basins through reforestation and forest management, adoption of better farming practices such as sloping agricultural land technology (SALT), and water storage on a large and small scale. In the Rio Grande de San Miguel basin, there is no site for a sizable reservoir, and thus small reservoirs and ponds need to be combined. Some of them may be interconnected by channels to enhance overall water use efficiency, both horizontally through contour canals and vertically in cascades by using gravity flow. This system may be particularly relevant in the Region for the purpose of supplemental irrigation to bridge dry spells during the rainy season and extend cropping season by a few months at most, rather than full scale irrigation in the middle of the dry season.

Flood control

Habitual floods in the Easter Region, and particularly in the Rio Grande basin, are often a blessing in disguise, as they bring nutrient-rich soil from upper river basins. They cause property damages, including loss of livestock but human losses are minimal. Existing economic activities can tolerate short periods of inundation such as cattle raising in managed pastures and sugarcane plantations. While a reasonable level of flood protection should be provided, it is more important to support the livelihood adapted to minor flooding. This can be accomplished by adequate watershed management with proper land use in flood- prone areas. Houses with elevated floors and flood shelters on high grounds would reduce damages by habitual floods if combined with an early flood warning system as recently introduced in the

Rio Grande basin by SNET supported by USAID.

With a combination of a few small reservoirs and a large number of ponds in the upper and the middle catchment areas, habitual floods can be mitigated. To cope with larger floods, the small reservoirs and other structural measures in the downstream such as dykes, embankments and channel improvements as planned by another JICA study (1997) for Río Grande would be necessary. The principle of watershed management for flood control, however, is to start from the upper and middle catchment areas. A feasibility study of a most effective reservoir on a tributary of Río Grande should be undertaken in the nearest future. In the meantime, a system of small ponds in the upper and middle catchment areas should be planned, and priority schemes implemented to realize irrigation benefits earlier and to assess mitigation effects of small habitual floods.

Water resources assessment and monitoring

The ongoing SNET initiative for hydrogeological monitoring should be expanded particularly in the Eastern Region into a comprehensive water resources assessment and monitoring system to evaluate surface water and groundwater in terms of both quantity and quality. The system would include: 1) meteorological measurement, 2) river flow gauging, 3) groundwater assessment with monitoring and test wells, 4) water quality analysis, and 5) data processing, transmission and retrieval.

As the population expands in the Eastern Region, particularly in a few larger cities, a conjunctive use of surface water and groundwater would become necessary. These two sources of water are particularly interlinked in the Eastern Region with respect to quantity and quality. For optimum use of water resources, these inter-linkages need to be clarified with better and more extensive data.

The initial step for optimum use of water resources in the Eastern Region may be taken within a broader context of the national water resources development and management planning, while urgent measures are taken to expand the SNET hydrogeological monitoring system. The latter may be linked also with the environmental monitoring system for the Fonseca Gulf proposed elsewhere.

Water supply expansion and sewerage

The service coverage of water supply is still very low in the Eastern Region, particularly in Morazan and La Union. As urbanization proceeds not only inevitably but also as a necessary condition to support the Eastern Region development, the demand for urban water supply would increase rapidly. Existing urban water supply systems should be improved and expanded particularly for the La Union-Conchagua area, Santa Rosa de Lima, San Miguel city, San Francisco Gotera, Usulutan city and Santiago de Maria. In association with any future expansion of water supply for these urban centers, provision should be made for proper

treatment of sewage as well.

Rural water supply and sanitation should be improved consistently as important part of the basic human needs. Community involvement would be essential for effective implementation and management of facilities. Local communities are expected to participate not only in planning but also in construction works such as well drilling, material transportation, installation of equipment and pipes etc. This would ensure effective use of local sources of water and selection of more adequate materials and methods of construction. More importantly, local people would be motivated to manage and operate the facilities they have planned and implemented.

8.2.5 Strategy for solid wastes and wastewater treatment

(1) Conditions and problems of solid waste management in the Eastern Region

Existing conditions in selected municipalities

1) La Union

The unit of public services of La Union is in charge of collection, transport and final disposal of solid wastes as well as street cleaning in this municipality. Collection covers 2,677 households or 49.3% of all the urban households, and other public facilities including two hospitals and a health center. Monthly rates for the services are charged according to areas occupied by offices or residences. The annual revenue was US$44,533 in 2000, covering 59.4% of the total direct cost of US$74,939, which corresponds to 7.6% of the municipal budget of US$987,276. Collected garbage is estimated at 6.63ton/week, or 56.7% of the generated garbage of 11.68ton/week as estimated. The final disposal site is located 4km east of the urbanized area with 229,000m^2 rather close to a river at the minimum distance of 25m. A natural drainage channel parallel to the road flows into the La Union bay causing contamination.

2) Conchagua

The department of public cleanliness of Conchagua with six staff members collects, transports and disposes solid wastes in the municipality. Collection covers 821 out of 1,351 registered households. Service fees are collected monthly. The annual revenue was US$9,662 in 2000, covering 37.1% of the direct cost of US$26,018, which corresponds to 1.3% of the municipal budget of US$1,989,413 in 2000. A final disposal site, located 12km from the city, was closed after six years of operation due to the opposition of the farmers' association that owns the land. The municipality now uses the same landfill site in La Union as the municipality of La Union.

3) San Miguel

The management office of public services is in charge of collection, transport and final disposal of solid wastes in the city. Collection services are outsourced to private companies through bidding. Service fees are charged by floor area, and collected with other public utility charges

such as street lighting. Some 60,000 customers are served, including residents, companies, institutions, and others. The annual revenue from the service fees was US$1,417,527 in 2000, corresponding to 160% of the total direct cost of US$888,616 or 11.3% of the municipal budget of US$7,833,442. An old disposal site was closed in 2000. There is a new disposal site of 18.2ha at Uluazapa, located 6.5km from the city, owned by the municipality. A bulldozer and a compactor are used to cover waste with soil and compact it every 20 days.

Plan for municipal association of Fonseca gulf

An integrated solid waste management plan has been prepared by the Central American University (UCA) sponsored by the Spanish Agency for International Cooperation (AECI) for the municipal association of Fonseca gulf. The basic idea of the plan is to reduce the amount of wastes by recycling, composting and other methods, and take the rest to a sanitary landfill to be established. It is expected that a study to establish the sanitary landfill site will be supported by FISDL (90%) and AECI (10%). According to the plan, all the municipalities of La Union will use the landfill for 30 years. Some municipalities of San Miguel and Morazan may also join by paying charges.

Problems

The main problems of solid waste management in the Eastern Region are as follows:

1) Collection coverage is limited, and wastes are deposited in vacant lands or dumped on riverbanks and in ravines;
2) Service fees for collection are not collected from all the customers and charged in proportion to floor areas rather than quantities of wastes, causing a sense of unfairness among people;
3) Medical wastes are often mixed with domestic and other wastes;
4) Final disposal sites are not prepared as sanitary landfills, causing seepages to contaminate soil, groundwater and surface water; and
5) Closed landfill sites are not properly treated or managed.

(2) Conditions and problems of wastewater treatment in the Eastern Region

Existing conditions in the Eastern Region

1) Overview

Out of 262 municipalities in El Salvador, 82 municipalities (31%) have sewage systems, which cover 66 % of the national urban population or over 2 million. In the four departments of the Eastern Region, the coverage of its urban population is relatively low compared to the Country as a whole as shown in Table 8.19.

The sewage system in most municipalities, including La Union and San Miguel, are managed by ANDA, but there are some municipalities that are independent of the control by ANDA.

ANDA has its branch office in each region. The one in the Eastern Region is located in San Miguel with 265 staff members. ANDA does not manage rainwater drainage, which is managed by each municipality.

Table 8.19. Coverage by Sewage Systems

	Usulutan	San Miguel	Morazan	La Union	San Salvador	El Salvador
No. of municipalities with sewage system	7	4	2	3	15	82
Urban population with sewer system	50,135	107,945	6,995	17,190	1,358,495	2,171,640
Total urban population coverage (%)	37	49	14	26	84	66

Source: ANDA.

2) La Union

The sewage system of La Union city, first constructed in 1950's, has been expanded as the city develops to cover now 2,504 households. At present, it consists of 3.0km-long primary and 7.0km-long secondary collectors. The collected wastewater flows into the La Union bay through six discharge points, five directly and one via a canal, without treatment. In addition, large quantities of organic materials such as food wastes, wash water wastes, and garbage and debris are conveyed to the ocean through sewers and open channels. The municipal slaughterhouse also discharges its wastes without any treatment. Most shrimp processing plants have only sediment traps and filters to treat processed water.

3) Conchagua

No sewage system exists in the municipality of Conchagua. Septic tanks are used in the urban area, and other simple facilities used in the rural area.

4) San Miguel

The sewage system of San Miguel city was first constructed in 1950's, and is now divided into 10 zones. It consists of interceptors, primary collectors 19.7km in length, secondary and tertiary collectors 159.7km in length. The collected wastewater flows into the Rio Grande de San Miguel through nine discharge points without any treatment. The system covers a population of 19,800 or 63.5% of the total population.

5) Industrial wastewater

ANDA maintains an inventory of industrial wastewater discharging into Rio Grande San Miguel with data on BOD, COD, SS, sediments, pH, and temperatures of discharge from each company. The inventory covers only 34 companies, of which 13 do not have any water quality data. The water quality data of nine companies were analyzed for 1995-98.

6) Toilets in rural areas

Human waste treatment in rural areas is 5.5% by septic tanks, 14.6% by LASF and 58.4% by pit holes, while 21.5% of the rural households do not have a toilet. LASF is a structure with two compartments used alternately as toilets. The liquid portion is discharged outside and the solid portion is used as fertilizer after drying. Many of the toilets of this type provided in rural areas were not used properly due to the lack of education among people.

Existing plans

ANDA is going to initiate a six-month study with a fund lent by the Salvadoran Fund for Pre-Investment Study (FOSEP) to prepare a feasibility study and detailed design for the construction of a wastewater treatment plant in La Union city. Conchagua has also been included in the latest plan of the project. The proposed project will have the capacity to receive wastewater from present and future urban areas up to 2022 and to treat it to the water quality stipulated in the present regulation.

The project as currently planned consists of the following.

Phase I:

1) construction of interceptors along the shorelines to collect wastewater from all the existing sewers and open drainage channels,
2) connection of rain water drainage to sanitary sewers,
3) installation of pumps for wastewater,
4) construction of a wastewater treatment plant, and
5) management and treatment of industrial wastewater.

Phase II:

1) extension of the sewage system,
2) construction of a rainwater retention basin to accommodate runoff from the watershed of the Conchagua volcano, and
3) rehabilitation of the existing wastewater treatment plant.

For the treatment method, the aerated pond has been selected as most appropriate after analyzing eight alternatives including activated sludge, oxidation ditch and others in view of investment costs, annual O&M cost, complexity of operation, and other factors.

There is an abandoned wastewater treatment plant on the premises of CORSAIN in the La Union city. It was constructed by a French company funded by the French government and operated for 1980-83 to treat domestic sewage. It has been abandoned as the operation was found to be uneconomical. The ANDA study will examine the possibility to rehabilitate the facilities.

San Miguel was covered by the Feasibility Study and Final Design for the Project of Potable Water and Sanitary Sewage Systems for the Cities of Santa Ana, San Miguel and Sonsonate,

financed by FOSEP, the Ministry of Finance and IDB. The plan is pending at present and ANDA is not making efforts to seek funding for its implementation.

The municipal association of Fonseca gulf is planning to install two pilot wastewater treatment plants that employ non-mechanical system: one in La Union covering 200-250 households and the other in Intipuca for 100-150 households. Another wastewater treatment facility is planned by an international NGO to treat wastewater from an existing seafood market on the shore.

Problems

Pollution of water bodies by the discharge of untreated sewage and other wastes washed away by rainwater is already a serious problem. Water quality data on the La Union bay and the Rio Grande are given in Tables 8.20 and 8.21, respectively. As shown in Table 8.20, COD of the water in the La Union bay is extremely high, and the total-N and the total-P contents exceed the levels to cause eutrophication: 0.06mg/ℓ for total-N and 0.01mg/ℓ for total-P. Data in Table 8.21 show that BOD levels and fecal coliform counts in waters of the Rio Grande are extremely high, far exceeding the standards suitable for even indirect use for recreation such as boating to say nothing of bathing.

Table 8.20. Water Quality Data on La Union Bay

	Sampling points				
	1	2	3	4	5
Temperature (°C)	29.5	29.2	29.0	27.0	27.0
pH	7.8	7.8	7.9	7.9	7.9
COD (mg/ℓ)	1314	1101	1435	1648	1443
Total-N (mg/ℓ)	5.8	6.1	3.9	5.8	5.0
Total-P (mg/ℓ)	0.17	0.09	0.04	0.22	0.19

Source: NK & OCDI, the Study for Port Reactivation in La Union, Department of La Union.

Table 8.21. Water Quality Data on Rio Grande de San Miguel

Date	Sampling point	Temperature	BOD (mg/l)	Fecal coliform (MPN/100ml)
Dec. 09, 96	El Zamorano	27	340.0	4,600
	Puente Las Carretas	27	780.0	4,600
Dec. 23, 96	El Zamorano	29	180.0	2,100
	Puente Las Carretas	31	1,225.0	1.1×10^{7}
Jan. 07, 97	El Zamorano	31	37.0	2.4×10^{5}
	Puente Las Carretas	27	782.0	4.6×10^{6}
Jan. 21, 97	El Zamorano	30	122.0	1.5×10^{3}
	Puente Las Carretas	28	1,321.0	4.6×10^{7}
Feb. 04, 97	El Zamorano	29	74.0	460
	Puente Las Carretas	29	930.0	9.3×10^{6}
Feb. 18, 97	El Zamorano	28	37.0	1.1×10^{5}
	Puente Las Carretas	29	430.0	2.4×10^{7}

Date	Sampling point	Temperature	BOD (mg/l)	Fecal coliform (MPN/100ml)
	Puente Las Carretas	28	930.0	2.4×10^7
Mar. 19, 97	El Zamorano	31	15.50	1.1×10^4
	Puente Las Carretas	27	1,283.0	1.1×10^7

Source: Decontamination and Bio Recovery of Rio Grande.

(3) Strategy for solid wastes and wastewater treatment

Solid waste management

It is most important to reduce the amount of solid wastes at source and recycle them as much as possible. A prerequisite is to raise the awareness of people that it is their responsibility to reduce the amount of wastes voluntarily with conscious effort and to stop dumping wastes. Enforcing waste reduction tends to increase illegal dumping without people's enhanced awareness and participatory monitoring. Efforts to reduce wastes should be supported by introduction of collection service fees proportional to the amount of wastes generated.

The composition of solid wastes in La Union city as a representative case of the Eastern Region is provided in Table 8.22. Composting, if encouraged and practiced widely, is expected to reduce the amount of organic wastes that constitute the majority (66% as of 1998) of the entire solid wastes. Composts may be produced by individual farmers and used as fertilizer to enhance agricultural productivity. In view of promotion of organic agriculture in the Eastern Region, particularly for vegetables, coffee and cashew, local markets should be developed for composts. This would provide incentives for farmers to produce composts on the one hand, and support organic agriculture on the other. Collection of organic wastes from households and markets holds a key. Also, technical extension should be provided for compost making by individual farmers.

Table 8.22. Composition of Solid Wastes, La Union City

	Organic matter	Paper & cardboard	Plastic	Textile	Ferrous metals	Non-ferrous metals	Wood	Glass	Other
% (weight)	66.0	9.0	6.0	2.0	3.0	5.0	0.0	7.0	2.0

Source: Arcadis/Euroconsult, 1998.

San Salvador-based recycling companies should be invited to establish operations in the Eastern Region. Initially, paper and cardboard boxes will be the main objects for recycling but the operations may be expanded into ferrous and non-ferrous metals, plastics and glasses. Municipalities and local chambers should support them to facilitate collection to make initial operations financially sustainable. It may help to give the operators franchises to ensure their long-term commitment and operations in different municipalities as designated, respectively.

The integrated solid waste management plan for the municipal association of the Fonseca gulf should be adopted as the model for any solid waste management in the Eastern Region in the

future. It should be implemented by all means in a full scope as planned, including recycling, composting and sanitary landfill. Separate treatment of hospital wastes should be built in this model plan.

Wastewater treatment

The ongoing ANDA initiative for the wastewater treatment plant in La Union city should be supported and accomplished for both Phase I and Phase II, covering Conchagua as well. A stage-wise development plan should be prepared for San Miguel based on the existing feasibility study, and a realistic financing plan worked out, clarifying the cost to be borne by the municipality. Realistic standards should be set for ambient water quality of the Rio Grande in view of future changes in flow distribution as a result of dam construction upstream in order to determine the level of treatment. Data on the 40 companies discharging their wastewater into the Rio Grande should be established as a prerequisite to apply the polluter-pays-principle.

For urban areas not covered by these projects, sewage systems and wastewater treatment plants should be planned by local communities with appropriate technology (AT) under the technical guidance of ANDA having AT experiences elsewhere. In rural areas, the use of LASF or conventional latrines should be expanded, depending on the groundwater table, soil permeability and fund availability, by technical guidance and education to enhance people's awareness about sanitation.

8.3 Human Development

8.3.1 Strategy for educational development

(1) Characteristics of education in El Salvador

Low literacy rate and shorter length of study

The literacy rate in El Salvador, 75% in 1999, 92% for male and 76% for female in 2000 (World Bank, op. cit. 2002), is higher than in Nicaragua, Honduras and Guatemala, but significantly lower than in Costa Rica (96% in 2000), Belize (93%), and Panama (93% for male and 91% for female). Also, the literacy rate varies widely among the departments, ranging from 90.7% in San Salvador to 64.6% in La Union. Morazan (66.7%) and Usulutan (69.3%) in the Eastern Region also have the literacy rate lower than the national average.

The average length of the study ranges from 6.9 years in San Salvador to 3.2 years in Cabañas. Departments in the Eastern Region have generally shorter study duration: 5.0 years in San Miguel, 4.3 years in Usulutan, 3.8 years in Morazan, and 3.4 years in La Union.

Urban bias in educational spending

Table 8.23 shows the allocation of national budget for the education sector to departments and population distribution by department in 1997. San Salvador has by far the largest allocation

(33.5%) of the education budget, larger than its large population share. The Eastern Region as a whole received a proportionally larger share (24.5%) of the education budget than its population share (21.9%). Its allocation to departments, however, is biased to more developed San Miguel and Usulutan. Morazan and La Union received shares of the education budget smaller than respective population shares.

Table 8.23. Budget Allocation and Population Distribution by Department, 1997

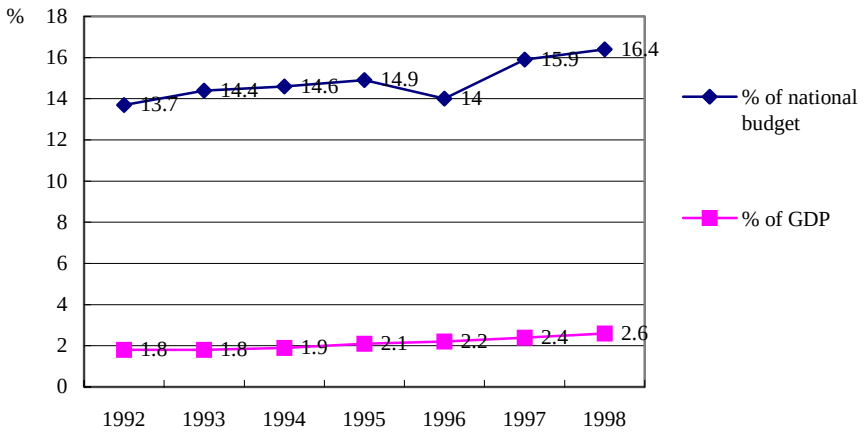
Department	Budget (% of natl. total)	Pop. distribution (% of natl. total)	Department	Budget (% of natl. total)	Pop. distribution (% of natl. total)
Ahuachapán	4.1	5.5	Cabañas	2.2	2.8
Santa Ana	8.2	8.7	San Vicente	2.7	2.8
Sonsonate	6.4	7.4	Usulutan	6.0	5.8
Chalatenango	3.3	3.6	San Miguel	12.0	7.8
La Libertad	8.2	10.5	Morazan	2.5	3.2
San Salvador	33.5	28.2	La Union	4.0	5.1
Cuscatlán	2.7	3.5	Eastern Region	24.5	21.9
La Paz	4.0	5.0	El Salvador	100.0	100.0

Source: FUSADES, *Crecimiento con Participación Volumen II*, 2000.

Small education budget as a percentage of GDP and national budget

During 1992-98, the ratio of the education budget to the GDP increased consistently in El Salvador. The trend is the same for the education budget as a percentage of the national budget (Figure 8.8). Despite the continuous efforts of the Government to strengthen the education sector in El Salvador, the budget allocation falls short of levels in a few Central American countries and Mexico (Table 8.24).

Figure 8.8. Educational Budget as Percentage of National Budget and GDP, 1992-1998



Source: MINED, *Educación para Todos. Un Sueño Posible*, 2002.

Table 8.24. Educational Budget as Percentage of National Budget and GDP in Central American Countries, 1997

	Costa Rica	Guatemala	Honduras	El Salvador	Nicaragua	Mexico	Panama
% of natl. budget	21.0	17.0	15.0	15.9	15.0	24.0	18.0
% of GDP	4.7	1.6	4.0	2.4	3.9	5.8	5.2

Sources: World Bank, 1997; MINED (for El Salvador).

Low enrollment at secondary schools

The enrollment rate in secondary education is very low in El Salvador, 37.7% in 2000. This rate is much higher in most Latin American countries: 69.5% in Peru, 62.5% in Panama, 54.0% in Ecuador, 49.0% in Nicaragua, and 48.5% in Costa Rica (Table 8.25). High costs of attending secondary schools may be a major reason for the low participation rate. In 2002, the average monthly cost to attend public secondary schools ranged from ¢50 or US$5.71 to ¢150 or US$17.1, and private school enrollment costs at least ¢100 or US$11.4 (APREMA, *Guia para Padres de Familia*, 2000). These costs correspond to 10-20% of the average per capita monthly household income of most departments. Also, a recent study indicates that costs for uniform, textbooks, food, transport and others account for 57% of the total direct cost of secondary education (World Bank, Secondary Education in El Salvador: Education Reform in Progress, 1999). Moreover, the survey conducted in 1997 to population of age 16 to 18 years has revealed reasons for not attending secondary schools as: need to work for 32.6%, family problems for 23.7%, excessive costs for 17.5%, and no value for 18.1%.

Table 8.25. Secondary Education Enrollment Rates in Latin American Countries, 1999

	Bolivia	Colombia	Costa Rica	Ecuador	El Salvador	Guatemala	Honduras	Mexico	Nicaragua	Panama	Peru
Enrollment rate (gross)	37.0	72.5	48.5	54.0	37.7 (2000)	25.0	33.0	64.0	49.0	62.5	69.5

Sources: UNICEF homepage (http://www.unicef.org); MINED, *Educación para Todos*, 2002 (for El Salvador).

Pedagogical licensing system for teachers

In El Salvador, all teachers and professors, from the primary to the university levels, need to major in pedagogy in universities. Licenses are given to those who have completed the degree, and those who do not have a license are not allowed to become teachers. While this system is enforced, there is no corresponding system to upgrade skills and quality of teachers. Many teachers at vocational technical schools do not have any technical background. Teachers receive generally higher salaries in El Salvador than other professions. For example, teachers get 2.1 times as much as the average wage of all sectors in rural areas (FUSADES, *Crecimiento con Participación: Volume II*, 2000).

Limited coverage by higher education

Technological institutes, universities and graduate schools offer higher education in El Salvador. Table 8.26 shows the number of students in 2000 by field of specialty and by degree. The largest number of students is found in economy, administration, and commerce with 31,405 students or 27.4%, followed by law (18.4%), technology (16.9%), health (14.2%), and education (11.9%).

Table 8.26. Number of Students by Major and Degree in Higher Education, 2000

	Technician	Technologist	Professor	Engineer, BA, architect	Master	Doctor	Total
Art and architect	78			3,287			3,365
Economy, administration, and commerce	526			30,127	752		31,405
Health	855	1,423		13,767	249		16,294
Science				2,270	21		2,291
Agrofishery and environment	174			1,399	53		1,626
Law				21,047			21,047
Humanity	103			583		3	689
Technology	4,556			14,861			19,417
Education			8,928	4,510	176		13,614
Social science	283			4,627	17		4,927
Total	6,575	1,423	8,928	96,478	1,268	3	114,675
%	5.73	1.24	7.79	84.13	1.11	0.0026	100.00

Source: MINED, *Resultados de la Calificación de Instituciones de Educación Superior*, 2000.

University education concentrates at the undergraduate level, and in particular no institute offers masters or doctors degrees in technical fields. This may be due to the dominance of private institutes that prefer, without government subsidies, to offer courses in such fields that require smaller investments. University degrees are offered only in eight technical fields: biomedicine, civil engineering, food and nutrition, electrical engineering, electronics, computers, industry and mechanics.

Technological institutions receive high school graduates and train them for two years. The degree of technical expert (técnico) is offered at present in 11 fields: computers, automotives, agro-industry, biomedicine, civil engineering, industrial tailoring, electrical engineering, electronics, industrial engineering, mechanics, and food processing.

(2) Educational levels of the Eastern Region

The Eastern Region has a 19.3% share in terms of the number of secondary schools, but its enrollment share is slightly lower at 18.8%. Morazan and La Union have shares of secondary schools and enrollment much lower than respective population shares (Table 8.27).

The Eastern Region has 13,591 university students or 12.6% of the total at nine universities as of 2000. Of these, the University of Interamericano Simón Bolívar in San Miguel closed in

2002. At present, there are five institutes in San Miguel and three in Usulutan, and no university exist in La Union and Morazan. Computer availability and access to the Internet at universities are much lower in the Eastern Region. Even at Universidad de Oriente (UNIVO), a most prestigious university, the number of students per computer was 45.8 in 2000 as compared to the national average of 27.0, and students per Internet-connected computer 47.2, while the national average was 43.0 in 2000.

Only three out of the nine technological institutes in El Salvador are located in the Eastern Region with 891 students or 18.6% of the total. There is a plan to construct a technological institute in La Union but no such a plan for Morazan.

Table 8.27. Number of Secondary Schools and Enrollment by Department, 1998

Department	No. of schools (%)	Enrollment (%)	% of total population (1997)
Ahuachapán	127 (2.82)	704 (2.63)	5.50
Santa Ana	332 (7.38)	1,981 (7.39)	8.70
Sonsonate	233 (5.18)	1,873 (6.98)	7.40
Chalatenango	126 (2.80)	489 (1.82)	3.60
La Libertad	408 (9.07)	2,098 (7.82)	10.50
San Salvador	1,933 (42.96)	11,930 (44.49)	28.20
Cuscatlán	142 (3.16)	806 (3.01)	3.50
La Paz	160 (3.56)	1,084 (4.04)	5.00
Cabañas	58 (1.29)	213 (0.79)	2.80
San Vicente	111 (2.47)	588 (2.19)	2.80
Usulutan	275 (6.11)	1,637 (6.10)	5.80
San Miguel	400 (8.89)	2,283 (8.51)	7.80
Morazan	74 (1.64)	367 (1.37)	3.20
La Union	121 (2.69)	762 (2.84)	5.10
Eastern Region	870 (19.33)	5,049 (18.83)	21.90
El Salvador	4,500 (100.00)	26,815 (100.00)	100.00

Source: Based on MINED, *Estadísticas Educación, CENSO Annual de Matrícula Estudiantil*, 1998.

(3) Strategies for improving primary education

To improve primary education, the Education Reform Project has been implemented since 1999, supported by the World Bank. The project aims to improve and expand the coverage, quality, and efficiency of the initial, preschool and basic education systems, especially in rural and marginal urban areas. There are the following four project components (cf. World Bank website).

1) Expansion of access to preschool and basic education: construction of new classrooms, development of an innovative initial education program with parental participation; and establishment of accelerated education modalities to meet the needs of overage children in rural and marginal urban areas and expand alternative (multi-grade) classrooms.
2) Quality improvements: revision of curricula for initial and special education, basic education for adults, and accelerated programs to address the special needs of overage

students; review, designing and provision of educational materials for teachers and students for all levels and modalities; strengthening of teacher training programs; improvement of health and nutrition school programs; and provision infrastructure and furniture to schools.

3) Institutional strengthening and modernization: establishment of a financial planning and monitoring system; development of a sustainable system for ongoing school-based management initiatives; and further development of communication strategies to increase public awareness of the basic education reform.
4) Project administration: financing for operation costs, equipment and office supplies.

The World Bank project represents a successful model for improving the quality of primary education. The effort of MINED, however, is necessary to sustain the system developed by the project even after its completion in 2005.

(4) Strategy for improving secondary and higher education

Rationalizing education budget

In El Salvador, the ratio of education budget to the GDP increased consistently during 1990's, but still it is much smaller compared to the neighboring countries. Thus, the education budget is expected to continue to increase, for the Government is well aware of the importance of human resources development in strengthening the economic competitiveness of El Salvador. The increasing education budget should be directed to rectifying the existing imbalance in regional distribution of education and training opportunities. Particularly, since the Eastern Region with the La Union port is expected to contribute significantly to the national economic development in the medium to long term, much larger allocation to the Region is justified already as the investment in education and training takes effects with a time lag. Given the increasingly tight financial conditions foreseen, the Government budget should be directed more to supporting existing private institutes for technical education at secondary and tertiary levels.

Establishing a technological institute

The ongoing efforts to establish a new technological institute in La Union should be supported. The institute is planned to offer courses in naval mechanics, marine biology, hotel management and tourism, port development and administration, naval electronics, electronic communications, and environmental management. While these are adequate, addition of other fields should be planned for this or other institutes such as food science, fermentation technology, dye works, industrial design, agronomy, and soil science to support new economic activities.

Establishing scholarship fund by public-private cooperation

Some financial support is necessary to increase the participation rate for secondary schools and

also to encourage tertiary education. One way is to establish a scholarship fund to support willing youth to pursue and accomplish secondary and tertiary education. To raise fund from a wide range of sources, it may be effective to establish an NGO particularly in the U.S. with the initiative of overseas Salvadorans there supported by DGALE of the Ministry of Foreign Affairs through consulates.

In the U.S., NGOs play active roles in various social and economic functions. The revenues of all the NGOs in the U.S. account for as much as 8% of the GNP. The composition of the income sources for all the NGOs in 1999 consisted of: membership fees and service fees for 51%, contribution by the Government for 27%, and donation from individuals and enterprises for 21%. For donations, contributions from individuals are the largest, accounting for 76%, followed by foundations for 12%, enterprises for 4%, and bequest for 8%. Tax exemption for grants to NGOs is a factor for the large amount of donation (Misawa, *Funding Mechanism of NPOs in the United States*, 2003).

Sustaining on-going initiatives to upgrade teachers' quality

The Technical Medium Education Reform Process Assistance (APREMAT) has been implemented since 1999 supported by EU. It focuses on curriculum development, instructor training, and installation of facilities and equipment at 22 pilot schools initially selected from all the departments. The Secondary Education Reform Project for general high schools supported by the World Bank also has a teacher-training component. These efforts need to be extended to cover more schools. At the same time, the pedagogical licensing system for teachers and professors needs to be reformed.

Networking R&D efforts

To promote R&D at education institutes having limited fund, their facilities and resources should be shared and research activities coordinated. In the Eastern Region, five institutes, viz., Universidad de El Salvador, Universidad de Gerardo Barrios, UNIVO, Instituto Tecnológico de Usulután, and ITCA San Miguel have agreed to establish a regional research system with the assistance from CND. This initiative should be supported by the Government with such measures as tax exemption associated with import of machinery and equipment for R&D. Also private enterprises may join the system for additional resources. In turn, such enterprises may receive financial support for their own R&D. Large enterprises may be required to earmark a certain fixed portion (usually 0.5-1.5%) of their sales to R&D.

8.3.2 Strategy for vocational training and ICT human resources development

(1) Strategy for vocational training

Expanding INSAFORP training

Training conducted by INSAFORP and other organizations is insufficient in terms of the

number of courses and subjects covered. It should be expanded to cope with developing needs of the Eastern Region. Examples of new training courses are given in Table 8.28.

Table 8.28. Example of Training Courses to Be Offered in the Eastern Region

Field/title	Contents
IT	Database design and management, network design and management, system design, programming language/method, web-design, security, business software (word processing, spreadsheet, presentation), Internet, and operating system,
Tourism	Tour guide, hotel receptionist, maid, cooking, hygiene, waiter, and handcraft
La Union port / FPEZ development	Crane operation, forklift operation, loading/unloading, refrigeration, electrics, electronics, plumbing, machine processing, metal processing, computer maintenance, mechanics, machine maintenance, physical distribution management, and occupational safety
Enterprise management	Accounting, marketing, management strategy, business manner, human resource management, report writing, exporting, importing, quality control, e-commerce, and secretarial work
Entrepreneurship	Business model establishment, business plan preparation, law, management strategy, accounting, and leadership development
Others	Dye works, apparel design, food processing, wood processing, and English

Source: JICA Study Team.

Establishing the Eastern Region skill development fund

The skill development fund has been successfully operated in many countries since it was first introduced in Singapore in 1979. According to a survey conducted in 1998 by the skill development fund of Singapore, workers who received training have seen the increase in income levels, knowledge and skills by 10-20%, quality of services in the enterprise improved by 11-20%, and quality of products improved by 1-10%. In addition, 60% of the surveyed enterprises increased their net profits and achieved cost reduction as a result of improved skills of their employees.

Employees should contribute to the fund from their payroll in the form of tax, and the Government provide matching grant. In Singapore, the rate of tax for employees was 4% initially, which has now been reduced to 1%. Deducting training fee from payroll will induce workers to receive training. This is in contrast with the INSAFORP scheme, for which the main financial source is employers' contributions. In the proposed fund scheme, INSAFORP should establish eligibility requirements, issue vouchers, and monitor training quality and compliance. Both private individuals and enterprises are eligible for vouchers, which are used by trainees to cover certain amount of the course fee. With vouchers, trainees can select programs and providers. The main objectives for issuing vouchers are to (i) ensure the efficiency of training systems by exposing providers to market forces, (ii) enable trainees to choose from a variety of training providers, and (iii) increase the number of training providers with increasing training demand.

Both courses conducted by INSAFORP and the Eastern Region skill development fund should be developed in coordination for systematic skill development, meeting the demand of trainees

at different levels. INSAFORP should set the target level of achievement for each course, and after completion of the course, issue a certificate. This will facilitate enterprises to hire personnel with proper skills.

Introducing tax incentives for in-service or outside training

Some industries provide training for their workers as a prerequisite for their successful operation. Incentives should be provided to attract such enterprises that conduct in-service training on their own or receive training from outside providers. They include corporate tax reduction in proportion to in-service training costs, exemption of import tax on equipment for training, and subsidy for training costs.

Establishing an incubation center

The incubation center is considered to be a successful model in many countries for developing new business and supporting entrepreneurial development. The center usually offers office spaces with appurtenances, Internet-connected computers, meeting space, and logistic supports at low costs. Many centers also offer technical advisory services for legal matters, technology, financial sources, government and other assistance available, etc., and other support such as access to a database of products prices, possible customers, training opportunities, etc. The first center of this sort in El Salvador should be established in the Eastern Region.

(2) Strategy for ICT human resources development

Call centers and logistic functions should be promoted in El Salvador, particularly in tandem with the La Union port and FPEZ development. Not only ICT engineers and technicians but also ICT policy makers and end users need to be trained to support this drive. Necessary knowledge and skills by target trainee are indicated in Table 8.29.

Since ICT skills become obsolete quickly, an alliance with a reputable institute outside is desirable to update skills and train ICT teachers constantly. Also, highly skilled ICT human resources may be introduced from outside through joint-venture arrangements. At the same time, incentives should be provided for the recruitment of local people by those enterprises such as tax reduction and subsidies for employment insurance. Another effective way to train ICT policy makers is to invite foreign experts and retired politicians from successful developing countries to El Salvador to conduct technology transfer to those policy makers.

Table 8.29. Examples of Knowledge and Skills Needed by Various Groups in ICT Human Resources Development

Target and objectives	Examples of necessary knowledge and skills
ICT policy makers - Capacity building for formulation of strategies, policies, and laws for ICT promotion	- Planning, drafting, execution of policies and laws for socio-economic activities using ICT - Knowledge of successful and unsuccessful cases of ICT promotion policies - Market needs of ICT in developed countries - Consideration to rural areas and socially disadvantaged groups at policy formulation
ICT engineers and technician - Human resources development necessary for the ICT sector development	- Database design and management, - Network design and management, - System design, - Programming language/method, - Web-design, and - Security
ICT end-users - Acquisition of basic computer and Internet skill for daily use and better employment opportunities	- Business software (word processing, spreadsheet, presentation, etc.) - Internet - Operating systems

Source: JICA Study Team.

Chapter 9 DEVELOPMENT PLANS, PROGRAMS AND PROJECTS

9.1 Development Plan for the Eastern Region

The basic strategy for the Eastern Region has been established with the following three components (Subsection 3.3.3).

1) Land and water resources development and management particularly of the Río Grande de San Miguel and the upper catchment areas in the north,
2) Spatial structure strengthening with the establishment of key infrastructure facilities, selective strengthening of urban functions, and rationalization of land use, and
3) Human and institutional development based on local government strengthening and people organizing and participation.

Also important characteristics of the Eastern Region have been noted (Subsection 3.3.2). That is, the Eastern Region is the most important livestock region in the Country; crop production is largely neglected and productivity is low; water resources are favourably endowed but underutilized; organizational strength exists among different groups of people; environmental concerns and tourism promotion are relatively high and reflected in organized activities; and key infrastructure is lacking to link with other regions.

Specific projects and programs have been formulated under the basic strategy in order to further develop the favorable characteristics and to rectify unfavorable characteristics noted above. Six broad programs have been defined:

(1) Agro-Industrial Complex (AIC) Development,
(2) Watershed Development and Management,
(3) Environment and Tourism Development,
(4) Spatial Structure Strengthening,
(5) La Union Port Revitalization, and
(6) Entrepreneurial Base Development.

The correspondence between the basic strategy and the broad programs is indicated below.

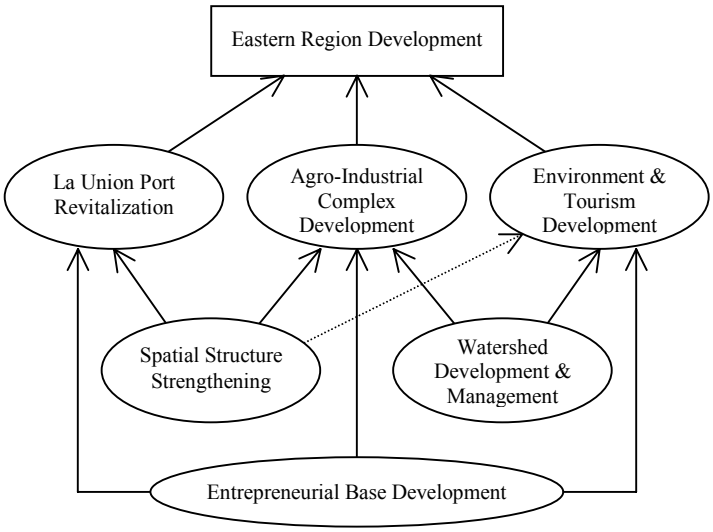
	Basic strategy*		
Broad program	Land and Water	Spatial structure	Human and institutional
1. Agro-industrial devt.	✓		
2. Watershed devt. and mgt.	✓	✓	
3. Environment-tourism devt.		✓	✓
4. Spatial structure strengthening		✓	
5. La Union port revitalization		✓	✓
6. Entrepreneurial base devt.			✓

* ✓ denotes strong relevance.

The structure of the Eastern Region development master plan with the six broad programs is

illustrated in Figure 9.1.

Figure 9.1. Structure of the Eastern Region Development Master Plan with Six Broad Programs



Of the six broad programs, the La Union Port Revitalization is described in detail in Section 9.2 as it relates to the La Union port and its hinterland. All the programs are described in Section 9.3 (details by project in Volume 3: Project Report). Institutional and financial measures to complement the project/program implementation are proposed in Section 9.4. Institutional arrangements are discussed at two levels: the Eastern Region as a whole and the La Union port and its hinterland. For the Eastern Region, alternative institutional arrangements are examined, and for the La Union port and its hinterland, management needs are clarified. Based on these, recommended immediate actions are presented. Alternative sources of fund for the Eastern Region development are examined, and new funding schemes are proposed.

An indicative investment schedule is presented in Section 9.5. Performance of investments in El Salvador in recent years is analyzed to set a framework for public fund allocation to the Eastern Region in the future. Costs involved in the implementation of the Master Plan are roughly estimated by project/program and made to fit the framework set for the three phases in view of the development phasing due to the Eastern Region development scenario.

9.2 Development Plan for the La Union Port and Its Hinterland

9.2.1 Planning framework for macrozoning

(1) Industrial land demand in La Union-Conchagua area

Industrial land demand in El Salvador, the Eastern Region and the La Union-Conchagua area is projected in Table 9.1.

Table 9.1. Industrial Land Demand in El Salvador and the Eastern Region in 2019

Region/area	%	ha	Region/area	%	ha	Region/area	%	ha
El Salvador	100	1,426	Eastern Region	100	713	La Union	100	285
Eastern Region	50	713	La Union	40	285	Port hinterland	18	50
Other regions	50	713	San Miguel	30	214	Other areas	82	235
			Usulutan	20	143			
			Morazan	10	71			

Source: JICA Study Team.

The industrial land demand in El Salvador is projected given available macroeconomic data and the results of the industrial location survey carried out as part of the Study. The total land demand for El Salvador is distributed to the Eastern Region and the other regions in 50% each in consideration of high expectation of potential investors toward the Eastern Region development and the Region's potential for developing and expanding economic links with Honduras, Nicaragua and countries across the Pacific ocean. La Union and San Miguel are regarded as two leading departments in the Eastern Region in industrial location. An area of 50ha is planned for industrial development with a free trade zone status in the direct hinterland of the port area ("La Union FTZ" hereafter). Two types of industrial location are foreseen in the La Union FTZ: one that imports raw materials and parts through the La Union port, process them in the FTZ and export final products from the La Union port (Model 2 in Subsection 5.1.4), and the other that procures raw materials from other parts of El Salvador, Honduras and Nicaragua and export them from the La Union port after processing them in the La Union FTZ (Model 1 in Subsection 5.1.4). The second type of industries can be located in other parts of the La Union department as well. More detailed industrial location planning is found in Project Report (Volume 3).

(2) Population in the La Union-Conchagua area

The population in the La Union-Conchagua area is projected by first estimating the number of workers in the La Union FTZ, the port area and the service sector, and then assuming a dependency ratio. The total employment is estimated at 27,700, consisting of 6,000 in the FTZ industries, 20,400 in services and 1,300 in port-related employment.

The dependency ratio, the number of persons in a household dependent on an incomer earner, is assumed to be 1.6 based on the socioeconomic data in the La Union municipality. Thus, the population in the La Union-Conchagua area is expected to reach 72,000 in 2019. In preparing a macrozoning plan, it is assumed that a new residential area and the existing urban area in equal proportion will accommodate the projected population: 36,000 in the new urban area and the existing urban area each.

9.2.2 Macrozoning

Macrozoning for the La Union-Conchagua area has been worked out utilizing a geographic information system (GIS) in the following steps:

1) Preparation of a land use map of the La Union-Conchagua area as shown in Figure 9.2,
2) Preparation of a slope map,
3) Identification of development potential area according to three factors: non-built-up area, inclination of less than 6% and altitude less than 300m, and
4) Selection of development areas from the development potential areas based on the planning framework explained above and a set of factors.

Figure 9.3 presents the macrozoning of the La Union-Conchagua area in 2019, based on the aforementioned planning framework and the following considerations. The macrozoning procedure is described in more detail in Project Report.

1) The area at an altitude higher than 300m is designated as a preservation area. This area serves as the recharging basin for all the rivers and groundwater originating in the Conchagua volcano. Only limited spot developments, for example, for tourism and recreational purposes, are permitted in this area.
2) An area of 70 to 80ha located right behind the planned port area is designated as the industrial and logistic area based on the two factors: direct access to the port and availability of relatively flat land.
3) The possibility of expansion is considered for port, industrial and logistics functions. An area of 100ha to the southeast of the port is planned for this purpose. This is the only flat area remaining with direct access to the port. Land allocations between the port, the logistics and the industrial functions should be determined as the actual demand for these functions begins to arise in the future.
4) The port area of 50-60ha is designated according to the project design already prepared by the Government.
5) The La Union waterfront is an important asset for recreational and tourism development. The waterfront area could be developed in different forms comprising restaurants and souvenir shops (e.g., Fishermen's Wharf in San Francisco, California, the U.S.), boardwalk, park, fishing wharf, and tourist park with such attractions as aquarium and swimming pool. Mooring facilities would be needed in this area for local residents moving between the city and islands as well as for tourist boats.
6) A fruits farm for tourist is planned in the Amapalita/Conchaguita community, taking advantage of the existing fruits farm there.
7) The new residential area is designated considering two factors: altitude and relation with the bypass and the existing urban area. It would be possible to develop water supply facilities

Figure 9.2. Land Use of La Union-Conchagua Area, 2002

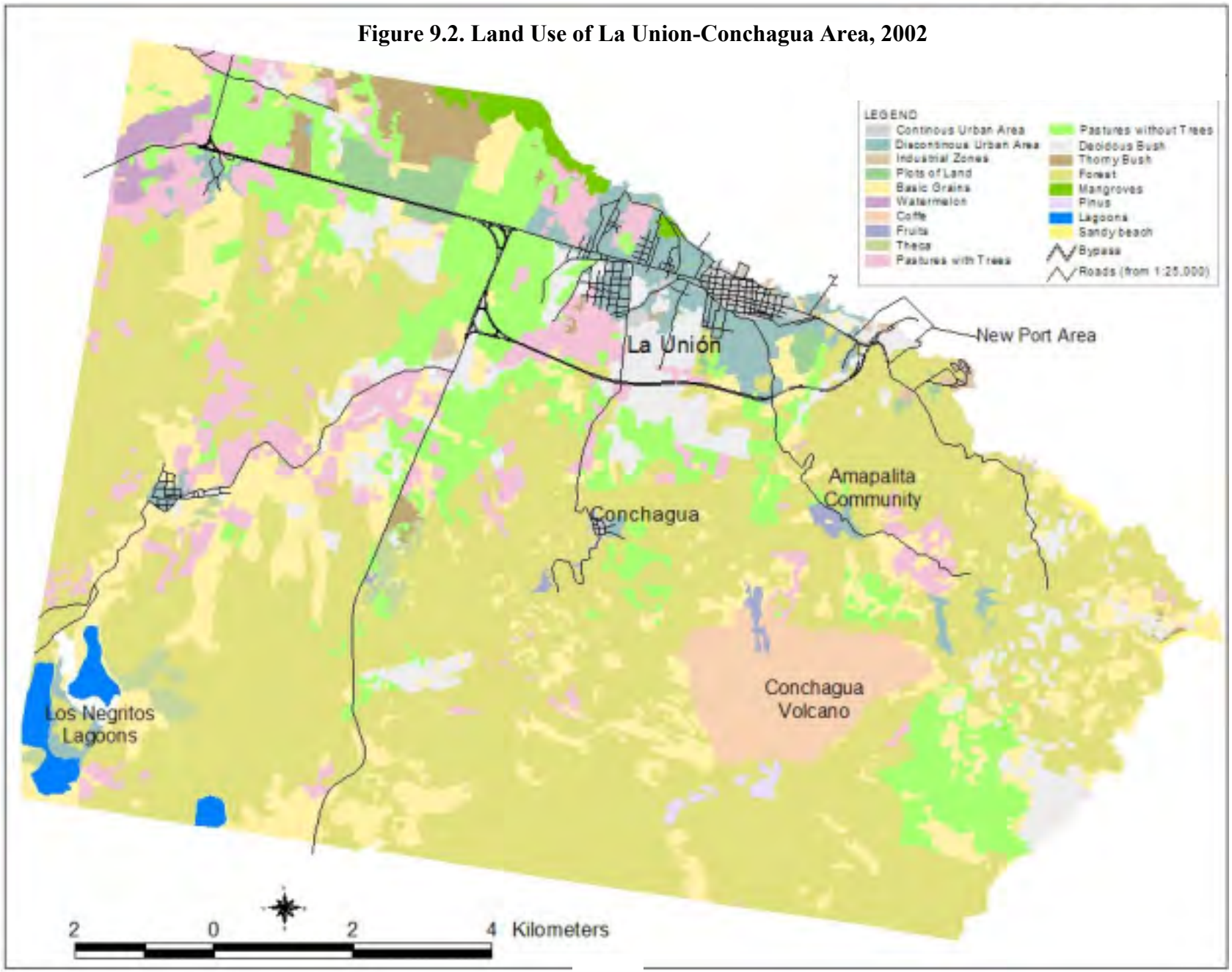
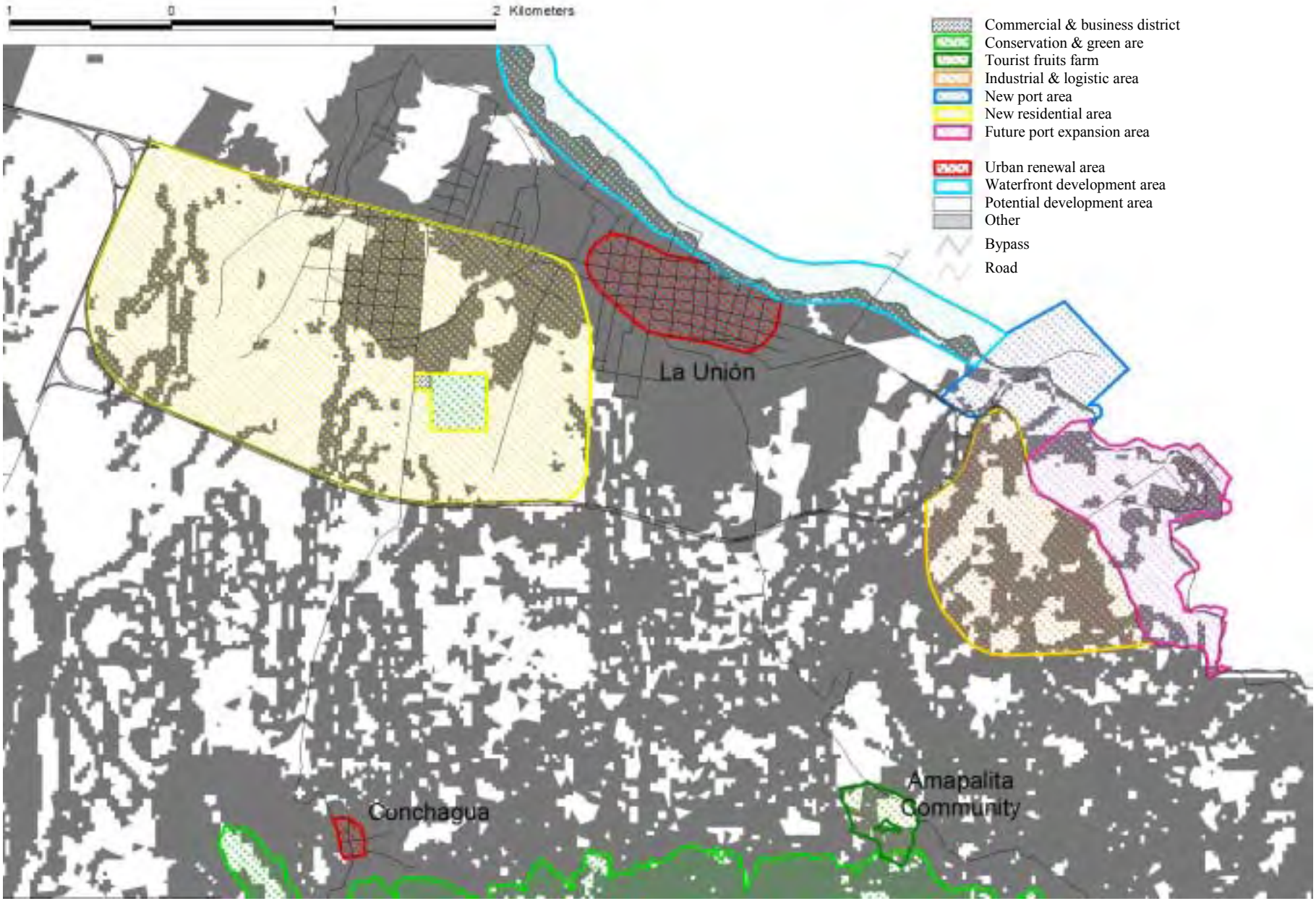


Figure 9.3. Macrozoning for La Union-Conchagua Area



in a cost-effective manner if residential development takes place in areas at lower altitudes because of shorter depth for drilling wells and lower requirement for pumping up water to consumers. The bypass route is running at an altitude of 60-70m, which is an allowable range for installing a cost-effective water supply system development. From the viewpoint of ensuring a comfortable living environment, it would be better to avoid the bypass running in the middle of new residential area. For these reasons, the new residential area should be confined to the north of the bypass. The new residential area shown in Figure 9.1 expands over an area of 550ha. The residential development is to be planned within this boundary in an area of 360ha avoiding slopes and areas already exploited. The population density assumed is 100 per ha, housed in detached residential homes or multi-story condominium or apartment buildings.

8) Of the new residential development of 360ha, roughly 180ha (50%) will be allocated for residential development, 90ha (25%) for parks/greenery and 90 ha (25%) for other areas. The park and green area would include a green belt separating the residential area from the bypass to ensure a good living environment and a central park. The central park would serve the whole La Union-Conchagua area and the surrounding region. The area for the central park is 20ha. The central park area can provide space for relaxation, recreation and leisure, and also accommodate large-scale facilities such as football stadium and gymnasium. Cultural facilities including theaters and museums can also be located in this area at the northern part adjacent to the commercial and business district.
9) The commercial and business district (CBD) is planned at the junction of the two roads running north to south from the existing major road leading to downtown La Union and the road connecting La Union and Conchagua.
10) The existing urban area of La Union will be revitalized to provide much more active commercial and business environment, taking advantage of its location facing the sea and local architectural characteristics. The Conchagua urban area will be revitalized as the base for tourism and recreational activities. A systematic approach would be needed to achieve successful urban renewal, which would be the first case in El Salvador. In this sense, the legal and institutional frameworks for carrying out urban revitalization programs need to be clarified.

9.2.3 Urban and infrastructure development projects in La Union-Conchagua area

(1) Proposed projects

The following projects are proposed for the La Union-Conchagua area in order to make the area functional and environmentally attractive.

1) Urban development projects:
   - La Union Free Trade Zone (LUFTZ),

- La Union residential development,
- La Union-Conchagua urban renewal,
- Distribution core development,
- Tourist core development, and
- IDB backoffice.

2) Human resource development project:
   - La Union Technological Institute.

3) Infrastructure projects:
   - Urban water supply,
   - Transmission line and substation,
   - Wastewater system, and
   - Solid waste management.

(2) Outline of projects

1) Urban development projects

La Union Free Trade Zone

The La Union FTZ will be established in the industrial-logistic zone designated right behind the port area. Its maximum area will be about 50ha based on industrial land demand projection. It is recommended that the development and operation at the initial stage be undertaken by a public organization in consideration of the need to provide various privileges to make the investment in the La Union FTZ an attractive option at an early stage of development (Section 9.4). Utility tariffs, for example, need to be competitive with other FTZs in El Salvador. The private sector's profit maximizing principle could make this approach difficult. Once the momentum for investment in the La Union FTZ is gained or all the land lots are filled, management could be transferred to private hand. Special tax incentives could be provided in the La Union FTZ as a trial case at the beginning and extended to other part of the Eastern Region later on. A feasibility study needs to be carried out prior to promoting this project to implementation, including precise delineation of the area for the FTZ development.

La Union residential development

The new 360ha residential area will be developed with 50% allocated to housings, 25% to park/greenery and 25% to other areas including road, infrastructure, commercial areas, educational facilities, administrative services, water bodies, etc.

The following would be carried out under the institutional arrangements proposed in Section 9.4:

1) Preparation of a land use plan of the residential area,
2) Legalization of the land use plan and its application,

3) Supervision of residential development to be carried out by the private sector,
4) Purchase of land to be used for public purposes (park, administrative services, etc.), and
5) Development of public facilities.

The existing legal framework for land use control needs to be clarified.

La Union-Conchagua urban renewal

Part of the existing urban area in La Union and Conchagua will be renewed with a view to creating an urban environment, which is more efficient and unique, having characteristics different from the new CBD planned in the new residential area. Its effects include enhancement of land use efficiency, creation of an environment suited to higher-grade commercial, business and tourist facilities, increase in land use allocation for public space such as roads and parks, and minimization of disasters.

The urban renewal project would proceed in the following steps:

1) Preparation of an urban renewal plan,
2) Legalization and agreement preparation for urban renewal plan,
3) Implementation by public-private cooperation, and
4) Guidance of individual private building renewal projects according to the prepared agreement and urban renewal plan.

Since there exits no previous cases of urban renewal in El Salvador, it would be necessary to start from analyzing examples of other countries in the following aspects and their applicability to El Salvador:

- Legal system concerning land right and residential right,
- Planning and implementation process with citizens' participation,
- Financial support programs, and
- Forms of public and private cooperation.

Distribution core development program

The distribution core will be located within the industrial-logistic zone planned in the port hinterland. It has two components: distribution park development and distribution information system development. A distribution park would contribute to strengthening the La Union port function, promoting foreign direct investment in the distribution sector and activating domestic distribution industry. The park will be accommodated with transport and utilities infrastructures and an administrative building. A bonded warehouse and a refrigerated warehouse will be rented out. Land lots will also be sold or rent.

A good distribution information system is a prerequisite to making the La Union port an internationally competitive port. A high-level distribution information network will be established, which would connect a cargo identification system (e.g., radio frequency and cargo

ordering information) to the port EDI (electronic data interchange), truck location determination system, and port reservation information system.

Tourist core development

The objective of this project is to prepare infrastructure for attracting cruise ships to the La Union port. The project would provide a set of facilities to serve cruise passengers and cruise-related business personnel, including the immigration office, facilities outside the customhouse (e.g., tourist information center, restaurants, open factory shops, tour conductors' office, promenade, resting area, open space, etc.) and those inside the customhouse (e.g., bus terminal, waterfront walkways, souvenir shops, etc.).

IDB backoffice

A backoffice will be established first in San Salvador and a branch to be opened in La Union in the future. This back office takes care of IDB's various administrative works that can be handled outside the headquarters in the U.S., taking advantage of information and communication technology. El Salvador has a number of advantages over other countries such as strong government commitment to foreign investment, competitive utility rates, relatively cheap yet diligent labor force, the existence of supportive IT training institutions such as INSAFORP and Infocentros, the opening of the La Union port in the near future, and proximity to the U.S. The project will benefit IDB in reducing its operation costs and El Salvador in boosting its IT industry. This backoffice will be located in the planned CBD.

2) Human resource development

The La Union Technological Institute, originally proposed by the Ministry of Education, aims to provide technical training programs in naval mechanics, marine biology, hotel management and tourism, port development and administration, naval electronics, electric communications, and environment management. Proposed short-term training courses include computer assisted fishing technique, handicraft, foreign languages, and computer sciences. The most urgent task for this institute, once established, would be to focus on port-related subjects and make efforts to mobilize human resources capable of providing training both from within and outside El Salvador. An option would be to cooperate with the Cortes port education system in Honduras through dispatch of trainees, teachers' exchange, joint development of programs, etc. Taking actions such as these would be a prerequisite to offering an attractive set of concession conditions as well as making the best of the distribution information system development proposed earlier.

3) Infrastructure development

Urban water supply

Based on the population projected for 2019 and data on the unit water consumption rate, the

water demand is projected at 19,800m^3 per day or 7.2 million m^3 per year, an increase by 13,300m^3 per day compared with the present condition. This level of increase in water demand would necessitate drilling eight additional wells.

Power transmission line and substation

A power transmission line of 60km and 380kV would be installed by either a power company or a distribution company in order to cope with the increasing power demand in the La Union and Conchagua area. The area will be connected to the national grid. A power substation will also be constructed.

Wastewater treatment system

Though sewer collectors serve the La Union urban area for a total of 10km, the collected wastewater is discharged to the sea without treatment. There is a project plan for wastewater treatment prepared by ANDA, which would cost $4.5 million for the initial investment and $0.2 million for operation and maintenance. This plan needs to be updated taking into consideration the socioeconomic framework and macrozoning proposed by the Study.

Solid waste management

A comprehensive solid waste management plan is under preparation by the Central American University, financed by AECI. A new sanitary landfill will be constructed to cover all the municipalities of the La Union department and part of the San Miguel and Morazan departments, and it is expected to be in operation for 30 years. Only solid wastes left after all the waste treatment efforts such as recycling and composting are to be transported to and disposed at the sanitary landfill site. Its location is being studied.

A component to be added to this project would be awareness raising and recycling promotion. Solid waste generation will be substantially minimized by a change in people's behavior. An education program should be prepared and provided focusing on recycling, composting and other waste reducing methods. NGOs are expected to play an important role in this program. Reduction in solid waste generation would lead to the saving on investment, operation and maintenance costs of the facilities.

9.3 Development Programs and Projects

9.3.1 Agro-Industrial Complex (AIC) Development

This broad program consists of the following program and projects:

1.1 AIC support program,
1.2 One village-one product pilot implementation,
1.3 Agro-business center establishment,
1.4 Organic fertilizer R&D and production,

1.5 San Miguel sugar mill power generation, and
1.6 Fishery support program.

The first program provides a comprehensive package of support measures for most promising industries/commodity groups identified in the Eastern Region. The next four projects facilitate the establishment of individual activities involved in the AIC. The sixth program supports the fishery sector to diversify the regional economy for various linkages development. Since many agro-products related to these projects are targeted at export markets, it is recommended that the Government strengthen efforts to develop quarantine regulations for plant and animal products.

(1) AIC support program

Industries/commodity groups identified as most promising in the Eastern Region are: (1) apiculture, (2) sugar and confectionary, (3) cashew, (4) organic coffee, (5) indigo, (6) kenaf, (7) poultry farming, and (8) dairy farming. Of these, apiculture and sugar-related industries may be promoted most effectively by associating with existing cluster/complex. Apiculture forms a most successful cluster in El Salvador, consisting of honey suppliers, processors, traders and support agencies for technical extension, products development and quality control. Apiculture industry in the Eastern Region may start as suppliers to this cluster. A sugar-related complex already exists based in San Salvador to produce not only raw and refined sugar but liquors and ethanol from molasses. Associating with this, a similar complex operation may develop centering on the existing sugar mill in San Miguel. Organic coffee is to be promoted under another broad program.

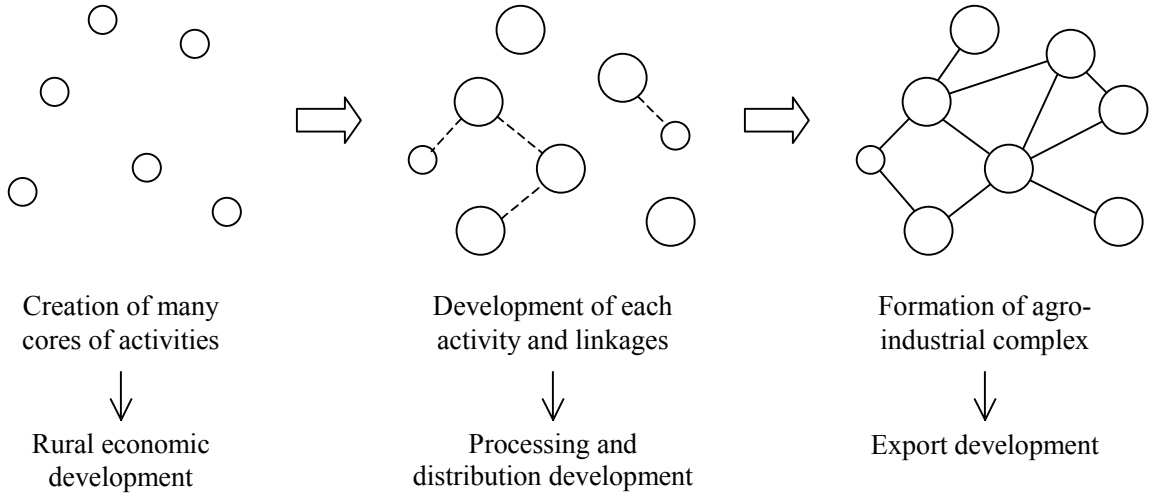
Poultry farming is expected to develop in the Eastern Region, partly shifting from the Western region as the availability of import feed improves with the La Union port. This may depend primarily on the private sector. In addition, the program supports small farmers to organize them for poultry farming in combination with cultivation of vegetables. This integrated farming scheme would increase the value-added for vegetable production through reduction in production costs and production of organic vegetables as a result of application of chicken wastes for fertilizer. The scheme would also reduce risk associated with overproduction of perishable products. Moreover, small farmers would be prepared to link up with large-scale commercial poultry operators expected to establish as the La Union port becomes operational.

For the indigo industry, a pilot project has been implemented as part of the Study covering indigo plants production, indigo dye extraction, dying with indigo, products development and marketing. The program supports extension of these efforts for indigo industrialization. For dairy, cashew and kenaf industries, specific support programs are developed as outlined below.

To develop these industries, a pilot project approach should be taken to create many cores of development in the Eastern Region. Organizations of farmers and producers would be formed

or strengthened, and technical and other support measures would be provided to these organizations. Pilot projects should be replicated; the organizations would expand; and inter-industry linkages would develop to form eventually the agro-industrial complex as illustrated in Figure 9.4. Various pilot projects may be supported by different donor agencies and NGOs.

Figure 9.4. Schematic of AIC Development Process



Dairy industry

Support components for this industry include the following:

1) expansion/strengthening of existing dairy farmers/organizations including small farmers,
2) technical extension for high input-high yield dairy farming in areas with improved water availability,
3) joint procurement of import feed grains and supplements,
4) associations with maize and sorghum producers for silage production,
5) school milk program, and
6) establishment of a dairy plant.

This program has two outputs: dairy plant and school milk program. The dairy plant will produce cheese and cheese products for national and export markets. A joint venture with foreign investors is being sought. Overseas Salvadoran communities particularly in the U.S. are among the target markets. The school milk program will improve the nutrition of rural children and provide an incentive for poor children to attend primary schools. It will also provide easily accessible outlets for small local businesses. For both purposes, expansion/strengthening of dairy farmers' associations hold a key for collecting sufficient quantity of milk and ensuring its quality.

Feed improvement is a prerequisite for high input-high yield dairy farming. Feed grains and supplements may be more easily imported as the La Union port establishes. Feed production in the Eastern Region should shift gradually to green maize and sorghum for silage production.

Water availability is expected to improve as small reservoirs and ponds are constructed in middle to upper catchment areas of rivers. It is expected that flooding in the midstream to downstream areas of Río Grande will be mitigated as well.

Cashew industry

Support components for this industry include the following:

1) cashew producers' organizing (expansion of existing organizations),
2) provision of saplings,
3) technical extension for grafting and organic fertilization,
4) products development with R&D,
5) establishment of processing plants, and
6) association with exporters, confectionery industry, etc. (for a cluster).

The cashew industry in the Eastern Region should specialize in organic cashew manufacturing mainly for export market in developed countries (e.g., Japan and Europe). At the same time, the concept of complete cycle processing should be applied to produce a variety of products in a complex, as in the case of the existing sugar-related industry. Promising products include organic nuts, cashew apple wine and vinegar, and preserves. Kernel cells should also be utilized for extraction of high value industrial oil. Also cashew makes viable integrated farming with goat raising as its young leaves provide good forage. R&D is necessary to produce some of these products of good quality.

It is vitally important to establish processing plants in the Eastern Region in addition to restoration and full utilization of existing facilities. This will allow taking the initiative in marketing of high quality nuts, and also to exploit opportunities for associated processing for diversified products and marketing to confectionery and other industries. A cluster may be formally formed with exporters, the confectionery industry and support agencies for technical extension, R&D for products development, and quality control.

Kenaf industry

A feasibility study of kenaf pulp mill found marginal financial viability on the condition that the pulp would be exported to Japan for paper manufacturing. The viability may be much improved if the product supplies to a paper mill nearby. The initial investment cost is relatively high for the pulp mill, and will be much higher with the paper mill. A recent study examined kenaf fiber production and export at the pre-feasibility level. The viability appears to be high but there are uncertainties in the export market for jute and allied fibers (JAFs) for price and quality competition. Kenaf fibers are considered to be versatile raw materials for light construction materials of various kinds, and products development has been conducted in the U.S., Europe and Japan.

In view of the above, a strategic approach should be taken to the establishment of kenaf

industry in the Eastern Region. Initially, kenaf fibers may be produced for export to market where products development is more advanced (e.g., the U.S. and Germany). At the same time, R&D for products development should be undertaken in El Salvador aiming at complementary products to support other industries. Depending on the development of international market for non-tree pulp as well as success of the products development for kenaf fibers, a judgment may be made for further development of the kenaf industry.

Kenaf fibers production may start at a pilot scale based on kenaf cultivation in some 100ha, where farmers may be more easily organized. Products development should be carried out vigorously supported by the Government until 50% import duties on gunnysacks are removed in three years.

(2) One village-one product model

One effective way to promote new agricultural activities constituting the AIC and establish specialty products that may be exported is to apply the famous one village-one product approach. Applicability of this approach to rural development in the Eastern Region should be examined through a model project. A key for the success of this approach is information (Box 6). A mobile or stationary agricultural information network may be established to support this approach.

Mobile agricultural information network

There are two agriculture information network stations in the Easter Region, located in Morazan and Usulutan, respectively. According to the manager of Usulutan, the network serves the local farmers well, on average 50-100 people per month. However, many farmers are not aware of the network or had no transportation or time to visit the station.

The network provides some useful advice to farmers as to techniques in growing and diversifying their products. It is also a conduit for market information. This mobile unit aims at introducing farmers to the available IT. The mobile unit will travel around the Eastern Region, especially its remote areas, to teach farmer how to use the Internet and search for the information related to their concerns. It will be used also as an educational laboratory and provide regular health visits for children. Information will then be collected, stored, and transmitted on the one hand and be provided to farmers and their children on the other. If the installation of mobile services as planned proves to be infeasible, this project will work with Telecom's Telecompadres to deliver services to fixed stops in the rural areas.

(3) Agro-business center establishment

The successful development of the AIC depends on promotion of local products, particularly new ones, and enhancement of industrial linkages between enterprises in the Eastern Region. To facilitate these, an agro-business center should be established with exhibition facilities for

Box 6

One Village-One Product Approach, Oita Prefecture, Japan

The world-famous one village-one product approach to rural development was popularized by the Governor of Oita prefecture in Japan, M. Hiramatsu, who has retired after 24 years for eight terms of governorship. Some important factors for the initial success of the approach applied to this less developed part of Japan may be extracted from his book.

Basic idea

The basic idea of the approach is to create specialty products that villages can be proud of. Such products should be unique in some way to sell well for the benefit of respective villages and make the respective villages known to a larger world (neighboring villages, the whole prefecture or even all over Japan). Once established, villagers would be motivated to continue producing those products.

Three principles

Three principles apply to sustainable rural development by this approach. First, specialty products would have to be local and global at the same time. Local characteristics based on local resources must appeal to the global market; or as globalization proceeds, local characteristics, flavors or subtleties should become more appealing (cf. Global Paradox by J. Naisbitt). Second, the approach would have to be supported by self-reliant and creative efforts by villagers. The local administration plays only supportive roles, and this is certainly not a subsidy-oriented approach. Third, human development is the key for sustainable rural development, and in particular the approach offers leadership training through practice.

Attractive catchphrases

Various tools have been devised and used to elicit the initiative and creativity of villagers. One was the use of attractive catchphrases. The well-known catchphrase for the village to which the approach was first introduced was: "Let's plant plum and chestnut trees and go to Hawaii." The village successfully converted from traditional paddy cultivation to more lucrative plum and chestnut production, and most successful villagers were awarded a trip to Hawaii. These primary products were further processed locally to increase value-added (profit). The common theme that threaded through the approach "think globally; act locally" also guided local people and administrations.

Use of local media

Another effective tool was the use of local media. A TV program entitled "Let's Create – Our Native Village" broadcasted early cases of success of specialty products creation in the prefecture to motivate other villages to do the same. This led to competition among villages for the program to feature their respective efforts and products. A cable TV was used by some villages to share information on their unique activities as well as local meteorology and other practical information for agricultural activities. More broadly, the Oita prefecture introduced an integrated information system earlier than most other prefectures, linking the Governor's office and cities/villages for socio-economic statistics, data on small and medium enterprises and others. Also, combining personal computers and acoustics couplers, the information exchange system was established early for petitions by citizens to the Governor's office, introductions of various events by public and private organizers, information collection by media reporters, discussions on various issues, etc.

Fund

The one village-one product fund was initially created by a local enterprise, and subsequently expanded by contributions from others. The fund has been used to provide bounties rewarding efforts by villagers. Its use has extended to support overseas training, field survey to other prefectures, construction of community parks, and other purposes related to specialty creation.

Top sales

Another key for the success of the one village-one product approach is marketing. Initially, the Governor Hiramatsu himself performed as a spokesperson. Each time he traveled to Tokyo for petitions to the Central Government, as necessary under the highly centralized administration in those days, he brought specialty products of Oita for sort of test marketing. For instance, he promoted local liquor and citrus to high-ranking restaurants, where he entertained high-ranked officials of the Government, and successfully converted the image of a people's drink to a drink for the rich.

Marketing

After 10 years of the Governor's terms by 1989, a total of 258 specialty products had been established throughout the prefecture with a population of 1.25 million. Of these, 18 products had annual turnovers exceeding one billion Japanese yen (about US$8 million) and 124 products over 100 million Japanese yen.

To effectively market these and other new products, the Oita's one village-one product corporation was established for innovative marketing with capital contributions shared equally by local investors and Tokyo-based capital. The corporation established and utilized alternative marketing channels based on direct communications between producers and consumers such as direct mail, shopping by telephone, and membership system. It planned trade fairs in Tokyo and participated in international trade fairs. For targeted marketing, it conducts market surveys and researches specific for different types of products.

Evolution and interlocal cooperation

The one village-one product approach was initiated by the Governor to counter the strong centralization and polarization with over-concentration of population and economic activities in the Tokyo metropolitan area. Outmigration of people, particularly the youth, would have to be stopped. To realize this, attractive employment opportunities would need to be created within the prefecture. To sustain the creation of such employment opportunities, in turn would call for human development so that the local or regional development would be supported by the local initiative, capital and other resources. To continue attracting people to stay or even come from outside, attractive local culture would need to be created eventually.

This is precisely how the one village-one product approach evolved in the Oita prefecture. Its first phase focused on the creation of specialty products, followed by human development in the second phase, and eventually cultural development was focused in the third phase. With the revitalized local culture, the Oita prefecture has been active in promoting cooperation with other communities of different culture in developed and developing countries through so called interlocal cooperation.

Reference:

- M. Hiramatsu, *Initiating from a Region* (in Japanese), Iwanami Shinsho No.138, Iwanami-Shoten Publishing Co., Ltd., Tokyo, 1990.

local products and database of producers and related enterprises. Development of technical linkages with local institutions is another important function of the center. The center will develop links with foreign organizations and companies as well.

The center will provide the following services:

1) provision of market information and market promotion of local products,
2) introduction of related local enterprises and foreign partners,
3) facilitating information exchange and business transactions among local industries, and
4) provision of business services such as interpretation, translation, use of the Internet, etc.

It is recommended that each section of the center invite experts from international organizations, including volunteer organizations, and utilize student volunteers so that they can acquire business experiences in their specialties.

(4) Organic fertilizer R&D and production

The Eastern Region promotes organic agriculture for various crops, including vegetables, coffee and cashew. Organic fertilizer may be produced from various materials such as cattle and chicken manure, plant and fruit residues, fish wastes, and even sludge from wastewater treatment. Different kinds of organic fertilizer fit to different crops.

The project will establish small-scale organic fertilizer plants of various types, and support R&D for development of appropriate organic fertilizer for various crops. They may include composting plants, biogas digesters and fishmeal plants. Technical institutions may be accredited by the Government to undertake a basic study to examine existing technologies and select those that are more appropriate in the Eastern Region. Private enterprises and NGOs are invited to submit proposals to establish pilot or small-scale plants. The technical institutions evaluate the proposals, and provide technical assistance to successful applicants for the implementation.

(5) San Miguel sugar mill power generation

As part of the complete cycle processing for sugar-related products included in the AIC, byproducts of sugar manufacturing may be used to produce power not only to be used at the sugar mill but also to be sold to the grid. The Chaparrastique sugar mill currently has two units for a total of 3.5MW generating capacity. This may be increased to 8MW, also replacing one unit. The new addition of 6MW would cost about US$4.8 million. The addition would provide an incremental energy of 15GWh per year at the incremental cost of US$0.039 per kWh. By selling the extra energy to the grid at US$0.059 per kWh, financial situations of the sugar mill would improve significantly. To provide incentives for the sugar mill to invest in this addition, the Government should provide guarantee for a credit that may be necessary for the investment.

(6) Fishery support program

Fishermen of small-scale operation need to be mainstreamed in the development drive in the Eastern Region. Their livelihood activities should be developed into economically viable ones to increase their income levels. This would also contribute to the diversification of the regional economy and the development of linkages with other economic activities of the AIC. The program will support more promising fishery-related activities identified in the Eastern Region. They include aquaculture in the Jiquilisco and the La Union bay areas, integrated farming combining fishery and other agricultural activities, some small-scale marine fishery activities, and value-added fish processing.

9.3.2 Watershed Development and Management

This broad program consists of the following program and projects:

2.1 Río Grande de San Miguel water resources development and management,
2.2 Small and micro irrigation,
2.3 High elevation coffee expansion and improvement program,
2.4 Lower Lempa re-regulating dam and irrigation, and
2.5 Urban and rural water supply improvement.

The first project is instrumental in changing the land and water regime of the Eastern Region in a fundamental way. The second project contributes to enhancing the water retention capacity of upper and middle basins. The third program helps protect and improve upper catchment areas. The fourth project represents a long-term option. The fifth project will be implemented steadily throughout the Region.

(1) Río Grande de San Miguel water resources development and management

This is a complex project consisting of the following component projects (Figure 9.5):

- El Guayabal multipurpose dam,
- San Miguel irrigation (9,000ha)
- Río Grande midstream river improvement,
- Olomega diversion,
- Jocotal irrigation (3,000ha), and
- flood plain management.

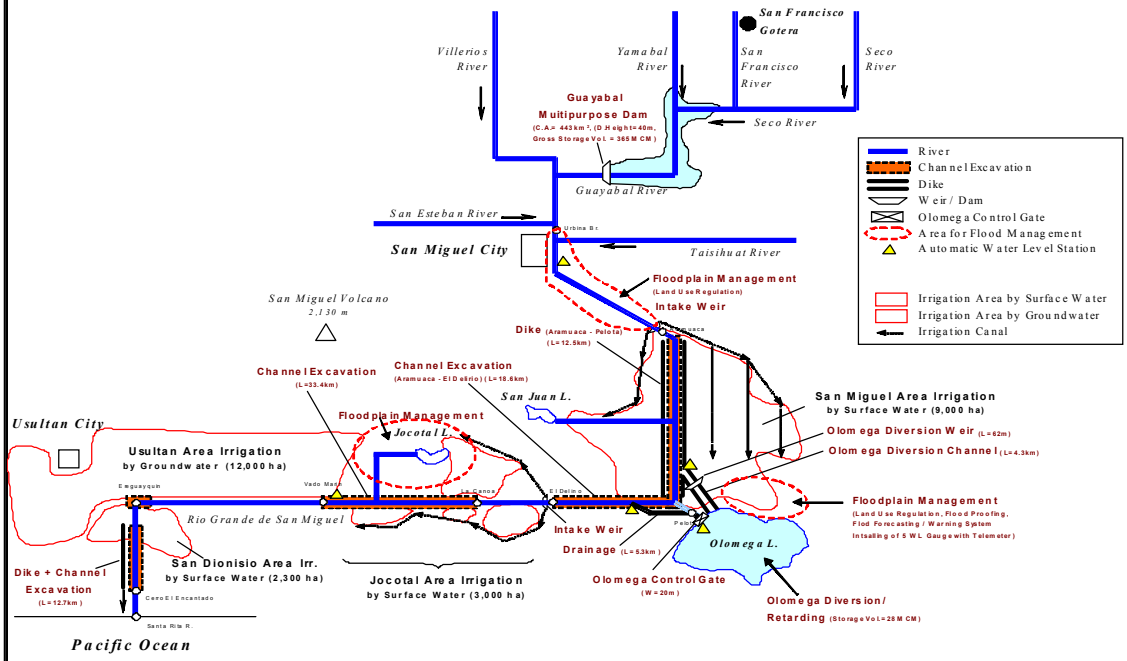


Figure 9.5. Proposed Rio Grande de San Miguel Water Resources Development and Management

A pre-feasibility study of the project is contained in Project Report, and the following represents the outline of each component. A comprehensive feasibility study should be undertaken in the next stage to determine the exact location and dimension of each facility. This project would benefit from Projects Nos. 2.3 and 2.4, which would improve the water retention capacity and reduce soil erosion in the upper and middle catchment areas of Rio Grande.

El Guayabal multipurpose dam

There are more than a few potential dam sites examined along the Río Grande de San Miguel by previous studies. Most recently, another JICA study examined a dam at San Esteban on the main stream but dropped this option from the perspective of flood control. Another dam at El Guayabal on a main tributary would create comparable storage volume as the San Esteban dam with much smaller embankment volume. Although the catchment area at El Guayabal is much smaller with 443km^2 than at San Esteban with 825km^2 and so is the flood peak reduction capacity, it would allow to contain flood water more cost effectively than the San Esteban dam.

The water stored in the reservoir may be used to irrigate the large irrigation area along the middle reach of the Río Grande. It may be used also as a source of water for supply to San Miguel city. Small hydropower plant may be installed as well.

The most serious problems associated with any dam project are related to its impact on the natural and social environment. The El Guayabal dam, 42m in height, will involve relocation and resettlement of some 350 households in the reservoir area as estimated. A comprehensive environmental impact assessment should be conducted in the next stage. Also, alternatives should be examined by the participatory approach to build consensus among stakeholders, including local people and NGOs.

San Miguel irrigation

The previous studies identified potential irrigation areas of 9,000ha along the middle reaches of the Río Grande, and a total of 29,000ha extending from the Olomega valley to the downstream Río Grande in Usulutan. The San Miguel irrigation area with 9,000ha can be protected from medium floods of over 10 years return period by the El Guayabal dam in combination with the dikes and channel excavation along middle reaches of the Río Grande. This area, in turn, can be irrigated by water to be released from the El Guayabal dam. More promising cropping patterns under irrigation have been worked out at this time in view of new market opportunities. Under such cropping patterns, the El Guayabal dam with the San Miguel irrigation is assessed at a preliminary level to yield an economic internal rate of return of 26.6% with estimated annual irrigation benefit of US$103.6 million.

Río Grande midstream river improvement

The 1997 JICA study recommended as a priority project a combination of dikes and channel excavation along the middle and the downstream reaches of the Río Grande and diversion of flood water into the Olomega lagoon, which would serve as a retarding basin to provide protection against floods of 10 year return period. The combination of the proposed dikes and channel excavation along the middle reach and the El Guayabal dam is expected to provide much more effective flood protection.

Olomega diversion

As a medium-term option, a portion of the floodwater is to be diverted to the Olomega lagoon through a diversion weir and 4.3km-long channel. The Olomega lagoon is expected to serve as a retarding basin with storage volume of some 25 million m^3. A control gate will be installed at the outlet to regulate the water level in the lagoon at 200m. The water stored in the lagoon is to be used for irrigation in Jocotal and other areas downstream.

Jocotal irrigation

In the medium to long term, channel excavation would be provided for 33.4km along the Jocotal irrigation area extending in 3,000ha. The area can be irrigated by surface water of Río Grande to be supplied partly from the Olomega lagoon. Under the new cropping patterns, the Jocotal irrigation is assessed at a preliminary level to yield an estimate of annual irrigation benefit at US$38.0 million.

Flood plain management

While a reasonable level of flood protection is provided by the measures outlined above for most areas, flood plain management is equally important to support the livelihood adapted to flooding. Proper land use should be promoted in flood-prone areas. Guidance should be provided for construction of houses with elevated floors and provision of flood shelters on high grounds to protect property including cattle. These measures should be combined with an early flood warning system to reduce damages by habitual floods. Recent efforts by SNET to establish the early flood warning system in the Río Grande basin, supported by USAID, should be strengthened.

(2) Small and micro irrigation

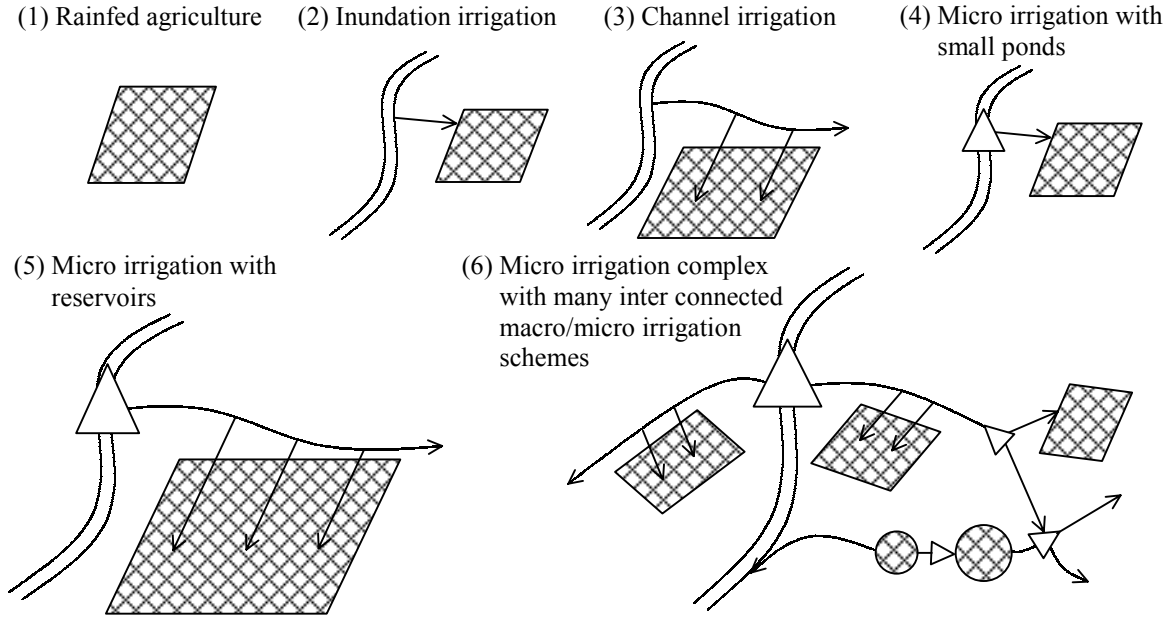
Small-scale irrigation by small reservoirs and ponds would contribute not only to increasing agricultural productivity but also to enhancing water retention capacity and soil conservation. Some of them may be interconnected horizontally through contour canals and vertically in cascades to enhance overall water use and soil conservation efficiency. Such an interconnected system is called a tank system in southern India and Sri Lank, which has been successfully utilized for many centuries (Box 7). Planning for an elaborate tank system may be conducted

Box 7

Tank Irrigation System, Southern India and Sri Lanka

Tank system in the evolution of irrigated agriculture

Irrigated agriculture by using small ponds or tanks has been practiced widely in developed and developing countries. In some areas, these ponds/tanks are inter-linked by channels to enhance overall water use efficiency. Most elaborate systems of inter-linked tanks are found traditionally in southern India and Sri Lanka. These systems represent the final outcome of the evolution of irrigated agriculture from (1) rain-fed irrigation, through (2) inundation irrigation by seasonal or temporary river diversion, (3) channel irrigation by permanent river diversion, (4) micro irrigation with small ponds, and (5) macro irrigation with large reservoirs, to (6) complex of macro irrigation consisting of many inter-connected macro and micro irrigation schemes as illustrated.



Source: JICA Study Team

Tank system in southern Sri Lanka

Particularly in the southern Sri Lanka, this evolution took place over 15 centuries starting in the mid first millennium BC to develop eventually some of most elaborate tank systems. Such systems combine many tanks, small and large, both horizontally through contour canals and vertically in cascades by using gravity flow. Runoff water is intercepted by channels as well as tanks, and tanks lower down receive water by overflow from tanks higher up on each chain of the system.

The tank systems serve not only for higher agricultural productivity with irrigation water and enhanced soil moisture, but also for flood control by storage and interception of flood waters, prevention of soil erosion, recharge of groundwater, and watershed conservation. They are now often called water and soil conservation ecosystems.

Comparison between hydraulic engineering and water soil conservation ecosystems

Tank irrigation may be contrasted with the modern hydraulic engineering approach to irrigation. By the latter, water is treated as inanimate physical entity but active on account of its energy. By the ecosystem approach that the tank system represents, water is seen animate in nature's biogeochemical cycles, but receptive or passive, following the law of nature. Contrasting features of the hydraulic engineering approach and the ecosystem approach are summarized in the table below.

Comparison between Hydraulic Engineering and Water and Soil Conservation Ecosystems

	Hydraulic engineering perspective (hard technology)	Ecosystems perspective (soft technology)
1. Water	Inanimate physical entity Active	Animate in biogeochemical cycles Passive
2. Small tank	Inefficient, to be replaced by a larger reservoir	Essential part of micro irrigation system to be built in macro irrigation complex
3. Large reservoir	Efficient system in combination with channel distributary system	Could be part of macro irrigation system if located and sized properly
4. Diversion channel	Built to augment the use of large reservoirs in the last stage of irrigated agriculture	Built in early stage of irrigated agriculture and evolution of irrigation ecosystem
5. Small earth bund	"Abandoned small tank"	Structure to deflect water flow for micro water and soil conservation system
6. Downstream development areas	Must be cleared of all vegetation to lay out channel distribution irrigation system	Essential part of micro water and soil conservation ecosystem with vegetation
7. Forest areas	Essential only in upper catchment areas to sustain use of large reservoirs	Interspersed within water and soil conservation ecosystem with irrigated areas

Source: Adapted from Mendis, 1995.

Applicability of the tank irrigation system to the Eastern Region of El Salvador

It appears particularly appropriate to introduce the tank system to the Rio Grande de San Miguel basin. Climatic conditions in the basin are characterized by pronounced dry seasons, more pronounced than in the southern Sri Lanka, and dry spells even during the rainy season. Small tanks may bridge the dry spells, and enhanced soil moisture will allow extension of cropping season into the dry season. Although sites suitable for sizable reservoirs are not found in the basin, many small reservoirs or tanks may be developed in the middle to the upper catchment areas to serve also for flood control, soil conservation and groundwater recharge purposes. Irrigation by the tank system fits well with the micro-basin approach considered suitable to the Rio Grande de San Miguel.

While water storage in small tanks may not be seen efficient as compared with a large reservoir, the tank system stores water in tanks, channels and soil itself. Construction of the tank system mainly involves relatively simple earth works that may be substantively undertaken by mobilizing labour of local people. If designed property. It may represent most cost-effective approach to irrigated agriculture and watershed management in the Rio Grande de San Miguel basin.

Reference:

- D.L.O. Mendis, *Scientific Principles Embodied in the Evolution and Development of Ancient Water and Soil Conservation Ecosystems (Irrigation Systems) in Sri Lanka*, mimeographed, obtained through personal communications with the author, August 1995.

particularly for the upper and middle catchment areas of river basins. At the same time, priority schemes of small-scale irrigation should be implemented to realize irrigation benefits earlier to convince more farmers to undertake irrigated agriculture particularly for new crops.

Small-scale irrigation schemes consist of the following four types, depending on the source of irrigation water:

1) surface water irrigation in southern part of San Miguel, Usulutan and La Union,
2) small reservoir irrigation in upstream and midstream areas of small tributaries in the northern La Union, Morazan, and middle part of San Miguel,
3) spring water irrigation at the foot hills of the San Miguel volcano, and

4) groundwater irrigation in the northern La Union, Morazan, and Usulutan.

Micro irrigation may combine a simple weir possibly made of gabions or sand bags, PVC channels to convey water, small ponds (tanks) waterproofed with rubber sheets, and drip irrigation (Figure 9.6). The same channel may feed a few or more ponds. The cropping pattern is assumed to be a combination of maize during the rainy season and vegetables during the dry season. For a hypothetical case of a small river with the catchment area of 1.0km^2 as a water source, the unit construction cost of the micro irrigation scheme and the internal rate of return (IRR) are calculated for different areas as follows.

Location	Storage volume (m^3)	Pond surface area (ha)	Unit construction cost (US$/ha)	Internal rate of return (%)
La Union north	1,242	0.05	31,000	15.2
central	3,434	0.14	45,000	8.9
south	3,126	0.13	43,000	9.5
Morazan south	3,404	0.14	44,000	9.1
San Miguel south	2,049	0.08	36,000	12.5

If the catchment area is larger than 1.5km^2, IRR becomes higher than 11% at all the locations. Thus, this micro irrigation scheme is assessed to be reasonably feasible at a preliminary level.

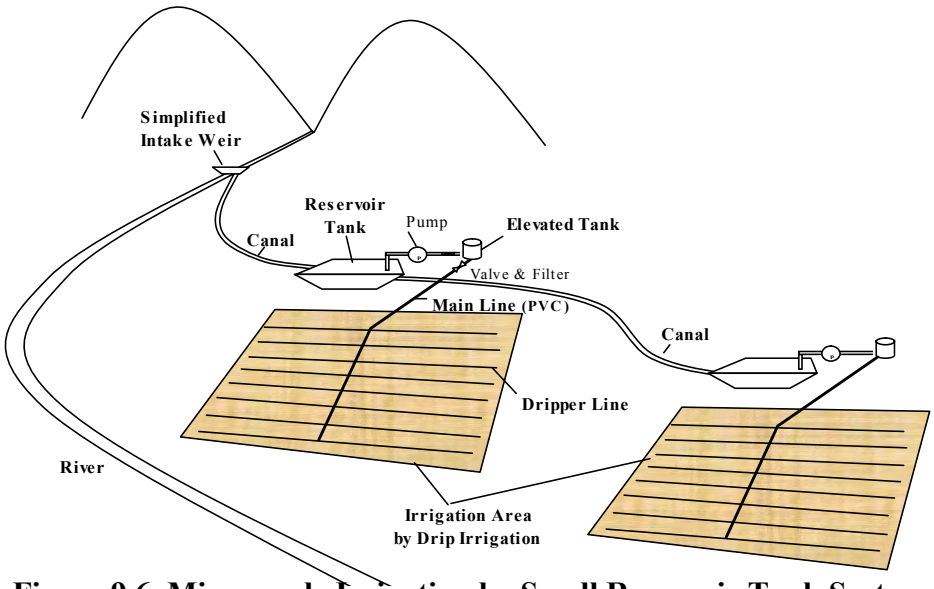


Figure 9.6. Micro-scale Irrigation by Small Reservoir Tank System

(3) High elevation coffee improvement program

This program consists of the following components:

1) improvement of coffee areas with shade trees as part of reforestation program focusing mainly on high elevation coffee,
2) promotion of organic coffee,

3) establishment of small processing facilities to produce high quality coffee by organized coffee growers, and
4) development of original coffee brands.

Compared to other Latin American coffee producing countries, El Salvador has a smaller percentage of coffee area under intensive production system (Table 9.2). Most coffee areas in El Salvador are under the shade tree system, which is considered more environment-friendly and represents the strength of coffee production in El Salvador. Along the same line, organic coffee production should be promoted in El Salvador, especially at high elevation. The Eastern Region has a relatively small share (7.7% of the total coffee area) in high elevation coffee cultivation, but the full potential has not been developed. Improvement of coffee areas at high elevations should be undertaken as part of reforestation program to reduce investment requirements and support coffee growers currently suffering from falls in coffee prices.

High quality organic coffee should be processed locally and marketed as final products mainly for export. Organized coffee farmers should establish improved processing facilities for operation under technical guidance. Original coffee brands should be developed to market high quality organic coffee in the Eastern Region under the common strategy.

Table 9.2. Scale of Coffee Cultivation under Intensive Production System

Country	Coffee-planted area (10^3ha)	Coffee area under intensive production system (% of total coffee area)
Colombia	1,149.20	69
Mexico	669	17
Guatemala	245	20
Honduras	200	35
El Salvador	165.6	8
Costa Rica	108	40
Dominican Rep.	103	25
Nicaragua	94.1	29
Haiti	34	10
Total	2767.9	41.1*

*Intensive production system is done without cover shade trees and not considered to be ecologically friendly.
Source: World Bank Paper 2002, *Agricultural Technology Note 30*, "Toward More Sustainable Coffee".

(4) Lower Lempa re-regulating dam and irrigation

The existing September 15 dam is used almost exclusively for hydropower generation. The water released for power generation varies widely especially during the dry season when the power plant operates only for load increments. As water situations become tight with increasing water demand for irrigation and urban water supply, El Salvador would not be able to afford single purpose operation for hydropower for any existing and future dams. In the case of the September 15 dam, a flow re-regulating dam may be constructed downstream at San

Marcos Lempa. This dam can be planned for multiple purposes including irrigation (23,000ha), additional hydropower, fisheries and tourism. In particular, the reservoir in extensive forest area would offer various tourism opportunities. The Lempa riverside road construction is proposed to improve access to this tourism area, which may be used as the access road to the dam site. This road with 15km length would command a magnificent view of the river and the volcano at the riverside.

(5) Urban and rural water supply improvement

The production and supply capacity by ANDA are already insufficient to meet the water demand in San Miguel and La Union cities, and the demand-supply balance is tight for Usulutan city (Table 9.3). As urbanization is expected to proceed rapidly in these and a few other cities, continual expansion of water supply capacity would be necessary. At present, San Miguel has an expansion plan for a larger water supply system covering several communities.

Table 9.3. Current Situation of Urban Water Supply System by ANDA in the Eastern Region, 2000

	San Miguel City	Usulutan City	La Union City
Water Source (groundwater + springs, %)	95 + 5	41 + 59	(mostly groundwater)
Groundwater (# of wells)	13	3	5
Well depths (m)	120-180	20	100
Surface water (# of sites)	1	1	(1)
Receptions (# of intakes)	5	2	(1)
Current total daily production capacity (m^3/day)	31,135	11,750	6,500
Current water demand (Dec. 2001)			
No. of households served	22,332	7,666	4,036
Population served (est., 5 people/household)	111,660	38,330	20,180
Coverage in serviced area (%)	71.6	86.3	86.1
Municipal population coverage (%)	47	56	50
Average monthly consumption (m^3/month)	1,048,000	325,500	202,300
Average daily consumption/demand (m^3/day)	34,930	10,850	6,740
Average unit daily consumption (ℓ/p/d)	313	283	334
Deficit (production capacity - demand, m^3/day)	-3,795	900	-240
Years in operation	> 60	> 40 (since 1962)	> 40
Illegal connection (%)	35	> 1.3	> 2.5
Water loss (%)	30	(n.a.)	(n.a.)
24-hour service	yes	no	no

Source: Compiled by JICA Study Team based on hearing from ANDA.

Six cities have been selected for improving urban water supply systems expanding their coverage to neighboring communities as well: San Miguel, Usulutan, La Union, San Francisco Gotera, Santiago de María, and Santa Rosa de Lima. Of these, priority may be given to San Miguel, La Union and San Francisco Gotera. The first two cities already face water shortages, and the third city has the lowest population coverage for water supply by ANDA of the six cities.

Rural water supply and sanitation will be improved consistently as important part of basic human needs. Community involvement will be essential for effecting implementation and management of rural water supply facilities. Local communities should participate not only in planning but also in construction works such as well drilling, transportation of materials, installation of equipment and pipes, etc. This would ensure effective use of local sources of water and selection of more adequate materials and appropriate methods of construction. Most importantly, local people would be motivated to properly manage and operate the facilities that they have planned and implemented.

Of the total population in the Eastern Region, about 60% or 769,000 are rural as of 2000. The rural population not covered by water supply system is about 538,000. As the population increases and the urbanization proceeds, the rural population will decrease slightly to 714,000 by 2019. To attain complete coverage of the rural population by water supply system by 2019, additional 176,000 rural people need to be covered by the program.

9.3.3 Environment and Tourism Development

This broad program consists of the following components programs:

3.1 Cooperative tourism promotion program,
3.2 Fonseca gulf joint environment and tourism development program,
3.3 Environmental awareness program, and
3.4 Solid wastes management program.

(1) Cooperative tourism promotion program

This program extends the ongoing promotion activities by local tourism groups coordinated by CND with the following components:

- Tourism circuits formation,
- Tourism products development,
- Local tour operators training, and
- Strategic alliance promotion.

In addition, a tourism core should be established in the La Union-Conchagua area as described in Subsection 9.2.2.

Tourism circuit formation

To market the Eastern Region tourism widely, several tourism itineraries should be prepared aiming at different market segments. To attract cruise passengers, short tour itineraries should be prepared for a half to one day in and around the La Union-Conchagua area with artificial attractions and environmental amenity. La Union and Fonseca gulf based tour itineraries may be developed jointly with tour operators in Honduras and Nicaragua. Tourism objects in the northern area may be packaged mainly for domestic tourists interested in history and socio-

cultural inheritances. Itineraries for sports and adventure tourism may be prepared for younger generations in El Salvador and the U.S., combining opportunities for land and air based adventures to be created with surfing, windsurfing, diving and other water sports.

Tourism products development

The Eastern Region tourism should develop its brand for environment-friendly and health-oriented tourism. Recipes for healthy dishes should be developed using local organic products through a contest to be organized by CND/CORSATUR. Unique handicrafts and specialty products should be developed combining local materials and supplemental materials to be imported, such as clothing dyed with indigo and other dye materials and jewelry. Experience-oriented tours should be developed in association with indigenous industries, such as those through which to experience dye works.

Local tour operators training

The number of tour conductors increased from mere five during the civil war to over 100 at present. Most of them, however, do not speak English. The number of English-speaking tour conductors and operators need to be much increased. The proposed La Union technological institute would contribute to generating quality managers and operators for tourism. Training by INSAFORP and other organizations should expand to train tour guides and other service personnel at hotels and restaurants.

Strategic alliance promotion

A strategic alliance should be sought with San Salvador-based tour conductors to promote the Eastern Region brand of tourism and to accommodate tourists right at the beginning. Proactive promotion campaigns should be conducted when the La Union port is commissioned both in the Eastern Region and in San Salvador as a first step to form a strategic alliance.

(2) Fonseca gulf joint environment and tourism development program

This program seeks tourism development and environmental management in the Fonseca gulf in a complementary manner. The cruise industry and other related tourism development as well as fishery in the Fonseca gulf area would provide employment and livelihood opportunities for many local residents. These opportunities would make the local residents more conscious about the environmental quality of the Fonseca gulf and coastal areas.

The PROGOLFO initiative for environmental management of the Fonseca gulf should be extended, and the monitoring system for the gulf and coastal areas strengthened with more substantive participation of coastal municipalities and people. As a first step, a management plan for the Fonseca gulf and coastal areas should be prepared by the participation of the local people through their municipalities coordinated by CND. Opportunities for tourism and other livelihood activities should be reflected in the management plan under CND's guidance.

Improvement of the monitoring system would be an important part of the plan, particularly in view of possible environmental problems with the port construction and operation including dredging. The plan on the Salvadoran side should be presented as a model to induce the same activities on the Honduran and the Nicaraguan sides. Opportunities for joint tourism development should also be clarified.

(3) Environmental awareness program

This program aims to enhance the awareness of people particularly about proper solid wastes disposal and to improve rural sanitation by the use of LASF or latrines. An integrated solid waste management plan for the municipal associations of Fonseca gulf should be implemented as the model with a component of environmental awareness campaign. Solid waste collection with separation of organic wastes should be experimented with guidance, and the most effective practice established. Guidance for composting should be also provided. An NGO or other organizations having experience in environmental education would facilitate the process through various meetings and workshops and preparation of education materials. Field visits to landfill sites and participation in city/coast cleanup activities would also help raise the awareness.

(4) Solid wastes management program

The integrated solid waste management plan currently prepared for the municipal associations of Fonseca gulf should be implemented in its entirety with waste reduction measures and sanitary landfill as the model for any solid waste management in the Eastern Region in the future. Collection, transport and final disposal at a sanitary landfill of wastes may be entrusted to private companies through bidding. At the same time, local communities should monitor these practices.

To promote recycling of solid wastes as part of waste reduction measures, San Salvador-based recycling companies should be invited to establish operations in the Eastern Region. Municipalities and local chambers should support them to facilitate collection to make initial operations financially viable. It may help to give the operators franchises to ensure their long-term commitment and sustainable operations with increasingly more lucrative waste materials.

9.3.4 Spatial Structure Strengthening

This broad program consists of the following program and projects:

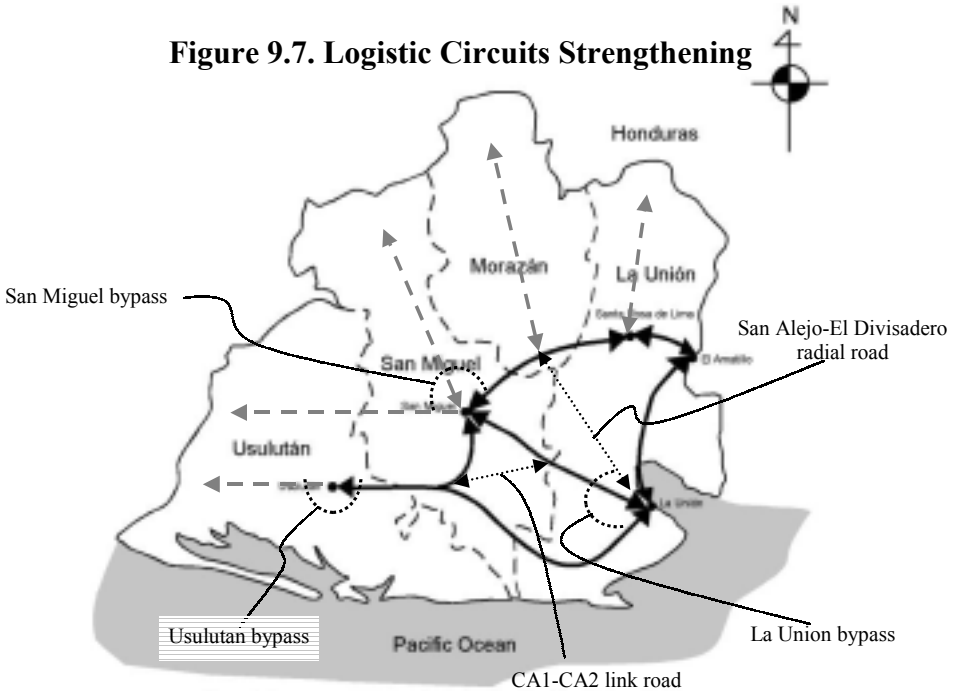
4.1 Logistics circuits strengthening,
4.2 Logistics facilities location planning and guidance,
4.3 El Amatillo border facilities improvement,
4.4 Northern longitudinal artery establishment, and
4.5 Rural road program.

(1) Logistic circuits strengthening

Logistic circuits of the Eastern Region have been defined linking San Miguel, La Union, Usulutan and a few other secondary towns. Practically all the areas in the Eastern Region will be within easy reach from/to the logistic circuits once some access roads are improved. Even remotest areas, therefore, can be integrated into the main economy of the Region centering around San Miguel and La Union. This project will strengthen physical links between cities in the logistic circuits through the following component projects (Figure 9.7):

- construction of bypass roads,
- San Alejo-El Divisadero radial road construction, and
- CA1-CA2 link road construction.

Figure 9.7. Logistic Circuits Strengthening



Bypass roads construction

Following the La Union bypass, another bypass should be constructed in Usulutan to resolve the existing traffic congestion through the city. It will through the southern part of the city for 8km. San Miguel will also need a bypass as traffic, especially of heavy vehicles, increases between the La Union port and the Central region and also between the El Amatillo border and the Central region. The San Miguel bypass will go through the northern and the eastern part of the city for 12km.

San Alejo-El Divisadero radial road construction

While there are two east-west roads linking San Miguel and El Amatillo, viz., one through Santa Rosa de Lima and the other through La Union, no effective north-south link serving this inner area of the logistic circuits exists. The road, once constructed, would improve the access

from Morazan to the La Union port significantly, serving as one of radial roads leading to the port. The travel distance from San Francisco Gotera to the La Union port will be reduced by 22km. The road will go through mainly pastures on gentle slope for 33km.

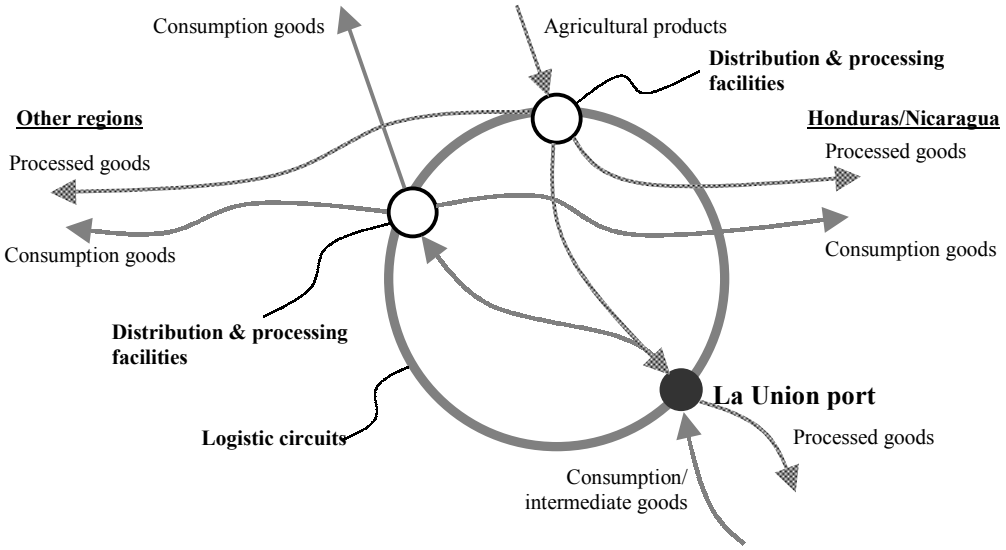
CA1-CA2 link road construction

As the traffic between the La Union port and the Central region increases significantly, it is important to ensure alternative transport routes even under unexpected conditions. At present, most vehicles traveling on CA2 go through San Miguel for travel between Usulutan and La Union rather than CA2 along the coast. Thus practically only one route serves this portion of travel. The proposed road will go through the northern part of the Olomega lagoon to provide the shortest link between CA2 and La Union. With this 18km road, the travel distance is reduced by 20km. Planning and construction of this road should take into account the flood control works around the Olomega lagoon mentioned in Subsection 9.3.2.

(2) Logistic facilities location planning and guidance

The idea of logistic circuits is to locate various logistic facilities at nodal points within the circuits. They include regional markets, processing facilities, and other trade and distribution facilities. Inland container depots, truck yards and industrial/commercial estates may also be included. Since even the remote areas in the Region are expected to be within easy access to the logistic circuits, it would make sense to establish marketing and processing facilities there to handle supply from production areas. Conversely, consumer goods imported through the La Union port will be traded in the logistic circuits for distribution throughout the Region (Figure 9.8).

Figure 9.8. Commodity Flows with Logistic Circuits



Detailed land use planning may be necessary to locate various logistic facilities properly,

avoiding flood-prone areas or areas with high disaster risks. As these facilities are to be established by the private sector responding to developing needs, however, it is not desirable or necessary to designate specific areas for any facilities. Only municipalities are expected to provide proper guidance.

To facilitate the establishment of these facilities, the artery roads should be upgraded to cope with increasing traffic. The traffic between San Miguel and La Union would increase to 20,000 vehicles per day more or less by 2015 (Section 6.3), and the traffic on other artery roads within the logistic circuits would be 15,000-20,000 vehicles per day.

(3) El Amatillo border facilities improvement

The existent border facilities at El Amatillo are inadequate, e.g., the narrow access road, the old bridge with limited capacity, and the lack of sufficient truck yard. Combined with the complexity of customs procedure, large losses are incurred to traffic crossing the border due to long waiting time. The comparative transport cost analysis has clarified that the land transport from Nicaragua and Honduras through the La Union port to the U.S. west coast is promising in the near future (Subsection 7.1.1). A prerequisite to realizing this potential is the improvement of these border facilities.

The existing bridge constructed in 1932 for traffic of the HS-15 cargo type needs to be replaced by a new one to accommodate high level of heavy traffic of the HS20-44 cargo type. The new bridge should be constructed some 3km downstream from the existing one, where an improved alignment of the access road would be allowed as well as much larger truck yards on both sides of the crossing. Customs facilities should be re-established with high-grade telecommunications and other utilities to expedite customs procedure.

(4) Northern longitudinal artery establishment

The proposed northern longitudinal road crosses the Lempa river into the Eastern Region at Nuevo Edén de San Juán, passes through San Luis de la Reina, San Simón and Osicala, to reach the primary road CA7. The exact alignments are still to be worked out as the road goes through mountainous areas. A stage-wise development of the road should start from CA7 with the view to expanding the catchment area for the La Union port.

The road may be extended from Osicala, through Corinto and Nueva Esparta, to Concepción de Oriente on the border with Honduras. With a bridge crossing the Goascorán river, this road may link to the El Amatillo-Comayagua road in the medium to long term. This road will not only serve the least accessible northern part of La Union and Morazan but also facilitate transportation of agricultural products from the least developed southern part of Honduras. As it passes through mountainous areas, disaster prevention measures should be incorporated in the alignment selection and the construction.

(5) Rural road program

At present, maintenance and improvement of municipal roads are undertaken by mobilizing voluntary works of local communities. These efforts need to be expanded with support to improve rural access roads so that even the remotest areas in the Eastern Region would be integrated into the main economy of the logistic circuits.

The program will provide (1) simple machinery and tools for road works, (2) training of community leaders for people organizing, and (3) technical guidance and training for stabilization, repair and maintenance, drainage improvement, and surfacing of rural roads. Further improvement of selected roads will be subject to the performance of the self-help efforts by local communities.

9.3.5 La Union Port Revitalization

This broad program comprises the following programs and projects:

5.1 Free port and economic zone (FPEZ) establishment program,
5.2 La Union port city development program,
5.3 Conchagua geothermal prospecting, and
5.4 La Union power transmission.

(1) FPEZ establishment program

This program has the following components:

- free trade zone (FTZ) and open factory areas,
- core facilities for logistic functions,
- conservation of upper catchment areas,
- amenity facilities such as indigo museum, waterfront development, picnic areas, etc., and
- institutional and organizational development.

Detailed plans for facilities as well as macrozoning for land use are described in Section 9.2. Institutional and organizational development is proposed in Section 9.4.

(2) La Union port city development

This program has the following components:

- infrastructure and utilities including bypasses, water supply, sewerage and drainage, solid waste management, power supply, telecommunications and urban roads,
- residential development,
- social and cultural facilities such as hospital, schools, technological institute, sporting facilities, urban parks, etc.,
- municipal market and slaughterhouse, and
- development of a new central business district (CBD).

The plan for this program is included in the macrozoning for land use presented in Section 9.2

together with descriptions of main components.

(3) Conchagua geothermal prospecting

While geothermal generation already plays an important role in El Salvador's power sector, no systematic exploration has been made for geothermal resources. GESAL is preparing to study several promising sites in addition to continued development of the areas already developed. The Conchagua site should be prioritized for prospecting in view of its proximity to the La Union port. Clean and renewable local energy at possibly 10MW would contribute to stable and reliable power supply in the La Union-Conchagua area. An environment-friendly model of the Berlin geothermal plant should be replicated, and a geothermal-environment tourism park established as an additional attraction for foreign and domestic tourists, and investors as well as local residents.

(4) La Union power transmission

As the La Union port is expected to be operational in the mid-2007, a bid needs to be called to supply power to the port area. The transmission line of 60km at 380kV and a substation would be required. Since the port would be a huge consumer, the port authority has leverage to tender for the lowest cost energy possible for the benefit of local consumers.

9.3.6 Entrepreneurial Base Development

This broad program consists of the following projects and programs:

6.1 Secondary and higher education strengthening program,
6.2 SMEs support program,
6.3 ICT human resources development program, and
6.4 Agro-industrial technology center.

(1) Secondary and higher education strengthening program

This program comprises the following components:

- secondary and higher education scholarship in the Eastern Region,
- establishment of a technological institute,
- expansion of APREMAT, and
- Eastern Region research center.

<u>Eastern Region secondary and higher education scholarship</u>

To increase the enrollment rate for secondary schools significantly and also to subsidize high cost of attendance at tertiary education, a scholarship fund should be established by MINED. Operation of the fund may be entrusted to a third party having experiences in fund raising and management for efficiency. At the same time, a fundraising unit should be established in the U.S. as an NGO. Fundraising activities are to be conducted both in the U.S. and El Salvador. Main sources of fund would be membership fees, government grants and subsidies, and

donations from individuals and enterprises.

Technological institute establishment

The project consist of the following components:

1) Construction of a new technological institute in La Union
   Unused and deteriorated infrastructure of Centro Escolar de La Unión high school should be demolished and new buildings constructed.
2) Provision of necessary equipment
   Equipment necessary for planned courses should be provided, including computers, laboratory equipment, workshop equipment and audio-visual facilities.
3) Training of professors
   Technical knowledge and teaching methods should be transferred by national and/or international experts.
4) Curriculum development
   Curricula need to be developed for planned courses in naval mechanics, marine biology, hotel management and tourism, port development and administration, naval electronics, electronic communications, and environmental management. It is proposed to add courses at ICT as well.
5) Development of vocational training courses
   Short-term training courses for the unemployed and enterprise workers are also planned. MINED has proposed to develop courses in fishery, handicraft, foreign languages and computer sciences. It is proposed to add courses related to tourism (e.g., guest services and hotel administration), in electrics, electronics, mechanics, and computer maintenance.

APREMAT expansion

The ongoing APREMAT represents a successful model for improving secondary education in technical fields, focusing on curriculum development, instructor training, and installation of facilities and equipment. Its expansion should cover comparatively more schools in the Eastern Region to broaden human resources base in these fields for new economic activities.

Eastern Region research center

Five research institutes in the Eastern Region have agreed to establish a regional research system with assistance of CND (Subsection 8.3.1). They will share facilities and resources and coordinate research activities. To support their activities, an initial database with GIS should be established, transferring the one created by the JICA Study. The database will be expanded in steps comprising additional socioeconomic data generated by surveys to be conducted by the institutes of the regional research system. Useful data for potential and prospective investors will be compiled, including business information for training opportunities, potential markets

and partners, and available technologies and resources.

The database will be easily accessible with a network linking research institutes, business communities, and support agencies. The network will allow the users exchange information freely and easily. This will strengthen research-business linkages to allow and facilitate technological innovation to support the Eastern Region development.

(2) SMEs support program

This program comprises the following components:

- Eastern Region skill development fund establishment,
- incubation centers,
- introduction of modern corporate management,
- training for micro entrepreneurs, and
- establishment of corporate associations.

Eastern Region skill development fund establishment

A skill development fund should be established to significantly increase the number of vocational training courses and improve their quality. The fund is established by subsidies from the central and local governments, employees' contributions from their payrolls, and contributions by international donors. Training vouchers are issued by INSAFORP, and used by trainers to cover part of course fees. Training institutes return the vouchers to INSAFORP for payment. INSAFORP establishes eligibility requirements, and monitor quality and compliance.

Incubation centers

Incubation centers should be established, capitalizing on the existing Infocentros to be selected by their headquarters. Each center offers office spaces, meeting rooms, computers with Internet access, telephones and facsimiles, copy machines, other office equipment and furniture, and secretarial services. The headquarters recruit advisors necessary for enterprise establishment specialized in law, accounting, corporate management, business planning, training, etc. They also maintain a database of financial sources, governmental and other support available, training opportunities, etc. Each Infocentro incubator invites entrepreneurs to become its tenants. If there are too many applicants, priority will be given to those submitting more creative and marketable business proposals. Office spaces will be leased at low rents for one year, after which entrepreneurs are expected to leave to establish their own office elsewhere. The headquarters should conduct an entrepreneur contest once a year for tenants and reward the most successful one. Winners may receive reward such as access to "Fondo de Asistencia Técnica".

Modern corporate management introduction

This program supports small and medium enterprises to modernize corporate management. A technological institute or an international NGO would provide corporate diagnosis, and provide entrepreneur training and skill training based on the diagnosis. The process of diagnosis itself provides training for managers and workers. Continual guidance and consultancy would help to strengthen the competitiveness of their products.

Micro entrepreneur training

This program establishes services to provide business information through the Internet as a first step of business training for micro entrepreneurs. An existent foundation or NGO would become the executing agency supported by the Government, donors and the private sector including IT companies. Computers and associated facilities and services are provided to municipal offices, at which micro entrepreneurs have access to business information.

Business associations establishment

The program supports the establishment of business associations by SMEs that want to move into factories in an industrial zone. A private firm such as a leasing company or a developer would construct rental factories in an industrial zone and provide equipment and machinery for leasing. INSAFOCOOP, the government agency to develop cooperatives and provide a registration system with a database for them, would support procedures for SMEs to organize a business association. The association would submit its business plan for a leasing contract. Each SME rents a factory together with production equipment and facilities. This would facilitate the creation of new business by reducing initial investment costs.

(3) ICT human resources development program

The program aims to improve skills of ICT-related personnel at all the levels with the following three components:

- ICT policy makers strengthening,
- ICT engineers and technicians strengthening,
- ICT end-users training, and
- Model e-community center.

ICT policy makers strengthening

This project aims to train government officers in charge of ICT policy making both at the national and at the municipal levels. Foreign experts may be dispatched for technology transfer in the following:

- ICT-related laws and policies,
- planning, documentation and implementation of policies for socio-economic activities using ICT,

- dissemination of successful and unsuccessful cases of ICT promotion policies,
- dissemination of market needs for ICT in developed countries, and
- consideration of rural areas and the socially disadvantaged to avoid the digital divide.

ICT engineers and technicians strengthening

This project aims to develop engineers and technicians in the ICT sector. As ICT skills go out of date quickly, it is essential to establish a system to train ICT teachers periodically. During the project implementation, a committee comprising MINED, foreign experts, ITCA staff in San Miguel and the private sector would develop curricula and methods of ICT teachers training to ensure continued training even after the project.

Foreign ICT experts are dispatched to ITCA San Miguel together with necessary equipment to train ITCA staff, who, in turn, provide training to ICT teachers at universities, technological institutes, high schools and vocational training institutes throughout the Country. Subsequently, the ITCA San Miguel should establish an alliance with a reputable international institute for continual updating and upgrading of its capacity. Short-term vocational training courses are also offered to the unemployed and enterprise workers.

ICT end-users training

This project aims to train ICT end-users by using the Eastern Region skill development fund or through conventional INSAFORP training. The project also supports the joint venture arrangements between domestic and foreign firms to introduce highly skilled human resources.

Model e-community center

This project is designed to expand the e-culture and e-services throughout local communities, starting with an existing Infocentro. Following the two Infocentro-based projects (Projects No. 6.2b and 6.2d), various services are to be provided for the public under the concept of e-government.

(4) Agro-industrial technology center

The project supports the establishment of the National Laboratory of Legal Metrology proposed by CONACYT to test and experiment for technology development and extends it into the agro-industrial technology center (AITC). The AITC is to specialize in production technology related to agro-business, especially food processing. The metal works and machinery industry should also be covered as it supplies production machinery and equipment. The AITC may also offer information and other support services to SMEs as a predecessor has done (Box 8).

The functions of the AITC are to (1) provide consultancy services for production technology in the fields of process food engineering, biotechnology and industrial design of processing machines and equipment; (2) test, calibrate and analyze products, semi-products and materials and issue certificates; and (3) plan and provide information for research in production

technology for commercialization, products development and diversification of agro-industry.

A proposed organizational structure of the AITC is illustrated in Figure 9.9.

Box 8

Shenzhen Technology Center, People's Republic of China

Establishment and development plan

The Shenzhen technology center evolved from an information exchange forum by eight companies based in Hong Kong for the purpose of supporting Japanese SMEs to establish their affiliated firms in the People's Republic of China. The first center started in 1991 with five firms in rented factories of 4,440m^2, which subsequently expanded to 16 firms. The second center started in 1994 with five firms in16,000m^2, expanded to 23 firms.

These firms started to construct their own factories in 1998 as the third technology center, aiming at an industrial estate of some 6,000 employees by 2005. Their objective is to converge all the firms in the first and the second centers into the third technology center to strengthen their support to firms establishing there. This ultimate center is planned with various urban functions and facilities, such as banks, restaurants and convenience stores as well as housings, utilities and other infrastructures. It is operated with capital contribution by small shareholders in the private sector.

Functions

The Shenzhen technology center provides various services to facilitate SMEs to establish their operations in the Chinese market. The main functions are:

(1) Provision of infrastructures and facilities at low costs, including accommodations for employees;
(2) Databank of human resources, updated by regular recruitment advertisements and school visits;
(3) Training in languages, quality control, production line management, and other specialized courses;
(4) Agency for administrative procedures, import-export and tax business, accounting, and other office works; and
(5) Information services including information of procurement and marketing partners to facilitate business expansion, coordination of products development by firms located in their IE, and exchange of technical and managerial information.

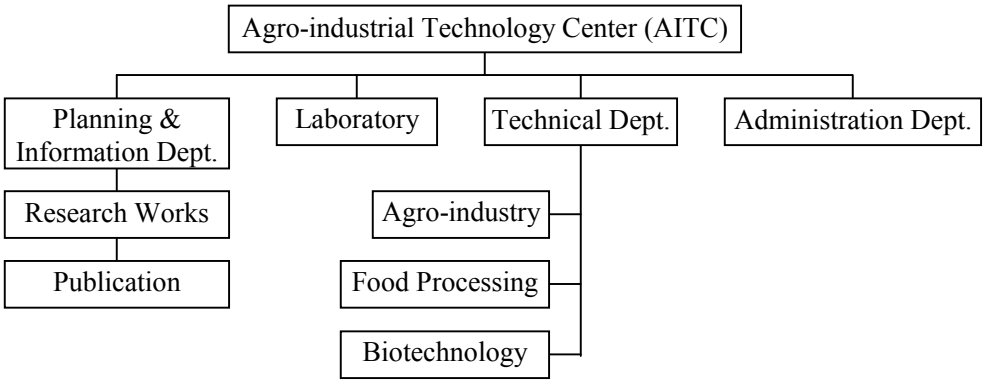
Relevance of the center to the Eastern Region

Industries in the Huanan region where the Shenzhen technology center is located are characterized by dominance of SMEs, mostly labor-intensive suppliers of parts for export. Due to the proximity to Hong Kong, export processing entrusted by Hong Kong based enterprises is the common form of operation. Since there are only a few large enterprises in the region, SMEs there face difficulty in developing linkages by themselves and expanding their business operations. Introduction of additional SMEs as well as information exchange among those already established are essential for them to develop. These conditions generally apply to the Eastern Region.

References:

Related websites (e.g., http://www2.ipcku.kansai-u.ac.jp/~shin/tc_outline.html by S. Hasegawa, Faculty of Commerce, Kansai Univ.)

Figure 9.9. Organizational Structure of Agro-industrial Technology Center



9.4 Institutional and Financial Measures

9.4.1 Institutional arrangements for the Eastern Region development with the La Union port

(1) Imminent needs for institutional arrangements

La Union port and its hinterland

Proper institutional arrangements for effective planning, development and management of various functions and facilities in the La Union port hinterland as well as port-related functions and facilities are the matter of urgency, as the construction of the port will start shortly. CEPA has been examining a management organization for port-related functions and facilities in the past few years and discussing with concerned agencies for timely implementation of related projects to support the La Union port development such as ANDA for water supply expansion, INSAFORP for port-related training, and MINED for a new technological institute. Also a new institution of Maritime Port Authority has been created to regulate maritime navigation and port services, and the legal framework for concessions of some port functions has been established.

However, there exists no single entity to coordinate all the activities in the La Union port area to ensure timely implementation of various projects by different entities, both public and private. At present, a ministerial task force, consisting of a few representatives of the Government, is in charge of coordinating activities in the limited area around the future La Union port. It is expected that this task force will be expanded and strengthened, including representatives of local governments and the private sector. Eventually, a permanent entity may be created, with comprehensive jurisdiction over management of all the functions and facilities in the port hinterland.

While this stepwise approach for development management is realistic, certainly to avoid political issues associated with the creation of new institutions, it may result in a piecemeal approach. With the limited areal jurisdiction initially, the task force would not be in a position

to regulate development activities just outside the area. In particular, land speculation would occur making the future expansion of its jurisdiction difficult, to say nothing of regulating developments.

Eastern Region development

The PNODT study has recommended a new administrative division with three regions, 14 sub-regions and 31 micro-regions. It is expected that an intermediate level of development administration would be established between the Central Government and municipalities. The proposed micro-regions may correspond to this level, but the functions of the other two levels for development administration are not clear yet nor the specific functions to be transferred to the intermediate level for decentralization. These issues may not be resolved easily as they have serious political implications. At the very least, however, the imminent needs for institutional arrangements for the La Union port and its hinterland should be satisfied in such a way that would not complicate these issues. For the time being, it is realistic to support the ongoing initiative of the two municipal associations for the Fonseca gulf and the Rio Grande de san Miguel as institutional instruments for the Eastern Region development.

(2) Needs and options for development management

Conditions for the Eastern Region development with the La Union port

Continued priority policy and commitment by the Government for the Eastern Region would be an essential condition for the Eastern Region development in order to fill in the existing infrastructure gaps as well as to maintain peace and order. The establishment of the La Union port symbolizes such priority but effective utilization of the port for the Eastern Region development needs to be ensured. Initially, complementary projects and programs proposed by the Master Plan would be implemented for the most part by relevant government agencies within the framework of the existing development administration.

In parallel with this, the capacities of local governments would continue to be enhanced for development planning, implementation and management. This can be accomplished most effectively through planning and implementation of the increasing number of projects in various sectors with the local initiative. This would call for the mobilization of more local resources in the public and the private sectors, including overseas Salvadorans and their remittance. Projects to be implemented by government agencies, local governments and the private sector need to be coordinated to ensure effective realization of the Eastern Region development objectives.

In view of the above, the following conditions need to be satisfied by institutional arrangements for the long-term development of the Eastern Region.

1) Stronger planning and coordinating functions at both local and regional levels;
2) New funding mechanism to increase regional fund mobilization in a significant way;

3) Enhanced and institutionalized participation by the local people in the development; and
4) Active participation by the private sector in the development not only for a wide range of development activities but also for development management.

Options for institutional arrangements

Several options are conceived for institutional arrangements for the Eastern Region development with the La Union port to achieve the conditions specified above. Four distinct alternatives are summarized in Table 9.4 with the advantages and disadvantages of each.

The establishment of the Eastern Region Development Authority may be a long-term option that would deserve further examination. A development corporation is easier to establish. While it will allow management flexibility for its corporate nature, it may face difficulty in coordinating public projects of sector agencies and sourcing private sector funds. The Eastern Region is too large for the corporation to handle these difficulties. The existing ministerial task force is a variant of the fourth option but its jurisdiction is very small.

Table 9.4. Alternative Institutional Arrangements for the Eastern Region Development

Option	Basic features	Advantages	Disadvantages
1. Regional Development Authority	- Created by congress through legislation - Independent or attached agency with minimal supervision - Mandates, power and functions defined as created	- Very stable organizational structure - Full authority to ensure coordinated developments	- Need for tedious and meticulous process to establish - Danger of being politicized
2. Development Corporation	- Created under relevant corporation laws - Require initial Government capitalization - Capitalization by local governments and the private sector as well	- Relatively easy to establish - Less likely to be politicized - Management flexibility due to corporate nature	- Difficulty in sourcing private sector funds due to lack of track records - Difficulty in coordinating public projects of line agencies
3. Project office	- Office created by executive order of the President - Funding from the Government with direct supervision by the lead agency - Commission or board for policy making and development project office for implementation	- Assurance of funding - More stable than council/commission - Powerful enough if placed under the Office of the President	- Difficulty in ensuring balanced development due to biased supervision by the agency to which it is attached - Needs an executing arm if placed under the Office of the President
4. Council or commission	- Project-oriented organization with a project management office - Funding from participating agencies and local governments - Mainly for coordination, monitoring and project/investment promotion	Easier and faster to establish	- Unstable for its existence likely to be threatened by leadership turnover by elections - Difficulty in securing funds for operation and maintenance

Source: JICA Study Team.

Management needs and organization for the La Union port area and its hinterland

Effective development management for coordinated implementation of various projects in the La Union port area and its hinterland would be essential to utilize the port most effectively for the benefit of the Eastern Region. It is desirable that a new management organization be established to take charge of a larger area in the hinterland of the future La Union port or the La Union Freeport and Economic Zone (FPEZ).

Three conditions are most essential for the management organization to perform its functions effectively. These are (1) strong authority, (2) limited control and (3) flexibility. The management organization should be the only entity, empowered by legislative actions, to have comprehensive management functions for the entire area. This does not imply that all the functions and facilities in the area should be controlled by this organization. On the contrary, most functions and facilities would be entrusted to the private sector for their development, management and operation (Box 9 for a successful case). The new organization, however, should have strong authority to supervise and guide all the developments in the area. Strict enforcement of limited control is the second essential condition. This applies particularly to regulations related to land use and transactions. The third essential condition is flexibility to allow quick response to changing and varying management needs that may arise as the area develops in steps.

These essential conditions may be satisfied most effectively by combining resources in the public and the private sectors. Public-private partnership for development management holds a key to successful development of the La Union port and its hinterland. The idea may be substantiated by a corporate type entity for development management. Through capitalization by local governments and local people, this entity may be instrumental in satisfying the four conditions listed above for the institutional arrangements to be applied first to the La Union port and its hinterland.

A possible organization structure of the development corporation, which may be called the FPEZ development corporation, is shown in Figure 9.10. The corporation will be headed by the chairperson of the board of directors, supported by shareholders. Three departments may be established initially for support services, operations and business development. Several companies would be established to undertake specific activities such as waterfront development, free zone development and management, utility services, and tourism activities as well as port-related services.

(3) Recommended immediate actions

With or without regional institutions, a separate entity for development management would be required for the La Union port and its hinterland, and a development corporation by public-private partnership may be an option to be pursued. While the establishment of such a

Box 9

Subic Special Economic and Freeport Zone, Philippines

Jurisdiction

The Subic Special Economic and Freeport Zone has an areal jurisdiction over 105,102ha, of which the proclaimed area comprises Olongapo City, Subic Town, San Antonio, and the former U.S. Naval Reservation, covering in total 67,452ha. The Subic Bay Metropolitan Authority (SBMA) was created in 1992, empowered by the Government to administer, supervise and monitor the development of the Zone. It is a public corporation acting as an operating and implementing arm of the Bases Conversion and Development Authority.

Organizational structure

SBMA has a 15-member board of directors headed by the chairperson/administrator. The 15 directors appointed by the President consist of two representatives from the National Government, five from the private sector, and eight representing the local government units. Its management organization consists of 42 offices and departments. The legal, administrative and financial office consists of three divisions of administration, finance and legal affairs with 12 departments. The operations office has three divisions of port operations, health and welfare, and public works and technical services with eight departments. The business development office has two divisions of trade and tourism, and land and estate with seven departments. There are also other support offices and departments.

Land use plan

The land use plan for the core area of the former U.S. Naval Reservation with 10,004ha is summarized below.

Land use	Area (ha)	Main facilities and uses
Special areas	30	Coastal Corporation facilities, Naval supply depot
Seaport	20	Cargo port, piers and wharfs
Airport	285	2,746m runway, terminal facilities
Protected areas	9,009	
Mixed commercial	181	Central business district (CBD)
Industrial	214	Industrial park, Subic Technopark
Tourism and recreational	199	Beach resorts, golf course, Grand island
Residential	35	About 1,850 units
Community facilities	25	Naval hospital, high school, elementary school
Utilities	6	Filtration plant, power plant
Total	10,004	

Workforce and employees

SBMA employees total 4,283 as of March 2001 (which increased to 5,341 by January 31, 2003), including those employed by the Freeport Services Corporation (FSC), a subsidiary company of SBMA. Active workforce employed by firms located in the Freeport Zone includes 30,139 employees from 381 investors as of August 2000 (which increased to 50,924 by January 31, 2003). The breakdown by sector is shown below.

	Manufacturing	Services	Construction	Total
No. of active workforce	11,371	14,343	4,425	30,139
(%)	(48)	(37)	(15)	(100)
No. of companies	67	317	65	449

Port facilities and cargo traffic

The port facilities of Subic comprise a total wharf length of 4,029m, consisting of 2,231m at 12.0m or deeper water depth and 1,798m at 6.0-10.0m water depth. Containerized cargo handled in 2000 was 23,794 TEUs, of which 11,626 TEUs were import cargos (49%). Non-containerized cargo totaled 270,177MT, of which import accounted for 245,808MT (91%).

Locating firms and investments

The number of firms locating in the Free Zone has increased steadily with 60 during 1992-94, 152 additional locators during 1995-97, and 127 more during 1998-2000. The number of locating firms, employees and investment by sector (as of June 2000) are as follows.

Sector	No. of locators	Average no. of employees/locator			Ave. investment / locator (US$10^3)
		Regular	Contract	Total	
Commercial	126	14	2	16	347
Services	137	22	9	31	4,661
Manufacturing	60	139	7	146	4,867
Real estate devt. & mgt.	16	189	147	336	40,570
Total/Overall	339	51	14	65	5,649

Ownership and management of facilities and services

All the port facilities in land and water areas are owned and maintained by SBMA, except the Subic Bay Yacht Club owned and maintained by Subic Bay Waterfront Development Corporation. Facilities leased to the private sector are maintained by the same entity. Full container shipping services are provided by shipping lines regularly calling at the Freeport. Some port services are provided by the private sector by concessions.

Industrial parks are operated by joint ventures between SBMA and private firms. Most tourism facilities are operated by both FSC (SBMA subsidiary) and the private sector. Utilities are provided by joint ventures between the private sector and the Government (SBMA for water supply, sewerage and telecommunications, and NPC for power supply). Ownership and management of various facilities and services are summarized below.

Facilities and services	Ownership and management
All port facilities	Owned and maintained by SBMA
Subic Bay Yacht Club	Owned and maintained by Subic Bay Waterfront Development Corporation
Port services	
- Container shipping services	Private shipping lines
- Cargo handling, lighter operation	Concessionaires
Industrial parks	
- Subic Technopark	Subic Techno Park Corporation (JV between SBMA and Japanese firms)
- Subic Bay Industrial Park	Subic Bay Development Corporation (JV between SBMA and the United Development Corporation)
Central business district	Administered by SBMA as secure customs territory with complete Freeport customs and tax regimes
Tourism facilities	
- Convention centers	Operated by FSC and the private sector
- Accommodations	(The same as above)
- Beach resorts	(The same as above)
- Water sports facilities	(The same as above)
- Other sports facilities	(The same as above)

Facilities and services	Ownership and management
- Parks and picnic areas	Operated by FSC
- Casinos	Operated by private hotels
Utilities	
- Power supply	Enron Subic Power Corporation (by BOT with NPC)
- Water supply and sewerage	Subic Water and Sewerage Corporation (JV between SBMA, private firms and Olongapo City Water District)
- Communications	Subic Telecommunications Co., Inc. (JV between SBMA, PLDT and AT&T of U.S.)
Other	
- Hospitals, schools, churches, etc.	Various public and private entities
- Fire protection	Owned and operated by SBMA

Development plan

SBMA has identified the target sectors for investment promotion as follows:

(1) IT-related services, including call centers and other remote processing activities,
(2) Electronics assembly, including components and final products,
(3) Assembly of sporting goods and marine products,
(4) Educational services, including a university and a research center,
(5) Tourism investment, including hotel and resort developers, eco-tourism project developers, and tour operators, and
(6) Real estate development projects such as a convention center and land-based eco-tourism attractions, housing developments and apartment buildings, office buildings, and office parks.

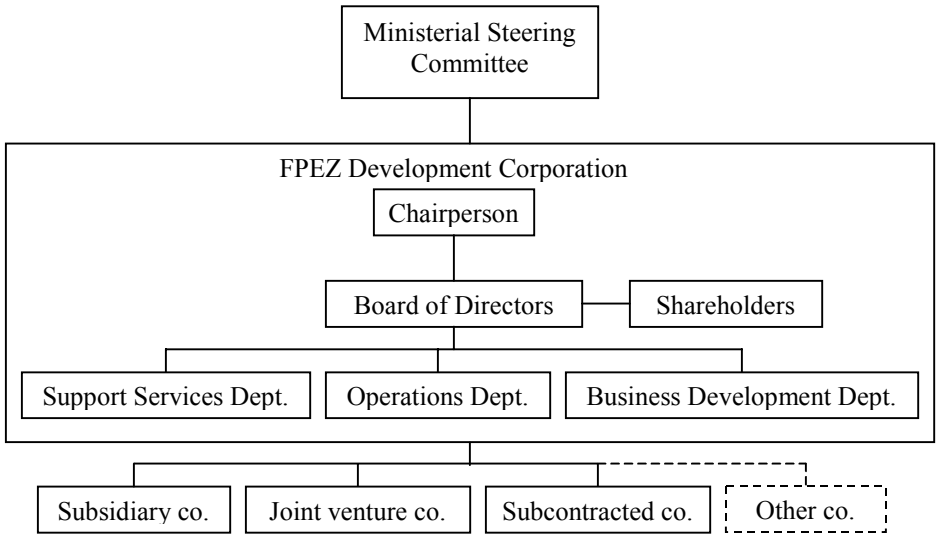
In connection with new infrastructure development, particularly a new container terminal and the Subic-Clark toll road, the following are expected:

1) Increase in large-scale logistics investments,
2) Increase in port-related engineering contractors and construction firms,
3) Increase in ship and equipment repair, maintenance, and outfitting operations,
4) Arrival of apartment building developers/managers,
5) Arrival of office building and office park developers,
6) New hotels and nature lodges,
7) Natural and cultural exhibits,
8) Rise of adventure tourism,
9) Ecology and environmental research center, and
10) Privatization-related investments, particularly in power distribution and other services.

The total revenue of SBMA in 2000 was estimated at Ph. P 2,282 million from land and building lease, port operations, utilities, tourism, and other income. The total expenditure of SBMA in 2000 was estimated at Ph. P 1,948 million for personnel services, interest payments on loans, power supply, other services by FSC, and other expenses. The profit before depreciation and taxes was estimated at Ph. P 333 million in 2000. The profit is expected to increase to Ph. P 1.6 billion in 2005, due to 50% increase in revenues and the total expense at a similar level as in 2000.

References:
1. SBMA, *Socio-economic and Physical Profile*, March 2001.
2. SBMA, *Subic Special Economic & Freeport Zone, Strategic Plan 2001-2005*, November 24, 2000.
3. Personal communications with SBMA staff through Edna B. Tatel, RECS associate in the Philippines, April 3-21, 2003.

Figure 9.10. Possible Organizational Structure of FPEZ Development Corporation



development corporation may involve political issues that may not be easily resolved, immediate actions need to be taken to ensure timely implementation of priority projects within a few years time, ensuring also subsequent developments in a coordinated manner.

The existing ministerial task force may have strong enough authority but it does not extend to future development areas. Municipalities have authority in principle to regulate land use in their respective jurisdictions through approvals according to their land use plans. To extend effective land use control over a larger area including future development areas of the La Union port and its hinterland and also conservation areas to ensure comfortable living environment for residents and visitors, two conditions need to be met in the nearest future. First, a formal land use plan needs to be prepared for an area large enough for the purposes. Second, the land use control function of the La Union and the Conchagua municipalities should be made effective. A possible way to pursue the latter is to allow the mayors of the two municipalities to represent in the ministerial task force for its authority. Another more subtle way is to cultivate public acceptance from the local people and governments for the planned development of the La Union port and its hinterland so that they can check undesirable developments in their territories and neighborhoods.

In sum, the immediate actions recommended are:

1) Representation of the mayors of the La Union and the Conchagua municipalities, or CND on their behalf, in the ministerial task force,
2) Preparation and formal adoption of a land use plan for the La Union port and its hinterland, and
3) Establishment of a local management unit (LMU) based on the existing management groups for cultivation of public acceptance and coordination of development activities at the local

level.

(4) Step-wise institutional development

In parallel with these, the ministerial task force may initiate discussions with related agencies on more permanent institutional arrangements for the La Union port and its hinterland and also the Eastern Region development. The institutional arrangements for the La Union port and its hinterland (i.e., FPEZ) and the Eastern Region will evolve step-wise as illustrated below.

	Institutional arrangements		
Area of jurisdiction	Immediate action		Future operation
FPEZ (La Union port & its hinterland)	(Local)	Local Management Unit	Development Corporation
	(Central)	Ministerial Task Force (expanded)	
Eastern Region	(Local)	Municipal Associations of Fonseca Gulf & Rio Grande de San Miguel	Development Authority
	(Central)	Existing devt. administration	

9.4.2 Funding for the Eastern Region development

Regional development is realized by public and private investments in economic activities, support infrastructure, and human capital as well as resources and environmental capacity. The sources of investment funds for the Eastern Region development are the Government and municipalities, private individuals and enterprises, and external contributions including international donors and NGOs, and overseas Salvadorans. While continued commitment and support by the Government is expected as mentioned in the previous section, significant increase in Government contributions is not likely in view of the needs to maintain macroeconomic stability, an important factor to attract foreign direct investments. Thus, increased funding from other sources should be sought.

(1) Financial capacity of municipalities in the Eastern Region

The financial capacity of the two municipal associations in the Eastern Region has been analyzed. These associations have relatively small municipalities, not with respect to land area but with respect to population and municipal income (Table 9.5). Population density is 146 per km^2 for Fonseca Gulf and 287 per km^2 for Río Grande, much smaller than the average 494 per km^2 of 38 municipalities analyzed by FUNDAUNGO (2000). The average per capita municipal income in 2000 was US$40.4 for Fonseca Gulf and US$34.7 for Río Grande excluding the San Miguel municipality with a dominant population of 254,000. These may be compared with US$50.3, the average of 38 municipalities analyzed by FUNDAUNGO.

The income structure of these associations is characterized by large shares of capital income in the total income: 80.1% for the Fonseca Gulf and 78% for Río Grande in 2000. These shares are much larger than the average 42.7% for the 38 municipalities. This reflects reliance on the

capital transfer from the Government (80% of the FODES fund as stipulated by law). Conversely, the capacity of member municipalities of the associations to raise other capital incomes is limited.

Table 9.5. Comparison of Municipal Associations in the Eastern Region

	Fonseca gulf municipal association	Río Grande de San Miguel municipal association	Municipalities analyzed by FUNDAUNGO
No. of municipalities	9	9	38
Total area (km^2)	1,193	1,152	2,556
Total population 2001	174,112	330,369	1,529,425
Population density (/km^2)	146	287	494
Average area per municipality (km^2)	132.6	128.0	67.3
Average population per municipality	19,346	36,708	40,248
Total municipal income, 2000 (US$$10^3$)	7,071*	2,648†	76,926
Average income per municipality (US$$10^3$)	786	331	2,024
Average income per capita (US$)	40.4	34.7	50.3
Income structure (%)			
Current income	19.9	22.0	57.3
Capital income	80.1	78.0	42.7
FODES capital transfer	51.3	59.3	15.4

* except El Carmen; † except San Miguel

Sources: JICA Study Team survey, 2003; FUNDAUNGO, *Study on Municipal Finances in El Salvador (1997-2000)*, 2000.

Per capita municipal income varies widely among member municipalities of the associations: from US$26.4 in Conchagua to US$88.4 in Intipucá for Fonseca Gulf and from US$28.2 in Yucuayquín to US$86.4 in Comacarán for Río Grande excluding San Miguel in 2001. The average per capita income increased from US$40.4 in 2000 to US$46.9 in 2001 for Fonseca Gulf and from US$34.7 in 2000 to US$58.1 in 2001 for Río Grande excluding San Miguel.

FUNDAUNGO (op. cit.) also analyzed the performance of public services provided by municipalities. Income from public services for eight municipalities in the Eastern Region is summarized in Table 9.6.

Table 9.6. Income from Public Services of Municipalities in the Eastern Region, 1999

(Unit: ¢10^3)

Municipality	Solid waste collection	Street lighting	Administrative services	Road pavement	Municipal market	Municipal slaughterhouse	Cemetery	Total	Per capita (¢)
Santa Elena	55.4	184.4	138.2	30.8	21.5	35.2	26.3	491.8	30.8
Berlín	99.1	74.3	92.6	70.3	271.5	25.7	15.3	648.8	33.2
Usulután	899.1	668.8	788.6	338.3	964.5	102.5	291.9	4,053.7	59.0
Puerto el Triunfo	142.7	149.4	88.6	36.7	113.8	0	20.3	551.5	34.0
Corinto	55.3	0	82.6	21.2	20.6	336.1	17.1	533.0	30.9
El Carmen	0	7.6	28.8	3.5	0	0	1.2	41.1	2.3
El Tránsito	68.4	74.2	432.7	28.0	213.3	404.2	38.1	1,259.0	70.9
Sociedad	0	0	54.4	0	0	3.5	2.9	60.8	5.3

Source: FUNDAUNGO.

The table shows wide variance in service provision and/or fee collection among the eight municipalities. The per capita expense also varies widely from ¢2.3 to ¢70.9 with the average of the eight municipalities at ¢41.4. For all the 38 sample municipalities, the per capita share of service fees was ¢133.0. Thus, the eight municipalities in the Eastern Region had much lower levels of service provision or lower service fees or both. Moreover, all the municipalities incurred net losses from these services.

(2) Overseas remittance

The Eastern Region depends more on family remittances. The share of families receiving remittances was 30% in the Region in 2000, higher than any other region and much higher than the national average of 20%. It varies among the departments in the Eastern Region, ranging from 40.7% in La Union to 24.4% in Usulutan in 2000. The average remittance received was also the largest in the Eastern Region at ¢1,103 per month in 2000. With the lower average income of ¢2,655 per month, the remittance accounted for 41.5% of the household income in 2000.The total remittance from overseas Salvadoran is increasing consistently since the end of the civil war (Table 9.7). Its ratio to the GDP decreased from 14.4% in 1992 to 10.5% in 1996, presumably reflecting return of some migrants. However, it started to increase thereafter to reach 13.9% in 2001.

Table 9.7. Family Remittances and GDP in El Salvador

(Unit: US$10^6)

Year	Remittance	GDP	% of GDP
1992	858.3	5,955	14.4
1993	864.1	6,938	12.5
1994	962.5	8,086	11.9
1995	1,061.4	9,501	11.2
1996	1,086.5	10,316	10.5
1997	1,199.5	11,135	10.8
1998	1,338.3	12,008	11.1
1999	1,373.8	12,465	11.0
2000	1,750.7	13,139	13.3
2001	1,910.2	13,739	13.9
		10-year average	12.1

Source: Central Bank of El Salvador.

The Multipurpose Household Survey in 1999 by the Salvadoran Government found that 80.0% of the households receiving remittances use them dominantly for consumption purposes, followed by 9.1% for educational expenses, and 4.4% for medical expenses. Only 1.5% of remittances were devoted to investments (for commerce and agricultural input), and 1.9% saved. Other studies have also reported that the use of remittances is determined more by senders than recipients (cf. a survey by the JICA Study Team, 2003).

(3) FISDL fund for social development

FISDL has established a financing scheme for social development using local contributions including remittances from members of hometown associations. The financing is made by the following procedure: Participatory project formulation → Verification → Bidding → Execution → Liquidation.

A project is formulated by the local initiative, supported by the respective hometown association, follows the FISDL procedure, and is selected for financing through competitive bidding. The minimum requirement is that at least 10% of the project cost is bone by the respective municipality and its hometown association.

If the total cost of all the proposed projects is within the FISDL contribution of US$4 million, all of them will be supported. Otherwise, those projects having larger shares of local contributions are prioritized. Maintenance of the projects thus implemented is undertaken by relevant agencies such as MOP for roads, MINED for schools and municipalities themselves.

There are advantages of the FISDL scheme for social development. First, for it is participatory, those projects responding to the needs identified by local governments and people are supported and implemented. In the participatory project formulation, various actors work together, including local residents, NGOs, churches, and municipal governments. Resources of overseas Salvadorans are naturally mobilized through hometown associations. Second, the scheme involves smaller public sector resources. Smaller financial resources are required in the public sector as municipalities and their hometown associations organize themselves to collect donations. Administrative resources involved in planning, evaluation and implementation of projects are minimal as FISDL does not formulate projects nor evaluate them for their impact. Third, the scheme utilizes a competitive process to enhance cost-effectiveness of proposed projects and efficiency of public resources allocation. Municipalities have incentives to reduce costs of proposed projects and to increase shares of local contributions.

The FISDL scheme also has a few disadvantages. First, it relies exclusively on external sources of fund. Second, the fund is thus limited, and only small projects can be supported. The projects costs range generally in US$200,000-250,000. Third, the impact of projects is not reflected in prioritization.

(4) Proposed new funding schemes

As mentioned in the previous subsection, new funding schemes should be introduced to increase regional fund mobilization in a significantly way. Funds so secured would be directed to economic activities, support infrastructure and human capital. For human capital, two new schemes have been proposed in Subsection 9.3.6: the Eastern Region secondary and higher education scholarship fund with the establishment of a fundraising unit in the U.S. as an NGO, and the Eastern Region skill development fund based on employees' contributions from their

payrolls as well as government and other donors. New schemes for the other two aspects are proposed.

Credit guarantee fund

Small enterprises face difficulty in gaining access to credit from formal financial institutions due to collateral requirements. Financial institutions tend to avoid the high risk and low profitability associated with small lending for administration costs partly caused by poor managerial capability of small enterprises. While the managerial capability of small enterprises should be improved, other risks need to be minimized.

A credit guarantee fund should be established by the Government to support a portion of the total credit granted. Such a fund has been created in Taiwan to support credits to overseas Taiwanese. The guarantee fund will be managed by a prestigious bank in the U.S. providing good and transparent management.

The guarantee fund in El Salvador should also be used to give incentives for overseas Salvadorans and their remittance recipient families to use the remittance for investment in economic activities. Remittances themselves would work as guarantee for the remaining portion of the credit. Details of fund operation and management should be worked out between the Government and the designated bank.

Organizing remittance recipient families

At present, the monthly remittance received per family is relatively small. The average monthly remittance in the Eastern Region was US$126 per family. Also, decisions on the use of remittances are made individually.

To support the credit program, community development should be promoted and remittance recipient families organized by municipality, business community or any other group. These organizations would allow the use of the credit guarantee fund in a more sustainable way, offering joint guarantee as well as much larger remittance pooled among the respective organizations.

Investment promotion centers

While many overseas Salvadorans obtain information on the needs of their home communities in El Salvador through personal channels and hometown associations, information on broad investment opportunities is usually not available for them. An investment promotion center should be established in each of the major cities in the U.S. with a concentration of Salvadorans to provide the following functions:

1) to generate information necessary to identify low risk and high profitability investment sectors and projects,
2) to conduct feasibility or pre-investment studies and then to disseminate their findings to the

Salvadoran community in each city and also financial institutions,

3) to provide technical assistance and training necessary for small enterprises and entrepreneurs to improve their managerial capacity and also to formulate projects,
4) to establish contacts with financial institutions necessary for possible returnees to seek finance for new undertakings, and
5) to establish an ICT network of overseas Salvadoran communities linking investment promotion centers in different cities.

To establish the centers, different actors need to work together, including consulates and the embassies, hometown associations of overseas Salvadorans, Government institutions, business associations, and local financial institutions as well as local governments and people. A database should be created of Salvadoran professionals particularly in the U.S., which can be used in two ways. One, professionals necessary for any project in El Salvador may be invited to participate in its planning and implementation. Two, professionals may invite project proposals by specifying conditions to be satisfied for them to live and work in El Salvador.

To work with these centers, a counterpart institute should be organized in the Eastern Region. It would disseminate information on investment opportunities in the Region and available funding and other support measures, promote export of nostalgic products, and organize other promotional activities. It should be tied up with the proposed Eastern Region Research Center (Subsection 9.3.6). Training needs for local enterprises and entrepreneurs should be satisfied largely by the SMEs Support Program (Project No. 6.2), combined with short visits of experts from the proposed investment promotion centers.

Capitalization for the development corporation

It is recommended that a development corporation be established by public-private partnership to take charge of the proposed FPEZ. Local people and enterprises may be invited to subscribe to shares of the corporations. Although the corporation would develop into a most lucrative entity as it is in charge of the most rapidly developing area, its initial financial performance may be relatively low. To encourage participation from a wide range of people and enterprises, including contributions by overseas Salvadorans, the Government should ensure an adequate dividend on shares during the initial years of the corporation. The capital of the corporation would be used for investments in economic activities and infrastructure as well for high returns. Thus, relatively small Government contributions can be used to support infrastructure development as compared with the direct public investment in infrastructure.

9.5 Indicative Investment Schedule

9.5.1 Framework for investment planning

(1) Investment performance and assumptions for projection

To attain the economic growth levels specified by the socioeconomic framework for the Eastern Region, a large amount of investments would be required by the public and the private sectors in the proposed projects and programs for the next 16 years. Additional investments would be expected in the private sector. Including development expenditures on regular programs of central ministries and municipalities, the total amount of investment required for the Eastern Region development is estimated and the fund availability from different sources is examined.

To estimate the public investment that may be mobilized at the national level in different periods, the following assumptions are made for macroeconomic performance:

1) The GDP growth will be at the annual rate of 4.0% through the year 2019 in accordance with the national socioeconomic framework laid out in Subsection 5.1.2;
2) Efficiency of the total investment as measured by the incremental capital-output ratio (ICOR) will improve from 5.0 up to 2009, through 4.5 up to 2014 to 4.2 up to 2019; and
3) The ratio of public investment to the total investment will stay at 16% through 2019.

These assumptions are based on the macroeconomic performance of El Salvador in recent years (Table 2.1) and considered to be appropriate for a long-term planning purpose. The GDP of El Salvador increased at the average annual rate of 4.7% in 1990-2000. The total investment, measured here are the gross fixed capital formation, was about 17% of the GDP during this period. This makes the ICOR 3.6. The ICOR value, however, is considerably higher in recent years as indicated in Table 9.8. This implies that the investment efficiency was very high during the early 1990s when the Country was recovering from the civil war as infrastructure investment was efficient, given the absolute infrastructure deficiency and economic activities restored with minimal investments. The investment efficiency would improve steadily from the levels in the recent past.

Table 9.8. Investment Performance in Recent Years, El Salvador

(Unit: US$10^6)

	2000	2001	2002
Gross domestic product (GDP)	13,139	13,739	14,227
Fixed capital formation (GCF)	2,218	2,269	2,308
GCF/GDP (%)	16.9	16.5	16.2
GDP growth (% p.a.)	2.2	1.8	2.1
ICOR	7.7	9.2	7.7

Source: Central Reserve Bank of El Salvador, *Economic Indicators*, 1998-2002.

The ratio of gross domestic investment to the GDP increased from 13.9% in 1990 to 17.0% in

2000. The ratio of gross fixed capital formation to the GDP ranges between 15.8% and 18.7% during 1994-2002 (Table 2.1). With the assumed change in the ICOR value and the economic growth, this ratio increase to 15.0% for 2004-09, 18.1% for 2010-14, and 18.7% for 2015-19. The PNODT study assumed this ratio to increase more rapidly to 25.7% in 2000, but a conservative estimate is adopted here. The ratio of public investment to the total investment was 16.6% in 2000. The PNODT study assumed this to increase up to 17.5% by 2015. In the present analysis, this ratio is assumed to stay at the 16% level, considering the present and foreseen conditions of tightening public finance in El Salvador.

(2) Projection of public investment allocation

The public investment at the national level is projected by phase up to 2019 based on the assumptions above. The GDP growth by phase is assumed at 3.6% per annum up to 2009, 4.5% per annum in 2010-14, and 4.9% per annum in 2015-19 to attain the average 4.0% per annum during this period in accordance with the national socioeconomic framework. With the incremental GDP and the assumed ICOR value by phase, the total cumulative investment is estimated by phase. The public investment is calculated as 16% of the respective total. Allocation of the public investment to the Eastern Region is assumed to be proportional to the population or 20% in all the three phases. The results of the calculation are summarized in Table 9.9. The public investment allocation to the Eastern Region is projected at US$534 million in 2004-09, US$619 million in 2010-14, and US$798 million in 2015-19 for the total of US$1,951 million during this period. The ratio of public investment to the total investment must be comparatively larger in the Eastern Region at least initially, and 20% is assumed up to 2009, 18% in 2010-14, and finally 16% in 2015-19, equivalent to the national level. Consequently, the total investment in the Eastern Region is calculated to be US$2,305 million in 2004-09, US$3,211 million in 2010-14, and US$4,718 million in 2015-19 for the total of US$10,234 million during the entire planning period as also shown in Table 9.9.

Table 9.9. Projection of Public Investment and Allocation to the Eastern Region

	2002	2004	2009	2014	2019	Av./total
GDP (US$10^6)	14,200	14,700	17,500	21,800	27,700	(2004-19)
GDP growth (% per annum)			3.6	4.5	4.9	4.0
Cumulative GDP (US$10^6)			81,700	99,800	125,900	
Incremental GDP (US$10^6)			3,200	4,300	5,900	
ICOR			4.5	4.2	4.0	
Cumulative total investment (US$10^6)			14,400	18,060	23,600	
Cumulative investment/GDP (%)			17.6	18.1	18.7	
Public investment as % of total investment (US$10^6)			16.0	16.0	16.0	
Cumulative public investment (US$10^6)			2,304	2,890	3,776	
Allocation to the Eastern Region (%)			20.0	20.0	20.0	
Cumulative public investment in the Eastern Region (US$10^6)			461	578	755	1,794
Public investment as % of total investment (%)			20.0	18.0	16.0	
Cumulative total investment in the Eastern Region (US$10^6)			2,305	3,211	4,718	10,234

Source: JICA Study Team.

9.5.2 Project prioritization

Investment requirements for the proposed projects and programs will have to be satisfied largely by public investments and partly by private investments. The total investment required for the Master Plan projects/programs should not exceed the projected public investment allocations at any point in time. Moreover, considering other regular programs to be implemented by government agencies and municipalities, the investment requirements should be much less than the projected public investments. To satisfy these conditions, the proposed projects and programs are prioritized and phased for their implementation.

A few criteria are particularly important for prioritization of projects and programs to support the Eastern Region development. First, those projects essential for the initial operation of the La Union port have the highest priority. They include the La Union bypass (a component of Project No. 4.1), the El Amatillo border facilities improvement (Project No. 4.3), several component projects of Project No. 5.1 and No. 5.2, and the technological institute establishment (a component of Project No. 6.1).

Second, those projects that would contribute significantly to the medium and long-term development of the Region through upgrading resources and organizational capacities need to be initiated in Phase 1 and continued through Phase 2. They include many component projects of Agro-Industrial Complex Development (Project Nos. 1.1, 1.2, 1.3, and 1.4), Project No. 2.2 and No. 2.3, most component projects of Environment and Tourism Development, completion of the bypass road construction, and projects for human resources development and organizational strengthening of Entrepreneurial Base Development.

Third, those projects contributing to improvement of the livelihood of the majority of local people and poverty alleviation would be given additional points in priority assessment. Contributions would be particularly large from Project Nos. 1.1, 1.2, 1.3, 2.2, 3.1, and 6.2. Some infrastructure projects would be implemented continuously through Phase 1-Phase 3.

9.5.3 Indicative investment schedule

Within the framework of projected public investment allocation to the Eastern Region, an indicative investment schedule is prepared, including all the proposed projects and programs. Investment costs of all the proposed projects and programs are roughly estimated, and the investment schedule is constructed in line with the project prioritization.

Estimated investment costs include initial investments and some other development expenditures to be incurred in the implementation of some projects and programs. A limited number of proposed projects are to be implemented by the private sector but included in the investment schedule. Some other projects would have components to be undertaken by the private sector.

The indicative investment schedule is presented in Table 9.10. The total investment costs for all the proposed projects and programs are US$313.8 million in Phase 1 (up to 2009), US$437.2 million in Phase 2 (2010-14), and US$551.5 million in Phase 3 (2015-19). These estimates correspond to 68.1%, 75.6% and 73.0% of the projected public investment allocations in Phase 1, Phase 2 and Phase 3, respectively. The total estimated investment cost during the three phases is US$1,302.5 million, which corresponds to 73.0% of the projected total public investment allocation to the Eastern Region over the 15-year period.

Considering other regular development expenditures that would have to be covered by the allocated public investments, the investment fund availability is rather tight. However, comparatively more public investments should be allocated to the Eastern Region during Phase 1 in view of the expected contribution of the Eastern Region to the national development. This would induce more private investments in Phase 2 to ease the tight public fund during this phase.

Table 9.10. Indicative Investment Schedule for Eastern Region Development

(Unit: US$10^6)

No.	Project title	Status*	Implementing agencies	Investment Phase 1	Phase 2	Phase 3	Total
1.	Agro-Industrial Complex Development						
1.1	AIC support program						
	- Pilot projects	Ongoing	MAG-CENTA, CND	2.4	8.0		10.4
	- Dispatch of foreign experts	New	MAG/CND	1.2	1.2		2.4
1.2	One village-one product model	New	MAG, municipalities, NGOs	1.0	2.0		3.0
1.3	Agro-business center	New	MAG-Agronegocios	0.5			0.5
1.4	Organic fertilizer R&D	New	Research institute, NGOs, private	0.1	0.4		0.5
1.5	San Miguel sugar mill power generation	New	Private sector		1.2	3.6	4.8
1.6	Fishery support program	Extended	CENDEPESCA, private sector	0.9	1.3		2.2
			Subtotal	6.1	14.1	3.6	23.8
2.	Watershed Development & Management						
2.1	Rio Grande de San Miguel water resources devt. & mgt.						
	- El Guayabal multipurpose dam	New	CEL, inter-ministerial	28.8	37.0		65.8
	- San Miguel irrigation	New	MAG	10.0	60.0		70.0
	- Olomega diversion	New	MOP, MARN		10.0	12.0	22.0
	- Rio Grande midstream river imp.	New	MOP, MARN	40.0	40.0		80.0
	- Jocotal irrigation	New	MAG		13.0	14.0	27.0
	- Flood plain management	Ongoing	MARN-SNET, MAG, municipalities	6.0	10.0	11.0	27.0
2.2	Small & micro irrigation	Ongoing	MAG-CENTA, municipalities	5.5	7.0	10.0	22.5
2.3	High elevation coffee improvement	New	PROCAFE, MARN, Trade Point, CND	0.3			0.3
2.4	Lower Lempa re-regulating dam & irrigation	New	CEL, inter-ministerial			226.0	226.0
2.5	Urban & rural water supply						
	- Urban water supply	Ongoing	ANDA, municipalities	17.3	25.0	30.0	72.3
	- Rural water supply	Ongoing	ANDA, municipalities	5.4	13.0	14.0	32.4
			Subtotal	113.3	215.0	317.0	645.3
3.	Environment & Tourism Development						
3.1	Cooperative tourism devt. program						
	- Tourism circuits formation	Ongoing	CORSATUR, CND	0.3	0.5		0.8
	- Tourist attractions creation	New	CORSATUR	2.0	5.0		7.0
3.2	Fonseca gulf joint environment & tourism development						
	- Fonseca gulf participatory mgt. planning	Extended	Municipalities, MARN, CND	0.5	1.0	1.0	2.5
	- La Union tourism core devt.	New	CEPA, CND	1.0	3.0		4.0
3.3	Environmental awareness program	New	MARN, municipalities, NGOs, CND	0.3	0.2		0.5
3.4	Solid waster management program	New	MARN, municipalities	2.0	10.0	15.0	27.0
			Subtotal	6.1	19.7	16.0	41.8
4.	Spatial Structure Strengthening						
4.1	Logistics circuits strengthening						
	- Bypass roads construction	Extended	MOP	16.0	19.2		35.2
	- San Alejo-El Divisadero radial rd.	New	MOP		13.1	15.0	28.1
	- CA1-CA2 link road construction	New	MOP		10.3	5.0	15.3
4.2	Logistic facilities location planning & guidance	New	Municipalities, SNET, MOP	0.5			0.5
4.3	El Amatillo border facilities imp.	New	MOP, Customs	7.6			7.6
4.4	Northern longitudinal artery establishment						
	- Northern longitudinal road devt.	Ongoing	MOP	14.4	25.0	35.0	74.4
	- Alternative northern road establishment	New	MOP		30.0	72.0	102.0
4.5	Rural road program	Ongoing	MOP	7.0	15.0	15.0	37.0
			Subtotal	45.5	112.6	142.0	300.1

(Unit: US$10^6)

No.	Project title	Status*	Implementing agencies	Investment Phase 1	Phase 2	Phase 3	Total
5.	La Union Port Revitalization						
5.1	FPEZ establishment						
	- La Union free trade zone	New	CEPA, private sector, CND	38.9			38.9
	- La Union distribution core devt.	New	Private sector				
	- FPEZ institutional development	Extended	CND, inter-ministerial	2.5			2.5
5.2	La Union port city development						
	- Water supply & sewerage			14.7	10.0		24.7
	- Transport infrastructure			33.2	26.4	39.6	99.2
	- Social & other infrastructure			8.9	8.9	8.9	26.7
5.3	Geothermal prospecting	New	GESAL	0.2			0.2
5.4	La Union power transmission	Ongoing	Private sector/ETESAL, CEPA	13.6			13.6
			Subtotal	112.0	45.3	48.5	205.8
6.	Entrepreneurial Base Development						
6.1	Secondary & higher education strengthening program						
	- Eastern Region scholarship	New	MINED, NGOs	8.2	8.2	8.2	24.6
	- Technological institute establishment	Ongoing	MINED	2.5	3.5		6.0
	- APREMAT expansion	Extended	MINED	5.0	5.0		10.0
	- Eastern Region research center	New	Universities, CND	0.5	1.0	1.0	2.5
6.2	SMEs support program						
	- Eastern Region skill devt. fund	New	Min. of Labor, INSAFORP	7.4	7.4	7.4	22.2
	- Incubation centers	New	Infocentro	1.1	1.1	2.2	4.4
	- Modern corporate management	Extended	CONAMYPE	1.1	1.1	2.2	4.4
	- Micro entrepreneur training	New	Infocentro, municipalities, NGOs	0.3	0.2	0.4	0.9
	- Business associations establishment	New	INSAFOCOOP	0.7	1.0	1.0	2.7
6.3	ICT human resources development						
	- Policymakers strengthening	New	CONACYT	0.5			0.5
	- Engineers & technicians	New	MINED, ITCA	1.1	2.0	2.0	5.1
	- End-users training	New	INSAFORP	0.5			0.5
	- Model e-community center	New	Infocentro, ITCA	0.4			0.4
6.4	Agro-industrial technology center	Extended	CONACYT	1.5			1.5
			Subtotal	30.8	30.5	24.4	85.7
			Total	313.8	437.2	551.5	1,302.5
			Projected public fund allocation	461	578	755	1,794

*New: newly formulated by Master Plan; Ongoing: already partly implemented; Extended: extending ongoing effort

Source: JICA Study Team.

Chapter 10 ACTION PLAN

The Eastern Region development is a long-term undertaking. Development efforts need to be sustained by participation of various stakeholders including Central Government agencies, local governments, public and private institutes, and business communities as well as local people and communities. A proper institutional framework should ensure such sustained efforts for sustainable regional development.

Within such an institutional framework, administrative capacities for development planning, finance and management should increase and entrepreneurial base expand particularly at the regional and the local levels. Conversely, administrative capacities would increase and entrepreneurial base expand at the regional and the local levels effectively as increasingly more projects and programs are planned, implemented and managed by the local initiative, facilitated by institutional supports by the Central Government.

Initial actions are proposed for the Eastern Region development in accordance with the Master Plan. These actions, in view of the above, aim at encouraging and strengthening the local initiative, and confirming the priority policy and commitment by the Government for the Eastern Region. Specific actions are described for the adoption and promotion of the Master Plan, implementation of pilot projects, further development of proposed projects and programs, and strengthening of implementing arrangements. Initial fund allocation for priority projects and possible fund sourcing are also suggested.

10.1 Master Plan Adoption and Promotion

10.1.1 Master Plan adoption

The bulk of development projects and programs proposed by the Master Plan can be implemented or further developed within the competence and policies of relevant sector agencies of the Government. However, the coordination of various development efforts by many agencies and timely implementation of inter-related projects will have to be ensured. For this purpose, Master Plan proposals will have to be first discussed among related agencies to resolve sector concerns and conflicts.

The Steering Committee and the Working Group created for the Study may provide appropriate vehicles for the discussions. It would be relevant to discuss the Master Plan proposals in terms of the six broad programs. In addition to regular members of the Steering Committee and the Working Group, other related agencies and institutes should be invited, depending on the programs. The expected participants in the six broad programs are presented in the table below.

Broad program	Participants
Agro-Industrial Complex Development	BMI; CENTA, CENDEPESCA, MAG-Agronegocios, MOE-PROESA, PRODERNOR, Tradepoint; CONACYT; NAS; UES
Watershed Development and Management	CDA (four departments); MAG; MARN-SNET, ANDA, CEL
Environment and Tourism Development	CDA; CONAMYPE, CORSATUR, FISDL, INSAFORP, ITCA, MARN; Naval; municipalities
Spatial Structure Strengthening	CDA; COMURES, MARN, MOP, VMVDU; municipalities
La Union Port Revitalization	ANDA, CEL, CEPA, MARN, MOP, PROESA; CDA; municipalities
Entrepreneurial Base Development	BMI, CONAMYPE, INSAFORP, ITCA, MINED, PROESA, universities; municipalities

Each meeting should be coordinated by CND. The Master Plan proposals would be discussed by broad program first at the Working Group level to clarify sector concerns and recommend resolution of sector conflicts. Results should be reported to the Steering Committee and sector conflicts resolved by broad program. Based on the resolution, CND should prepare a policy paper recommending the adoption of the Master Plan, with addenda if necessary, for submission to the cabinet. It is important that the Master Plan be adopted formally to become part of the national development policy. Addenda may be prepared to allow flexible operation of the Master Plan as well as revisions necessary to make it fit to policies of sector agencies.

10.1.2 Promotion and marketing

In parallel with these procedures, the Master Plan proposals should be disseminated widely to facilitate their implementation through further cultivating the public acceptance. The following would be particularly effective:

1) conducting four workshops/seminars to convey the Master Plan proposals to:
   - mayors and members of the Municipal Council of Conchagua and La Union for the zoning proposals and required norms,
   - mayors and the Municipal Councils of the six gulf municipalities for the analysis of the Free Port and Economic Zone,
   - officials and staff of public and private institutions related to each proposed project/program, and
   - members of Congressional Committees of Treasury, Public Works, Municipal Affairs, and Environment.
2) preparing publicity materials such as brochures and videos as well as the web site addressing to different audiences, including prospective investors,
3) drafting promotion materials for selected priority projects and programs for both the private sector and international donors,
4) launching a series of local TV programs combining video presentation, plan schematics and

commentaries by various people,

5) organizing investment promotion seminars, in coordination with PROESA, to market specific projects for private investments, and
6) convening international donors' meetings to strengthen the support base for coordinated development aid.

CND should take the initiative in all of these activities. To carry out these and other tasks, CND needs to be much strengthened for its technical and administrative capacity as proposed in Section 10.4. Further technical cooperation by international donors is also expected.

Considering that CND has been effecting participatory mechanism for the Eastern Region development with extensive consultation with various groups of local people, further cultivation of public acceptance is expected especially at the grassroots level. A consortium of NGOs may be formed to cooperate with CND for social marketing of the Master Plan.

To cultivate a sense of solidarity widely in the Eastern Region and promote the Eastern Region under the shared vision established by the Master Plan, the following should be prepared:

i) permanent exhibition of the Master Plan vision, strategy and proposals with photographs, videos and diagrams,
ii) stickers with the Eastern Region logo for wide distribution,
iii) six fiberglass logo posts for municipal offices of the micro-region,
iv) one fiberglass logo post at the permanent exhibition site,
v) reproduction of a large number of the Executive Summary,
vi) T-shirts with the logo for distribution to members of related agencies, institutions and business groups, and
vii) banner with the logo to be used for various events.

10.2 Pilot Project Implementation

As part of the Study, the selected pilot projects have been promoted, which were formulated through consultative meetings with various local groups, facilitated by the CND/JICA joint team. The indigo industrialization pilot project should be extended. To evaluate the initial implementation of the pilot project, a joint evaluation team should be formed with the participation of agencies involved in the pilot project implementation. The responsibilities of these agencies for dissemination and replication of the results of the pilot projects should be clarified. Also, more pilot projects would be formulated and implemented in different sectors by the local initiative, supported by CND.

10.2.1 Extension of indigo industrialization pilot project

Immediately following the completion of the ongoing pilot project, two initiatives should be taken at the central and the local levels. At the local level, CND should fully take over the

management responsibilities to maintain the momentum generated through the pilot project implementation. Basically, the same structure of the pilot project team should be maintained but the performance of each actor involved in the pilot project should be evaluated by CND. Various activities initiated by the pilot project should be continued using, in principle, local resources. To support the CND management function, a dispatch of a technical expert should be sought together with minimal additional facilities provided to allow continued implementation including proper reporting of progresses and information exchange among actors involved.

At the central level, a committee should be formed, at the initiative of CND, involving all the related organizations such as MAG, MOE, PROESA, ITCA, and universities to support the indigo industrialization. The committee should formulate a three-year program aiming at accelerating the growth of the indigo industry. By the end of the program, a number of private firms would start producing and selling indigo products in the form of indigo powder and dyed products to international markets. The program would contain the following components:

1) upgrading and dissemination of technology for farming, extraction, dyeing and quality control compatible with international requirements,
2) financial assistance to farmers in constructing more extraction facilities,
3) establishment of marketing strategy and promotion activities encompassing products development, brand establishment and sales promotion,
4) promotion geared toward potential investors, and
5) establishment of a public-private joint-venture indigo company as an initial step.

The three-year program should be implemented basically by the same team as involved in the pilot project and its follow-up, supported by those agencies and institutes constituting the committee. A clear division of responsibilities should be established for both the team members and the committee members. For any function that may not be performed satisfactorily by either party, external support should be sought.

10.2.2 Initiation/Continuation of additional pilot projects

(1) Coffee improvement

The objective of this pilot project is to improve coffee production and processing with emphasis on high elevation coffee for quality products aiming at export market. The project consists of the following components:

1) formation of coffee producers organizations,
2) installation of two units of coffee pulping machines,
3) market survey and preliminary marketing,
4) technical extension for coffee production, harvesting, pulping and other treatment,
5) development of trade name and logo for export coffee, and

6) processing of organic coffee certification.

Four coffee producers organizations have been formed in Jucuapa and Chinameca, Berlín and San Francisco Javier, Santiago de María and Tecapán, and Perquín. Purchase orders for coffee pulping machines have been placed for the next harvesting season. The market survey has been conducted by Trade Point, focusing on Japan, the U.S., Canada and a few other potential markets. The project will analyze market requirements, advantages and disadvantages of each marketing opportunity and other related aspects. The process to obtain organic coffee certification has been set in motion at two cooperatives of Jucuapa and Las Marías. A trade name and a logo for export coffee may be developed through a contest.

The pilot project should be extended in the next stage in a few aspects. Additional pulping machines would be installed. Depending on outcomes of the pilot implementation, different dimensions and organizational arrangements may be experimented. Coffee producers organizations would be further strengthened for joint marketing of quality products under the common trade name and logo selected during the pilot implementation. Following the preliminary marketing, major contracts would be negotiated with selected export markets.

Another possible extension is the introduction of beekeeping in some coffee plantations. This would involve formation/strengthening of beekeepers organizations, contract arrangements with coffee growers organizations, support for procuring additional equipment for beekeeping and honey extraction and processing, and technical extension. Production of propolis may also be pursued.

(2) Tourism circuits formation

Extending the participatory efforts by local tourism groups assisted by CND, a pilot project has been formulated to drive the tourism development in the Eastern Region. The main objective of the project is to establish viable tourism circuits combining different tourist attractions in the Region.

Three tourism circuits have been identified as most promising:

1) Fonseca gulf route in the municipalities of Conchagua and La Union,
2) peace route through the municipalities of Perquin, Arambala, Jocoatique, and Villa El Rosarid in Morazan, and
3) Juiquilisco bay and Tecapa Chinameca mountains route covering the municipalities of Jucuaran, Puerto el Triunfo and Alegria in Usulutan.

To make these routes viable tourism circuits, tourism products along each route need to be upgraded and combined, and tourism services improved. One possibility is to develop unique local cuisine using locally available raw materials. They may include health food and organic food. Other possibilities should also be pursued.

(3) Eastern Region research center

Five education/research institutes in the Eastern Region, viz., Universidad Gerardo Barrios, UNIVO, UES (Universidad de El Salvador), ITUS (Instituto Tecnológico de Usulután), and ITCA San Miguel have agreed to establish a regional research system with the assistance of CND. They will share facilities and resources and coordinate research activities. To support their activities, a common database should be established, and these institutes inter-linked for information exchange.

Local entrepreneurs have limited access to business information for training opportunities, potential markets and partners, available technology and resources. Prospective investors do not have adequate data and information on the Eastern Region, to say nothing of business opportunities. To support business development, it is essential to establish a database for business information and to disseminate regional information to other regions and for prospective investors. As a prerequisite to the pilot project implementation, the member institutes of the regional research system should clarify, in cooperation with CND, the implementing arrangements for the center including staffing and cost sharing and the functional division with the existing Infocentros.

As an initial step to establish the Eastern Region research center, the pilot project would establish a prototype database in the Eastern Region to support the ongoing initiative of the regional research system. A GIS database established through the Study would be replicated in the Eastern Region with the basic hardware and software, and expanded in steps. Institutes of the regional research system would carry out various surveys to generate additional data useful not only for their research activities but also for local entrepreneurs and prospective investors.

10.2.3 Formulation of more pilot projects

Several rural development projects were formulated through community workshops as part of the Study. A few of them were elaborated, and other projects formulated by various promotion groups in the Eastern Region should be elaborated as additional pilot projects. Including these, potential pilot projects are described.

(1) Cashew fruits and out shells processing

The project objective is to prepare conditions necessary to improve generation of income and employment opportunities from the cultivation and processing of cashew through the selection of appropriate technology for cashew fruit and shell processing to be implemented in the next growing season. Local initiatives pre-selected for involvement are the cashew producing cooperatives of Corolama in San Miguel and San Ramon in Usulutan.

(2) Small-scale milk processing

This initiative involves approximately 200 small and medium-scale livestock farmers organized

in a cattle producers' association from seven municipalities in the northern La Union. The main objective of the project is to upgrade and standardize the quality of small-scale cattle production and milk processing to improve commercialization. This will imply:

- training for "popular" veterinarians within the producers' organization to improve the quality and the quantity of milk produced,
- intensive training and identification of needs for technological upgrading for milk processing,
- elaboration and initial implementation of collective commercialization strategy, and
- strengthening and legalization of the producers' organization.

(3) Apiculture competitiveness strengthening

The main objective of the project would be to strengthen the honey processing capacity of the association comprising approximately 30 beekeepers from the municipalities of Villa El Triunfo, Volcan de Chaparrastique in San Miguel, Tecapán, Jucuapa, and San Jorge. The main outcome would be the identification of appropriate technology and possible installation of a small-scale honey processing plant to be managed by this group. The project will also train the beekeepers in order to strengthen their production and marketing capabilities.

(4) Small-scale irrigation

In 1989 and 1991, MAG identified 10 sites for small-scale irrigation in the Eastern Region: six in San Miguel, three in Usulutan, and one in La Union as presented in Table 10.1 and Figure 10.1. These sites are generally located in areas where more serious dry spells occur. These irrigation projects have not been implemented except the Ceiba Hueca project in Usulutan due to limited funding. The remaining projects should be implemented as pilot projects to demonstrate effects of irrigation and produce vegetables and other marketable crops. For each project, the following should be realized:

- beneficiary farmers' organizing,
- provision of technical guidance for the design and the construction of irrigation facilities based on the review of the original study by MAG, and
- provision of other support to the farmers' organization, such as credit and facilitation of marketing.

(5) Poultry-vegetable integrated farming (Avi-Horta)

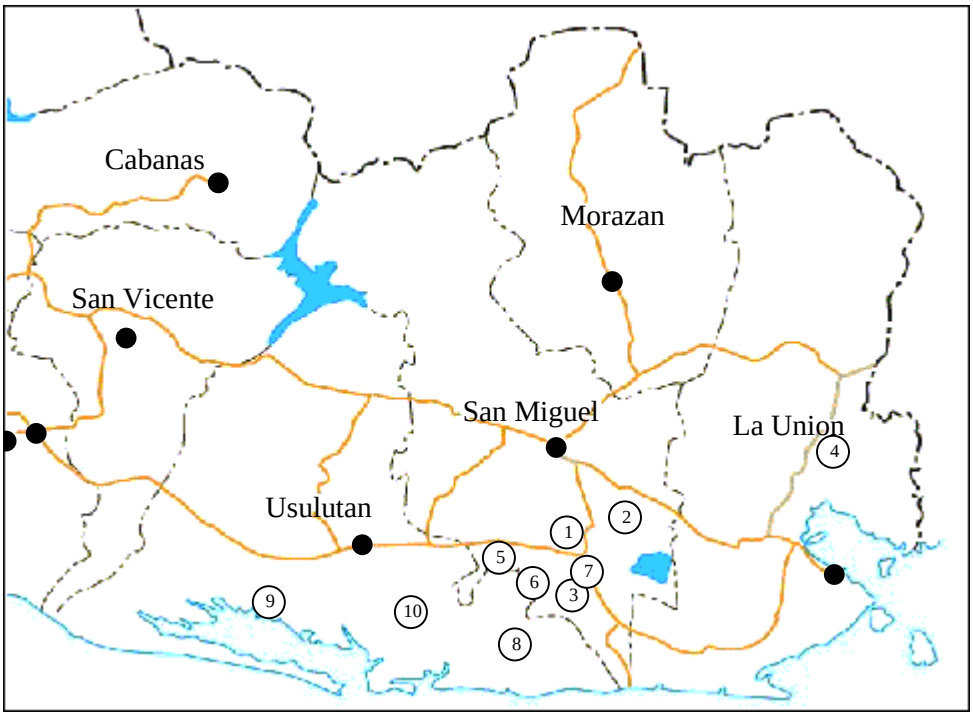
The objective of this pilot project is to develop a model-farming scheme for small farmers in the Eastern Region to improve their livelihood and at the same time contribute to the Eastern Region development drive. The model combines poultry farming (or aviculture) for meat and eggs and production of a few vegetables (or horticulture). Some waste vegetables may be used to feed chickens, and chicken wastes used as organic fertilizer to grow vegetables for integrated farming. This will increase the value-added for vegetable production through both reduction of

Table 10.1. Small-scale Irrigation Project in the Eastern Region (FS by MAG, 1989 and 1991)

No.	Name of Project	Depart-ment	Munici-pality	Irrigation Area (ha)	Water Source	Method of Irrigation	Study Year	Cost (US$10^6)	B/C	Status of Project
1	Cantora	San Miguel	San Miguel	50.00	Laguna San Juan	Pump	1989	*0.314*		not implemented
2	Peblo Viejo	San Miguel	San Miguel	100.00	Rio Grande de San Miguel	Pump	1989	*0.628*		not implemented
3	Los Naranjos	San Miguel	Chirilagua	70.00	Rio Grande de San Miguel	Pump	1989	*0.440*		not implemented
4	El Colorado	La Union	Pasaquina	40.00	Rio Grande de San Miguel	Pump	1989	*0.251*		not implemented
5	Santa Fidelia	San Miguel	San Miguel	62.00	Rio Sirama	Pump	1989	*0.390*		not implemented
6	Gualuca	San Miguel	San Miguel	100.00	Rio Grande de San Miguel	Pump	1991	0.619	1.55	not implemented
7	El Corralito	San Miguel	San Miguel	100.00	Rio Grande de San Miguel	Pump	1991	0.646	1.25	not implemented
8	Hacienda Nueba	Usulutan	C.Batres	63.00	Rio Mendez & Ceiba Hueca	Gravity	1991	0.251	2.72	not implemented
9	La Presa	Usulutan	Jiquilisco	78.00	Rio El Cacao	Gravity	1991	0.565	1.85	not implemented
10	Ceiba Hueca	Usulutan	C.Batres	35.50	Rio Ceiba Hueca	Gravity	1991	0.267	2.81	Existing
	TOTAL			698.50				4.371		

Source 1: Estudio de Prefactibilidad, Factibilidad y Disenos Finales de Ingenieria de Los Proyectos de Riego y Drenaje, Grupo "C", BCIE, MAG, 1989, EYCO.
Source 2: Estudio de Factibilidad Tecnica y Economica y Disenos Finales de Ingenieria para El Proyecto de Riego y Drenaje, BCIE, MAG, 1991, HIDRODESARROLLO.
Note: Costs in 2003 based on estimated costs in 1989 & 1991 by the above MAG study using CPI deflator at 2.2 for 1991 and 3.24 for 1989.

Figure 10.1. Prospective Sites for Small-scale Irrigation Project Identified by MAG



production costs and production of organic vegetables and also reduce risk associated with over-production of perishable products. Candidate sites for pilot implementation were surveyed in Bajo Lempa of Usulutan, Anamoros and Lislique of northern La Union, and Jocoro of Morazan. Farm holdings in these areas are typically small at 1-2mz. The model scheme for these areas would combine the production of a few vegetables such as tomato, green pepper and

cucumber under irrigation by ponds or shallow wells and poultry with 50 chickens initially.

10.3 Further Project Development

The Master Plan specifies the phasing for implementation of the proposed development projects and programs. For those projects and programs specified for Phase 1 up to 2009, initial actions are proposed by broad program.

10.3.1 Agro-Industrial Complex Development

(1) More pilot projects should be formulated in line with the Master Plan strategy (Table 10.2) by subsector/commodity constituting the AIC, comprising support components specified by the Master Plan, implemented by MAG and other related agencies, and coordinated by CND.

(2) MAG or CND should invite municipalities to submit proposals on their own specialty products to be created with indigenous resources, and MAG and NGOs would support the implementation of selected proposals applying the one village-one product approach.

(3) The Eastern Region agro-business center should be established, strengthening one of regional branches of Agronegocios of MAG.

(4) One of technical institutes in the Eastern Region should be accredited by the Government to undertake a basic study to examine existing technologies and applicability for organic fertilizer and to select private enterprises and NGOs through competition to undertake pilot organic fertilizer production.

(5) Dispatch of a foreign expert should be sought for export marketing of the promising commodities identified by the Master Plan (Table 10.2) as well as for investment promotion for commercial scale implementation consistent with pilot projects.

(6) Ongoing efforts by CENDEPESCA should be extended to support fishermen of small-scale operation in cooperation with donor agencies.

10.3.2 Watershed Development and Management

(1) A comprehensive feasibility study with environmental impact assessment (EIA) should be conducted for the El Guayabal multipurpose dam combined with the San Miguel irrigation and the Río Grande midstream river improvement (to be implemented earlier).

(2) The priority scheme for the Río Grande midstream river improvement formulated by the 1997 JICA study should be implemented together with the strengthening of the early flood warning system by SNET.

(3) Several pilot projects should be implemented for small and micro irrigation as part of the AIC initiative; the ongoing CENTA project, implemented with JICA technical cooperation, should be replicated to support some of the pilot projects.

Table 10.2. Master Plan Strategy for Most Promising Commodities and Target Markets

Subsector	Master Plan strategy	Promising commodities	Target markets
Apiculture	1) Organizing suppliers in the Eastern Region to receive training from the existing cluster 2) Developing local sales outlet for stable operation and adequate profits to allow expansion of production and diversification of products 3) Exchanging information with local farmers planning to expand horticultural and fruit production and establishing long-lasting relationships for complementary development 4) Aiming at establishing full scale processing facilities in the Eastern Region to strengthen the cluster as the leader in Central America	- High quality honey (bottled, etc.) - Propolis, pharmaceutical and cosmetic products	Central American and other La tin American countries
Cashew	1) Promoting organic cashew aiming at export market to take full advantage of high quality cashew produced in El Salvador and the Eastern Region 2) Supporting expansion of cashew planting and production, reviving old trees by grafting (for about 1,000mz), and producing and distributing saplings (at present for ¢1.00/tree) to farmers 3) Expanding processing capacity through utilizing existing idle plant and investing in new facilities	- Organic cashew nuts - Cashew wine	- Japan - Domestic market
Coffee	1) Promoting organic coffee particularly in high elevation areas for high quality products aiming at export market 2) Promoting organic coffee particularly in high elevation areas for high quality products aiming at export market 3) Establishing sales channels to chain coffee shops in developed countries 4) Establishing and promoting Salvadoran brands of coffee	- Organic coffee - Low price coffee for blending	- Japan - Domestic market, U.S.
Dairy	1) Organizing dairy framers and integrating them with other related farmers and organizations, including grains producers and importers, feed traders, veterinary services providers, disease control and insemination facilities 2) Establishing a dairy plant for cheese through a joint venture with foreign investor aiming at export market, including overseas Salvadorans 3) Promoting milk supply to students with a government subsidy to improve nutrition, to give students an incentive to pursue education, and to boost dairy farming	Processed cheese	U.S. (targeting at overseas Salvadorans)
Sugar-related	1) Modernizing the existing sugar factory in the Eastern Region to increase sugar yield and to improve the quality	- Liquor and rum from molasses - Bagasse	- Domestic market and neighboring countries

Subsector	Master Plan strategy	Promising commodities	Target markets
	2) Modernizing the existing sugar factory in the Eastern Region to increase sugar yield and to improve the quality 3) Developing confectionary products aiming at domestic and Central American markets		- Domestic industries (power generation, non-tree paper)
Poultry	1) Promoting feed import from Nicaragua, and also through the La Union port after 2007 2) Establishing fishmeal plants in the Eastern Region using currently wasted fish 3) Organizing small and micro producers 4) Providing technical assistance through organized producers for breed improvement and adequate feeding	- Fresh chicken meat - Eggs	- Honduras, Guatemala, Nicaragua - Central America
Indigo	1) Expanding the pilot project through participation of all the actors, including farmers, dye producers, dye workers, designers, marketing agents, researchers, etc. 2) Establishing and promulgating the basic policy to promote Salvadoran indigo and indigo culture 3) Supporting products development for diversified products ranging from handicraft to high value clothing 4) Undertaking vigorous marketing for both dye and indigo dyed products	- Indigo dye - Indigo dyed products	- Japan, EU - U.S., Japan
Kenaf	1) Undertaking kenaf fiber production initially aiming at export to the U.S. and Europe (e.g., Germany) where products development is more advanced 2) Diversifying kenaf products including not only carpet, handicraft, fiber mats and other domestic products but also light construction materials through R&D 3) Seeking partnership with foreign investors for either pulp and paper mill or light construction materials, depending on market conditions that may evolve in the coming decade	Kenaf fibers	Japan, EU, U.S.

Source: Subsection 5.3.2.

(4) The ongoing efforts for coffee improvement should be continued expanding the coverage of coffee areas and cooperatives, particularly for high elevation coffee.

(5) Urban water supply improvement should be initiated by ANDA for San Miguel, the municipalities of the Fonseca gulf micro region, and a few other larger cities.

10.3.3 Environment and Tourism Development

(1) The ongoing efforts for tourism circuits formation should be continued to develop more specialty products and to establish local tour circuits.

(2) Proactive promotion campaigns should be conducted for tourism in the Eastern Region when the La Union port is commissioned both in the Eastern Region and in San Salvador

as the first step to form a strategic alliance with San Salvador-based tour conductors.

(3) The new technological institute in La Union should start to offer a course on tourism services.

(4) The PROGOLFO initiative for environmental management of the Fonseca gulf should be extended; as the first step, a management plan for the gulf and coastal areas should be prepared by the participation of the local people through their municipalities coordinated by CND.

(5) The integrated solid waste management plan for the municipal association of the Fonseca gulf should be implemented as a model project, supported by MARN, with a component of environmental awareness campaign.

10.3.4 Spatial Structure Strengthening

(1) The construction of La Union bypass road should be completed, and the Usulutan bypass construction should follow immediately.

(2) A detailed land use plan should be prepared for the area in and around the logistic circuits including urban centers at nodes of the circuits to identify potential areas for various logistic facilities free from habitual floods; foreign and local consultants should be mobilized by CND to support related municipalities to prepare the plan and guidelines for the facilities' locations in cooperation with COMURES, ISDEM and SNET as well.

(3) A new bridge at the El Amatillo border should be constructed and customs facilities re-established with high-grade telecommunications and other utilities.

(4) A self-help program to improve rural roads should be initialized with the support of FOVIAL.

10.3.5 La Union Port Revitalization

(1) The area of the free port and economic zone (FPEZ) should be delineated, and a detailed land use plan prepared by VMVDU, within the macrozoning of the Master Plan, in cooperation with the municipalities of La Union and Conchagua supported by technical cooperation of a donor agency.

(2) The ministerial task force for the La Union port area should be expanded with additional ministries as well as CND representing local interests to take charge of the designated FPEZ area for authorization of development; at the same time, a local management body should be established by citizens and the municipalities of La Union and Conchagua for planning, management and operation of facilities within the FPEZ in cooperation with relevant public and private entities.

(3) A detailed plan for the La Union port city should be prepared by the municipality with technical supports to be procured through CND.

(4) The La Union power transmission line with a substation should be constructed through competitive bidding; responsibilities for power distribution should be clarified.

(5) Exploration of Conchagua geothermal reserve should be initiated.

10.3.6 Entrepreneurial Base Development

(1) The performance and possible expansion of FANTEL scholarships should be assessed first, and based on the results, the Eastern Region secondary and higher education scholarship should be designed by MINED, including the selection of an NGO for fundraising and management and the possible establishment of a fundraising NGO in the U.S.

(2) The new technological institute in La Union should be established as planned and made operational, supported by donor agencies for technical and financial cooperation.

(3) The expansion of the ongoing APREMAT program should be analyzed immediately, especially for the possibility to cover comparatively more schools in the Eastern Region, supported by a donor agency in view of the need to generate highly qualified human resources to support the development of the La Union port and its logistic functions.

(4) The Eastern Region research center should be established with core facilities at the University of El Salvador in San Miguel linked initially with the other institutes of the regional research system as well as CND.

(5) The effectiveness of INSAFORP for vocational training and skill development should be assessed, and the Eastern Region skill development fund should be designed to complement it.

(6) Incubation centers should be developed at selected Infocentros in the Eastern Region through coordination between the Infocentro headquarters and CND.

(7) A new program to modernize corporate management of SMEs should be introduced by CONAMYPE; dispatch of a foreign expert should be sought to help prepare a diagnosis program, manuals and curricula for management training and to cooperate in the program execution.

(8) A foundation or an NGO should be designated by the Government, facilitated by CND, to invite donors and the private sector including IT companies, which would support the installation of computers and associated facilities and services at municipal offices for use by micro entrepreneurs to obtain business information through the Internet.

(9) A committee should be organized with MINED, foreign experts, ITCA staff in San Miguel, and the private sector to develop curricula for ICT human resources development; foreign experts should be dispatched to ITCA San Miguel to provide the training.

10.4. Strengthening of Implementing Arrangements

10.4.1 Institutional framework with CND

The Eastern Region development will start to be implemented basically within the framework of the existing development administration. As the Eastern Region develops, administrative capacities for development planning, finance and management are expected to increase at the regional and the local levels. How and to what extent the capacities will increase depends, in turn, on the institutional arrangements for the Eastern Region development.

The existing development administration for the Eastern Region consists of the Central Government agencies and their local/regional branches, municipalities and CND. Along with the ongoing decentralization process, some ministerial functions are slowly transferred to municipalities. Formation of municipal associations is encouraged to pool limited resources of individual municipalities for their common interests. Currently creation of an intermediate level of administration has been contemplated between the Central Government and municipalities for more effective decentralization.

At present, municipalities can combine the budget transfer from the Central Government and local revenue to implement their own programs, in principle, without the approval of the Government. CND, liaising with municipalities, can coordinate development activities of sector agencies and promote their implementation. CND may also guide the private sector and facilitate private investments.

The Eastern Region development with the La Union port has been adopted as the takeoff strategy following years' efforts to prepare the National Plan and the strategy for development by the CND initiative. Institutional arrangements for the sustainable development of the Eastern Region should allow the extension of such efforts. Ultimately, a regional authority may be established for the purpose, but as the interim measure, the regional functions of the existing Government agencies should be strengthened, including CND.

10.4.2 Strengthening of regional functions

The following functions need to be strengthened at the regional level for effective realization of the Eastern Region development.

(1) Planning and research
   1) Preparation of medium term development strategy for the regional development,
   2) Promotion of community development and urban development, and
   3) Reinforcement of industrial and community linkages.

(2) Project promotion
   1) Assessment of proposed projects,
   2) Coordination for their implementation, and

3) Fund sourcing for project implementation.

(3) Entrepreneurial development

1) Promotion of SMEs through:
   - improvement of business environment,
   - facilitation of introduction and adaptation of advanced technologies, and
   - support for new industries,
2) Development of human resources,
3) Provision of regional and business information, and
4) Implementation of investment promotion measures.

At present, many central agencies have these functions, including PROESA, Tradepoint, ONI, INSAFORP, and FISDL, naming just a few as well as various ministries. Regional coverage of these functions, however, is quite limited. These functions should be strengthened at the regional level, focusing first on the Eastern Region, redistributing the resources of various existing agencies.

First, the technical and administrative capacity of CND should be much enhanced. Initially, CND may afford to employ a relatively small number of staff, and thus foreign experts to be dispatched on a long-term and short-term basis should complement its staff capacity, supported by donor agencies. Its functions related to planning and research would be most essential for CND, including information generation and exchange. They should be supported by the proposed Eastern Region R&D center.

Second, regional offices of a few central agencies should be established for some other functions listed above. The possibilities include the much discussed PROESA regional office to perform functions related to formulation and promotion of investment projects, or APE to be newly created for export promotion. The proposed agro-business center and agro-industrial technology center would strengthen the regional functions of MAG and CONACYT, respectively.

10.4.3 Central Government initiative

In parallel with the strengthening of regional functions, the Central Government should take the initiative in two aspects to support the Eastern Region development with the La Union port. One is investment promotion and the other is strategic strengthening of logistics industries, both related to the La Union port.

(1) Promotion group

A promotion group should be established to attract investments in the Eastern Region with the participation of CND, CEPA, PROESA, MOE, MAG, and other agencies and institutes. The roles of this group are 1) planning and coordinating investment promotion activities among

actors, 2) exchange of investment information, and 3) monitoring of ongoing projects. The group should also undertake the marketing of the La Union port in cooperation with the private sector to attract more cargoes and shipping lines. Specific activities include 1) conducting port seminars, 2) setting up a website and permanent sales window, 3) dispatching missions to the U.S., and 4) producing brochures. Domestic promotion should target at industries including maquilas currently using Port Cortes or Santo Tomas de Castilla for export.

(2) Logistic cluster

Strong logistics functions are essential for effective operation of the La Union port. Conversely, the establishment of the La Union port would provide opportunities to develop various logistic industries. Existing logistic and distribution related industries should be strengthened.

As a first step, the profiles of the existing companies involved in logistic and distribution services should be prepared. To apply the existing government program to develop these industries, a logistic cluster should be formed. Possible actors to be included in the cluster are 1) shippers/consigners, 2) trucking companies, 3) shipping companies, 4) forwarders, 5) warehouse operators, 6) airlines, 7) CEPA, 8) customs office, 9) port operators, and 10) government agencies. During initial cluster meetings, a common goal should be set among the actors, and issues involved in the cluster development identified such as regulations, multi-modal transport system, telecommunications, and electronic data exchange. Working groups may be formed to conduct research on more essential issues.

10.4.4 Implementing arrangements for La Union-Conchagua area

(1) Initial arrangements

As an immediate measure, the existing ministerial task force for the La Union port area should be expanded for both membership and jurisdiction. Its membership should be expanded to include other ministries and institutes as well as CND representing local interests on behalf of the municipalities of La Union and Conchagua.

Its jurisdiction should be expanded to cover much larger area in the municipalities of La Union and Conchagua that should be designated as the free port and economic zone (FPEZ). This will be the institution for authorization of development in the FPEZ, resolving possible conflicts between ministries and between central and local interests.

As the local counterpart to the ministerial task force, a local management unit (LMU) should be established. This may be built on the existing management group for the city of La Union, but should comprise representatives of citizens and business communities in the municipalities of La Union and Conchagua as well as the municipal governments. At the same time, a sub-regional management unit (SRMU) should also be formed by all the member municipalities of the Fonseca gulf micro region. The SRMU would assume the functions of the intermediate

level of administration currently contemplated, experimenting this new administrative structure prior to formal adoption.

CND should assume the chairmanship of LMU and act as its representative to any central institutions, including the ministerial task force. LMU will be responsible for planning, management and operation of facilities within the FPEZ in cooperation with relevant public and private entities. Any decision by LMU would be brought to the ministerial task force for authorization, if such were considered necessary by LMU. Any possible conflict between ministries and other institutes regarding development and management of any facilities in the FPEZ would also be brought to the ministerial task force for prompt resolution.

(2) Development corporation

In the subsequent stage of the development of the FPEZ, a development corporation should be established to take charge of the FPEZ by public-private partnership. It is expected that LMU will be developed into this corporation authorized by the ministerial task force.

CND should prepare legislative documents necessary for the establishment of the corporation, the nomination of the Chief Executive, and the public subscription for shareholders based on relevant laws. Legislative actions necessary for land acquisition may also be initiated by CND on behalf of the ministerial task force. The supervisory control of the Government may also be effected by the ministerial task force, which may be renamed the FPEZ steering committee.

First, the Chief Executive Director should be nominated, and the public will be notified how to subscribe to the corporation's shares and other related matters. At the first meeting of shareholders, a few directors will be elected to constitute the Board of Directors together with additional directors to be appointed by the Government. They will prepare the articles of association for the corporation.

10.4.5 Funding mechanism

New funding schemes should be introduced to increase regional fund mobilization in a significant way. Funds so secured would be directed to economic activities, support infrastructure and human capital. For human capital, two new schemes have been proposed: the Eastern Region secondary and higher education scholarship fund and the Eastern Region skill development fund (Subsection 10.3.6). For the other two aspects, the following should be introduced.

(1) The credit guarantee fund should be established by the Government, complementing the reciprocal guarantee trust fund recently established, to support a portion of the total credit granted particularly to overseas Salvadorans and their remittance recipient families; a prestigious bank in the U.S. should be designated to manage the fund, and details of fund management and operation should be worked out between the Government and the bank.

(2) CND should encourage various local groups, municipalities, and municipal associations to organize remittance recipient families and to apply for the reciprocal guarantee trust fund or the credit guarantee fund to support investments in their common interests, respectively; CND should provide guidance for the identification of investments opportunities and the formulation of specific projects.

(3) An investment promotion center should be established in each of the major cities in the U.S. with a concentration of Salvadorans by inviting contributions from respective overseas Salvadorans associations through the embassy and consulates; the Government should provide a matching contribution, and the priority for establishment should be given to a city that has successfully raise the necessary fund; local counterpart institutes should be established again with the priority given to those localities with the largest contributions.

10.5 Initial Fund Allocation and Fund Sourcing

The indicative investment schedule is presented in the Master Plan, indicating possible fund allocation by phase for all the proposed projects and programs. For those projects/programs or their components, for which some actions should be taken in Phase 1, more detailed fund allocation is proposed in Table 10.3. Such projects/programs that should be completed by the time when the La Union port would be commissioned in 2007 are designated. Cost estimates for individual projects and programs are indicative at this stage only for the purpose of obtaining the total cost by phase.

Proposed fund sources to implement the projects/programs and their components during Phase 1 are presented in Table 10.4. The fund sources include the Central Government and municipalities, international donors, the private sector, and NGOs. For those projects/programs to be funded by international donors, the proposed external support is also indicated in the table.

Of the 27 projects and programs proposed, 17 would need support from international aid organizations. Dispatch of foreign experts should be sought for the AIC support program (for overall planning and management and export promotion), the logistic facilities location planning and management (for development/land use planning), and the incubation centers (for corporate finance, management, training, etc.). Of the ongoing aid projects, extension should be sought for the early flood warning system by SNET/USAID, the agricultural technology development and transfer by CENTA/JICA, PROGOLFO, PROARCA, and APREMAT. Continued development and implementation of various pilot projects should be supported by several donor agencies and NGOs. Technical cooperation for FS, DD or program design should be sought for the El Guayabal multipurpose dam, El Amatillo border facilities improvement, La Union FTZ, modern corporate management program, business associations establishment program, ICT human resources development program, and agro-industrial center. Other projects would need mainly financial cooperation. With all the expected support from

international aid organizations, the public fund allocation by the governments during Phase 1 would be reduced approximately to a half.

Table 10.3. Proposed Fund Allocation during Phase 1 before and after the La Union Port Commissioning

Project/Program	Fund allocation 2004-07	2008-09	Note
1. Agro-Industrial Complex Development	4.0	2.1	US$6.1 million in total for Phase 1
1.1 AIC support program	2.2	1.4	Formulation & implementation of pilot projects
1.2 One village-one product model	1.0	-	(the same as above)
1.3 Agro-business center	0.5	-	
1.4 Organic fertilizer R&D	-	0.1	
1.6 Fishery support program	0.3	0.6	
2. Watershed Development & Management	38.8	74.5	US$113.3 million in total for Phase 1
2.1 Río Grande de San Miguel water resources devt. & mgt.			
- El Guayabal dam & San Miguel irrigation	8.0	30.8	FS, DD & preparatory works
- Río Grande midstream river improvement	15.0	25.0	Implementation
- Flood plain management	3.0	3.0	Flood warning system
2.2 Small & micro irrigation	2.0	3.5	Pilot projects implementation
2.3 High elevation coffee improvement	0.3	-	Pilot project & expansion
2.5 Urban & rural water supply			
- Urban water supply	7.3	10.0	Priority to La Union-Conchagua
- Rural water supply	3.2	2.2	
3. Environment & Tourism Development	1.2	4.9	US$6.1 million in total for Phase 1
3.1 Cooperative tourism development program	0.6	1.7	Pilot implementation
3.2 Fonseca gulf joint environment & tourism devt.	0.3	1.2	
3.3 Environmental awareness program	0.2	0.1	
3.4 Solid waste management program	0.1	1.9	
4. Spatial Structure Strengthening	23.1	22.4	US$45.5 million in total for Phase 1
4.1 Logistic circuits strengthening	10.0	6.0	Usulutan bypass
4.2 Logistic facilities location planning & mgt.	0.5	-	
4.3 El Amatillo border facilities improvement	6.0	1.6	
4.4 Northern longitudinal artery establishment	2.4	12.0	Stepwise improvement of priority sections
4.5 Rural road program	4.2	2.8	
5. La Union Port Revitalization	87.8	24.2	US$112.0 million in total for Phase 1
5.1 FPEZ establishment	41.4	-	Both facilities & institutions
5.2 La Union port city development	32.6	24.2	Priority to the existing urban area & port area
5.3 Geothermal prospecting	0.2	-	Initial implementation may follow
5.4 La Union power transmission	13.6	-	
6. Entrepreneurial Base Development	19.5	11.3	US$30.8 million in total for Phase 1
6.1 Secondary & Higher education strengthening program			
- Eastern Region scholarship	4.9	3.3	Subject to assessment first

Project/Program	Fund allocation 2004-07	2008-09	Note
- Technological institute establishment	2.5	-	
- APREMAT expansion	3.0	2.0	
- Eastern Region research center	0.5	-	Pilot implementation
6.2 SMEs support program			
- Eastern Region skill development fund	4.4	3.0	Subject to assessment first
- Incubation centers	0.6	0.5	
- Modern corporate management	0.6	0.5	
- Micro entrepreneur training	0.2	0.1	
- Business associations establishment	0.3	0.4	
6.3 ICT human resources development			
- Policymakers strengthening	0.4	0.1	
- Engineers & technicians	0.8	0.3	
- End-users training	0.4	0.1	
- Model e-community center	0.4	-	
6.4 Agro-industrial center	0.5	1.0	
Total	174.4	139.4	US$313.8 million in total for Phase 1

Source: JICA Study Team.

Table 10.4. Proposed Fund Sources and External Support during Phase 1 (2004-09)

Project/Program	Fund source				External support
	Government	Donor	Private	NGO	
1. Agro-Industrial Complex Development					
1.1 AIC support program	MAG	✓		✓	Dispatch of foreign experts for overall management and guidance and support for pilot projects
1.2 One village-one product model	MAG	✓		✓	Same as above
1.3 Agro-business center	MAG		✓		
1.4 Organic fertilizer R&D			✓	✓	
1.6 Fishery support program	CENDEPESCA		✓		
2. Watershed Development & Management					
2.1 Rio Grande de San Miguel water resources development & management					
- El Guayabal dam & San Miguel irrigation	CEL, MAG, MARN	✓			Technical cooperation for FS and DD, followed by financial cooperation for implementation
- Rio Grande midstream river improvement	MOP, MARN	✓			Financial cooperation
- Flood plain management	MARN, municipalities	✓		✓	Extension of SNET/USAID project
2.2 Small & micro irrigation	MAG	✓			Extension of CENTA/JICA project
2.3 High elevation coffee improvement	PROCAFE	✓			Support for pilot implementation
2.5 Urban & rural water supply					
- Urban water supply	ANDA, municipalities				
- Rural water supply	ANDA, municipalities			✓	
3. Environment & Tourism Development					
3.1 Cooperative tourism development program	CORSATUR	✓			Support for pilot implementation
3.2 Fonseca gulf joint environmental & tourism development	MARN, CEPA	✓			Extension of PROGOLFO
3.3 Environmental awareness program	MARN, municipalities			✓	
3.4 Solid waste management program	MARN, municipalities	✓		✓	Financial cooperation for equipment and landfill site and PROARCA training
4. Spatial Structure Strengthening					
4.1 Logistics circuits strengthening	MOP	✓			Financial cooperation for bypass roads
4.2 Logistic facilities location planning & mgt.	Municipalities	✓			Dispatch of foreign experts for planning
4.3 El Amatillo border facilities improvement	MOP	✓			Technical & financial cooperation
4.4 Northern longitudinal artery establishment					
- Northern longitudinal road development	MOP				
4.5 Rural road program	MOP, municipalities			✓	

Project/Program	Fund source				External support
	Government	Donor	Private	NGO	
5. La Union Port Revitalization					
5.1 FPEZ establishment					
- La Union free trade zone	CEPA	✓	✓		Technical cooperation for FS
- La Union distribution core development	CEPA		✓		
5.2 La Union port city development	ANDA, MOP, municipalities, etc.	✓			Financial cooperation for water supply & urban roads
5.3 Geothermal Prospecting			✓		
5.4 La Union power transmission	CEL, municipalities		✓		
6. Entrepreneurial Base Development					
6.1 Secondary & higher education strengthening					
- Eastern Region scholarship	MINED		✓	✓	
- Technological institute establishment	MINED				
- APPEMAT expansion	MINED	✓			Extension of MINED/EU project
- Eastern Region research center	MINED	✓	✓		Financial cooperation for core facilities
6.2 SMEs support program					
- Eastern Region skill development fund	Ministry of Labor	✓	✓		Financial cooperation for establishment of the fund
- Incubation centers	Infocentro	✓			Dispatch of foreign experts
- Modern corporate management	CONAMYPE	✓		✓	Technical cooperation for program design & execution
- Micro entrepreneur training	Infocentro, municipalities	✓	✓	✓	Financial cooperation for computers & equipment
- Business associations establishment	INSAFOCOOP,	✓			Technical cooperation for program design & execution
6.3 ICT human resources development	CONACYT, ITCA, INSAFORP	✓			Technical cooperation for training
6.4 Agro-industrial technology center	CONCYT	✓			Technical & financial cooperation

Source: JICA Study Team.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