

Chapter 2 Existing Conditions in the DIDP Area

2.1. Socioeconomy

2.1.1. Demography

(1) Area and population

Table 3 shows some basic demographic characteristics of the DIDP Area.

Table 3 Basic Demographic Characteristics of DIDP Area (1995)

Province/City	Land Area (km ²)	Population in 1995	Population Density (p/km ²)	AAGR (%) 1980-1990	AAGR (%) 1990-1995
Davao Province	8,129	1,191,443	147	3.8	2.4
Davao City	2,443	1,006,841	413	3.4	3.4
Davao del Sur	3,934	677,069	172	1.9	1.4
Davao Oriental	5,164	413,472	80	1.5	0.9
DIDP Total	19,671	3,288,825	167	2.9	2.3

Source: NSO

The DIDP Area has a total area of 19,671 km², of which Davao Province has the largest share with 41% of the total Area or 8,129 km². Davao Oriental is the second largest with 26% or 5,164 km², followed by Davao del Sur with 20% or 3,934 km² and Davao City with 12.4% or 2,443 km².

The total population of the Area in 1995 was about 3.29 million. Davao Province had the largest population of 1.19 million, followed by Davao City (1.01 million), and Davao del Sur (0.68 million). Davao Oriental had the least population of 0.41 million, the lowest population growth rate among the Provinces/City.

The whole of the DIDP Area in 1995 had an average population density of 167 people per square kilometer of land. Davao City was the most densely populated with 413 people per square kilometer, followed by Davao del Sur (172), Davao Province (147), and Davao Oriental (80), respectively. Despite the huge area, Davao Province has a relatively high population density. The very low density of Davao Oriental could be accounted to the large portion of the sparsely populated mountainous areas and poor access to some municipalities including those situated along the east coast.

Being placed as the commercial and trading center in Mindanao as well as BIMP-EAGA region, Davao City's population is growing rapidly with an annual average growth rate (AAGR) of 3.4% during 1980-1995. Davao Province's annual average population growth rate from 1990 to 1995 was 2.4%. Davao Province is located at the center of the DIDP Area, and is traversed by a national road connecting the southern city of Davao and two key cities of Butuan and Cagayan de Oro in the north. Davao del Sur experienced the relatively slow population growth with an annual average rate (AAGR) of 1.4% during the five years from 1990 to 1995.

(2) Urban/rural distribution

According to the 1990 Population Census, 55% of the population in the DIDP Area lived in rural areas. Davao City was highly urbanized, and 73% of the populace in the City lived in the urban area. All three provinces, on the other hand, had majority people in rural areas. Urbanization rate in Davao del Sur was the lowest (24%),

followed by Davao Province(35%),and Davao Oriental (39%).

(3) Employment

Employment data by sub-sector in the DIDP Area are given in Table 4, which reveals some characteristics of the economic structure of the DIDP Area.

In Davao Province, agricultural sector absorbs the majority of labor force. The top three sub-sectors were corn, paddy, and banana production, all of which employed 172,543 workers or 41.7% of the total workers (414,019) in 1995. Construction was the only industry sub-sector in the top ten, ranking 10th (11,961), while metallic ore mining ranking 12th (9,885).

In Davao City, trade ranked top with 75,983 workers or 19.0% of the total workers (400,101) in 1995, followed by corn farming. Other services sub-sectors were ranked in the top ten. Construction ranked third. Food and beverage industry was the highest ranking manufacturing sub-sector at 12th (10,039).

In Davao del Sur, corn farming ranked top with 79,795 workers or 30.0% of the total workers (265,984) in 1995, followed by coconut farming(29,499 or 11.1% of the total). Livestock ranked fourth (21,043), the largest among the LGUs in the DIDP Area. Fishery workers, ranked seventh (12,877), were also the largest.

In Davao Oriental, the top two sub-sectors (corn and coconut) employed 62,872 workers accounting for 46.2% of the total workers (136,130) in 1995. Fishery ranked third (8,901).

In the DIDP Area as a whole, corn farming was the largest subsector employing 225,368, accounting for 18.5% of the total workers in 1995. Other important crops which created employment include coconut (97,850), rice (89,140), and banana (55,980). Livestock and fishery sub-sectors also employed large number. Overall, the whole agricultural sector including agriculture, forestry, and fishery employed 636,114 or 52.3% of the total workers (1,216,234) in 1995.

Of all the manufacturing sub-sectors, food and beverage industry had the largest workers numbering 16,528 in 1995, but was not ranked even among the top ten sub-sectors. Construction ranked ninth (52,236) in the same year. Metallic ore mining employed 11,207 workers mostly in Davao Province.

Trade was among the top ten subsectors in all the DIDP provinces and Davao City. It was the second largest employer with 141,649 workers, next only to corn farming. Most workers seem to be engaged in small retailing such as sari-sari stores in urban and rural areas throughout the DIDP Area.

Table 4 Employment by Economic Sub-sectors in DIDP Provinces and City (1995)

	Number of Workers					Percent Shares (%)				
	DIDP Total	Davao Province	Davao City	Davao del Sur	Davao Oriental	DIDP Total	Davao Province	Davao City	Davao del Sur	Davao Oriental
Total	1,216,234	414,019	400,101	265,984	136,130	100.0	100.0	100.0	100.0	100.0
Agriculture/Forestry/Fishery	636,114	253,707	105,762	184,254	92,391	52.3	61.3	26.4	69.3	67.9
Agriculture	601,451	246,183	100,724	171,300	83,244	49.5	59.5	25.2	64.4	61.2
Palay	89,140	53,590	8,185	18,966	8,399	7.3	12.9	2.0	7.1	6.2
Corn	225,368	77,054	35,177	79,795	33,342	18.5	18.6	8.8	30.0	24.5
Coconut	97,850	24,080	14,741	29,499	29,530	8.0	5.8	3.7	11.1	21.7
Banana	55,980	41,899	9,859	3,421	801	4.6	10.1	2.5	1.3	0.6
Sugarcane	5,512	184	208	5,058	62	0.5	0.0	0.1	1.9	0.0
Livestock	48,187	13,119	9,341	21,043	4,684	4.0	3.2	2.3	7.9	3.4
Other Crops/Agri. Services	79,414	36,257	23,213	13,518	6,426	6.5	8.8	5.8	5.1	4.7
Forestry	936	370	243	77	246	0.1	0.1	0.1	0.0	0.2
Fishery	33,727	7,154	4,795	12,877	8,901	2.8	1.7	1.2	4.8	6.5
Industry	123,363	36,108	66,593	13,847	6,815	10.1	8.7	16.6	5.2	5.0
Mining and Quarrying	13,691	10,855	1,739	314	783	1.1	2.6	0.4	0.1	0.6
Metallic Ore	11,202	9,885	560	129	628	0.9	2.4	0.1	0.0	0.5
Non-Metallic	2,489	970	1,179	185	155	0.2	0.2	0.3	0.1	0.1
Manufacturing	53,391	12,095	32,165	6,962	2,169	4.4	2.9	8.0	2.6	1.6
Food and Beverage	16,528	3,018	10,039	2,855	616	1.4	0.7	2.5	1.1	0.5
Tobacco	394	39	291	36	28	0.0	0.0	0.1	0.0	0.0
Textiles/Garments/Leather	10,598	2,702	5,836	1,574	486	0.9	0.7	1.5	0.6	0.4
Wood/Cork/Cane/Bamboo	4,912	1,175	3,441	161	135	0.4	0.3	0.9	0.1	0.1
Furniture	4,048	1,202	2,239	355	252	0.3	0.3	0.6	0.1	0.2
Paper/Publishing/Printing	2,483	354	1,871	164	94	0.2	0.1	0.5	0.1	0.1
Chemicals/Rubber/Plastics	1,893	359	1,390	106	38	0.2	0.1	0.3	0.0	0.0
Non-Metallic Mineral Prds	2,145	244	1,647	230	24	0.2	0.1	0.4	0.1	0.0
Metal Processing	3,106	1,220	1,555	228	103	0.3	0.3	0.4	0.1	0.1
Machinery	3,028	793	1,804	272	159	0.2	0.2	0.5	0.1	0.1
Transport Equipment	1,131	266	646	150	69	0.1	0.1	0.2	0.1	0.1
Other Manufacturing	3,125	723	1,406	831	165	0.3	0.2	0.4	0.3	0.1
Electricity, Gas and Water	4,045	1,197	2,197	390	261	0.3	0.3	0.5	0.1	0.2
Construction	52,236	11,961	30,492	6,181	3,602	4.3	2.9	7.6	2.3	2.6
Service Total	456,757	124,204	227,746	67,883	36,924	37.6	30.0	56.9	25.5	27.1
Trade	141,649	35,597	75,983	21,226	8,843	11.6	8.6	19.0	8.0	6.5
Services	312,635	87,653	151,163	46,181	27,638	25.7	21.2	37.8	17.4	20.3
Repair	13,112	2,768	8,434	1,326	584	1.1	0.7	2.1	0.5	0.4
Restaurants and Hotels	16,803	2,479	12,391	1,379	554	1.4	0.6	3.1	0.5	0.4
Transportation	53,482	15,189	27,300	7,770	3,223	4.4	3.7	6.8	2.9	2.4
Post and Communication	2,504	348	1,866	188	102	0.2	0.1	0.5	0.1	0.1
Financial Intermediation	8,480	1,677	5,726	654	423	0.7	0.4	1.4	0.2	0.3
Real Estate and Renting	3,042	546	2,126	204	166	0.3	0.1	0.5	0.1	0.1
Private Business	32,137	10,944	12,628	4,851	3,714	2.6	2.6	3.2	1.8	2.7
Government Services	71,294	20,028	28,852	13,477	8,937	5.9	4.8	7.2	5.1	6.6
Private Educa./Health, etc.	17,709	4,008	10,811	2,245	645	1.5	1.0	2.7	0.8	0.5
Other Services	22,920	6,793	11,444	2,904	1,779	1.9	1.6	2.9	1.1	1.3
Domestic Services	71,152	22,873	29,585	11,183	7,511	5.9	5.5	7.4	4.2	5.5
Not Stated	2,473	954	600	476	443	0.2	0.2	0.1	0.2	0.3

Source: 1995 Census of Population (NSO)

(4) Income and expenditure

Based on the Family Income and Expenditure Survey conducted in 1994, annual average family income in the DIDP Area as of 1994 was about P39,025, as shown in Table 5. The value was about 9% and 5% lower than the national and Region XI averages, respectively. From 1985 to 1994, the annual average growth rate (AAGR) was about 2.3%. Davao City had the highest average annual income (P68,999 per annum): higher than the national average by more than 60% and Region XI by more than 67%. On the other hand, Davao Oriental had the lowest average family income (P24,834), which even decreased by 0.9% over the period.

Table 5 Family Income and Expenditure in DIDP Area, Region XI and the Philippines: 1985 and 1994

Province/City	Average Family Income			Average Family Expenditure		
	1985	1994	AAGR	1985	1994	AAGR
Davao Province	29,198	36,068	2.4%	25,638	30,545	2.0%
Davao City	47,116	68,999	4.3%	37,599	56,657	4.7%
Davao del Sur	21,926	26,197	2.0%	21,081	21,596	0.2%
Davao Oriental	26,254	24,834	-0.9%	22,372	20,708	-0.9%
DIDP Total	31,124	39,025	2.3%	26,673	32,377	2.2%
Region XI	31,817	41,207	2.9%	27,134	34,698	2.8%
Philippines	34,695	42,800	2.4%	30,017	34,823	1.7%

Note: Values are in Pesos at 1988 constant price. Growth rate is annually averaged.

Source: 1994 Family Income and Expenditure Survey (NSO)

As for expenditure level, the DIDP average in 1994 was P32,377, slightly lower than both Region XI and the nation, respectively. Compared with the trend in income, growth rate of expenditure in Davao del Sur had been stagnant.

(5) Sources of income

Families in the DIDP Area derive income mainly from two sources: salaries/wages (43%) and entrepreneurial activities (46%), as shown in Table 6. Agricultural entrepreneurs accounted for 183,512 or about 31% of the total number of families (585,084) and 68% of those under entrepreneurial activities (271,294) in 1994. On the other hand, the number of salaried families working in agriculture-related establishments was 83,738, or about 33% of the total salaried families (251,080) and 14% of the total. The total number of family that derived income from agriculture was 267,250 or about 46% of the total number of families.

Table 6 Number of Families by Main Source of Income in DIDP Area (1994)

Main source of Income	Davao Province	Davao City	Davao del Sur	Davao Oriental	DIDP Total
Wage and Salaries	69,611	102,304	52,305	26,860	251,080
- Agricultural	34,059	15,101	24,247	10,331	83,738
- Non-agricultural	35,552	87,203	28,058	16,529	167,342
Entrepreneurial	95,584	51,270	75,084	49,356	271,294
- Agricultural	73,621	11,148	58,800	39,943	183,512
- Non-agricultural	21,963	40,122	16,284	9,413	87,782
Other Source	18,058	26,174	8,148	10,330	62,710
Total	183,253	179,748	135,537	86,546	585,084

Source: 1994 Family Income and Expenditure Survey (NSO)

The estimates by the National Statistical Coordination Board (NSCB) in 1994 show that 39% of the total number of families were way below the poverty threshold in the DIDP Area, and around 22% are within the vicinity. Families deriving income from agriculture constituted the majority of families within or below the poverty threshold. Table 7 shows this comparison between agriculture and non-agriculture related income sources.

Table 7 Poverty Level in the DIDP Area (1994)

Income Sources	Income Class Distribution (%)		
	< P40,000	P40,000 - P59,999	> P60,000
Wages/Salaries			
Agriculture	48	25	27
Non-agriculture	15	21	64
Entrepreneurial			
Agriculture	62	22	16
Non-agriculture	26	22	48
Other Sources	42	16	42

Source: 1994 Family Income and Expenditure Survey (NSO)

2.1.2. Food sufficiency level

Based on the per capita requirement of various food commodities set by Food and Nutrition Research Institute (FNRI), self-sufficiency rate in the DIDP Area is estimated as shown in Table 8

Table 8 Self-sufficiency Rate of Various Commodities in DIDP Area (%): 1991 and 1995

Province/City	Rice		White Corn		Pork		Beef		Chicken		Fish	
	1991	1995	1991	1995	1991	1995	1991	1995	1991	1995	1991	1995
Davao Province	132	95	1185	354	85	83	15	17	7	20		11
Davao City	19	25	54	186	105	113	11	19	34	39		14
Davao del Sur	191	139	123	114	97	84	26	51	33	38		40
Davao Oriental	66	60	1559	851	121	136	36	28	37	34		74
DIDP Total	104	79	390	214	98	99	19	26	25	31		26

Source: JICA-DIDP team based on the data from BAS, NFA, FNRI, NEDA, NSCB, NSO

The DIDP Area, despite the size of agriculture, has not been self-sufficient in the basic food commodities. Self-sufficiency in rice, the people's staple, has always been elusive in the last six years. Overall self-sufficiency rate in rice in 1995 was 79%.

Production of corn has always been a surplus in terms of human consumption requirement mainly because of a small percentage of corn-eating population. Total self-sufficiency rate in corn in the Area in 1995 showed 214%. Significant portions of produced corn in Davao Oriental are shipped towards Visayas, especially Cebu.

Except for pork, meat production in the DIDP Area has not been enough for its population. The chronic deficit in beef requirement is a nationwide phenomenon and is being remedied by the Government through deregulation of the livestock industry. In 1995, the DIDP Area beef sufficiency level was only 26% with Davao

Province and Davao City having the lowest (17% and 19%, respectively). Davao del Sur was about 51% sufficient while Davao Oriental was 28%.

The Area produced only about 31% of its chicken meat requirement. Davao Province had the lowest sufficiency level due to low production rate. The same is true with the provinces of Davao del Sur and Davao Oriental. Davao City's higher sufficiency level was due to the size of broiler poultry raising. In all three provinces, a big majority of chicken raised were native breeds which take much longer time (average of six months for enhanced native breed) to grow than broiler. Despite the growing period, native chicken is a much preferred meat because of its taste.

Despite the long coastal area, the self-sufficiency rate in fish in the DIDP Area was as low as 26%. Davao Oriental showed rather high self-sufficiency rate of 74%, while that in Davao Province and Davao City was less than 20% each.

2.2. Natural Conditions

2.2.1. Climate

The DIDP Area has generally favorable climatic conditions for agriculture. Rainfalls are evenly distributed throughout the year without pronounced dry periods and typhoons. Temperature is uniformly high with a monthly maximum range of 31-33 °C and monthly minimum of 21-23 °C.

Judging from records at a limited number of rainfall stations, most parts of the DIDP Area receive an annual rainfall exceeding 1,500 mm. Mountainous areas in the north and the northeast receive much higher rainfalls. Annual rainfall is smaller in the peninsular portion of Davao Oriental and the southern part of Davao del Sur, where relatively dry periods are experienced during March-May.

2.2.2. Land resources

Land morphology

The DIDP Area is characterized by its dominantly undulating and hilly topography, which was formed by the complex movement of the Philippine Plate, the Pacific Plate, the Eurasian Plate, and by the Pan-Pacific Volcanic activity.

Elevation

According to the computation results of GIS from digitized maps, some 39% of the total DIDP Area, or 7,724 km² is lower than 200 m in altitude. Lower areas lie along coastal areas and major river basins including Padada, Libuganon, Saug and Agusan rivers. Mountains stand mainly along the DIDP's western border with other provinces, and border of Compostela Valley and Davao Oriental. The area in higher than 1,000 m in altitude covers 2,077 km² or 11% of the DIDP Area. Area with elevation between 200 m and 500 m accounts for 5,005 km² or 25% of the whole DIDP Area, and that with elevation ranging from 500 m to 1,000 m shares 25% (4,858 km²) of the total DIDP Area.

Slope

Flat or gently sloped area with slope gradient smaller than 8% occupies 5,446 km² or 28.2% of the total DIDP Area. Area with slope gradient higher than 30% is 7,840 km² or 40% of the DIDP Area.

Soils

Soils in the DIDP Area derived from volcanic rocks/ash, limestone, alluvium etc. are generally fertile. According to the soil map prepared by DA-BSWM, soils in the Area are classified into 13 soil sub-groups and six associations of soil groups, based on the USDA Soil Taxonomy as shown in Table 9 and Figure 1.

Soil fertility and workability classification was made for each of soil units, as part of land capability classification, using available data on soil profile description and physico-chemical analysis, conducted by DA-BSWM. The result revealed that at least 50% of the DIDP Area are moderately suitable (suitability class = 2) for any crops in terms of soil fertility.

Table 9 Area of Soil Sub-Groups/Associations by Province/City in DIDP Area

Soil sub-groups/groups/ associations	Davao del Norte	Compostela Valley	Davao City	Davao del Sur	Davao Oriental	DIDP Total
Tvoic Troofibrists	21.9	0.0	0.0	7.7	13.8	43.5
Hapludult-Rhodudults-Distropepts Association	0.0	33.7	465.5	158.9	370.9	1,029.0
Typic Paleudults	0.0	42.9	0.0	166.7	0.0	209.7
Hapludults-Dystropepts-Eutropepts-Association	5.1	281.1	805.8	154.0	650.6	1,896.6
Rendolls-Eutropepts Association	299.6	245.8	32.1	65.7	147.5	790.8
Vertic Epiaqualls	4.2	0.0	0.0	24.7	0.0	28.9
Aquic Hapludalfs	0.0	20.3	0.0	0.0	9.8	30.1
Typic Hapludalfs	12.0	6.5	4.3	391.4	8.6	422.8
Aeric Tropaquepts	337.7	175.1	0.0	5.3	0.0	518.2
Aquic Eutropepts	88.4	0.0	4.2	10.2	12.8	115.6
Fluventic Eutropepts	638.7	566.3	197.4	555.4	672.4	2,630.3
Typic Eutropepts	359.5	553.7	252.8	172.7	715.6	2,054.4
Eutropepts-Hapludalfs Association	549.6	347.0	282.6	425.3	282.9	1,887.5
Eutropepts-Troporthens Association	0.0	15.1	0.0	163.5	332.2	510.7
Typic Hydraquents	0.0	0.0	0.0	0.0	18.3	18.3
Typic Psammaquents	0.0	77.4	0.0	0.0	0.0	77.4
Typic Tropopsamments	5.1	0.0	2.9	198.8	90.9	297.7
Lithic Troporthens	0.0	0.0	5.8	7.4	0.0	13.3
Troporthens-Eutropepts-Hapludalfs Association	1,004.2	2,115.1	323.9	1,615.5	1,675.5	6,734.2
Riverwash	0.0	0.0	0.0	0.0	2.4	2.4
Escarments	0.0	0.0	26.3	0.0	0.0	26.3
Unclassified	326.0	0.0	0.0	0.0	0.0	326.0
Total	3,652.1	4,480.2	2,403.7	4,123.4	5,004.4	19,662.0

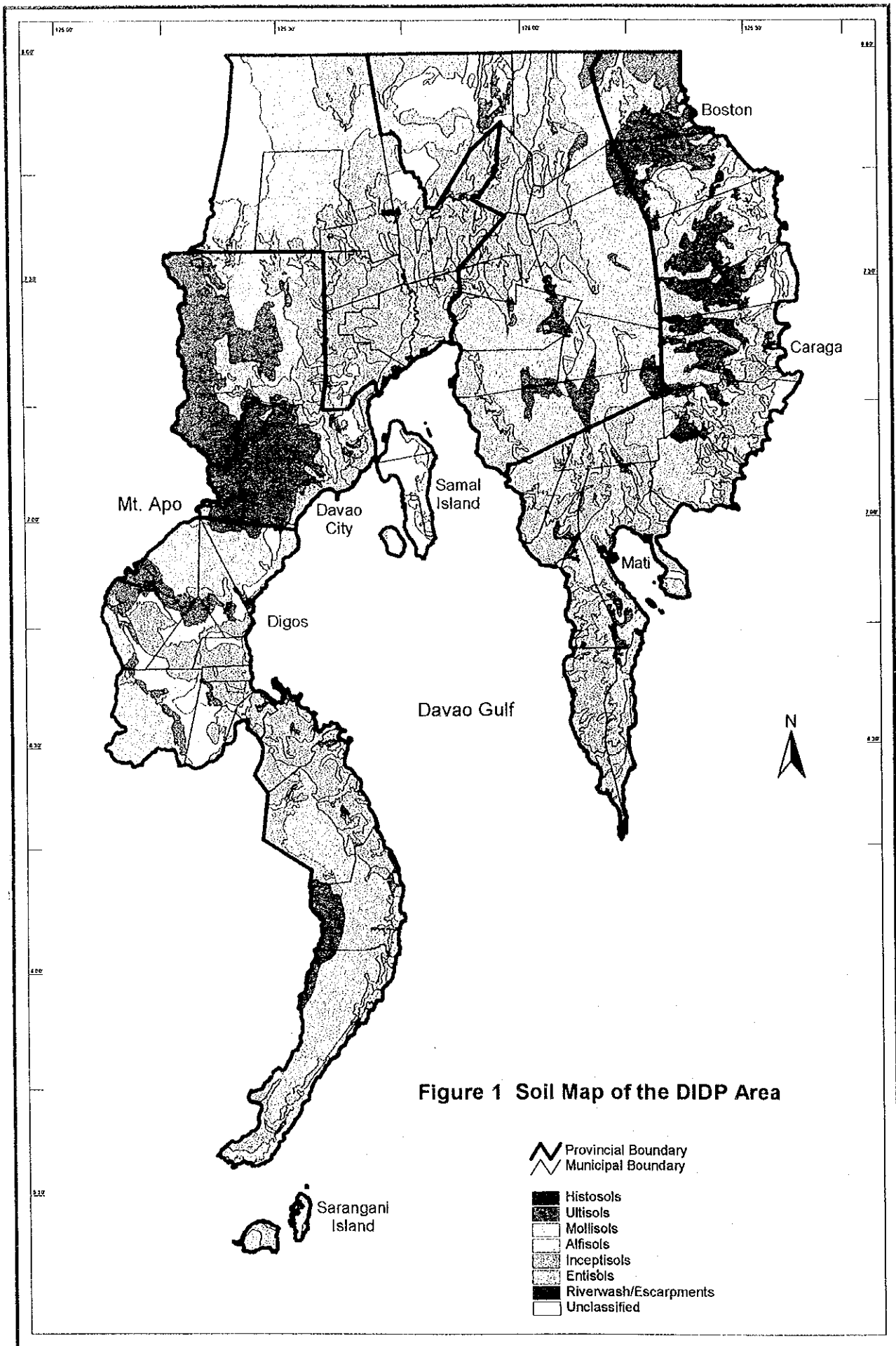
Note: unit is square kilometers.

Source: JICA Study Team

Chemical property of soils in the DIDP Area are generally favorable to plant growth, characterized by high base saturation rate, high base holding capacity, adequate pH value in both top- and sub-soils, adequate electric conductivity (EC) value of soil solution etc. Crop growth limiting factors in terms of chemical properties of soils are, if any, nitrogen and/or phosphorus contents. It suggests that fertilizer requirement in the DIDP Area is less than other areas where other nutrients including potassium, calcium and magnesium are needed. Farmers can take advantage of lessening costs of production.

Land capability

In order to assess land suitability for various crops for future land use planning, land capability classification was made by using GIS, based on the following available data obtained from BSWM:



- 1) Land management units (LMUs) map;
- 2) Soil taxonomy map showing soil mapping units (SMUs);
- 3) Primary data on soil survey (soil profile description) and physico-chemical analysis in and around the DIDP Area;
- 4) Soil/Land Resources Evaluation Project reports for Davao City, Davao Province and Davao del Sur;
- 5) Erosion map; and
- 6) Slope map.

Classification was made by basically following the criteria set by Soil Research Development Center of DA.

Soil rating is made for four different crop production groups:

- 1) Lowland rice including irrigated and rainfed production;
- 2) Upland crops such as grains, vegetable and legumes, rootcrops;
- 3) Tree crops including fruit orchard, forest species, palm species; and
- 4) Pasture crops.

Land suitability for each group is categorized into the following four classes:

Class 1: Soil is highly productive for agricultural use; None to slight limitations of hazards for sustainable crop production; Regarded as naturally fertile and of greatest potential for agricultural use, without need for any particular improvement practices;

Class 2: Soil is moderately productive for agricultural use; With moderate limitation of hazards for sustainable crop production; Some improvement practices are required, hence, with reduced benefits as compared to Class 1;

Class 3: Soil is marginally productive for agricultural use; With severe limitations of hazards for sustainable crop production; Can be cultivated for selected crops under very careful management; Intensive improvement practices are required such that added expenditure to maintain production will bring marginal benefit; and

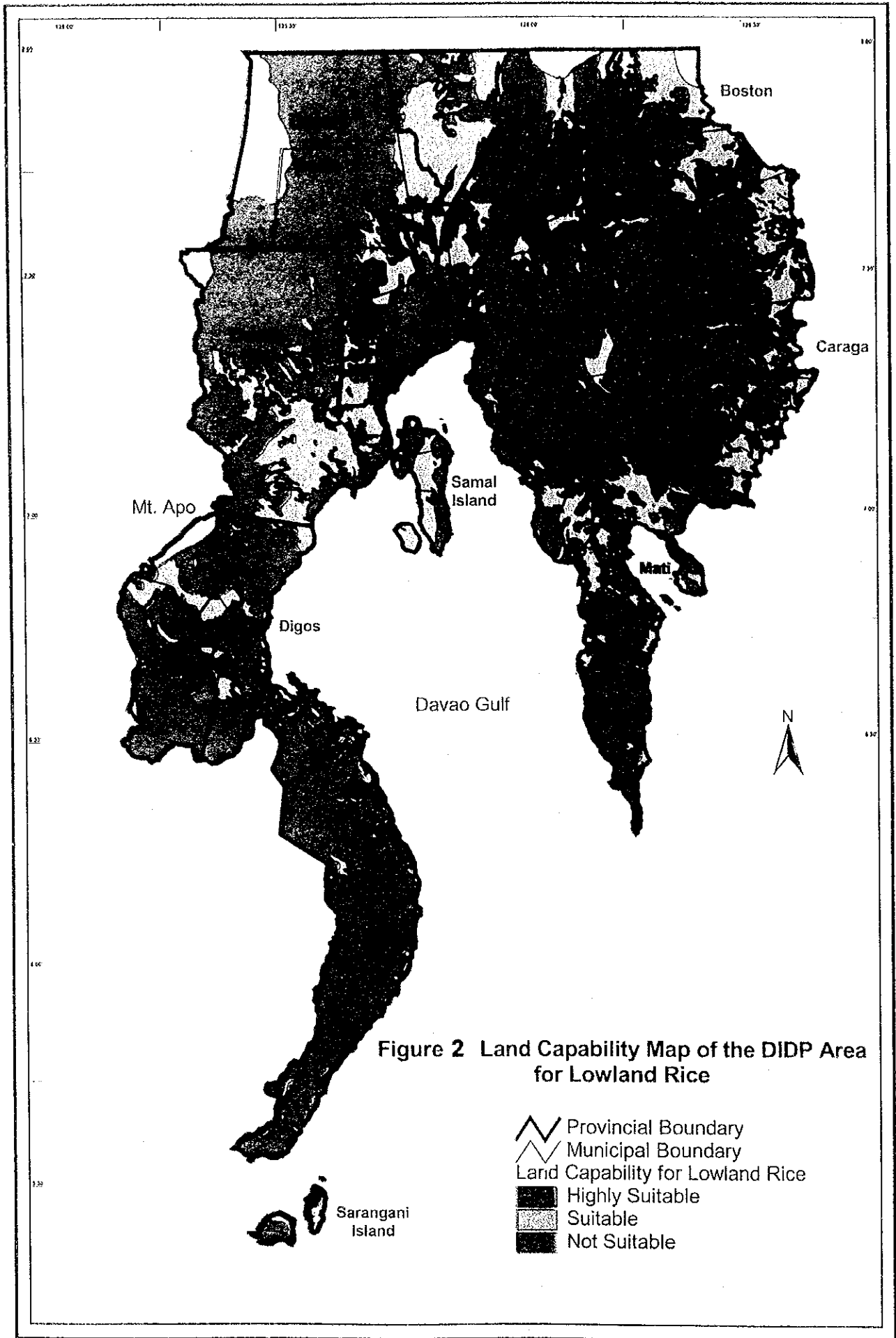
Class 4: Soil is unproductive or incapable of supporting agricultural production; With the greatest natural limitations of hazards.

The results are shown in Table 10 and illustrated in Figures 2 to 5 for each of the crop groups.

Table 10 Land Capability Classification

	Davao del Norte	Compostela Valley	Davao City	Davao del Sur	Davao Oriental	DIDP Total
	(ha)	(ha)	(ha)	(ha)	(ha)	(ha)
Lowland paddy						
Class 2	69,421	35,821	20,225	44,018	37,530	207,015
Class 3	61,563	73,812	66,152	45,808	127,524	374,859
Class 4	199,177	313,848	147,432	310,603	325,705	1,296,764
Upland crops						
Class 2	41,814	29,724	7,578	36,861	33,657	149,632
Class 3	90,930	88,975	76,092	48,119	132,104	436,220
Class 4	197,392	304,799	150,121	315,355	324,939	1,292,606
Orchard						
Class 2	45,659	31,863	8,679	38,694	37,924	162,820
Class 3	184,847	189,353	177,493	133,156	278,513	963,352
Class 4	99,634	202,276	47,619	228,479	174,260	752,269
Pasture						
Class 2	46,088	33,653	9,793	42,379	40,771	172,684
Class 3	185,078	196,076	202,844	171,367	353,592	1,108,956
Class 4	98,975	193,763	21,154	186,585	96,332	596,810

Source: JICA Study Team



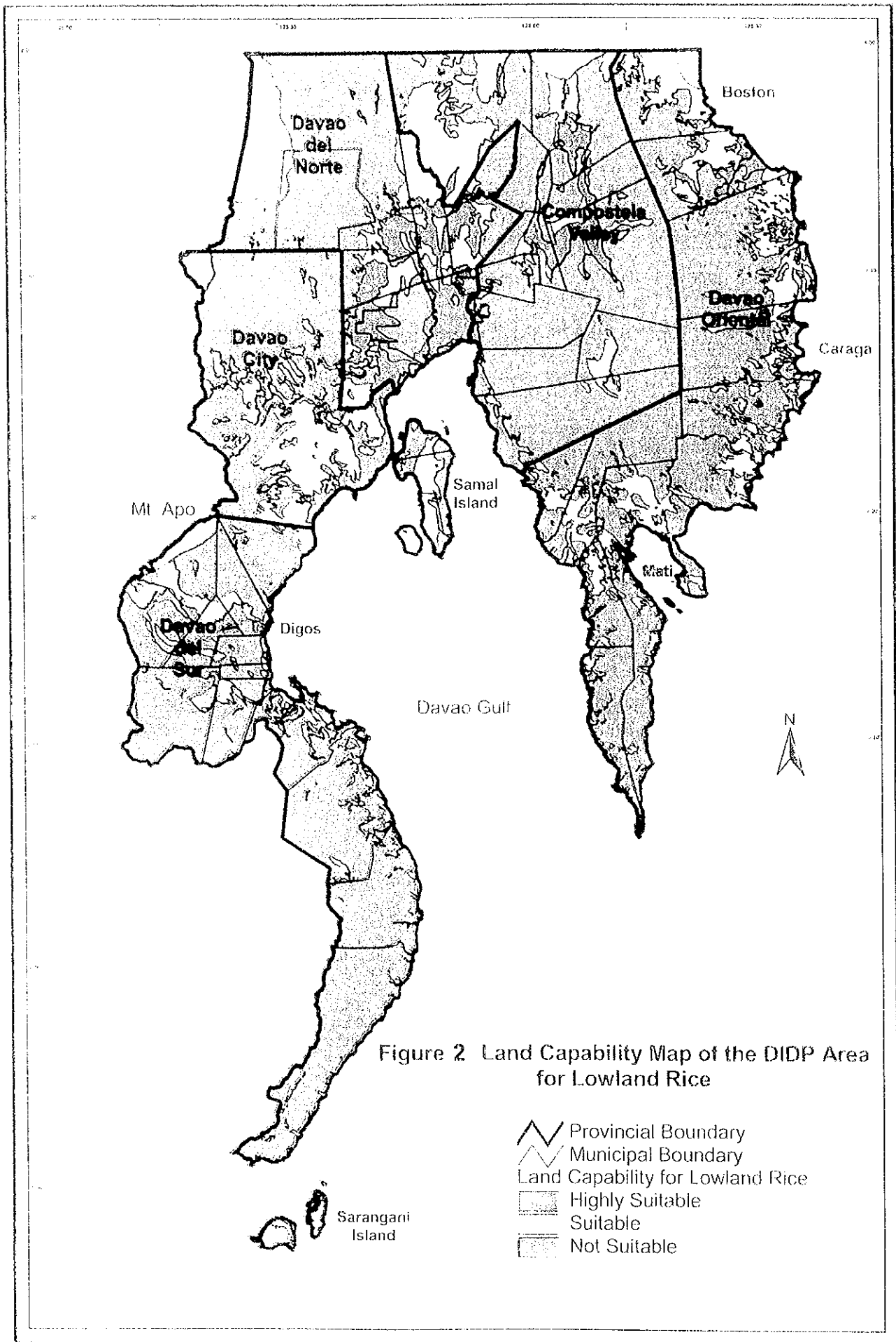





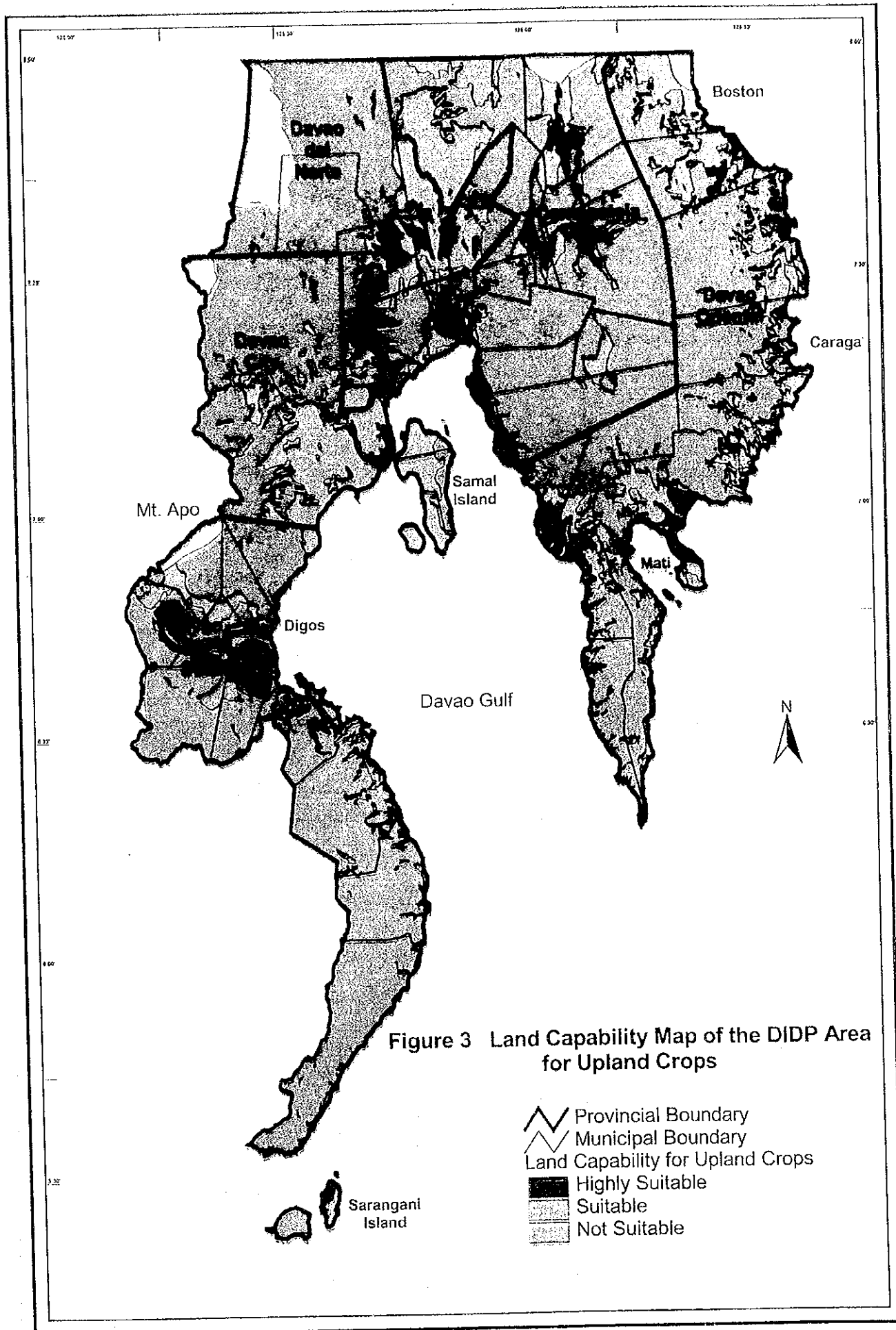
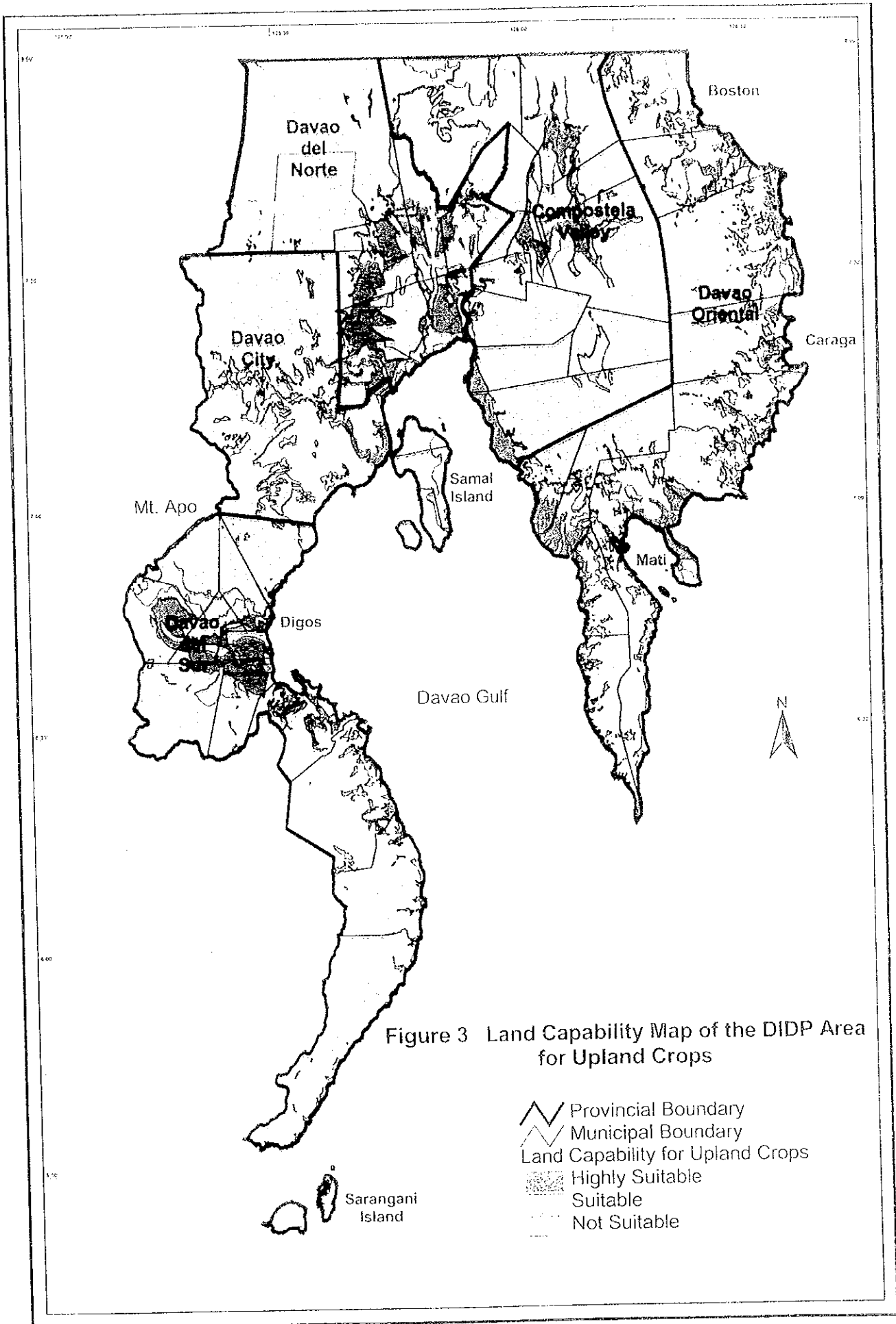


Figure 2 Land Capability Map of the DIDP Area for Lowland Rice

-  Provincial Boundary
-  Municipal Boundary
- Land Capability for Lowland Rice
 -  Highly Suitable
 -  Suitable
 -  Not Suitable





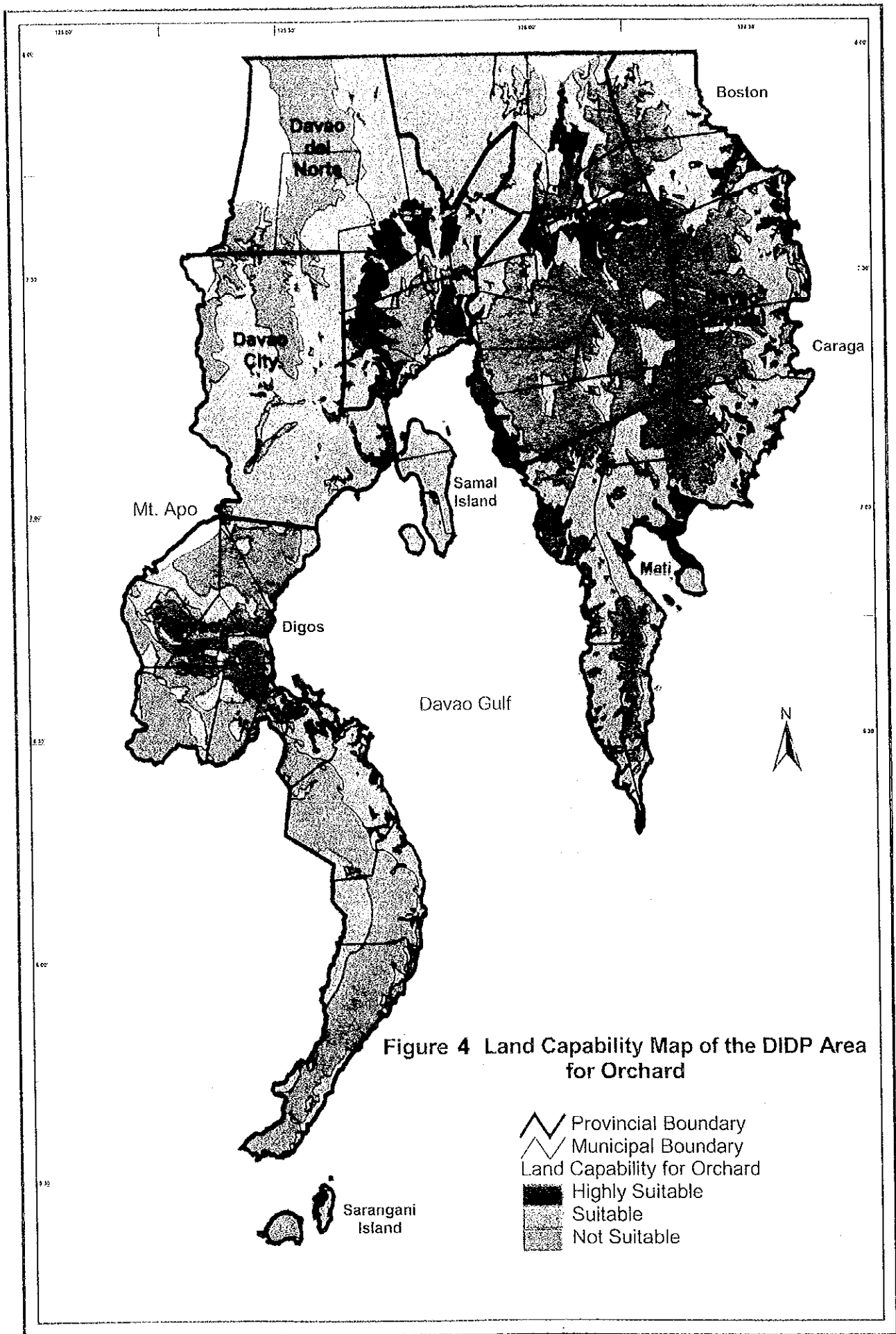


Figure 4 Land Capability Map of the DIDP Area for Orchard

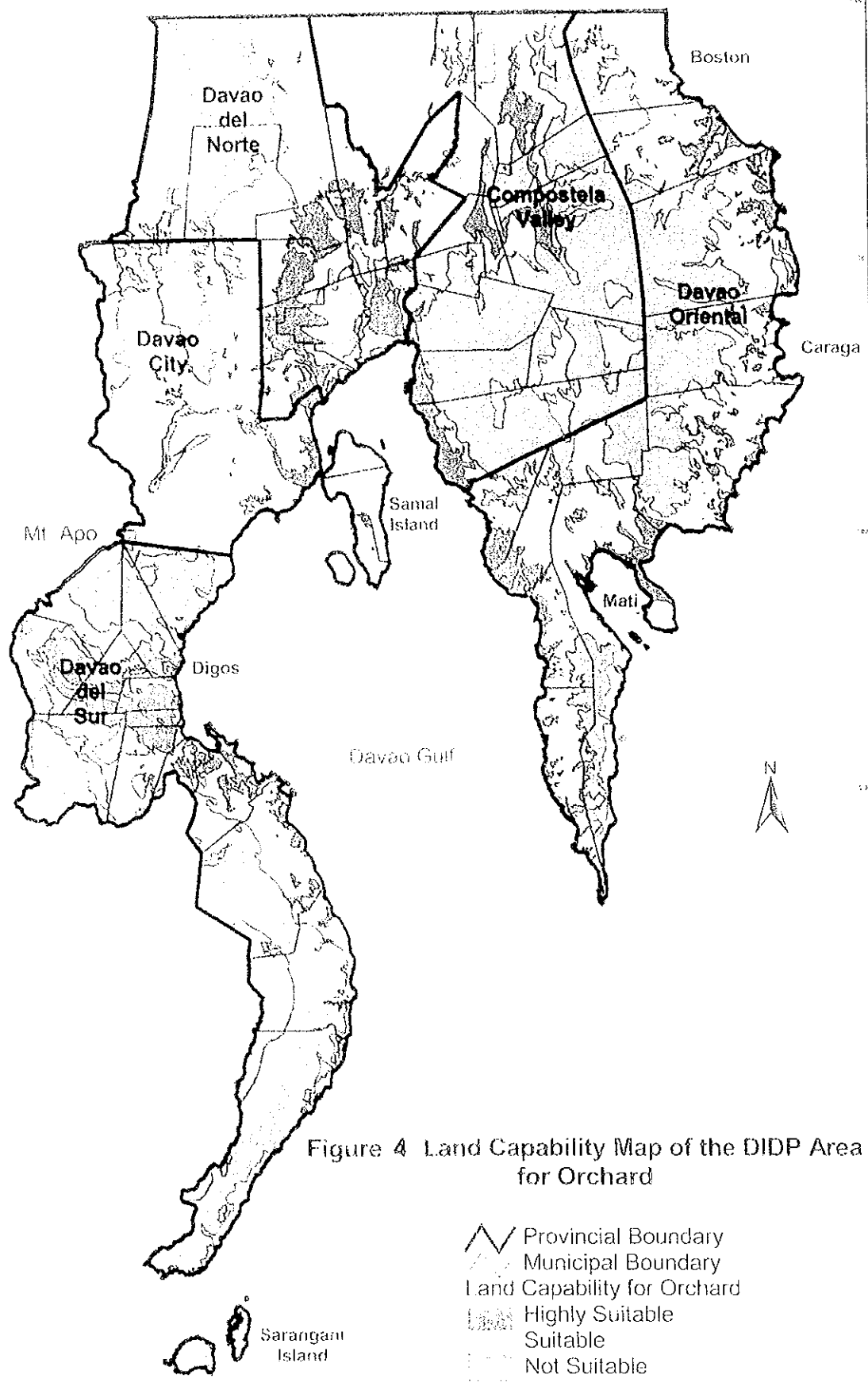
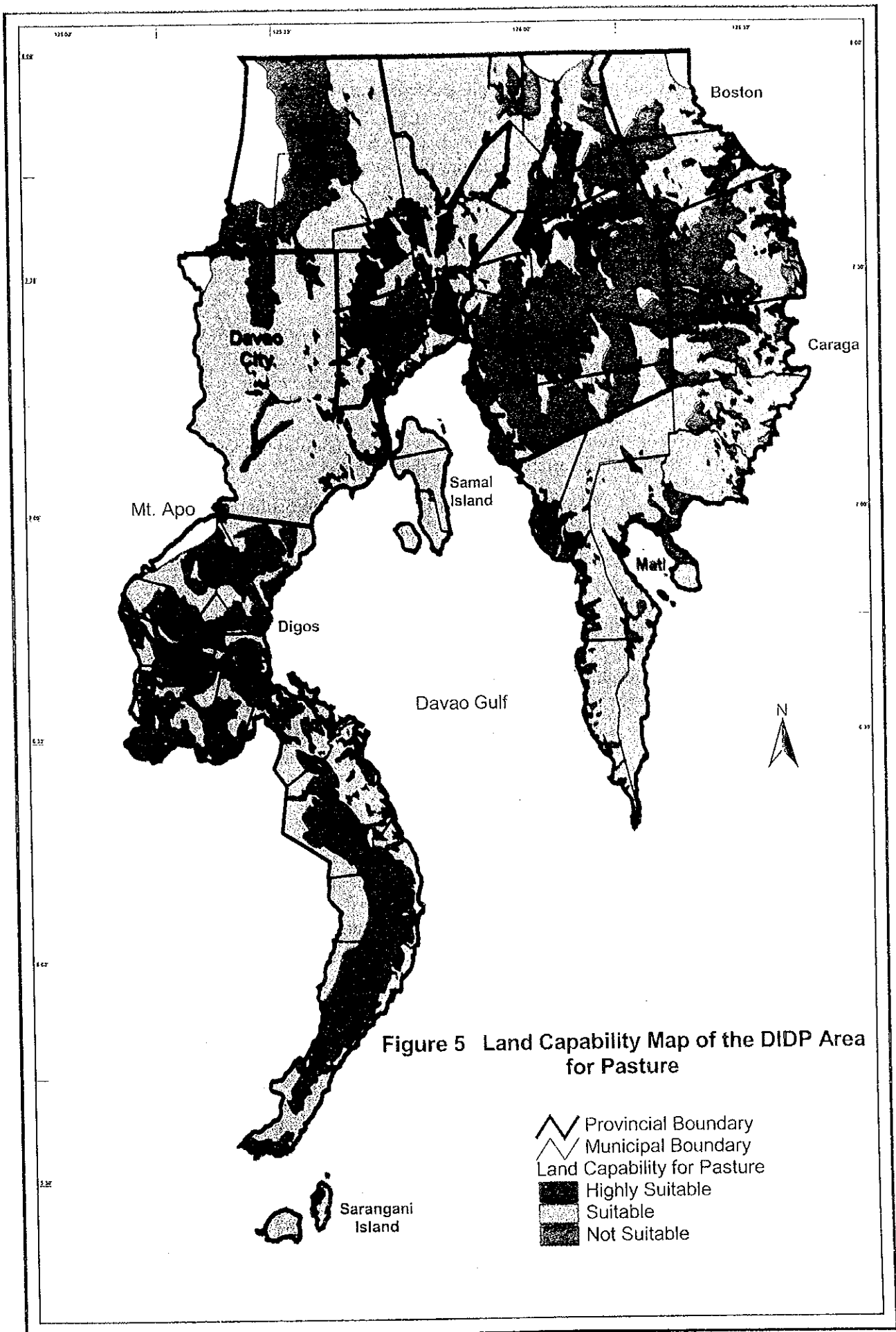


Figure 4 Land Capability Map of the DIDP Area for Orchard

- ▬ Provincial Boundary
- ▬ Municipal Boundary
- Land Capability for Orchard
 - ▨ Highly Suitable
 - ▩ Suitable
 - Not Suitable



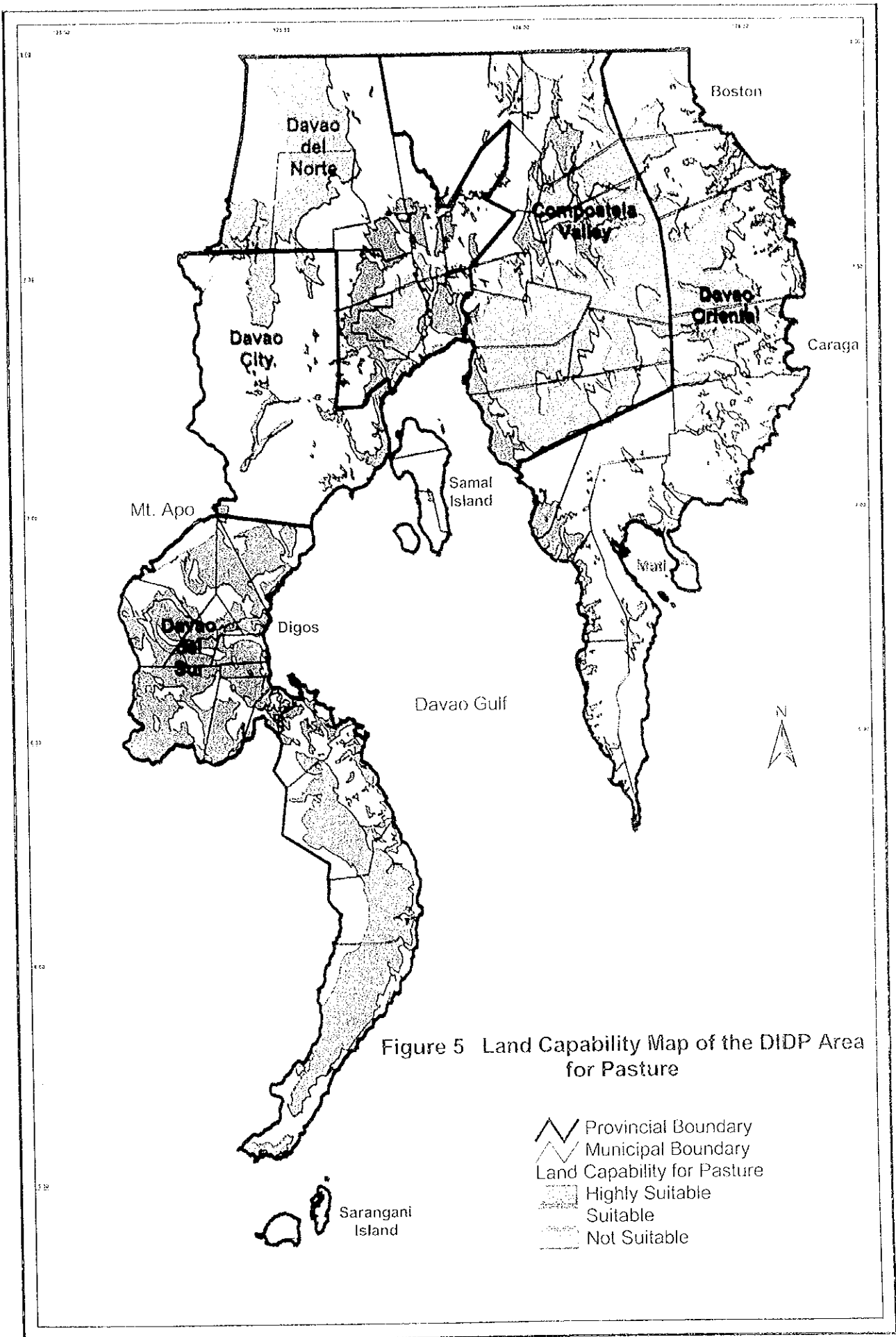


Figure 5 Land Capability Map of the DIDP Area for Pasture

The area under the capability class 2 extends generally over the flat lands along the major river basins, irrespective of crops. The bigger area under the class 2 for lowland rice may be its suitability under the submerged condition. The big difference in area distribution under class 3 and class 4 between lowland rice/upland and orchard/pasture could be explained by their capability under the slope land. While lowland rice and upland crops will not be able to grow on lands with steep slope, orchard or tree crops and pasture will still be cultivated. Larger area under class 3 for pasture than for orchard will be explained by pasture's tolerance under shallow soils.

A consolidated land capability map was prepared using a GIS, to serve for land use planning, by overlaying the four capability maps. As a result, 17 combined classes have come out. Those classes were further categorized into six broad classes using the following criteria:

- 1) Areas where only one group has the highest suitability class among four groups, are designated as suitable areas for those crops;
- 2) Areas where more than one group have the same suitability classes, priority is put on lowland paddy, followed by upland crops, orchard, and pasture; and
- 3) The area where suitability class is three for all four groups are designated as suitable area for both upland and orchard.

The results are shown in Table 11 and Figure 6.

Table 11 Combined Suitability Classes Identified on the Consolidated Map

No.	Lowland Paddy	Upland Crops	Orchard	Pasture	Area (km ²)	Designated Suitable Groups	Area by Suitability (km ²)
1	2	2	2	2	1,355.4	Lowland paddy	
							2,149
2	2	3	3	2	32.3	Lowland paddy	
3	2	3	3	3	671.7	Lowland paddy	
4	2	4	4	4	10.8	Lowland paddy	
5	3	4	4	3	69.1	Lowland paddy	
6	3	4	4	4	9.6	Lowland paddy	
7	3	2	2	2	132.7	Upland crops	
							240
8	3	2	2	3	2.4	Upland crops	
9	4	3	3	3	105.1	Upland crops	
10	3	3	3	3	3,358.7	Upland/Orchard	3,359
11	4	4	3	3	5,416.9	Orchard	
							5,549
12	3	3	2	2	129.8	Orchard	
13	3	3	2	3	2.4	Orchard	
14	3	3	3	2	42.8	Pasture	
							1,559
15	4	3	3	2	30.8	Pasture	
16	4	4	4	3	1,485.5	Pasture	
17	4	4	4	4	6,092.1	Unsuitable	6,092
18	-	-	-	-	722.9	Unclassified	723
		Total			19,671.0		19,671

Source: JICA Study Team

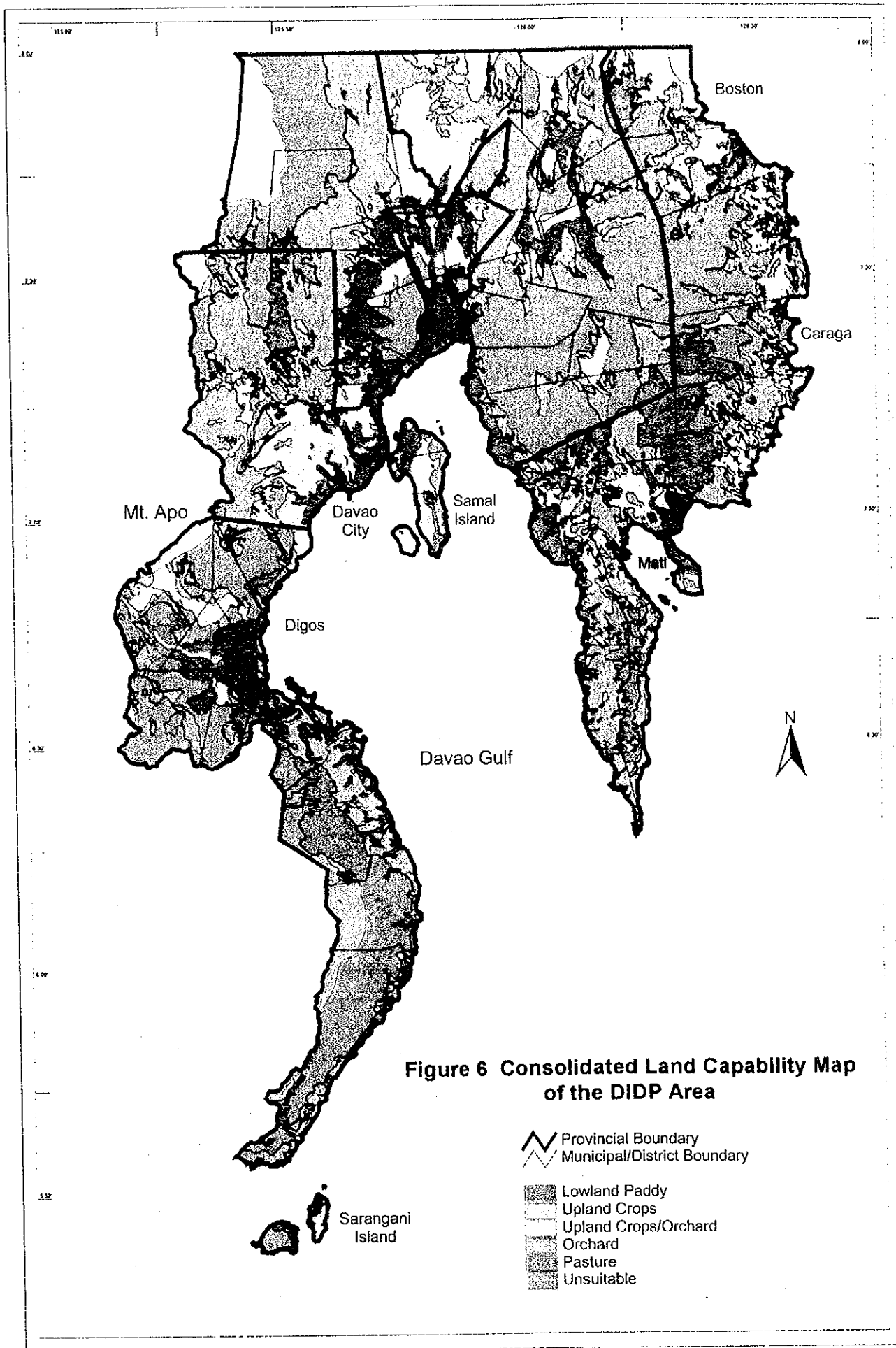


Figure 6 Consolidated Land Capability Map of the DIDP Area

2.2.3. Water resources

Of the 16 major rivers in the DIDP Area, only two rivers, the Libuganon and Padada-Mainit rivers are sources of water for national irrigation systems serving the aggregate area of 7,962 ha. Small rivers serve other national irrigation systems and communal irrigation systems.

The rapid assessment of water supply sources was conducted by the National Water Resources Council (NWRC) in 1982. According to the data from existing wells, a potential area of high yielding wells is located at the foot of Mt. Magolo to the southwest of Digos. Shallow and deep well areas are found in the middle to downstream area of the Tagum-Libuganon river and along the coast of Davao Gulf. Deep well areas are more extensively located in upland to hillyland areas.

2.3. Agricultural Land Use

Based on the Census of Agriculture 1991, the crop area in the DIDP Area totaled about 8,042 km², as shown in Table 12. Davao Province had the largest crop area with 3,120 km² or 39% of the total crop area, followed by Davao del Sur (2,245 km² or 28% of total) and Davao Oriental (1,824 km² or 23%).

Coconut and corn are two major crops planted in the DIDP Area. Coconut area covered 2,694 km² or 33.5% of the total crop area in 1991. Davao Oriental had the biggest coconut area of 1,038 km² or more than 50% of the province's crop area. Corn area, mainly found in Davao Province and Davao del Sur, accounted for 2,675 km² or 33% of the total crop area. Paddy which is dominantly planted in the low land area covered 1,167 km². Davao Province shared 56% (657 km²) of the total paddy area. Other important crop are banana with 421 km², coffee with 306 km², and cocoa with 204 km². Davao Province has the largest share in banana planted area. Sugarcane is only seen in Davao del Sur with an area of 59 km².

Table 12 Agricultural Land Use of DIDP Area in 1991 (km²)

Province	Paddy	Corn	Banana	Coconut	Cacao	Coffee	Sugarcane	Others	Total
Davao Province	657	994	286	686	117	172	0	208	3,120
Davao City	83	255	45	218	57	70	0	125	853
Davao del Sur	275	914	54	751	20	43	59	129	2,245
Davao Oriental	152	513	35	1,038	11	22	0	53	1,824
DIDP Total	1,167	2,675	421	2,694	204	306	59	516	8,042

Source: 1991 Census of Agriculture (NSO)

2.4. Sizes of Landholding, Tenure and Agrarian Reform

2.4.1. Sizes of landholding

The 1991 Agriculture Census Survey reported a total of 267,223 farms covering 796,893 ha in the DIDP Area, increased from 187,711 farms and 746,727 ha in 1980, respectively as shown in Table 13.

The average size of farm holding decreased from 3.98 ha in 1980 to 2.98 ha in 1991. During this period, the number of farms smaller than three hectares increased by 88%, while larger farms generally decreased except farms larger than 25 ha. The slight increase of farms larger than 25 ha may be explained by operation of plantations by cooperatives and leaseback agreements among agrarian reform

beneficiaries and plantation operators.

Table 13 Farming Household by Size of Landholding: 1980 and 1991

Holding Size	1980		1991		Change (1980-91)	
	Number	Area (ha)	Number	Area (ha)	Number	Area (ha)
DIDP Total	187,711	746,727	267,223	796,893	42.36%	6.72%
Under 1 ha	17,769	8,716	64,492	28,287	262.95%	224.54%
1 – 2.99 ha	77,650	124,972	115,215	179,104	48.38%	43.32%
3 – 4.99 ha	44,560	158,290	42,056	147,388	-5.62%	-6.89%
5 – 9.99 ha	35,286	218,291	33,555	209,736	-4.91%	-3.92%
10 – 24.99 ha	11,266	152,075	10,674	145,068	-5.25%	-4.61%
25ha and over	1,180	84,383	1,231	87,310	4.32%	3.47%

Note: Tabulation is by residence of farm operator.

Source: 1980 & 1991 Census of Agriculture, Vol. 1 (NSO)

2.4.2. Tenure

The ownership structure of farms changed along with decrease in farm holding sizes and increase in smaller farms, as shown in Table 14.

Owned farms and owner-like possession of farms covered 79% of the total farmland in 1980. This share decreased to 55% in 1991. Farms under various ownership types increased dramatically over 1980-91, implying more farm operators acquired additional lands for cultivation either by lease or other arrangements. Farms under lease or tenancy also increased significantly. As the CARP barely started during this period, the increase in partly-owned and rent-free farms may be attributed to the opening up of new areas for cultivation, e.g. A & D areas released to farmers under Certificate of Stewardship. All the three Davao Provinces and Davao City share the similar land ownership structure.

Table 14 Number and Area of Farms by Size and Tenure in DIDP Area: 1980 and 1991

Holding size	1980		1991		Growth	
	Number	Area (ha)	Number	Area (ha)	Number	Area (ha)
All Forms 1/	187,711	746,727	267,223	796,893	42%	7%
Owned and Owner-like Possession	137,080	587,498	125,878	434,901	-8%	-26%
Partly-owned 2/	3,764	40,942	61,577	192,342	1,536%	370%
Leased/Tenanted	34,064	81,339	48,361	105,526	42%	31%
Rent-free	6,253	11,069	22,798	29,857	265%	170%
Other Forms	6,549	24,335	8,609	32,267	31%	33%

Note 1: A farm is counted only once. The sum of the reported number of farms may not be equal to the number under "All forms."

Note 2: Farms partly owned refer to farms operated under more than one form of tenure, i.e., owned/ owner-like possession and rented/leased form.

Source: 1980 and 1991 Census of Agriculture Vol. 1 (NSO)

2.4.3. Agrarian reform

As of 1997, the CARP subjected 279,798 ha to land reform, of which 189,814 ha or 68% was the total working scope in the DIDP Area, i.e., excluding areas not workable under various circumstances. Of the total working scope in the DIDP Area,

Davao Province comprises the largest area of 97,951 ha or 52% of the total, followed by Davao Oriental with a 24% share. The CARP scope in Davao del Sur and Davao City is relatively small, corresponding to 14% and 11% of the total, respectively.

Acquisition and distribution of lands under Operation Land Transfer (OLT), Voluntary Offer to Sell (VOS), Voluntary Land Transfer (VLT), GFI-owned lands and KKK Lands declared under Executive Order 448 constitute the first phase of CARP implementation scheduled from 1988 to 1992. As of the end of 1996, however, the program accomplished, only 90%. Phase II of the program covered landed estates, settlements and private lands larger than 50 ha. Acquisition of private lands was the main difficulty of the program implementation, such that at the end of the 1996 reporting, only 56% were distributed. Phase III covers private lands which are larger than 5 ha. Accomplishment data shows a much constrained agrarian reform as barely a year is left to complete the remaining areas which account to 53% of the total working scope. Commercial farms acquisition and distribution will start in June 1998, as mandated in CARL 6657. The CARP is scheduled to terminate by 1998 but agrarian reform (i.e., land tenure improvement) is said to continue.

After the land distribution, a series of support services are given to the agrarian reform beneficiaries. In the DIDP Area, 47 agrarian reform communities (ARCs) have been established: 22 in Davao Province, nine in Davao del Sur, and eight each in Davao City and Davao Oriental.

Support services include infrastructure development such as irrigation and road, livelihood development like credit and institutional development including training. Multi-lateral agencies (WB, ADB, UNDP and FAO) and bilateral agencies (OECD and CIDA) in cooperation with DA, DPWH, NIA, DTI etc. have already committed to implement various projects to help ARCs to improve the living standards.

2.5. Overall Sector Performance

GRDP and employment

The agricultural sector shared 38.1% share in the GRDP of Region XI in 1995, much larger than the sector's share in the GDP, 21.5% in 1995. The agricultural sector in the DIDP Area including forestry and fishery employed 363,114 in 1996, accounting for 52.3% of the total DIDP employment. The crop sub-sector is the largest employer: in particular the four main crops, corn, coconut, paddy and banana, accounted for 74% of the total agricultural employment in 1996 (Table 4).

GVA estimated

The agricultural gross value added (GVA) in Southern Mindanao, or Region XI in 1995 was P53,251 million. Based on this figure, the JICA Study Team estimated the GVA in agriculture for the DIDP Area.

First, value of production in Southern Mindanao and the DIDP Area by major crops and sub-sectors in 1995 was calculated based on production and farm gate price data from the Bureau of Agricultural Statistics (BAS). The value of fisheries was taken from BAS. The value of production in forestry was estimated based on the 1995 Philippine Forestry Statistics by DENR.

The value of agricultural services, which may include simple processing of raw

materials, seed multiplication etc. is assumed at 20% of the total value of agricultural crop production. The total value of production in Southern Mindanao and the DIDP Area was estimated as shown in Table 15.

The value of production in agriculture in 1995 was P61.8 billion for Southern Mindanao and P36.3 billion for the DIDP Area.

Table 15 Estimated Value of Production for Southern Mindanao and DIDP Area (1995 in million pesos)

	Davao Province	Davao City	Davao del Sur	Davao Oriental	DIDP Total	Southern Mindanao
Agricultural Crops	10,748	3,730	5,129	3,995	23,602	34,828
Agricultural Services	2,419	1,159	1,225	939	5,743	8,684
Livestock	950	1,156	662	539	3,307	5,357
Poultry	399	911	337	160	1,807	3,236
Fishery	199	324	626	283	1,432	6,483
Forestry	150	0	43	363	363	3,200
Grand Total	14,866	7,280	8,022	36,254	36,254	61,789

Source: JICA Study Team

Cost-benefit analysis for several major crops, livestock, poultry, fishery and forestry is then made to obtain value-added ratio, based on data obtained from various sources such as provincial agricultural offices, interview with farmers etc. Value added ratio is calculated as:

$$[\text{Gross value added}] = [\text{Value of Production}] - [\text{Intermediary cost}]$$

$$[\text{Value added ratio}] = [\text{Gross value added}]/[\text{Value of production}]$$

Gross value-added by sub-sector and by major crop is then calculated by multiplying the value with value-added ratio for Southern Mindanao.

Gross value-added of agriculture in the DIDP Area is finally calculated applying value-added ratio obtained for Southern Mindanao region.

Based on the above procedure, GVA of the agriculture in the DIDP Area by sub-sector in 1995 is estimated at P31.1 billion at current prices, as shown in Table 16.

Table 16 Estimated GVA in Agricultural Sector for Southern Mindanao and DIDP Area (1995 in million pesos)

	Southern Mindanao	DIDP Total	Davao Province	Davao City	Davao del Sur	Davao Oriental
A. Agricultural Crops	30,431	20,447	9,056	3,228	4,475	3,688
Palay	4,347	2,383	1,262	198	629	294
Corn	4,836	1,062	329	179	333	221
Coconut	4,652	4,163	919	478	713	2,053
Sugarcane	223	223	0	0	223	0
Banana	5,041	4,790	3,350	525	722	194
Others	11,332	7,825	3,197	1,848	1,854	926
B. Livestock	4,519	2,789	801	975	558	455
C. Poultry	2,267	1,266	280	638	236	112
E. Agricultural Services	7,632	5,054	2,129	1,020	1,078	826
D. Fishery	5,535	1,223	170	276	535	242
F. Forestry	2,868	325	135	0	39	151
Grand Total	53,251	31,104	12,570	6,138	6,920	5,475

Source: JICA Study Team

2.6. Crop Production Performance

The DIDP Area produces a variety of agricultural commodities, both food and non-food. Production statistics of crops in 1995 are shown in Tables 17 to 19. Discussion of performance shall be limited to major commodities, area harvested and contribution to the total agriculture value-added, potential for expansion and importance to the local residents. Twelve crops significantly occupy agriculture areas, 15 significantly contribute to the country's production and 12 are very promising in terms of yield.

2.6.1. Paddy

Paddy continues to be an important crop in the DIDP Area, which produces more than half of the Southern Mindanao region's production with a comfortable level of yield. Paddy production in the DIDP Area, however, declined over the last six years (1990 to 1995) mainly due to reduction in area harvested and to some extent, due to decrease in yield. Reduction in area was specifically observed in Davao Province, the largest rice producer among the four. A drastic decline of harvested area of rainfed paddy occurred from 1990 to 1992 when historical drought hit the Area. The decrease in harvested area in irrigated areas may partly be attributed to the deterioration of irrigation facilities.

Through the years, the average yield in the DIDP Area generally surpassed that in Southern Mindanao, whole Mindanao, and the Country due to high yield in irrigated paddy which constituted about 90 % of the total production. Irrigated paddy's average yield was about 3.8 tons/ha as compared with the rainfed's 1.9 tons/ha. With the use of high yielding varieties (e.g., IR74 and IR64) and proper farming practices including fertilizer application, pest control, and water management, paddy productivity is much higher under irrigated condition. However, the yield under irrigation is still far from the Government's target of 5 tons/ha.

Table 17 Harvested Area of Major Crops in 1995 by Province/City

Unit: ha

Crops	Davao Province	Davao City	Davao del Sur	Davao Oriental	DIDP Total	Southern Mindanao*	Mindanao	Philippines
1. CEREALS	124,720	39,435	93,676	71,520	329,351	697,091	2,665,344	6,451,023
Paddy	57,170	16,355	25,806	11,640	110,971	183,361	919,828	3,758,691
Irrigated	53,600	3,240	25,263	8,190	90,293	138,243	545,584	2,334,373
Rainfed	3,570	13,115	543	3,450	20,678	45,118	374,244	1,424,318
Corn	67,550	23,080	67,870	59,880	218,380	513,730	1,745,516	2,692,332
White Corn	59,840	18,040	64,020	59,790	201,690	331,140	1,223,275	1,670,318
Yellow Corn	7,710	5,040	3,850	90	16,690	182,590	522,241	1,022,014
2. VEGETABLES	5,201	1,606	4,407	1,588	12,802	13,600	186,559	521,112
Cabbage	40	253	162	17	472	532	1,142	8,529
Carrot	10	29	125	0	164	198	276	3,187
Tomato	60	102	280	50	492	582	2,782	17,896
Onion	0	0	0	0	0	7	36	8,693
Eggplant	150	119	25	110	404	514	2,059	17,643
Camote	3,150	281	1,039	862	5,332	5,514	36,210	145,925
Mongo	328	208	990	80	1,606	1,648	7,888	34,860
Peanut	113	422	124	31	690	727	4,751	47,642
Ubi	47	17	18	8	90	103	654	5,446
Potato	9	8	662	0	679	697	1,917	5,364
Cassava	1,294	167	982	430	2,873	3,078	128,844	225,927
3. FRUITS	33,150	8,238	7,514	7,262	56,164	75,195	222,120	486,046
Banana	30,500	3,734	4,970	4,392	43,596	45,593	159,460	322,008
Durian	950	997	203	17	2,167	2,167	3,742	3,742
Jackfruit	461	125	5	312	903	959	2,362	9,069
Mandarin	127	132	66	1,535	1,860	1,879	3,899	7,675
Mango	688	1,312	2,000	380	4,380	6,980	14,919	80,393
Papaya	60	56	69	80	265	337	1,184	5,125
Pineapple	14	1,065	30	18	1,127	15,356	33,374	43,962
Pomelo	300	707	126	458	1,591	1,614	1,980	3,752
Calamansi	50	110	45	70	275	310	1,200	10,320
4. INDUSTRIAL CROP	116,897	52,829	124,983	162,586	457,295	584,767	1,880,426	3,814,410
Coconut	95,220	40,404	94,440	157,080	387,144	505,437	1,610,980	3,064,457
Sugarcane	0	0	6,946	0	6,946	6,946	30,072	302,005
Coffee	14,511	9,127	15,300	1,805	40,743	44,659	101,482	144,389
Cacao	760	2,600	4,585	100	8,045	8,230	13,798	16,235
Rubber	4,680	630	930	0	6,240	6,337	86,688	86,688
Cashew	25	6	7	408	446	448	982	31,567
Castor	0	37	73	0	110	110	171	517
Tobacco	10	7	19	16	52	62	4,225	56,304
Abaca	1,664	10	2,587	3,177	7,438	8,665	26,362	103,141
Cotton	0	0	53	0	53	3,795	5,428	8,403
Kapok	0	8	25	0	33	33	193	649
Ramie	27	0	18	0	45	45	45	55
5. CUT FLOWERS	26	64	6	0	96	101	181	578
Anthurium	17	8	0	0	25	26	44	106
Chrysanthemum	0	14	0	0	14	14	23	96
Orchids	9	14	6	0	29	31	36	92
Rose	0	28	0	0	28	30	78	284
Grand Total	279,994	102,172	230,586	242,956	855,708	1,370,754	4,954,630	11,273,169

Note: * Southern Mindanao includes all constituent city/provinces of DIDP, Sarangani and South Cotabato provinces.

Source: DA-BAS

Table 18 Production of Major Crops by Province/City in 1995

Unit: ton

Crops	% Change 1990 -1995	Davao Province	Davao City	Davao del Sur	Davao Oriental	DIDP Total	Southern Mindanao*	Mindanao	Philippines
1. CEREALS		255,045	57,137	150,781	78,616	541,579	1,367,842	5,626,991	14,669,159
Paddy	-26.0%	206,298	30,239	100,055	44,878	381,470	610,038	2,794,759	10,540,649
Irrigated	-16.9%	192,036	12,159	99,314	39,632	343,141	507,128	1,957,860	7,598,555
Rainfed	-62.7%	14,262	18,080	741	5,246	38,329	102,910	836,899	2,942,094
Corn	-40.0%	48,747	26,898	50,726	33,738	160,109	757,804	2,832,232	4,128,510
White Corn	-47.9%	40,396	17,990	44,577	33,657	136,620	337,720	1,574,205	1,862,423
Yellow Corn	415.1%	8,351	8,908	6,149	81	23,489	420,084	1,258,027	2,266,087
2. VEGETABLES		28,919	8,067	17,154	8,850	62,989	69,114	1,539,973	3,314,959
Cabbage	4.2%	300	1,743	1,295	19	3,357	3,781	8,606	129,989
Carrot	115.9%	54	43	411	0	508	587	815	31,953
Tomato	-24.4%	420	514	2,339	207	3,479	3,971	33,341	155,823
Onion	-100.0%	0	0	0	0	0	42	174	88,426
Eggplant	-38.8%	351	2,671	363	121	3,506	5,103	11,391	130,702
Camote	4.9%	17,068	1,141	2,820	4,973	26,002	27,365	160,626	698,900
Mongo	30.4%	322	99	696	40	1,157	1,193	6,014	26,651
Peanut	10.2%	82	303	37	30	451	477	3,063	36,200
Ubi	-31.0%	246	66	136	21	469	535	3,062	24,176
Potato	97.3%	43	17	4,174	0	4,233	4,350	30,844	85,302
Cassava	-21.2%	10,034	1,471	4,883	3,439	19,827	21,710	1,282,037	1,906,837
3. FRUITS		1,131,975	220,523	267,969	86,222	1,706,689	2,229,221	4,268,435	5,744,865
Banana	45.1%	1,119,191	181,035	261,054	78,486	1,639,765	1,700,363	2,720,029	3,489,452
Durian	24.0%	2,850	4,546	637	12	8,045	8,045	28,525	28,525
Jackfruit	-1.9%	1,678	102	0	820	2,600	2,767	15,620	40,248
Mandarin	0.0%	346	1,144	190	3,167	4,846	4,920	12,039	20,657
Mango	7.3%	5,084	6,809	4,151	1,235	17,280	32,543	130,245	595,138
Papaya	27.9%	1,697	4,646	890	574	7,806	9,498	20,670	58,160
Pineapple	-51.6%	102	10,674	68	219	11,064	455,293	1,316,361	1,442,815
Pomelo	-15.5%	810	10,747	653	1,000	13,210	13,442	17,303	22,557
Calamansi	-12.5%	217	821	326	709	2,073	2,350	7,643	47,313
4. INDUSTRIAL CROP		594,536	258,532	1,016,477	1,958,174	3,827,719	4,957,773	10,270,014	30,572,382
Coconut	15.8%	564,229	245,031	587,239	1,954,131	3,350,631	4,472,022	8,192,420	12,183,088
Sugarcane	125.8%	0	0	408,804	0	408,804	408,804	1,769,913	17,774,401
Coffee	-4.6%	17,744	9,519	13,212	1,842	42,318	47,269	91,984	133,999
Cacao	-11.3%	395	1,872	3,260	61	5,589	5,669	7,207	7,927
Rubber	18.5%	10,479	1,999	2,067	0	14,545	14,665	181,200	181,200
Cashew	337.6%	18	18	15	163	214	216	1,838	153,762
Castor	5.6%	0	37	68	0	105	105	171	545
Tobacco	26.0%	5	3	13	7	28	42	1,983	63,706
Abaca	-8.8%	1,2040	16	1,288	1,477	3,985	5,959	18,130	64,833
Colton		0	0	48	0	48	2,892	4,609	8,093
Kapok	12.1%	0	37	13	0	49	49	478	742
Ramie	-96.9%	59	0	22	0	81	81	81	86
5. CUT FLOWERS**		35	696	158	0	889	928	1,124	5,894
Anthurium	162.4%	21	57	0	0	78	86	118	275
Chrysanthemum	28.9%	0	18	0	0	18	18	50	942
Orchids	62.4%	14	545	158	0	717	733	737	1,199
Rose	11.0%	0	75	0	0	75	91	219	3,478
Grand Total***		2,010,475	544,259	1,452,381	2,131,861	6,138,976	8,623,950	21,705,412	54,301,365

Note: * Southern Mindanao includes all constituent city/provinces of DIDP, Sarangani and South Cotabato provinces.

** unit is thousand dozen.

*** Cut flowers not included.

Source: DA-BAS

Table 19 Yield of Major Crops by Province/City in 1995

Unit: tons/ha

Crops	Davao Province	Davao City	Davao del Sur	Davao Oriental	DIDP Total	Southern Mindanao*	Mindanao	Philippines
1. CEREALS	2.0	1.4	1.6	1.1	1.6	2.0	2.1	2.3
Paddy	3.6	1.8	3.9	3.9	3.4	3.3	3.0	2.8
Irrigated	3.6	3.8	3.9	4.8	3.8	3.7	3.6	3.3
Rainfed	4.0	1.4	1.4	1.5	1.9	2.3	2.2	2.1
Corn	0.7	1.2	0.7	0.6	0.7	1.5	1.6	1.5
White Corn	0.7	1.0	0.7	0.6	0.7	1.0	1.3	1.1
Yellow Corn	1.1	1.8	1.6	0.9	1.4	2.3	2.4	2.2
2. VEGETABLES								
Cabbage	7.5	6.9	8.0	1.1	7.1	7.1	7.5	15.2
Carrot	5.4	1.5	3.3		3.1	3.0	3.0	10.0
Tomato	7.0	5.0	8.4	4.1	7.1	6.8	12.0	8.7
Onion						6.0	4.8	10.2
Eggplant	2.3	22.4	14.5	1.1	8.7	9.9	5.5	7.4
Camote	5.4	4.1	2.7	5.8	4.9	5.0	4.4	4.8
Mongo	1.0	0.5	0.7	0.5	0.7	0.7	0.8	0.8
Peanut	0.7	0.7	0.3	1.0	0.7	0.7	0.6	0.8
Ubi	5.2	3.9	7.6	2.6	5.2	5.2	4.7	4.4
Potato	4.8	2.1	6.3		6.2	6.2	16.1	15.9
Cassava	7.8	8.8	5.0	8.0	6.9	7.1	10.0	8.4
3. FRUITS								
Banana	36.7	48.5	52.5	17.9	37.6	37.3	17.1	10.8
Durian	3.0	4.6	3.1	0.7	3.7	3.7	7.6	7.6
Jackfruit	3.6	0.8	0.0	2.6	2.9	2.9	6.6	4.4
Mandarin	2.7	8.7	2.9	2.1	2.6	2.6	3.1	2.7
Mango	7.4	5.2	2.1	3.3	3.9	4.7	8.7	7.4
Papaya	28.3	83.0	12.9	7.2	29.5	28.2	17.5	11.3
Pineapple	7.3	10.0	2.3	12.2	9.8	29.6	39.4	32.8
Pomelo	2.7	15.2	5.2	2.2	8.3	8.3	8.7	6.0
Calamansi	4.3	7.5	7.3	10.1	7.5	7.6	6.4	4.6
4. INDUSTRIAL CROP								
Coconut	5.9	6.1	6.2	12.4	8.7	8.8	5.1	4.0
Sugarcane			58.9		58.9	58.9	58.9	58.9
Coffee	1.2	1.0	0.9	1.0	1.0	1.1	0.9	0.9
Cacao	0.5	0.7	0.7	0.6	0.7	0.7	0.5	0.5
Rubber	2.2	3.2	2.2		2.3	2.3	2.1	2.1
Cashew	0.7	3.0	2.1	0.4	0.5	0.5	1.9	4.9
Castor			0.9		1.0	1.0	1.0	1.1
Tobacco	0.5	0.5	0.8	0.4	0.5	0.7	0.5	1.1
Abaca	0.7	0.7	0.7	0.6	0.7	0.7	0.7	0.6
Cotton			0.9		0.9	0.8	0.8	1.0
Kapok			0.5		1.5	1.5	2.5	1.1
Ramie			1.2		1.8	1.8	1.8	1.6

Note: * Southern Mindanao includes all constituent city/provinces of DIDP, Sarangani and South Cotabato provinces.

Source: DA-BAS

2.6.2. Corn

The total corn harvested area in 1995 was 218,380 ha, which accounts for 43% of Region XI and about 8% of the whole Country's. Corn harvested area, however, has been declining over the last six years, a phenomenon which is true not only in the DIDP Area but in the whole Philippines. Corn cultivation in Mindanao has become a less profitable enterprise because of diminished competitiveness due to very low yield (1.6 tons/ha in 1995: cf. average yield of corn in the U.S. is 8 tons/ha). Transport has been very inefficient and costly which added to the unit price of corn at destination. As a result, users of corn opted to import from neighboring countries which effectively offered cheaper prices.

Overall productivity of the DIDP Area averaged 0.7 tons/ha which is only about half that of the other areas in Mindanao. White corn mainly produced for domestic consumption is the common variety planted, which may be one reason for the lower yields. White corn accounts for 91% of the area's total production. Davao Province used to share more than 50% of the DIDP Area's harvested area and production volume. However, in six years, the area was reduced by about 60% and production volume by more than 70%. Low yields of yellow corn could be accounted to low level of fertilizer application, use of native varieties and unstable weather condition.

2.6.3. Coconut

Coconut is one of the most important crops in the DIDP Area due to large hectareage occupied by this crop. More than 50% of the DIDP's total agricultural area is planted to coconut. Moreover, almost all coconut areas of the Southern Mindanao region (Region XI) are found in the DIDP Area (98%). The share of the Area's production in the Country was 27.5% in 1996.

Coconut has been produced for long time without applying sufficient amount of fertilizer. As a result, soil fertility diminished, and the Area's performance now is barely 30% of the potential maximum yield of 3.5 tons/ha under well-managed condition. Although the Area has attained relatively higher yield than other areas, productivity could be much improved.

Among the four component LGUs, Davao Oriental showed the highest yield due to a more favorable soil and climate conditions, while Davao del Sur showed the lowest productivity due to many senile trees. Table 20 shows the comparison of coconut production in 1996 among LGUs in the DIDP Area.

Table 20 Coconut Production in DIDP Area (1996)

Province/City	Planted Area (ha)	Production		Yield of Copra (tons/ha)
		Nuts (000 pcs)	Copra (tons)	
Davao Province	76,597	434,487	86,897	1.13
Davao City	36,364	221,514	44,303	1.22
Davao del Sur	95,085	332,984	66,597	0.70
Davao Oriental	151,384	1,012,213	202,443	1.34
DIDP Total	359,430	2,001,198	400,240	1.11
Region XI	363,486	2,023,463	404,692	1.11

Source: PCA, Region XI

2.6.4. Banana

Banana is by far the most important cash crop in the DIDP Area. After the introduction of cavendish variety in the 1950s by the U.S. based multi-national company, mono-culture plantation farm has been expanded widely in the Area, for export. There are about 20 banana plantations in Davao Province, Davao City and Davao del Sur which grow cavendish variety. Native varieties such as lacatan, señorita and latundan are grown in smaller farms. Commercial scale production of these varieties is in farm sizes of 5 ha to 50 ha.

The total harvested area in 1995 in the DIDP Area was 43,600 ha, producing 1.64 million tons of banana. As of 1995, about 95% of the total areas planted to banana in Southern Mindanao is found in the DIDP Area and concentrated in Davao Province (70% of DIDP total). Davao del Sur, Davao Oriental and Davao City share 8, 9 and 11%, respectively. The DIDP Area produces 60% of Mindanao's banana production and nearly 50% of the Country's total. As Davao Province has the largest planted area, it correspondingly produces the largest quantity. In terms of productivity, however, Davao del Sur showed relatively high performance with an average of 62 tons/ha over the last seven years although it has been declining since 1994. Davao Province showed lower yield despite the largest share of plantation farms.

Overall high productivity in banana (the highest in the Country) could be attributed to the fact that majority of production comes from plantations established on prime agricultural land with huge investment using advanced farming technology including variety selection, fertilizer application, pest control, irrigation etc. Banana industry, however, is now facing severe market competition with Ecuador's products. Some plantations are now transferring to high-altitude area to produce preferred fruits with shape and taste.

2.6.5. Fruits/vegetables/cutflowers

Fruits

The three Davao provinces and Davao City have been known for fruits all over the Country. Exotic fruits such as durian, pomelo, mangosteen, mango, rambutan etc. are produced in abundance for local consumption and export to other areas including Metro Manila. These fruits are produced in commercial scale in varying farm sizes ranging from 1 ha to 60 ha. There are also larger farms that occupy a few hundreds of hectares that can be considered large plantation farms. Most of these farms are diversified. For example, the Menzi Cooperative which operates a 194 ha-farm produces mango, grapes and citrus like pomelo, valencia orange and mandarin orange.

Total fruit harvested area in 1995 in the DIDP Area is 12,568 ha or 1.5% of the Area's total crop area. Except a few plantations and commercial farms, production of fruits is still on a backyard scale. Farmers have one to five trees in their farms and homelots. Most of the major fruits produced in the Area have competitive yields and in varying degree per province. In terms of area and yield, comparative advantage of each province/city are as shown in Table 21.

Table 21 Comparative Advantage in Fruit Production by Province/City

Fruits species	Davao Province	Davao City	Davao del Sur	Davao Oriental
Mango	yield	yield	production	brand
Durian	area and yield	area and yield	yield	-
Pomelo	-	area and yield	yield	area and brand
Mandarin	-	yield	-	area and brand
Pineapple	-	area and yield	-	yield
Papaya	yield	yield	-	-
Calamansi	-	yield	yield	yield
Jackfruit	area and yield	-	-	area and yield

Source: JICA-DIDP Team based on the BAS data

Among others, mango and durian are being encouraged under the "Plant now pay later" program by Davao Province and Davao City. Mangosteen, rambutan, lanzones are also substantially important in the Area.

Vegetables, root crops and legumes

Vegetables consisting primarily of cabbage, eggplant, onion and tomato had a total harvested area of 1,338 ha in 1995. Over the last six years, harvested area has generally not increased much nor did production. These crops are mainly cultivated in Davao City and Davao del Sur, with relatively high yields. Other important vegetables are lettuce, broccoli, cauliflower, green pepper, sayote etc.

Root crops consisting of camote, cassava, ube, carrots and potatoes were harvested in some 9,138 ha in 1995. Camote occupied more than half of this area and also the most promising in terms of yield. Davao Province is a dominant producer of camote in terms of both area and production. Yield in cassava is lower, less than the Country's average but has always been higher in the previous six years. Main production area is Davao Province and Davao del Sur, though harvested area there has also been declining. Ube is not grown widely in the Area. Total harvested area was only 90 ha in 1995. Carrot and potatoes are becoming increasingly popular. Both crops are dominantly planted in the highland of Davao del Sur, and products are marketed not only in the Area but also in Cebu and Metro Manila.

Peanuts and mungo are planted in relatively small areas. Productivity is at par with the Country's average. Mungo is mainly cultivated in Davao del Sur, while major producer of peanuts is Davao City. Other important legumes are string bean and baguio bean.

Cutflowers

Cutflowers are very promising due to high local as well as international demand. Most commonly produced are anthurium, orchids, and chrysanthemum. Growth of production was high over the last six years, particularly anthurium and orchids whose annual growth rates were 12% and 9%, respectively. The main producers of anthurium are Davao City and Davao Province, while orchids are produced largely in Davao City and Davao del Sur. So far, Davao City has been the sole producer of chrysanthemum and roses, while Davao del Sur is promoting production. Main market of cutflowers from the DIDP Area is Metro Manila absorbing 80 to 90% of production.

2.6.6. Industrial crops

Aside from coconut, the major industrial crops produced in the DIDP Area include cacao, coffee, sugarcane, rubber, castor bean, abaca, cotton and ramie.

Cacao

The DIDP area produces the largest quantity of cacao in the Country (70%) while it has only about half of the Country's total production area. Obviously, the area's high production is attributed to high productivity which is consistently true to all the Davao provinces and Davao City. In the last six years, productivity (of about 710 kg/ha) consistently far exceeded that of the Country's average of less than 500 kg/ha. Cacao production could be much more enhanced. In particular, the MAIDEN (Mayo Agro-Industrial Development Enterprises Inc.) A plantation in Davao Oriental inter-cropping coconut with cacao in an area of 510 ha produces 1,200 tons of cacao per year. This shows that the area's potential could be realized with application of appropriate technology and inputs.

Cacao production has been stagnant over the years. Some 900 ha of cacao farm in Davao del Sur was recently replaced with mango. The major problems in cacao production are difficulty in pest control, poor maintenance of plantation after land distribution under CARP, unstable market, and low farm-gate prices.

Coffee

The DIDP Area produces 32% of the Country's coffee, 90% of Southern Mindanao's and 46% of the Mindanao Island's. Robusta is the dominant variety because of preference of the Filipino people. The dominant buyer of coffee is Nestle Philippines, Inc., taking about 75% to 80% of the total production. Over the last six years, coffee production has been almost constant. Davao Province is the biggest producer in the DIDP Area, followed by Davao del Sur and Davao City with 45%, 26% and 24% shares, respectively. The Nestle Philippines, Inc., recently established a experiment and demonstration farm in Tagum, Davao Province for promoting coffee planting through new planting, rehabilitation, rejuvenation, and regeneration to enhance coffee production in the DIDP Area and meet an upward demand.

Sugarcane

Sugarcane is produced only in Davao del Sur. Its harvested area was 6,946 ha in 1995. Some 50% of the area are cultivated by small holders. From 1987 to 1992, production area decreased at 20% per annum due to the slump in prices of sugar in the market. As sugar prices improved, the areas were restored and expanded. From 1992 to 1995, the area increased at 50% per annum. Productivity continued to increase from 1987 to 1994, the highest being in 1994 as 92 tons/ha. This may imply only productive farms could survive when sugar prices go down.

Rubber

Rubber is produced in Davao Province, Davao del Sur, and Davao City with a total harvested area of 6,240 ha, mostly in Davao Province where 75% of the total DIDP rubber area is located. Rubber production in the DIDP Area accounted for about 8% of the Country and Mindanao total in 1995. Most of this crop is found in Region XII, particularly in the Cotabato provinces. Yield of rubber in the Area is much higher than in other rubber producing areas. Davao City specially shows higher yield among the four LGUs. Consistently increasing for the last six years, rubber is

a promising crop in the Area, as soil and climate are suitable.

Abaca

Abaca was harvested in 7,438 ha in the DIDP Area in 1995, with a total production of 5,308 tons, sharing 8% of the Country's total. The largest area is found in Davao Oriental (51%) but productivity is much higher in Davao City and Davao Province. Overall trend in the yield of abaca in the DIDP Area is not very encouraging. Only Davao City showed an increase in productivity, while the rest are decreasing. Efforts to revitalize the abaca industry have set in, to meet the increasing demand in foreign countries. Development program for abaca products is being implemented to support the industry.

Other industrial crops include castor, tobacco, cashew, cotton, kapok, and ramie. Cashew is very promising in Davao City. These crops are planted in much smaller areas but have shown a relatively good potential in terms of suitability.

2.7. Performance of Livestock and Poultry

Livestock and poultry industry in the DIDP Area has been growing fast, especially cattle, hog, and duck. Recent trend of the industry is described here. An inventory of the animals is shown in Table 22.

2.7.1. Cattle

Cattle are dominantly raised in a backyard scale. Of the total number of heads of 92,440 in 1995, 91% or 84,310 were kept in the backyard. Backyard raising has dramatically increased starting from 1990 due to the DA's livestock dispersal program which included importation of fatteners to arrest the drastically declining trend of cattle heads in the late 1980s. Importation of meat was also allowed to abate the practice of slaughtering young breeder cattle. Davao del Sur shared 48% of the total inventory in the DIDP Area, and had consistently increased in number through out the last six years (1990 to 1995). Commercial scale is also increasing. The number of heads in commercial scale are found mostly in Davao City, Davao Province, and Davao Oriental.

2.7.2. Carabao

By the end of 1995, carabao inventory reached 151,717 with almost 100% coming from the backyard scale. Carabao is still considered a draft animal. The ban on carabao slaughter is still on but there has been no sanctions implemented. More often, carabeef is passed on as beef. Most provinces (except Davao Oriental) showed an increasing number of carabao heads. Overall annual growth rate for the DIDP Area was 2.3% during 1990-1995.

Table 22 Inventory of Livestock/Poultry by Area/Province/City in 1995

Livestock/poultry	Davao Province	Davao City	Davao del Sur	Davao Oriental	DIDP Total	Southern Mindanao	Mindanao	PHILIPPINES
1. Cattle	21,830	20,510	37,610	12,490	92,440	169,430	637,762	2,021,051
Backyard	19,430	17,970	36,540	10,370	84,310	138,520	575,690	1,835,130
Commercial	2,400	2,540	1,070	2,120	8,130	30,910	62,072	185,921
2. Carabao	48,688	31,001	45,220	26,808	151,717	211,011	896,016	2,707,826
Backyard	48,667	31,001	45,220	26,786	151,674	210,968	895,458	2,702,325
Commercial	21	0	0	22	43	43	558	5,501
3. Hog	196,040	224,950	112,900	110,950	644,840	947,000	2,546,640	8,941,200
Backyard	172,550	136,960	111,490	108,320	529,320	650,710	2,200,860	7,181,340
Commercial	23,490	87,990	1,410	2,630	115,520	296,290	345,780	1,759,860
4. Goat	109,730	49,899	106,820	57,653	324,102	390,199	1,177,565	2,828,089
Backyard	109,446	49,700	106,430	57,404	322,980	386,905	1,171,773	2,815,493
Commercial	284	199	390	249	1,122	3,294	5,792	12,596
5. Chicken	1,340,060	2,246,174	1,499,479	803,692	5,889,405	7,147,585	22,174,391	96,215,725
Broiler	11,474	1,246,616	138,513	84,365	1,480,968	1,642,996	2,488,881	27,884,980
Layer	54,372	402,648	45,380	5,971	508,371	641,773	1,385,725	9,364,485
Native/Improved	1,274,214	596,910	1,315,586	713,356	3,900,066	4,862,816	18,299,785	58,966,260
6. Duck	256,533	64,846	121,830	61,093	504,302	620,692	2,170,735	9,072,203
Backyard	249,553	64,846	121,500	61,093	496,992	606,539	1,949,221	6,855,460
Commercial	6,980	0	330	0	7,310	14,153	221,514	2,216,743

Source: JICA Study Team cited from the Data from BAS, DA

2.7.3. Hog

Hog is also generally raised in a backyard scale (82% of the DIDP total). This follows national trend. Hogs are generally easier for small farmers and poorer households to raise since feeds can be sourced from the neighborhood or farm by-products. Both backyard and commercial scale are increasing (annual average growth rate of 2.4% and 5.2%, respectively during 1990-1995). The total average growth rate (backyard and commercial) was 2.9% per annum. Commercial hog raising is rapidly increasing in Davao City, Davao del Sur, and Davao Province.

2.7.4. Goat

The DIDP Area shared 11.5% of the Country's total goat population in 1995. Goat is another livestock raised in a backyard scale (99.7% in the 1995 inventory). For the last six years, goat raised in backyard was increasing while commercial scale was decreasing. Total inventory in the DIDP Area was generally increasing over the last six years mainly due to the backyard scale production.

2.7.5. Poultry

Poultry production is mainly chicken and duck. Chicken consists of four breeds: broiler, layer, native/improved, and gamefowls. In 1995, the inventory showed that broiler heads were 25% of the total population, layers 9%, and native/improved 66%. Broilers and layers are raised mostly in Davao City, while native chickens are raised mostly in Davao Province and Davao del Sur. Chicken inventory was fluctuating through the years. Specifically, the virtual monopoly of broiler chicks production could be one area to be looked into as constraint to consistency of supply. Nowadays, more poultry raisers are under contract with corporate companies.

Duck is raised both for food and meat. The DIDP Area's inventory in 1996 shared 81% of Region XI's and 6% of the Country's total. Some 99% were raised in the backyard which are mostly accounted for by Davao Province and Davao del Sur. From 1991 to 1995, backyard duck raising was on the downward trend due to the drastic decline of production in Davao City.

2.8. Forestry Performance

The most recent forestry statistics reveals that, of the 15.88 million ha designated as forest land, only 5.49 million ha or 18% of the total national land was forested. It is attributable to the past logging activities without conservation or reforestation measures. From a net exporter, the Country has become a net importer of forest products, particularly wood, in the past 10 years or so. In the DIDP Area, it is reported the forested area accounts for some 25% of the total land area, showing better condition than the country's average, but a far cry to the desirable proportion of 35%.

Land area under timber licenses agreement, a long term license for the harvesting and removal from timber for public forest decreased from 8 million ha with annual allowable cut (AAC) of 15.6 million m³ in 1976 to only 1.5 million ha with AAC of 1.1 million m³ in 1995. About 87% of the total or 963,000 m³ of AAC are in Mindanao. In the DIDP Area, however, forestry activity is not so strong. In 1995, only one timber license agreement existed in Davao Oriental in a total area of 40,000 ha with AAC of 8,530 m³, compared with 1991's 12 licenses in a total area of 357,030 ha and 487,318 m³ of AAC.

On the other hand, land under the Industrial Forest Management Agreement (IFMA), an agreement to occupy and process any forest land in order to establish an industrial forest plantation, increased from only one agreement with 2,000 ha in 1977 to 248 agreements with 538,000 ha in 1995 nation wide. In the DIDP Area, there were 53 agreements with 80,282 ha, which are mainly found in Davao Province and Davao Oriental.

Massive logging operation has been vanished except in the IFMA areas. Part of the remaining forests are managed by local people under the Community Based Forest Management Program (CBFMP) created by the Executive Order No.263 issued in 1995. The CBFM is anchored on the participation of organized local communities in identified forest areas. The Government provides qualified local communities security of tenure and access to and responsibility in the utilization, management, protection and rehabilitation of forest resources, provided that they employ environment-friendly, ecologically sustainable and labor intensive harvesting methods. Of the total 106,609 ha under the program, the DIDP Area has seven projects with an aggregate area of 21,605 ha, three in Davao Province with an area of 17,015 ha, three in Davao Oriental with 3,180 ha, and one in Davao del Sur with 1,410 ha.

Forestry sector's contribution to economy shrank from 2.17% of GDP in 1976 to as low as 0.1% in 1996. Round wood production decreased from 8.7 million m³ in 1976 to 0.86 million m³ in 1995. Similar tendency is found in the production of processed wood such as lumber, veneer, and plywood. Although Mindanao including Region XI and the DIDP Area contributed significantly to forestry activity, production as well as earnings followed the decreasing trends in the whole Country. So did downstream industries like furniture making and other wood

processing.

Among the non-timber forest products, the DIDP Area has been known for bamboo and rattan production area. These two products have relatively maintained their supply volume over the years. Furniture industry using these products is still active. Bamboo is expected to be utilized as materials for plywood and other processed products.

2.9. Agri-business, Marketing and Trade

2.9.1. Agri-business and marketing

The following paragraphs describe the existing marketing systems of various commodities.

(1) Grains

Marketing of grains (such as rice and corn) is still dominated by traders as buyers of farmers' produce. In many cases, these traders are also money-lenders where the farmers borrow money for production purposes and/or family needs. This system which is characterized by a vicious cycle of borrowing left the rice and corn farmers at the mercy of the traders/lenders who lend at high interest rates and buy products at low prices.

Farmers who are not financially tied to the traders are more inclined to find better market for their products. However, they still tend to sell to the traders who come to the farms. For one reason, selling to traders simplifies the process especially eliminating transportation worries and getting immediate cash, and for another, most of the farmers do not know how to use the available price information.

It is reported that cartels in the DIDP Area, particularly in Davao City, have distorted pricing of rice. As sizes of these businesses are big enough to able to control supply and hence, they can also create an artificial deficit or surplus in the market thereby controlling both farmgate prices of paddy and retail prices of rice.

(2) Livestock and poultry

Livestock are also sold to traders who come to the farms. There are existing auction markets in Padada of Davao del Sur, Nabunturan of Compostela Valley, and Tagum of Davao del Norte. The last one has just started operation, but the former two have stopped operation since 1991. According to an interview with an extension worker in Davao del Sur, it is difficult for farmers to bring large animals to auction market, as most of them live far from the auction market without vehicle to transport. In usual cases, a trader contacts a village broker and asks him to look for animals for sale. The broker then transmits the trader's intention to animal raisers. By the time the trader comes to the place, the broker has the lists of farmers who want to sell their animals. The trader visits each farmer to verbally negotiate for the price without measuring animal's weight. After buying the animal, the trader brings animal to non-operating auction market to "measure" the actual weight of the animal before transport. There is no available price information at the auction market.

Traders sell to retailers either live or carcass. Some retailers purchase live animals directly from backyard or commercial raisers and slaughter. Around 70 % of the meat supply in the Davao City are processed in both public and private slaughter

houses including big meat processing companies. These meats are certified safe for consumption by the inspectors of the city/provincial veterinarian offices in the slaughter houses or inspectors of the National Meat Inspection Commission (NMIC) of the national government in the meats processing companies. The rest are slaughtered and processed elsewhere and goes around to the consumers without safety certificate. These are called "hot meat". It is more likely that there is a proliferation of hot meat in provinces due to unavailability of slaughter houses or meat inspectors.

Poultry products are also sold to the traders, directly to the institutional buyers or market vendors. Pre-selling negotiations is usually done for broiler chicken as this has to be disposed at specific age (i.e., within 30 to 45 days). Broiler chickens are often raised under contract growing agreements.

(3) Vegetables

The flow of vegetable products from farmers to consumers is as shown below.

farmer → trader → trader (central market) → retailer → consumer
farmer → trader → institutional buyer → consumer
farmer → trader → processor
farmer → processor
farmer → institutional buyer
farmer → consumer

Traders visit farms to survey availability of supply (type of commodity, quantity, variety, expected harvest time). At an appointed time, traders go back to the farms to collect the harvest, and bring them to the "bagsakan" (some kind of a wholesale market) in town. In wholesaling, price negotiations are done secretly. At the "bagsakan", all types of buyers can be found: traders who may be suppliers to institutional buyers, processors and retailers who do their own purchasing, and consumers.

Price information acquisition is an intrinsic activity for vegetable traders because these commodities have very volatile prices, highly perishable and easily affected by other factors such as competition with other supply areas. Among farmers, only independent ones benefit from price information. Financed farmers get to know the buying price after all the vegetables are harvested since the financiers dictate the buying price.

Some farmers go to trading centers of the provinces and Davao City to know the prevailing market prices. Retail prices are also broadcasted over the radio twice a day, i.e., early mornings and early evenings. These prices are used by self-financed educated farmers to sell their products.

(4) Fruits and other commercial crops

Marketing of fruits and other commercial crops is in varied marketing structures depending on the type of producer: corporate farms, cooperative members, and individual producers. These structures are described below.

Corporate farms: The marketing flow of corporate farms can be represented by four structures described as follows.

-
- 1) Corporate farms directly transact business with processors who have two ready buyers. These are the retailers and exporters who sell to foreign markets like Hong Kong, Singapore and Japan.
 - 2) Corporate farms directly sell their produce to exporters who offer higher buying prices compared to other types of traders.
 - 3) Corporate farms enter into contract with farmer-growers. This is practiced especially when there is an extremely high projection of export market demand.
 - 4) Corporate farms who are at the same time processors, process their produce into candies, jams, purees and other dried products and penetrate both domestic and foreign markets.

Cooperatives: Cooperatives marketing follows two structures as follows.

- 1) Cooperative markets its member's produce to consumers/end-users (households who purchase direct from the cooperative for a volume at a discounted price) and wholesaler-retailers who operate permanent stalls in the market, sell to small vendors and institutional buyers.
- 2) Cooperative members sell to market cooperative and contract buyers. Members sell part of their produce to the coop which has ready access to end users. They may also sell to contract buyers with whom they have previous arrangement.

Individual growers: There are four marketing flows that exist in the non-coop member individual growers. They sell directly to the (1) retailers who are usually ambulant and self-financed vendors, (2) wholesaler-retailers or assembler-wholesaler (who procure in bulk and transport to demand centers), (3) processors, and (4) sprayer-traders whom they share the produce with.

(5) Coconut, coffee and other industrial crops

Trading of industrial crops, including price formations is similar. The end buyers are the processors, the initial sellers are the farmer-producers and in between them are layers of traders. Usually, the traders of copra, coffee and abaca are the same people or enterprises, having buying stations that procure almost all kinds of industrial crops in the area. Assemblers are first layer of traders and direct suppliers to processors. They maintain a network of traders who go places to procure commodities.

The price leaders of industrial crops are the processors; for coconut - the oil millers who are generally exporters of crude and cochin oil; for coffee - Nestle Philippines, the single price leader in Mindanao and for abaca - the Grading Baling Establishments (GBEs) which are really exporters of raw fiber. The price of former two commodities depends largely on international market. The growing abaca handicraft industry is competing with the GBEs due to higher buying prices offered by the former. Despite that, the GBEs still prevail due to its comparatively large financial resources.

The processor determines the base price of commodity. Assemblers use these prices as reference for setting their buying prices. Assemblers and traders keep tract of prices very closely to survive the competition especially during very tight supply seasons. Well-organized and well-financed trading enterprises maintain a telecommunication facility to access information easily and transmit the same to the

traders who are out in the field.

Just as in other commodities, farmers who are not financially tied to traders have options where to sell.

(6) Cutflowers and other ornamental plants

Cut-flower raisers are categorized into small, medium and large enterprises. Small raisers have a maximum of four thousand pots while large raisers maintain more than 25 thousand pots. Large scale growers undertake own trading of produce. They also act as assemblers by buying flowers from small growers. However, quality of produce is a problem with small growers. Thus, some assemblers enter into contract growing arrangement with the small growers where the former provides planting materials, financial assistance (as the case may be) and technology to the small growers. In return, the latter sells the produce to the assemblers. Some small and medium scale growers form a cooperative for purposes of getting production assistance from government institutions and NGOs and most importantly, for purposes of marketing their products. Marketing cooperatives have played a crucial part of small scale producers as each producer can not produce in commercial scale. Marketing cooperatives buy from members and sell to direct users such as hotels, flower shops and retailers or ship to buyers in Manila and other regional centers.

Market information need assessment (MINA) in the DIDP Area has not included cut-flowers. Hence, there is no information as to where price formation starts or who the price leaders of the commodity are. Experience of Minmark, the marketing arm of the Federation of Mindanao Cutflowers Cooperatives (Minfed) revealed that, in general, prices of cut-flowers are rather stable and usually go up during lean months. However, despite the overall deficit situation in supply of cut-flowers in the country, market gluts sometimes occur as this commodity is seasonal and market information is nil. Especially in Metro Manila, the sub-standard cheap cutflowers including orchids are imported from Thailand, which lower the prices.

2.9.2. Trade

(1) Domestic trade

Food crops produced in the DIDP Area are locally consumed or brought to other regions in the Country. Of the total volume going out of the Area, the major destination is Metro Manila. Some portions go to other urban centers like Cebu and Iloilo. As estimated by a JICA Master Plan Study (Visayas and Mindanao Island Strategic Road Network Development Project, 1997), NCR/Metro Manila received 55 % of the total agricultural products from Region XI which includes the DIDP Area in 1995. Likewise, fruit/industrial crops are processed within the Area or transported outside. Notably, 60% of mangoes produced in Davao del Sur are shipped to Cebu for processing. Some copra produced from the east coast municipalities of Davao Oriental are also transported to Cebu by traders. Vegetables like tomatoes are also transported to Metro Manila or other cities during lean months. Produced rice may be locally consumed within the Area, since neighboring provinces like the rest of the Region XI provinces are rice producers. Rice produced in the DIDP provinces would probably complement the huge deficit in Davao City. In particular, rice produced in Banaybanay, Davao Oriental which has been known for good eating quality is popular in Davao City.

(2) International trade

Trade through the Davao ports (Davao City and Mati) is dominated by exports. From 1991 to 1995, exports had always exceeded imports, since the Country's imported commodities generally come in through Metro Manila. The average balance of trade for the period is P211 million in Davao City port and 21.6 million pesos in Mati port. Exports mainly consist of agricultural products. Notably, fresh bananas accounted for 87% of the total. Coconut came a very far second sharing only 6% of the total exports. Coconut products exported mainly consist of coconut oil. Other exported coconut products are copra meal, copra, desiccated coconut, activated carbon, cocoshell charcoal and fresh coconuts.

Exports from the DIDP Area go mainly to five major destinations; Japan, Korea, Middle East, China and USA. For the first quarter of 1997, Japan absorbed about 46 % of the total. Korea, Middle East, China and USA received 14 %, 11 %, 11 % and 7 %, respectively.

2.10. Cooperative Development

Cooperative activities have been very common in the DIDP Area. As of 1996, there were 2,767 cooperatives registered to CDA, 39% of which or 1,086 were agri-based multi-purpose cooperatives (MPCs). The total number increased more than thrice from 797 in 1991. Table 23 shows the number of registered cooperative by province and by type as of 1996.

Table 23 Number of Cooperatives by Type and by Province in DIDP Area (1996)

Type of Cooperative	Davao Province	Davao City	Davao del Sur	Davao Oriental	DIDP Total
Agri-based MPC	487	162	243	194	1,086
Non-agri MPC	422	441	236	110	1,209
Consumers Coop.	44	52	25	10	131
Marketing Coop.	9	17	16	11	53
Production Coop.	10	31	12	14	67
Credit Coop.	33	89	17	4	143
Service Coop.	7	34	8	1	50
Union/Fed./Coop. Bank	9	10	4	5	28
Total	1,021	834	561	349	2,767

Source: JICA Study Team based on the data from CDA Davao Extension Office.

Davao Province has the largest number of cooperatives with 1,021, followed by Davao City with 834, Davao del Sur with 561 and Davao Oriental with 349. Of the total number of cooperatives, Davao Province has also the largest number of agri-based MPCs with 487, or 48% of the total cooperatives in the Province. Davao del Sur has the second largest number of agri-based MPCs with 243 or 43% of the Provincial total, followed by Davao Oriental with 194 or 56% of total. Davao City has the smallest number of agri-based MPCs with 162, which accounts for only 19% of the City's cooperatives. Cooperative activities are well-diversified in Davao City where more than 50% of the cooperatives are non-agricultural MPCs.

Each cooperative is required to submit an annual report to CDA. The rule however, has not been followed well. According to CDA, only 40% of the registered cooperatives in the DIDP Area submitted their reports in 1994. Thus, cooperative activities have not been well monitored.

While some cooperatives have been well managed, others are reported to be dying. During the initial stage of cooperative movement, people were organized mainly for the sake of getting loan from financial institutions without insecurities of sustaining the business.

Provincial/City Cooperative Development Offices (PCDOs/CCDO) are responsible for assisting the development of cooperatives. PCDO in Davao Province, for example, extended the following assistance for promoting cooperative development in 1997: (1) financial assistance to cooperatives by providing 11 mechanical dryers, eight solar dryers, four bodega/warehouses and other facilities, (2) education and training assistance to cooperative members, officers and management staffs to improve their knowledge and skills on management, bookkeeping, auditing, credit process and collection, secretary development, supervisory training, project development and financial analysis, totaling 47 courses with 2,475 participants, (3) technical assistance such as feasibility study, project design and project proposals preparation, SALT establishment etc., and (4) other forms of assistance such as accreditation of cooperatives to ensure their viability and capability, trainings on Pre-Membership Education Seminar etc.

2.11. Agricultural Support Services

2.11.1. Irrigation

As reported by the National Irrigation Administration (NIA), the Country's prime irrigation agency, the total potential area for irrigation is about 103,300 ha as shown in Table 24. This includes the lands utilized for other purposes like establishments, banana etc. Davao Province covers the largest area potential for irrigation development (66%). About 24 % are in Davao del Sur including Davao City and less than 10 % are in Davao Oriental. Existing irrigated area in the DIDP Area is about 39 % of the potential area. Davao Province is about 35 % developed, Davao del Sur and Davao City - 50 % and Davao Oriental - 37 %. Theoretically some 62,850 ha can still be developed for irrigation.

Table 24 Irrigation Development Situation in DIDP Area (1996)

Province/City	Potential		Existing	
	Area (ha)	% Shares	Area (ha)	Dev't rate (%)
Davao Province	68,500	66.3	24,276	35.43
Davao del Sur	25,400	24.6	12,659	49.84
Davao Oriental	9,400	9.1	3,515	37.39
DIDP Total	103,300	100.0	40,450	39.16

Source: NIA Region XI

NIA develops two types of irrigation systems according to size: the national irrigation system (NIS) and the communal irrigation system (CIS). The NIS is that with 1,000 ha or more service area, while the CIS is an irrigation system with less than 1,000 ha of contiguous service area. Table 25 shows the list of NIS in the DIDP Area.

There are nine NISs in the DIDP Area with a total irrigation service area of 33,146 ha. Six are in Davao Province with 24,777 ha, followed by Davao del Sur, two NISs with 6,124 ha, and Davao Oriental with 2,245 ha. Total number of beneficiary farmers is 22,717, 71% of which or 16,195 are in Davao Province. Average irrigated area per beneficiary is some 1.5 ha, ranging from 1 ha to 2 ha, depending on the

NISs. Judging from the average irrigation intensity of 179%, which is derived from the total annual irrigation area divided by the irrigation service area, all NISs in the DIDP Area are very efficiently operated. The only exception is the Kipaliku NIS in Davao del Norte which has relatively low irrigation intensity of 122% (national average: 132%). The relatively large gap between service area and actual irrigable area exemplified by Libuganon NIS may be an issue that affects irrigation intensity.

Table 25 List of National Irrigation System in DIDP Area (1996)

Name of the System	Location (Municipalities)	Service Area (ha)	No. of Farmer Beneficiaries	Irrigated Area (ha)		Production (cavans/ha)	
				Dry Season	Wet Season	Dry Season	Wet Season
Davao Province							
1 Saug-Libuganon RIS	Asuncion	619	474	491	450	58	79
2 Batutu RIS	Compostela	3,269	2,508	3,204	2,940	68	76
3 Saug RIS	Asuncion	2,940	2,685	3,573	3,312	54	66
4 Libuganon RIS	Carmen, Sto. Tomas, Dujali and Kapitalong	10,239	6,991	8,490	8,819	68	71
5 Lasang RIS	Panabo, Carmen	4,450	2,138	4,309	4,289	78	72
6 Kipaliku RIS	Sto. Tomas and Kapalong	3,260	1,399	2,007	1,998	77	78
Sub-total		24,777	16,195	22,074	21,808	68	72
Davao del Sur							
1 Mal RIS	Matanao	2,612	2,464	1,400	2,486	74	80
2 Padada RIS	Hagonoy	3,512	1,832	3,420	3,420	112	110
Sub-total		6,124	4,296	4,820	5,906	101	97
Davao Oriental							
1 Lupon RIS	Banaybanay	2,245	2,226	2,288	2,288	86	95
Sub-total		2,245	2,226	2,288	2,288	86	95
NIS Total		33,146	22,717	29,182	30,002	85	88

Source: NIA Region XI

Under NISs, average yield varies by location. The Padada NIS in Davao del Sur shows the highest yield with 5 tons/ha, for both dry and wet seasons croppings. The Lupon NIS in Davao Oriental, producing fancy rice known as "seven tonners", also shows rather high yield, especially in dry season cropping. Rice produced in and around Lupon NIS has been transacted at higher price not only due to good taste but also due to higher milling rate. The reason for this, however, has not been clarified. On the other hand, relatively lower yields are recorded under NISs in Davao del Norte. According to the NIA, lower yield could be attributed to "tungro" virus disease which has affected wide area and poor water management practice which eventually hampers the effective integrated pest management (IPM).

Of all the NISs farmers, farmers at Padada NIS may be the most benefited with highest average yield, largest land holding size, and highest irrigation intensity.

Communal Irrigation Systems (CIS) in the DIDP Area are shown in Table 26. There are 55 CISs in the DIDP Area, with the total service area of 10,641 ha. Davao del Sur has the largest share with 6,535 ha covered by 22 CISs, followed by Compostela Valley with 1,912 ha by 16 CISs, Davao Oriental with 1,270 ha by 10 CISs, and Davao del Norte with 924 ha by seven CISs. Average size of CIS is calculated at 193 ha, ranging from 14 ha to 2,350 ha. The number of farmers benefited by CISs is about 6,900, with average land holding size of 1.2 ha.

Table 26 List of Communal Irrigation System in DIDP Area (1996)

Name of the System	Location	Service Area (ha)	No. of Farmer Beneficiaries	Irrigated Area (ha)		Production (cavans/ha)	
				Dry Season	Wet Season	Dry Season	Wet Season
Davao del Norte		924	813	920	924	78	79
1 Upper Taganay CIS	Sto. Tomas	194	168	194	194	85	66
2 Semong CIS	Kapalong	311	245	310	311	80	88
3 Balagunan CIS	Sto. Tomas	20	15	20	20	70	70
4 Gabuyan CIS	Kapalong	174	141	174	174	70	74
5 Limbaan CIS	New Corella	73	92	70	73	75	80
6 Anaman CIS	New Corella	99	88	99	99	70	80
7 San Nicolas CIS	Panabo	53	64	53	53	82	82
Compostela Valley		1,912	1,517	1,698	1,699	65	75
1 Ngan CIS	Compostela	292	204	292	292	68	79
2 Haguimitan CIS	Monkayo	14	18	13	14	70	75
3 Upper Naboc CIS	Monkayo	188	145	183	183	70	80
4 Lower Naboc CIS	Monkayo	242	184	242	242	70	75
5 Bataao CIS	New Bataan	155	255	155	155	70	75
6 Dauman CIS	Montevista	87	51	65	65	75	80
7 Lino-an CIS	Montevista	37	34	37	37	74	75
8 Matiao CIS	Pantukan	83	85	83	83	77	85
9 San Miguel CIS	Compostela	70	64	66	66	65	70
10 Upper Saosao CIS	Mawab	42	51	42	42	70	94
11 Simsimin CIS	New Bataan	50	31	20	20	64	70
12 Tigbao CIS	Maragusan	241	140	170	170	38	43
13 Lower Saosao CIS	Mawab	72	51	72	72	70	90
14 Mawab CIS	Mawab	167	84	167	167	60	88
15 Tagugpo CIS	Pantukan	102	70	41	41	40	45
16 Monkayo CIS	Monkayo	70	50	50	50	80	85
Davao del Sur		6,535	3,829	5,238	5,271	78	78
1 Kilolog CIS	Magsaysay	220	284	220	220	80	80
2 Emfisa CIS	Bansalan	200	137	166	166	70	70
3 Cabacungan CIS	Malalag	66	62	50	50	60	60
4 Badoma CIS	Bansalan	300	244	300	300	80	80
5 Unifarm CIS	Bansalan	400	171	400	400	80	80
6 Upper Cabasagan CIS	Matanao	70	53	62	62	75	75
7 Blucon-Albatana CIS	Magsaysay	300	121	117	150	75	75
8 Badagoy CIS	Magsaysay	2,350	1,130	1,750	1,750	80	80
9 Mabini-Barayong CIS	Magsaysay	152	111	150	150	80	80
10 Bala-Kanapulo CIS	Magsaysay	205	137	205	205	80	80
11 Balasiao CIS	Kiblawan	50	10	10	10	60	60
12 New Cabasagan CIS	Matanao	188	169	175	175	75	75
13 Dakinus CIS	Bansalan	250	177	150	150	75	75
14 Bangkal CIS	Matanao	300	101	300	300	80	80
15 Balutakay CIS	Digos	250	200	186	186	70	70
16 Bonifacio CIS	Kiblawan	64	88	25	25	62	65
17 San Isidro CIS	Magsaysay	250	95	200	200	75	75
18 Lower Narber CIS	Bansalan	240	140	220	220	80	80
19 San Agustin CIS	Digos	500	235	399	399	80	80
20 New Katipunan CIS	Matanao	100	81	83	83	75	75
21 Mamacao CIS	Sta. Maria	60	63	60	60	65	65
22 Lagaylay CIS	Sta. Maria	20	20	10	10	65	65
Davao Oriental		1,270	741	676	682	73	71
1 Macangao CIS	Lupon	35	37	32	32	83	85
2 Masao CIS	Baganga	40	50	30	30	58	65
3 Tagboa CIS	Lupon	40	46	40	40	66	57
4 Manorigao CIS	Caraga	170	84	70	70	60	60
5 Tibanban CIS	Gov. Generoso	200	168	142	152	83	70
6 Abijod CIS	Cateel	100	28	92	92	75	75
7 Taytayan CIS	Cateel	275	98	47	47	65	65
8 Baganga CIS	Baganga	270	130	140	140	78	80
9 San Antonio CIS	Cateel	50	30	43	43	65	69
10 Buguis CIS	Cateel	90	70	40	36	65	73
CIS Total		10,641	6,900	8,532	8,576	75	77

Source: NIA Region XI

Irrigation intensity varies from province to province. It is highest in Davao del Norte with the intensity of almost 200%, followed by Compostela Valley with 178%, Davao del Sur with 161%, and Davao Oriental with merely 106%. As there is little difference in irrigated area between wet and dry seasons, low irrigation intensity can be explained by the gap between service area and actual irrigated area.

Overall average yield under CISs is about 3.8 tons/ha, rather lower than NISs of 4.3 tons/ha. Although the reason for this has not been clarified, it is said that farming technology adopted by farmers under CISs are lower than that under NISs in terms of input level, water management etc.

Most of the irrigation systems developed by NIA are run-of-the-river type, meaning that water for irrigation is diverted from the river by raising the water level to allow flow of water to the diversion canal. Areas covered by irrigation service areas are mostly planted to rice (89%). About 4,489 ha are planted to annual crops (specifically plantation bananas).

Recently, NIA and the DA-RFU have embarked on shallow tubewell (STW) as another mode of irrigation development. This scheme uses small pumps to draw water from the ground of about three to six meter-depth to irrigate farms with three to five ha-size. Under the Gintong Ani Program, 166 STWs have been installed in the DIDP Area covering 850.5 ha, as shown in Table 27.

Table 27 Number of STWs and Their Coverage in DIDP Area

Province/City	Nos. of STW	Area (ha)
Davao del Norte	62	330
Compostela Valley	12	71.5
Davao City	9	45
Davao del Sur	83	404
Total	166	850.5

Source: DA Region XI

2.11.2. Research, development and extension

Research, development and extension in Region XI is managed by the Southern Mindanao Agriculture and Resources Research and Development Consortium (SMARRDEC) whose establishment was orchestrated by the Philippine Council for Agriculture, Forestry and Natural Resources Research and Development (PCARRD). SMARRDEC is based at DA-RFU XI. It determines the region's R&D priorities, coordinates the planning and implementation of research programs and develops policy strategies of research management. The consortium consists of 17 research organizations (agencies and SCUs) which implement their respective research programs. The research prioritization of SMARRDEC is based on the National Agricultural Research and Extension Agenda (NAREA). Currently, the consortium focuses on six programs: Durian Integrated Research and Development Program (IRDP), Regional R&D Information Service (RRDIS), Technology Promotion, Transfer and Commercialization (TPTC), Strengthening Linkages and Cooperation, Technical Assistance Service, and Human Resource Development Program. On-going researches of member agencies are mostly on technology verification and adaptation. Technology generation are mostly applied researches on fruit breeding to improve quality, rubber variety improvement, development of

ornamental crop varieties. Livestock sector research includes upgrading of stock and forage crops.

(1) Research and development

The Davao National Crop Research and Development Center located at Bago Oshiro, Davao City is mandated to develop relevant technology in fruits, to produce seeds and plant materials of excellent qualities and to provide product/services in the promotion of farm family income and quality of life. They are currently working on the development of local cultivars and developing disease-free planting materials particularly for exotic fruits, such as durian, mangosteen, rambutan, native banana varieties etc.

DOST has its own medium term plan so-called Science and Technology Agenda for National Development (STAND 2000), for the period of 1992 to 1998. STAND 2000 identified support to the coconut industry as one of the priority technologies to be developed. Under this, DOST is involved in the development of primary processing technologies such as coco wood utilization and integrated coconut processing/utilization. In terms of research and development (R&D), oleochemicals and cocohusk, fiber and shell have R&D programs. Along with the program, DOST XI has supported coconut processing industries including a kiln for coco wood drying, provision of starters for nata de coco, soap making, briquetting plants etc.

DOST projects in the region include site-specific adaptation of technologies generated by various state colleges and universities (SCUs). Six projects pertaining to post-harvest handling and processing technologies are going on, most of which are for mango, cutflowers and seaweeds. Also there are five projects on production technologies, particularly tissue culture for cut flowers and abaca and the trichoderma technology for organic fertilizer produce. DOST XI has helped set up a Coir Decortization facility in Mati, Davao Oriental, which was inaugurated in December, 1997.

The University of Southeastern Philippines, Tagum City Campus, in collaboration with the Provincial Government of Davao del Norte and DOST is currently undertaking the production of virus free seedlings of abaca, banana and ornamentals. Likewise, the university is undertaking researches in crops and animals including food processing and post harvest technology.

The University of Southern Mindanao in North Cotabato province is doing research on plantation crops including coffee, cacao, rubber, oil palms etc. The Davao Oriental State College of Science & Technology, established in 1990, has research fields in biology (especially in marine) and agricultural technology such as food processing and animal husbandry.

(2) Extension

Under the Local Government Code of 1991, extension services are among the devolved functions of DA to LGUs, thus it is now mostly undertaken by the LGU extension workers. Techno-demo farms are set up by the national government research centers with the participation of the extension workers and the farmer-cooperators. In addition, the Agricultural Training Institute (ATI) operates a training center at Panabo, Davao del Norte. The ATI's training program generally targets improvement of capability of technicians. Most of the trainings conducted are trainers training.

Extension workers who enter farmers' fields are under Municipal Agricultural Offices. Provincial Agricultural Offices have technical staffs, who are technologically specialists with specialized skill in crop production, vegetable production, fisheries etc. Many DIDP municipalities' average agriculture technician-barangay ratio is three, meaning that there is only one technician serving three barangays. Davao City is an exceptional case. Technician-barangay ratio is less than two, and the number of technician is expected to increase further. In some municipalities, LGUs constructed a small office where farmers consult the technicians. This office is strategically located for easy access to three barangays served by a technician. On the average, a technician stays three days in a week at the office. The rest of the days are spent on other activities such as field visits, attending trainings and reporting to the municipal agriculturist office.

The University of Southeastern Philippines, Tagum City, is actively involved in the training of farmers, housewives and out-of-school youths in various agri-related livelihood programs. In addition, the university, in a limited capacity, is establishing barangay development laboratories which assists farmers' livelihood projects in terms of farm inputs and training.

2.11.3. Financing

In 1995, Southern Mindanao Region hosted a total of 256 banks and 330 non-bank financial institutions. Of the total number of banks, 166 are found in the DIDP Area. Davao del Sur and Davao City hosted about 70 % or 114 banks, most of which are commercial banks while Davao Oriental had only 12 or 7%, as shown in Table 28.

Table 28 Number of Banking Offices in DIDP Area (1995)

Banking Group	Davao Province	Davao del Sur	Davao Oriental	DIDP Total
Commercial Banks	9	78	2	89
Thrift Banks	3	15	-	18
Rural Banks	25	14	8	47
Specialized Gov't Banks	3	7	2	12
Total	40	114	12	166

Note: Davao del Sur includes Davao City.

Source: Philippine Financial System, Fact Book 1995 (BSP)

The net loan portfolio of banks in the DIDP Area amounted to P13.9 billion while total deposits was P20.4 billion. Due to the small number of banks operating mostly rural banks, Davao Oriental banks shared only 2% of the area's total loan portfolio and deposit generation.

Government banks and rural banks (RBs) are the biggest agriculture credit providers among banking institutions. There are 12 specialized government banks (SGB) consisting of the Land Bank of the Philippines (LBP), Development Bank of the Philippines (DBP) and Bangko Sentral ng Pilipinas (BSP) including branches distributed as follows: seven in Davao City and Davao del Sur, three in Davao Province, and two in Davao Oriental. The number of RBs in the Area is 47. The aggregate size of these banks in the DIDP Area are indicated as shown in Table 29.

Total net loan portfolio of RBs and SGBs was P2.5 billion, accounting for only 18% of that of banks total. Judging from these figures, rural banks in Davao Province

were more active than those in other provinces. On the other hand, in Davao del Sur including Davao City, SGBs accumulated nearly half of total deposits in the DIDP Area. LBP is the major lending institution for agriculture financing. It was established to finance the agrarian reform program and to deliver credit services to the rural areas. After the Government issued a policy to stop the lending activities of non-bank agencies, all government funds allocated for agricultural lending under various programs were channeled to LBP. As of 1996, the total loan exposure of the bank in credit assistance amounted ₱9.1 billion in the whole Country, 4.4% of which or ₱0.4 billion went to the DIDP Area.

Table 29 Credit and Saving at Banks in DIDP Area (1995)

Type of Bank	Number	Total Resources	Net Loan Portfolio	Total Deposits
Davao Province				
- RBs	25	1,045	712	639
- SGBs	3	637	358	571
Davao del Sur				
- RBs	14	436	236	186
- SGBs	7	1,825	973	1,611
Davao Oriental				
- RBs	8	204	103	120
- SGBs	2	171	100	158
DIDP Total				
- RBs	47	1,685	1,051	945
- SGBs	12	2,633	1,431	2,340

Note: Figures in million pesos except for the column for number. Davao del Sur includes Davao City.

Source: Philippine Financial System, Fact Book 1995 (BSP)

The bank's credit assistance utilizes conduits consisting of rural financial institutions (RFI) and cooperatives. Data from 1991 to 1996 shows a noticeable decline of the number of farmers' cooperatives as LBP's credit conduits from 140 to 62, as shown in Table 30.

Table 30 Number of Credit Conduit Organization of LBP in DIDP Area: 1991 and 1996

	RFIs		Farmers' Coops		Credit Coops		Farmers Groups	
	1991	1996	1991	1996	1991	1996	1991	1996
Davao Province	7	9	51	20	-	4	-	2
Davao del Sur	6	7	65	29	-	26	-	7
Davao Oriental	1	2	24	13	-	1	-	-
DIDP Total	14	18	140	62	-	31	-	9

Note: Davao del Sur includes Davao City.

Source: LBP

Some farmers' cooperatives may have converted into credit cooperatives or cooperative banks. An unfortunate interpretation would be that farmers cooperatives are not able to pay back and therefore blacklisted by the bank.

The banking system in the Philippines is stringent in their policies on loan approval. Collateral is almost always required for loan application with a host of additional requirement to assure them that the borrowers are able to pay loans. Application takes time, especially for farmers to gather the right supporting documents, a

process most are not familiar. The requirement for collateral and tedious application procedure are the main reasons of farmers to shy away from banks, aside from the virtual unavailability of banks in the Area.

On the banks' side, assurance of collateral is the basic requirement to extend loan. In order to encourage banks to extend more credit to agricultural sector, the Government established specialized institutions to implement guarantee programs. These institutions include the Guarantee Fund for Small and Medium Enterprises (GFSME), Quedan Guarantee Corporation (Quedancor) and the Philippine Crop Insurance Corporation (PCIC). The GFSME and Quedancor are engaged in agricultural credit guarantees with accredited banks, while PCIC is in the business of agricultural production insurance for paddy, corn, livestock and farm machinery. The guarantee programs, however, are kept from the knowledge of the borrowers for the bank's advantage of strengthening the security of loan payment. Since these are transactions between bank and the guarantee agency, the guarantee premium is often passed on to the borrower as hidden costs while he is still required to produce collateral for his loan.

Reflecting the above situation, it has been reported that more than 50% of rural borrowers get loans from informal creditors such as land lords, merchants, middlemen, relatives/friends, despite the much higher interest rates (i.e. 60% to 240% per annum for informal credit vs. 14% to 22% for formal banking). The major reason for this is its easier accessibility; collateral not required, simple and fast procedure to obtain loan, flexible repayment schedule etc., all of which are reversed conditions in formal banking system.

In order to increase the flow of credit to the rural areas particularly to make private bank financing available for agricultural activities, a liberal financial environment is necessary (Llanto, 1994). Liberalization of the financial market was started under the Aquino Administration and was continued on by the Ramos Administration further improving the mechanisms to realize a fully liberalized financial policy regime. Thus, the thrusts of government in rural credit improvement include:

- increased investment in production and market-enhancing infrastructure;
- liberalization of agricultural commodity market prices;
- efficient government lending programs through bank, cooperative and NGO intermediation;
- effective credit guarantee and agricultural commodity insurance schemes; and
- development and strengthening cooperative entrepreneurial and financial management capabilities.

Resulting from the credit reforms effected by the two post-Martial Law administrations, the current rural financial market is expected to move towards increased participation of private banks and other financial intermediaries in rural lending, thereby, decreasing cost of money in the rural areas.