

of confluence between the Diyaella oya and Attanagalu oya, as well as further downstream along the Kalu ela and Dandugam oya. Also, the extreme downstream portion of the catchment is affected by tides from Negombo lagoon. All of the above factors must be considered in formulation of an adequate drainage plan for the catchment area.

b) Need for a Catchment Drainage Plan

Catchment-wide drainage strategies remain as yet unformulated for Gampaha district. Drainage planning in particular for lower reaches of the principal rivers requires a catchment-wide conceptual approach which goes beyond the jurisdiction of the Irrigation Department. Strategies must take into account and coordinate aspects of both catchment-side drainage and of normal field drainage requirements for paddy cultivation.

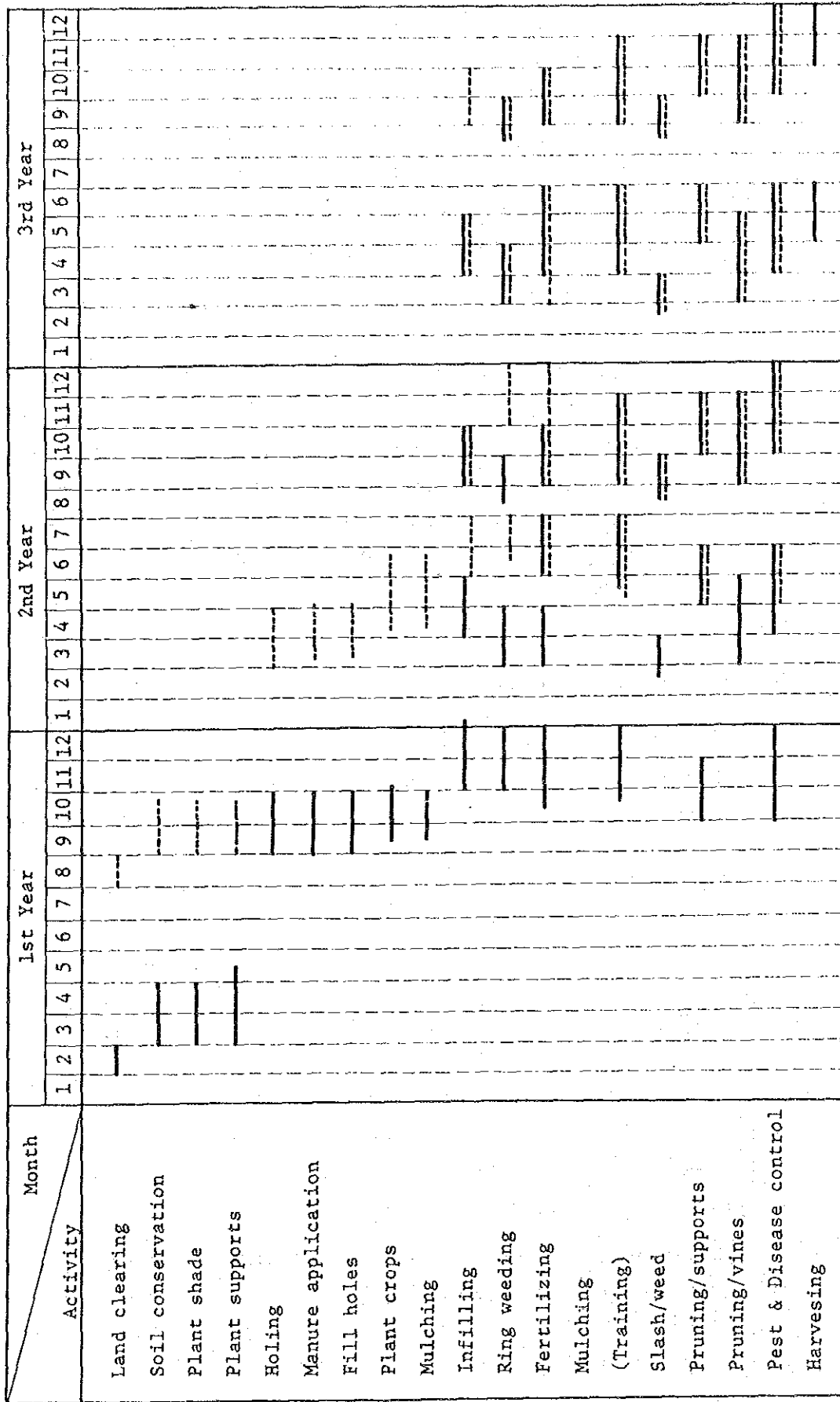
### 2.3.4 Productivity and Management

(1) Agricultural Crops and Cropping Pattern

The major crops in the Project area consist of coconut palm, paddy, cassava, banana, and pineapple. Paddy is raised twice a year in Yala season and Maha season. The cropping area of paddy varies by season depending upon fluctuations in rainfall. Nearly 100% of paddy fields are planted with rice in Maha season and 70 to 90% in Yala. Coconut palm, a perennial crop, is raised in upland fields excluding paddy fields, and harvested throughout the year. This crop is a staple food of this district together with paddy rice. The consumption of it in the Project area is 97 pieces per capita per annum. The inter-cropping of export crops such as pepper vine and coffee tree with coconut palm has been increasing since 1983. Judging from the favorable climate, land, and labor conditions of the Study area, this trend will continue in future. Cropping patterns of pepper and coffee are shown in Fig. 2.2.4.1 and 2.3.4.2.

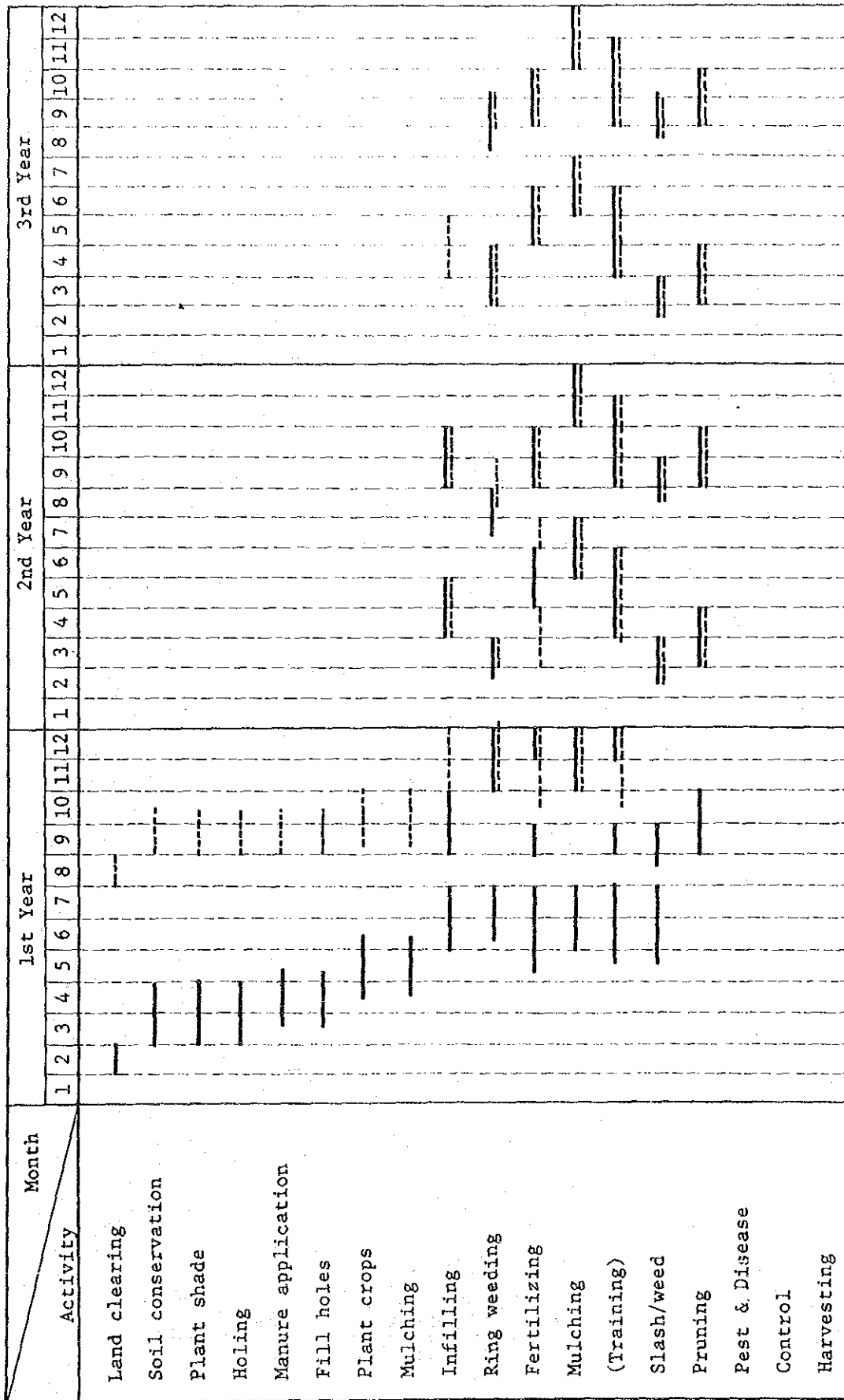
In selecting crops to be raised, farmers in the Study area tend to prefer paddy to the other crops so far as their farmland is suitable for paddy cropping. However, it is topographically difficult to convert the present coconut palm fields to paddy fields. Moreover, rivers in the area do not

Fig. 2.3.4.1 Cropping Calendar (Pepper)



Source: Minor Export Crop Dept. Campaha Dist.   
 ————— Yala planting (70%)   
 - - - - - Maha planting (30%)

Fig. 2.3.4.2 Cropping Calendar (Coffee)



Source: Minor Export Crop Dept. Gampaha Dist. ——— Yala planting (80%)  
 - - - - - Maha planting (20%)

have surplus water resources for irrigation of paddy fields, even if expanded. The present coconut palm field size will be maintained in future. The other upland crops such as cassava, banana, and pineapple are inter-cropped with coconut palm trees.

(2) Coconut

Gampaha is the second largest coconut producing district in the country, where 73,000ha (180,000ac) of coconut fields are cultivated. This accounts for 17% of the country's coconut area (416,800ha). The first district in coconut cultivation is Kurunegala which adjoins Gampaha to the north and has 147,000ha of coconut land or 35% of the country's total coconut area.

Coconut cultivation holdings are generally small. Approximately 86% of operators cultivate less than 2ha (5 acres), occupying 46% of coconut area in the district. Estate operators with more than 8ha (20 acres) occupy 30%, while the remaining 24% is cultivated by medium-scale operators with holdings ranging from 2 to 8ha.

The yield in 1985 was estimated at around 384 million nuts, while the country's total yield was 2,260 million nuts. High yield varieties of coconut are not widely planted, although replanting of old trees is encouraged. The distribution of old coconut palm trees with low productivity is limited because of recent progress in planting and replanting. However, high yield varieties have not yet been widely extended. The age distribution of coconut palm trees is tabulated below.

TABLE 2.3.4.1 AGE DISTRIBUTION OF COCONUT TREES

Age (years)	Area (acre)	Share (%)
0~5	28,800	16
6~15	32,760	18.2
16~30	41,220	22.9
31~45	38,880	21.6
46~60	31,320	17.4
over 60	7,020	3.9
	180,000 acres	100

Source: Sri Lanka Census of Agriculture 1982

The Coconut Cultivation Board (CCB), Ministry of Coconut Industries (M/CI) is encouraging planting of new area and replanting in old areas to improve the yield. To enhance coconut production, subsidy schemes are provided for the following:

- a) Replanting of trees which are over 60 years of age;
- b) Planting for new coconut cultivation areas;
- c) Inter-cropping of coffee and cacao;
- d) Pasturage in coconut land;
- e) Home gardens with coconut for self-consumption; and,
- f) Rehabilitation of unplanted fields in the coconut land.

The Board undertakes training and extension of cultivating and processing technologies, and distribution of subsidies. Recently, it has been emphasizing introduction of inter-crops in coconut land where trees are 16 to 45 years of age. Development of new varieties and cultivation technology, etc. is undertaken by the Kurunegala Coconut Research Institute, Coconut Research Board, with the Coconut Training Center giving guidance and training to the extension workers.

Post-harvest processing of coconuts is carried out in oil mills, desiccated coconut mills and coir (coconut fibre) mills. For protection of crops, coconut husks are buried in the soil to maintain soil moisture content of coconut palm fields at an appropriate level during dry season. Husks are also used as mulching for coffee and cacao. The majority of the country's coconut mills are located in Gampaha. Most of these mills are privately owned while a few are run by producers' cooperatives.

Constraints faced in coconut cultivation, production and processing may be summarized as follows:

- a) Yield is so low that small holders with 8ha (20 acres) or less harvest approximately 2,000 nuts/year/acre. This may be compared with the average yield of 4,000 nuts/year/acre by estate plantations.
- b) Small holders' cultivation technology is neither well developed nor extended.
- c) Coconuts are processed with obsolete machines and outdated techniques.

To improve the situation, a Coconut Development Project is being undertaken with financial aid from the Asian Development Bank (ADB).

Table 2.3.4.2 Size, Number and Acreage of Coconut Holding

Size Class	No. of Holdings	%	Area (acres)	%
Less than 2 acres	416,030	58.2	226,360	22.0
2 to less than 3	100,860	14.1	109,460	10.6
3 to less than 4	64,400	9.0	80,110	7.7
4 to less than 5	38,040	5.3	58,550	5.7
(Sub Total)	(203,300)	(28.4)	(248,120)	(24.0)
5 to less than 7	45,910	6.4	92,620	8.9
7 to less than 10	22,130	3.1	64,490	6.2
(Sub Total)	(68,040)	(9.5)	(157,110)	(15.1)
10 to less than 20	16,840	2.4	97,680	9.4
20 to less than 30	6,895	1.0	94,639	9.1
(Sub Total)	(23,735)	(3.4)	(192,319)	(18.5)
30 to less than 50	1,787	0.2	52,136	5.0
50 to less than 100	1,432	0.2	63,703	6.1
100 and Above 100	836	0.1	96,104	9.3
(Sub Total)	(4,055)	(0.5)	(211,943)	(20.4)
Total	715,160	100.0	1,035,852	100.0

Source: Census of Agriculture 1981, Department of Census & Statistics.

(3) Paddy

Gampaha district belongs meteorologically to the low country wet zone. Paddy fields exist in topographically low areas between upland coconut palm fields. In the Project area paddy is cropped twice a year; the first cropping in the southwest monsoon season from April to July and the second in the northeast monsoon season from September to December.

The Gampaha district has 17,070ha (42,200 ac) of paddy field, which accounts for some 3% of the country's entire paddy area of 570,000ha in 1985. Yield, however, was 3.1 tons (149 bushels)/ha in Maha season and 2.8 tons(139 bushels)/ha in Yala season, which is lower than the national average of 3.5 tons (168 bushels)/ha in Maha and 3.3 tons (159 bushesl)/ha in Yala respectively.

Main causes for this low productivity among others are:

- a) Insufficient cultivation management by most of the part-time or weekend farmers;
- b) Lack of on-farm water management;
- c) Less sunshine compared to the dry zone; and,
- d) Insufficient input of fertilizer, chemicals, etc. due to limited financial reserves of fragmented holders.

Rainfed paddy fields prevail in the Project area. Therefore, the introduction of a water management system poses several difficulties. In order to upgrade the agricultural productivity in the district, irrigation and drainage facilities must be improved to such extent they will be able to meet the minimum water requirements for paddy cultivation including drainage in the panicle formation period, or middle summer drainage.

Paddy cultivated in Yala season consists of the 3-month variety (about 38%), the 3 to 3.5-month variety (about 25%) and the 4 to 4.5-month variety (about 37%), resulting in a majority (about 63%) of the short variety. In Maha season, however, the 4.5-month variety accounts for about 54%, the 5 to 5.5-month variety for about 18%, and the 3 to 3.5-month variety for only about 28%.

Due to fluctuating rainfall, as illustrated by the 5-year average shown in Table 2.3.4.3, 61 to 81% of paddy field is cultivated in Yala season while in Maha season all the area is cultivated. It is particularly noted that only 25% was cultivated in Yala season in 1982 due to drought.

Average yield shows little variation according to season or irrigation system, due to the climatic characteristics in wet and intermediate zones.

Table 2.3.4.3 AVERAGE YIELD OF PADDY  
(1980-1986)

System	Yala (ton/ha)	Maha (ton/ha)	Average (ton/ha)
Major Irrigation	2.88	3.33	3.105
Minor Irrigation	2.64	3.21	2.925
Rainfed	2.84	3.08	2.96
Average	2.80	3.12	2.99

Source: Dept. of Agriculture, Gampaha

Development of foundation seed for the dry and intermediate zones is carried out in the Makandra Agriculture Research Center, Kurunegala district, where the BG variety is being improved, while, for the wet zone, the Bombuwela Agricultural Research Center, Kalutara district, is developing the BW variety. These foundation seeds are delivered through the district extension service to the contract farmers, who in turn reproduce registered and certified seeds for distribution to the farmers.

The BG variety, despite its suitability to the dry or intermediate zone, accounts for 70-80% of the district's paddy, because it is preferred by consumers and hence in markets. The wet zone-oriented BW variety accounts for 15 through 25%, and the next are the 5 to 6 month local varieties.

For easy weeding and increased yield per unit area, the Bureau of Agriculture has been making efforts to extend transplanting of paddy seeding. However, traditional cultivation by direct sowing prevails. At present, only 25% of total paddy area is seeded by the transplant method. The remaining 75% is directly sown. The present cropping pattern of paddy is shown in Fig. 2.3.4.3 and Table 2.3.4.4.

Characteristics of paddy cultivation in the district may be summarized as follows:



Fig. 2.3.4.3 Existing Cropping Calendar (Paddy)

Crop		Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	Remarks
Yala	Maha	H			P B		C	H			P T/B			P: Land preparation B: Broadcast T: Transplant C: Cultivation H: Harvest
3.5 month	3.5 month													
36%	12%													
Yala	Maha	H		P B		C		H			T/B			
4.5 month	4.5 month													
37%	54%													
Yala	Maha	H			P B		C	H				P B		
3 month	3 month													
38%	16%													
Yala	Maha	H								P B				
-	5.5 month													
-	18%													

Table 2.3.4.4 Paddy Cultivated Acreage and Variety By Cultivation (1981-1985)

Variety by cultivation period(month)	Year Season	81		82		83		84		85		5 years Average	
		Yala	Maha	Yala	Maha	Yala	Maha	Yala	Maha	Yala	Maha	Yala	Maha
5 - 5 ½	Yala	-	-	-	-	-	-	-	-	-	-	-	-
	Maha(ha) (%)	4,329 25.0	3,201 18.7	3,728 22.1	2,094 12.6	2,133 12.8	3,097 18.3						
4 - 4 ½	Yala(ha) (%)	2,104 19.7	2,792 23.7	296 7.1	8,740 64.7	5,331 42.3	3,853 36.6						
	Maha(ha) (%)	9,624 55.5	10,134 59.3	10,224 60.7	5,773 34.7	9,594 57.7	9,070 53.7						
3 ½	Yala(ha) (%)	2,691 25.3	2,799 23.8	472 11.3	2,700 20.0	4,725 37.5	2,677 25.4						
	Maha(ha) (%)	1,179 6.8	1,436 8.4	1,300 7.7	4,534 27.3	2,035 12.3	2,097 12.4						
3	Yala(ha) (%)	5,864 55.0	6,175 52.5	3,399 81.6	2,063 15.3	2,536 20.2	4,007 38.0						
	Maha(ha) (%)	2,202 12.7	2,324 13.6	1,601 9.5	4,229 25.4	2,862 17.2	2,644 15.6						
Total Acreage (ha)	Yala	10,659 (100)	11,766 (100)	4,167 (100)	13,504 (100)	12,592 (100)	10,537 (100)						
	Maha	17,334 (100)	17,095 (100)	16,853 (100)	16,630 (100)	16,625 (100)	16,908 (100)						
Cultivation intensity in Yala season		62%	69%	25%*	81%	76%	61-81%						

Source: District agriculture office in Gampaha.  
\* : Lack of rainfall in Yala season of 1983.

- a) Canals do not supply water to irrigated paddy fields. Rather flood irrigation is made from headworks and lowlying paddy field are submerged by irrigation water.
- b) On-farm water management is not undertaken even in irrigated fields with deficient drainage facilities throughout the district.
- c) The paddy field surface is not level, and paddy cultivation using ordinary methods is difficult. Farmers are not accustomed to levelling the surface of paddy fields.
- d) 4.5 and 5~6 month varieties are dominant, and land is utilized between monsoon seasons only for grazing of water buffalo.
- e) Most of the paddy fields are fragmented and smallholders with less than 0.2ha, account for 55% of the paddy farmers.
- f) As holdings are small, part-time farmers are predominant, accounting for over 80% particularly in the area near Colombo or the GCEC area.
- g) Paddy cropping is unstable because of fluctuations in quantity and period of rainfall, while rainfed paddy accounts for 44% of the district's paddy field, mostly under the wet zone climate.

(4) Minor Export Crops

1) Present Situation

Minor export crops, such as pepper, coffee, cacao, clove, Ceylon cinnamon tree, betel leaf vine, etc. have been increasingly cultivated in the district.

TABLE 2.3.4.5 MINOR EXPORT CROPS-CULTIVATED AREA (ha)

Crops	1981 (100)	1982	1983	1984	1985 (increase) (%)
Pepper	141 (100)	170	198	299	340 (240)
Coffee	204 (100)	253	311	414	504 (247)
Cacao	4	4	4	4	4 -
Clove	72 (100)	166	263	339	419 (582)
Cinnamon	531	531	531	531	531 -

Source: Minor Export Crop District Office Gampaha

In the last 5 years, pepper and coffee have increased 2.5 times, and clove nearly 6 times, while cinnamon cultivation has remained constant because it is limited to sandy soil. Cultivation of these minor export crops (MEC) is encouraged by the Minor Export Crop Department (DMEC) as a national policy to enhance exports. Since 1975, this effort has been directed to the highland areas, which are climatically suitable for MEC cultivation. In the districts of Kandy, Matale and Kegalle, MECs have become very important crops.

While national emphasis is not given to MEC cultivation in Gampaha district, the MEC Department, recognizing the importance of inter-cropping of MEC in coconut field, has been actively promoting such cultivation in the district. On the basis of successful experiment at the Delpitiya Mixed Crop Model Farm, Kandy district, the Department proposed in 1986 to establish a nursery for MEC planting material for promotion in Gampaha district.

In Gampaha district, introduction of MEC and hence systematic extension activities commenced in 1983. The introduction of MEC would benefit the district as further agricultural land reclamation is unlikely. Expansion of cultivation can only be achieved by extension of MEC as an inter-crop in coconut field or as a mixed crop in homestead gardens.

In the district about 80,000 acres (32,000ha) are planted to coconut palm trees between 16 to 45 years of age which are favorable for inter-cropping of minor export crops. Assuming that present upland crops such as pineapple, etc., fodder crops and coconut palm trees occupy about 50% of the above-mentioned acreage, about 40,000 acres (16,000ha) could be planted to minor export crops. Since the horizontal expansion of cultivation land is difficult in the district as mentioned above, this land area, the greatest potential land resource in the district, should be fully utilized.

In recognition of the above, Gampaha district envisages an expansion program (1986~1990) which aims to achieve expansion of pepper and coffee by 300ha/year, and clove by 200ha/year. The main constraint to this program is lack of nurseries for breeding the planting material. Breeding at present is done by 26 contract

farmers, and free planting material is distributed to farmers who are launching MEC cultivation. Besides these breeding farmers, there are 30 demonstration farmers, who were selected by the Department of Minor Export Crops for technology extension.

2) Anticipated Problems in Promotion of MEC

- a) MEC are relatively new crops to the farmers in the district and cultivation technology is not fully established.
- b) Farmers show interest in planting MEC as a cash income source; however, extension in the district is not effectively undertaken due mainly to insufficient supply of quality planting material.
- c) The techniques of irrigation and mulching are at a low level, resulting in a low and unstabilized yield in seasons with little rain.
- d) A District Office for the DMEC has not been established in the district and the existing extension facilities and equipment are insufficient for effective transfer and extension of MEC cultivation.
- e) It is expected that MEC will be an important source of foreign earnings to the country and production will be increased steadily. It is, however, observed that technology and facilities for post-harvest quality control are not organized efficiently to cope with competition in the international market.
- f) Producers organizations have not been established.

(5) Present Farm Management Models

A study on the present farm management models was conducted by dividing farmers into those who raise paddy and coconut in the traditional way (A) and those who have introduced inter-cropping of export crops with coconut trees in farm management (B). In general, the cropping area of cassava and banana is very small at less than one percent of the total cultivated area, and most of these products are home consumed. Accordingly, no detailed analysis on cassava and banana was made in this

study. The export crops of pepper and coffee are dealt with as typical crops in the district.

The production cost of paddy was studied by dividing farmers into those with holdings of one acre and these with holdings of two acres. The former represent farmers holding a cultivation area ranging from 0.5 to 1.0 acre and the latter from 1.0 to 2.0 acres.

The labor requirement for paddy cultivation is 40.4 persons/acre/day in Yala season and 47.0 person/acre/day in Maha season. The total production cost is Rs 2,412 (80% cropping) in Yala season and Rs 3,218 (100% cropping) in Maha season, totalling Rs 5,630. As for pepper and coffee, the production cost for the standard farm management model (1 acre) prepared by the Minor Export Crops Department is applied, resulting in an annual labor requirement of 108.2 persons/day for pepper production and 89.3 persons/day for coffee production. The cost is Rs 4,328 per annum for pepper and Rs 3,572 per annum for coffee. (See tables 2.3.4.6 to 2.3.4.11)

**Table 2.3.4.6 Paddy Labor Requirements (mandays)**

	Daily	Yala		Maha	
	Wage	1 acre	2 acre	1 acre	2 acre
	(Rs)	(days)	(days)	(days)	(days)
1. Land preparation	47	11.7	21.1	11.9	21.4
2. Planting/Sowing	40	8.4	15.1	10.2	18.4
3. Top dressing	39	0.5	0.9	0.7	1.3
4. Pest/Weed Control	44	0.7	1.3	1.0	1.8
5. Harvesting	39	9.6	17.3	10.9	19.6
6. Threshing/Cleaning	41	8.2	14.7	10.5	18.9
7. Transport	41	1.3	2.3	1.8	3.2
		40.4	72.7	47.0	84.6

Source: The Third Agricultural Benchmark Survey, Mahaweli Development Project, June 1986

Table 2.3.4.7 Paddy Production Cost ( Rs )

Farm Size (acre)	Season	Crop intensity	Seed	Fertilizer		Chemical	Hired labor					Family labor	Total			
				MPK	Urea Top-dressing		Leveling	Sowing	Spraying	Harvesting	Threshing			Cleaning	Transport	
2	Yala	80 (%)	409	604	204	-	196	793	483	46	540	482	24	75	178	4,034
	Maha	100	511	756	256	-	244	1,006	736	79	764	774	40	131	222	5,519
1	Yala	80	200	300	100	-	100	440	268	25	300	269	16	43	791	2,412
	Maha	100	260	380	125	-	120	560	408	44	425	430	20	74	932	3,218
0.2	Yala	100	58	85	75	37	-	-	-	-	-	-	-	-	483	738
	Maha	100	57	85	75	38	-	-	-	-	-	-	-	-	495	750
			115	170	150	75	-	-	-	-	-	-	-	-	978	1,488

source : Agriculture Development Authority Gampaha Dist.  
Agriculture Dept., (Extension) Gampaha Dist.  
Report of Economic & Social Statistics of Sri Lanka 1985.



Table 2.3.4.8 Pepper Labor Requirements

Item	year	1	2	3	4	5	6 - 10	11 - 15	Average
1 Fencing		10	-	-	-				
2 Land Clearing		6	-	-	-				
3 Level peg		10	-	-	-				
4 Holing		50	-	-	-				
5 FYM Application		10	-	-	-				
6 Fill Holes		12	-	-	-				
7 Planting		15	-	-	-				
8 Mulching		5	-	-	-				
9 Infilling		-	10	5	-				
10 Aftercare		12	20	28	-				
11 Weeding		-	22	26	45				
12 Mulching		5	5	5	5				
13 Fertilizing		15	20	30	45	45	45	45	
14 Slash/Weed		-	4	5	6	6	6	6	
15 Pruning vines		-	3	5	10	15	15	20	
16 Pest/disease contro		-	2	2	2	2	2	2	
17 Harvesting		-	-	12	17	22	22	30	
18 Processing		-	-	2	3	5	5	5	
19 Clean/grade		-	-	1	1	2	2	2	
Total		150	86	121	134	97	97	110	108
Annual Average Labor Cost (Rs 40 M/D)									Rs4320

Source: Planning Notes on M. E. C  
Economic Unit, Dept. of M. E. C, 1985

Table 2.3.4.9 Pepper Production Cost

Item \ year	1	2	3	4	5	6-10	11-15	Average
1 Fencing	1,500	-	-	-	-	-	-	
2 Tools	100	100	100	100	100	100	100	
3 FYM cost	150	150	150	150	150	-	-	
4 Fertilizer	450	750	1,200	1,550	1,800	2,400	3,000	
5 Plants	1,050	300	150	-	-	-	-	
Total	3,250	1,300	1,600	1,800	2,050	2,500	3,100	Rs2,533
Annual average production cost (1981, 15% up)								Rs2,913

Source: Planning Notes on M. E. C  
Economic Unit, Dept. of M. E. C, 1985

Note : Estimated cost (15% increase from 1981)

Table 2.3.4.10 Coffee Labor Requirements (mandays/acre)

Item	year	1	2	3	4	5	6 - 10	11- 12	Average
1 Fencing		10							
2 Land Cleaning		6							
3 Level peg		10							
4 Holding		40							
5 FYM Application		8							
6 Fill Holes		10							
7 Planting		12							
8 Mulching		4							
9 Infilling		10							
10 After Care		12	20	28					
11 Weeding			22	26	35				
12 Mulching		5	5	5	5				
13 Fertilizing		10	15	25	40	40	40	40	
14 Slash/Weed			4	5	6	6	6	6	
15 Pruning				2	2	3	3	3	
16 Pest/disease control			2	2	2	3	3	3	
17 Harvesting				10	15	20	20	30	
18 Proccessing				2	3	5	5	5	
19 Clean/grade				1	1	2	2	2	
Total		137	68	106	109	79	79	89	89.3
Annual Average Labor Cost (Rs 40 M/D)									Rs3,572

Source: Planning Notes on M. E. C  
Economic Unit, Dept. of M. E. C, 1985

TABLE 2.3.4.11 COFFEE PRODUCTION COST (Rs/acre)

Item	Year	1	2	3	4	5	6~10	11~15	Average
	1. Fencing		1,500						
2. Tools		100	100	100	100	100	100	100	
3. FYM Cost		100	100	100	100	100	100	100	
4. Fertilizer		375	750	1,125	1,500	1,500	1,500	1,500	
5. Plants		320	40	20					
Total		2,395	990	1,345	1,700	1,700	1,700	1,700	Rs 1,675
Annual Average Production Cost (1981, 15% up)									Rs 1,926

Source: Planning Notes on M.E.C.  
Economic Unit Dept. of M.E.C. 1985  
Notes: Estimated cost (increased 15% from 1981)

(6) Agricultural Production Cost

The percentage of agricultural production cost in gross farm income is tabulated below, with details in Table 2.3.4.12 ~ 13.

AGRICULTURAL PRODUCTION COST

Type of Farmer	Farm Size (Acre)	Cost/Gross Income	
		Farmer A (%)	Farmer B (%)
Large-Scale Farmers	10.0	43	40
Medium-Scale Farmers	4.0	50	44
Standard Farmers	1.2	56	57
Small-Scale Farmers	0.5	62	58
Very Small Farmers	0.25	34	-

Farmer A: Farmers cultivating coconut and paddy only.  
Farmer B: Farmers cultivating coconut, paddy and minor export crops.

Table 2.3.4.12 Farm Income (A)

Farm Size (acre)	Cropping Pattern (acre)	Gross Production (Rs)	Cost (Rs)	Farm Income (Rs)	Income Ratio (%)
Large Farmer (10.0)	Yala Paddy(1.6)	8,268	4,034	4,234	
	Maha Paddy(2.0)	11,433	5,519	5,914	
	Coconut (8.0)	12,816	4,325	8,491	
		32,517	13,878	18,639	57.3
Medium Farmer (4.0)	Yala Paddy(0.8)	4,116	2,412	1,704	
	Maha Paddy(1.0)	5,716	3,218	2,498	
	Coconut (3.0)	4,806	1,620	3,186	
		14,638	7,250	7,388	50.5
Standard Farmer (1.2)	Yala Paddy(0.5)	2,584	1,507	1,077	
	Maha Paddy(0.5)	2,629	1,507	1,122	
	Coconut (0.7)	1,121	540	581	
		6,334	3,554	2,780	43.5
Small Farmer (0.5)	Yala Paddy(0.2)	1,033	738	265	
	Maha Paddy(0.2)	1,051	750	301	
	Coconut (0.3)	801	270	531	
		2,885	1,758	1,097	38
Very Small Farmer (0.25)	Coconut (0.25)	400	135	265	

Table 2.3.4.13 Farm Income (B)\*

Farm Size (acre)	Cropping Pattern (acre)	Gross Production (Rs)	Cost (Rs)	Farm (Rs)	Income (%)
Large Farmer (10.0)	Yala Paddy (1.6)	8,268	4,034	4,234	
	Maha Paddy (2.0)	11,433	5,519	5,914	
	Coconut (8.0)	12,816	4,220	8,496	
	Pepper (1.0)	18,200	7,241	10,959	
	Coffee (1.0)	16,200	5,498	10,702	
		66,917	26,612	40,305	60
Medium Farmer (4.0)	Yala Paddy (0.8)	4,116	2,412	1,704	
	Maha Paddy (1.0)	5,716	3,218	2,498	
	Coconut (3.0)	4,806	1,620	3,186	
	Pepper (0.5)	9,100	3,820	5,280	
	Coffee (0.5)	8,100	3,000	5,100	
		31,838	14,070	17,768	55.8
Standard Farmer (1.2)	Yala Paddy (0.5)	2,584	1,507	1,077	
	Maha Paddy (0.5)	2,629	1,507	1,122	
	Coconut (0.6)	961	540	421	
	Pepper (0.3)	6,174	3,554	2,620	
		12,348	7,108	5,240	42.4
Small Farmer (0.5)	Yala Paddy (0.2)	1,033	738	295	
	Maha Paddy (0.2)	1,051	750	301	
	Coconut (0.3)	801	270	210	
	Pepper (0.1)	1,820	800	1,000	
		4,384	2,558	1,826	41.7
Very Small Farmer	Coconut (0.25)	400	-	400	

\* : Farmer who introduced intercropping of pepper, etc.

Table 2.3.4.14 Farm Management -- Present A

Farm Size (acre)	Land Use	Area (acre)	Full time Part time	Per-son	Cropping Pattern Area	Cropping (%)	Gross Production		Production Amount		Production Cost Rs	Net Farm Income	Income Ratio
							Yield ton /acre	Total Yield	Unit Rs/ton	Gross Income Rs			
Large Farmer (10.0)	Paddy	2.0	Full time	2	2 Yaha paddy + Maha paddy + Coconut	80	1.13	1.8	4.573	8,268	4,034	4,234	
	Upland	8.0					1.25	2.5	4.573	11,433	5,914		
							890nuts	7,120	1.8	12,816	4,491		
							Total	Total	32,517	13,878	Total 8,639	57.3	
Medium Farmer (4.0)	Paddy	1.0	Full time	1	1 Yaha paddy + Maha paddy + Coconut	80	1.13	0.9	4.573	4,116	2,412	1,704	
	Upland	3.0					1.25	1.25	4.573	5,716	2,498		
							890nuts	2,670	1.8	4,806	3,186		
							Total	Total	14,638	7,250	Total 7,388	50.5	
Standard Farmer (1.2)	Paddy	0.5	Full time + Part time	1	0.5 Yaha paddy + Maha paddy + Coconut	100	1.13	0.565	4.573	2,584	1,507	1,077	
	Upland	0.7					1.15	0.575	4.573	2,629	1,122		
							890nuts	623	1.8	1,161	581		
							Total	Total	6,334	3,334	Total 2,780	43.5	
Small Farmer (0.5)	Paddy	0.2	Part time + Full time		0.2 Yaha paddy + Maha paddy + Coconut	100	1.13	0.226	4.573	1,033	738	265	
	Upland	0.3					1.15	0.23	4.573	1,051	301		
							890nuts	445	1.8	801	331		
							Total	Total	2,885	1,758	Total 1,097	38	
Very Small Farmer (0.25)	Paddy	-	Part time + Full time		-	-	-	-	-	-	-	-	
	Upland	0.25					890nuts	222	1.8	400	135	265	

Table 2.3.4.15 Farm Management -- Present B

Farm Size (acre)	Land Use	Area (acre)	Full time Part time	Per-son	Cropping Pattern Area (acre)	Cropp- ing (%)	Gross Production		Production Amount		Production Cost Rs	Net Farm Income	Income Ratio
							Yield ton /acre	Yield	Unit Rs/ton	Gross Income Rs			
Large Farmer (10.0)	Paddy	2.0			2.0 Yaha paddy	80	1.13	1.8	4.573	8,268	4,034	4,234	
	Upland	8.0	Full time	2.0	2.0 Maha paddy	100	1.25	2.5	4.573	11,433	5,914	5,519	
					8.0 Coconut	100	890	7,120	1.8	12,816	4,320	8,496	
					1.0 Pepper	12	1.82	1.82	10,000	18,200	7,241	10,959	
					1.0 Coffee	12	1.62	1.62	10,000	16,200	5,498	10,702	
								Total	66,917	26,612	40,305	60	
Medium Farmer (4.0)	Paddy	1.0			1.0 Yaha paddy	80	1.13	0.9	4.573	4,116	2,412	1,704	
	Upland	3.0	Full time	2.0	1.0 Maha paddy	100	1.25	1.25	4.573	5,716	3,218	2,498	
					3.0 Coconut	100	890	2,670	1.8	4,806	1,620	3,186	
					0.5 Pepper	17	1.82	0.91	10,000	9,100	3,820	5,280	
					0.5 Coffee	17	1.62	0.81	10,000	8,100	3,000	5,100	
								Total	31,838	14,070	17,768	55.8	
Standard Farmer (1.2)	Paddy	0.5	Full time		0.5 Yaha paddy	100	1.13	0.565	4.573	2,584	1,507	1,077	
	Upland	0.6	Full time + Part time	1.0	0.5 Maha paddy	100	1.25	0.575	4.573	2,629	1,507	1,122	
					0.6 Coconut	100	890	534	1.8	961	540	421	
					0.3 Pepper	50	1.82	0.91	10,000	6,174	3,554	2,620	
									Total	12,348	7,108	5,240	42.4
Small Farmer (0.5)	Paddy	0.2	Full time		0.2 Yaha paddy	100	1.13	0.226	4.573	1,033	738	295	
	Upland	0.3	Full time + Part time		0.2 Maha paddy	100	1.25	0.23	4.573	1,051	750	301	
					0.3 Coconut	100	890	267	1.8	801	270	210	
					0.1 Pepper	33	1.82	0.182	10,000	1,820	800	1,000	
									Total	4,384	2,558	1,826	41.7
Very Small Farmer	Paddy	--	Full time + Part time		--	--	--	--	--	--	--	--	
	Upland	0.25			0.25 Coconut	100	890	222	1.8 Total	400	--	400	
								Total	400	--	400		



(7) Farm Income

Sources of income are roughly divided into farm income and non-farm income. Farmers derive their farm income mainly from coconut, paddy, and export crops such as banana, cassava, and pineapple. The most important sources of farm income are paddy and coconut, followed by the export crops of pepper and coffee. Cassava and banana are mainly home consumed, and cash income derived from the same is limited. Pineapple is raised by a few farmers.

(8) Livestock Production and Management

Estimated population figures for all forms of livestock according to the data gathered by the Department of Census and Statistics (1983) are approximately:

Neat Cattle	67,600
Buffaloes	28,900
Goats	21,600
Sheep	700
Pigs	26,000
Poultry	1,135,600

Except in the case of a few organized large scale commercial farms, rearing of livestock in the villages is not regarded as a separate enterprise; rather it generally forms an integral part of other agricultural systems, such as paddy/vegetable/coconut crop farming. In such enterprises, cattle are generally tethered for rough grazing from tree to tree and in the evening fed on a little cut grass. The main labor input is provided by the family. The milk output is consumed by the household and excess is sold to neighbors. The same applies to other livestock.

While the commercial farms in the district, especially pig and poultry farmers concentrated along the coast, maintain a fairly high level of management, all smallholders' animal production systems are characterized by a low level of management and productivity.

The institutions directly responsible for the promotion of livestock production or for supplying the necessary inputs or marketing are:

- Department of Animal Production and Health
- National Livestock Development Board
- National Milk Board
- Oils and Fats Corporation

a) Department of Animal Production and Health

This Department is responsible for health and disease investigation, vaccination against contagious diseases, supply of breeding material and day-old chicks, artificial insemination, pregnancy diagnosis and other extension and management guidance. These services are organized in the district by a Veterinary Surgeon with a supporting staff consisting of a Livestock Officer, eight Veterinary Surgeons and the necessary field staff.

It appears that the extension staff must be strengthened and at the same time transport facilities provided to enable them to visit various projects and villages quickly when need arises. Non-availability of suitable genetic stock for dairy, pig and poultry production is another major constraint for the development of the livestock industry.

b) National Livestock Development Board (NLDB)

The National Livestock Development Board was established to undertake livestock development on a commercial scale and also to provide extension and other services to the small-scale farmer. At present, the NLDB handles various projects, such as the heifer calf rearing project, pasture development project, establishment of Dairy Producers' Cooperatives, etc. The NLDB is also responsible for the implementation of the IDA Dairy Development Project.

c) National Milk Board

The main function of the National Milk Board was the establishment and maintenance of efficient and clean milk production and marketing services in order to ensure that an adequate supply of milk of good quality is available to consumers. The Board has 4 milk collecting centers in Gampaha district for the collection of milk from the farmers. After processing by pasturizing or sterilizing, the milk in turn is retailed through sales outlets.

d) Oils and Fats Corporation (OFC)

OFC is responsible for the production of animal feed for all forms of livestock. The present output of feed from the OFC is inadequate to meet the entire demand resulting in periodic shortages with serious consequences to farms dependent on the corporation for their feed supplies.

Despite the location of Gampaha district adjacent to Colombo where a large market for livestock products exists, animal husbandry in the district consists primarily, with the exception of some commercial farms near the coast, of low productivity natural grazing of livestock by farm family units.

### 2.3.5 Agricultural Machinery

(1) Extension of Agricultural Machinery

The utilization ratios in 1985 for agricultural machinery in Gampaha district among small scale farmers, with the exception of landless farmers and those who till only home gardens, were pumps: 0.4%, four wheel tractors: 1.0%, two wheel tractors: 1.2%, sprayers (portable type): 2.6%, and threshers, seeders and hand rotary weeders at about 0.2% each. As can be seen from these figures, introduction of agricultural machinery is only at a very early stage. As cultivated holdings are small and agricultural labor population high, the introduction of agricultural machinery in Gampaha district does not appear to be accorded high

importance. Nevertheless, farm mechanization is slowly progressing, particularly with regard to two wheel tractors and threshers.

The utilization rate for agricultural machinery in Gampaha district is low compared to the national average, and farmers continue to basically rely on hand tools such as mamotti. Other districts in Sri Lanka where cropped areas are large exhibit a machinery utilization rate much higher than Gampaha. In such districts, the utilization rate for tractors is low, due to the widespread use of hired labor.

TABLE 2.3.5.1 NUMBER OF AGRICULTURAL MACHINERY OWNED

Year	Water Pump	Tractor (4 wheel)	Tractor (2 wheel)	Sprayer (power)	Sprayer (manual)	Thresher	Seeder	Weeder
'81	55 (100)	286 (100)	130 (100)	38 (100)	521 (100)	-	64 (100)	132 (100)
'82	192 (349)	425 (149)	282 (217)	69 (112)	918 (176)	-	76 (119)	138 (105)
'83	245 (445)	613 (214)	618 (475)	72 (189)	1,243 (239)	20 (100)	111 (173)	147 (111)
'84	261 (475)	680 (238)	745 (573)	118 (311)	1,611 (309)	73 (365)	105 (164)	160 (121)
'85	281 (511)	694 (243)	780 (600)	167 (439)	1,730 (332)	125 (625)	148 (231)	168 (127)

Source: A.G.A. OFFICE ( ) = %

## (2) Use of Draft Animals

According to the 1982 agricultural census, there are over 51,000 heads of cattle in Gampaha district. Of this total, water buffalo accounts for 18,000 heads. The total number of head over three years of age is in excess of 42,000, out of which 14,000 heads are water buffaloes. About 37% of cattle, or 16,000 heads, are dairy animals, while 50%, or 21,000 heads, are used as draft animals. Ninety per cent of water buffaloes are draft animals. Draft animals are grazed in coconut groves and paddy fields following harvest. Method of husbandry is extremely extensive, incurring few management costs. Consequently, although of low efficiency, the use of draft animals in Gampaha district is extremely inexpensive and plays an important role in cultivation method. For the immediate future it is not

anticipated that the rate of draft animal use will decline in the district. Principal tasks performed by draft animals are field preparation, plowing, paddy threshing, and various transport.

TABLE 2.3.5.2 NUMBER OF CATTLE AND BUFFALOES BY TYPE OF PURPOSE  
(age 3 years and over)

	Milk	Draught	Stud	Other uses	Total
Cattle	14,842 (53)	8,664 (31)	397 (1)	4,119 (15)	28,022 (100)
Buffaloes	932 (7)	12,199 (86)	141 (1)	842 (6)	14,114 (100)
Total	15,774 (37)	20,863 (50)	538 (1)	4,961 (12)	42,136 (100)

Source: SRI LANKA CENSUS OF AGRICULTURE 1982 (Gampaha District Report)

### (3) Leasing of Farm Machinery

Although utilization rates for farm machinery in Gampaha are extremely low, leasing of machinery is extremely widespread. While 8,700 households lease four wheel tractors, 2,100 households lease two wheel tractors and 15,000 households lease sprayers.

Principal works performed by tractor are land preparation, ploughing, threshing, etc. Including the number of farmers utilizing leased machinery, extension rate for tractors (total for both four and two wheel tractors) is 7% of total farmers, and 20% if landless farmers and home garden farmers are excepted. If this figure is combined with the utilization rate of draft animals discussed above, 50% of farmers rely on either mechanical or draft animal power. This figure is even larger if consideration of leasing of draft animals is included, although precise details of the extent of this practice are not clear at present. The widespread presence of farm machinery leasing appears attributable to the fact that land holdings of farmers are so small that tractor owners often find their machinery idle, and the fact that leasing income pays for maintenance costs as well as generally augmenting farm income. It is reported that some machinery owners make a living solely from rental to area farmers.

Plowing of paddy field manually (by mamotti) requires roughly 35 man/days/ac. Labor wages in Gampaha district at present are around Rs 50 per day, accordingly necessitating Rs 1,750 per ha. for manual plowing. First time plowing by leased two wheel tractor, on the other hand, costs approximately Rs 1,000. Use of such leased machinery is accordingly cheaper than manual plowing.

Use of machinery has additional merits of relieving farmers from the burden of heavy labor, permitting timely implementation of farm works, increasing precision of farm operations, etc.

#### (4) Problems Affecting Farm Mechanization

Small scale farms in Gampaha district are numerous, with average farm size at 0.5ha. Landless and home garden only farmers account for 67% of small scale farmers. If these farmers are excluded, average farm scale is 0.9ha. Agricultural mechanization is consequently made difficult by present farm scale.

Eighty per cent of farmers are not engaged full time in agriculture, and incentive to do so is not generally present. Even where farmers desire to be engaged full time in agriculture, the farm production infrastructure to support such does not exist.

In view of these conditions, the utilization rate for farm mechanization in Gampaha district is subsequently considerably lower than the national average. Nevertheless, leasing of farm machinery is widespread for such tasks as paddy field preparation, plowing, threshing, etc. Rental costs are less than wages required for manual performance of the same works. Consequently, leasing systems must be considered in efforts to promote farm mechanization in the district.

Over 42,000 heads of cattle are husbanded in Gampaha district (according to 1982 survey), of which 50% are utilized as draft animals. Close to 90% of water buffaloes perform as draft animals. Animal husbandry is highly extensive, and few management costs are incurred. Although use of draft animals is extremely inefficient, the practice is inexpensive and accordingly maintains an important place in current cultivation methods.

Farmer familiarity with modern basic farm production technology is limited, and farm-wise promotion of mechanization would pose problems of

training in equipment use and maintenance. Agricultural training centers are currently located at Walpita and Ambepussa. However, facilities and teaching equipment are insufficient for training farmers in machinery operation and maintenance. Upgrading of these centers is desirable.

Small scale manufacturing and repair facilities for farm machinery are located at 4 locations within Gampaha district. Small workshops of 1~3 persons are located at 25~30 locations. However, these facilities handle only very simple equipment. There are no workshops capable of engine disassembly and repair.

Tractors, etc. are all imported models and expensive. Purchase price of a Japanese made two wheel tractor is Rs 100,000 and is highly costly when considered in terms of laborer wages of Rs 50 day/person.

Furthermore, paddy field scale and configuration is not conducive to introduction of mechanized cultivation.

### 2.3.6 Inland Fisheries

#### (1) Present Conditions

Negombo, one of the major fishing ports in Sri Lanka, is located in Gampaha district. About 15,000 tons of marine fish, representing 10% of the total annual catch in Sri Lanka, are annually landed at this port. The majority of these fish are distributed for consumption within the coastal area of Gampaha and Colombo.

Fish consumption in the rural areas of the Gampaha district is low, with annual per capita consumption estimated at only 4kg, including consumption of marine, freshwater and dried fish. This figure is extremely low in comparison to the national average of 12kg/person. Marine fish (mainly dried) accounts for about 90% of total fresh weight of fish consumed in Gampaha district. The cheapest source of animal protein in the district is freshwater fish (Rs15/kg on average), followed by livestock (Rs20-30/kg), while the most expensive source of animal protein is marine fish (Rs40/kg).

Inland fisheries in Gampaha district can be classified into brackish water fisheries which are concentrated in Negombo Bay, and freshwater fisheries in the form of water tanks, ponds and rivers. Total annual

production of brackish water fisheries in recent years has remained at a low level of approximately 1,000 tons. The area covered by freshwater fisheries in existing minor tanks, and village and private ponds is extremely limited, and total production, including fish caught in local rivers for domestic consumption, is estimated at only 370 tons. The predominant fish species is tilapia. At present, there are no farmers in the Gampaha district who derive their livelihood from inland fisheries.

(2) Administration

Inland fisheries have been under the jurisdiction of the Inland Fisheries Division of the Ministry of Fisheries since it was established in 1979. In Gampaha district, inland fisheries are supervised by the Pitipana Brackish Water Fisheries Station in Negombo.

(3) Underlying Problems

Fish provides about 60% of the national average consumption of animal protein while the remainder is provided by livestock. In consideration of this fact, the low fish consumption in the Study area (only 1/3 the national average) indicates the need for improvement of nutrition among the rural populace. In view of the limited supply of marine fish and the need to reduce fish imports, development of inland fisheries is an important strategy.

The Ministry of Fisheries in Sri Lanka is focusing future development on inland fisheries due to the recent slump in the marine fishing industry. The Ministry has been promoting a fingerling stocking program and fish culture pond construction since 1980 and introducing a subsidy system for related activities. Despite these measures, however, development of inland fisheries, particularly freshwater fisheries, in the Gampaha district has been hampered by lack of fingerlings, insufficient extension activities, and lack of supporting facilities and administrative infrastructures. As for brackish water fishery facilities, an experimental station has been established at Pitipana for production of black tiger prawn postlarvae in Gampaha district, and a similar facility has been established for production of giant prawn postlarvae production at Pambala in Puttalam District. These facilities, however, are insufficient to meet the demands of the rapidly developing brackish water fisheries.



## 2.3.7 Farmer's Organizations

### (1) Present Conditions

There are 401 active cooperative societies in the district, including multi-purpose cooperatives (17), thrift and credit societies (344), dairy producers' cooperatives (10), pig producers' cooperatives (2), fisheries cooperatives (6), textile societies (7) and coconut producer societies (1).

#### Multi-purpose Cooperatives (17)

Total membership is 177,560. Their main activities are sales of consumer goods, including food, cloth and utensils and also provision of inputs, credit supplies and marketing services to the farmers in the area. Ten out of the 17 societies are running profitably.

#### Thrift and Credit Societies (344)

Total membership is 21,039. These societies provide financial aid to the members to develop industries including farming and to start new small-scale rural industries. As a result of poor financial resources, these societies are dependent on commercial banks in the district to fulfil the members' demands.

#### Dairy Producers' Cooperatives (10)

Total membership is 2,910. Out of the 10 cooperatives, only 4 are running at a profit. These societies supply credit facilities to the members to buy cattle, feed and medicine. Technical assistance is given to the members by the officials of the society. Due to lack of transportation, chilling plants and other equipment, these societies are dependent on the Milk Board. The officials of these societies have decided to produce curd, yoghurt, butter and pasturized milk so that the members will receive additional benefits. The societies intend to supply milk to school children in the district at a reasonable price. For the implementation of these activities, the societies require deep freezers, fat separators, bottle coolers and transport facilities.

#### Pig Producers' Cooperatives (2)

Total membership is 270. These 2 societies collect pigs from their members and sell them for processing to the private sector.

These 2 societies dispose of 200 pigs every month. The officials have decided to open 8 retail outlets in the district and to establish feed mixing plants. Due to inadequate marketing facilities and financial aid, these societies are unable to meet the needs of the members.

#### Fisheries Cooperatives (6)

Three cooperatives out of 6 are defunct. Total membership is 2,902 and members are poor fishermen. These societies supply fishing boats and fishing gear to the members on a loan basis, and the members' catch is sold through the cooperatives.

#### Textile Societies (7)

Total membership is 6,810. The majority of the members use handlooms (7,100 machines). As a result of management inefficiency and marketing problems, these societies are heavily indebted.

#### Coconut Producer Society (1)

Total membership is 1,388. The society runs 3 desiccated coconut mills, 2 oil mills, and 2 copra mills. The society collects coconuts from the members, processes them and markets the end product. It also provides financial and technical assistance to the members to increase their production. Inadequate water supply for these factories is the main problem faced by this society.

#### (2) Problems

The Department of Cooperative Development deploys 3 Assistant Commissioners and 120 Coop Inspectors in Gampaha district. These personnel provide supervision and guidance in cooperative formation and operation. However, their mobility and hence effectivity is constrained by lack of transportation.

A major problem is that a large portion of the farmer organizations are afflicted by inefficient management, and are subsequently ineffectualized by private enterprises. (MPCS, Textiles)

Due to inadequate distribution facilities, added value is low (hog raising, milk production)

Rice production in Gampaha district is at a self sufficiency level for those farmers who cultivate paddy. In the case of the rural population not

engaged in such cultivation, rice is obtained from other regions outside the district through multi-purpose cooperatives or retailers. A government run Paddy Marketing Board, as seen in other areas of Sri Lanka where rice in excess of self-sufficiency is produced, is not present in Gampaha district.

### 2.3.8 Agricultural Supporting Services

#### (1) Present Conditions

##### Research

Agriculture in Gampaha is classified into three segments, one of which is under the guidance of the Makandura Agricultural Experiment Station, while the other two are directed by the Bombuwela Agriculture Experiment Station responsible for research of paddy, subsidiary crops, fruits and vegetables. Two other important institutes, the Coconut Research Institute (Puttalam) and the Minor Export Crops Research Station (Matale) are both less than 50km away from the district.

##### Extension

Presently, several different agencies are responsible for extension work in the district, the principal ones being: the Department of Agriculture (DA); the Coconut Cultivation Board (CCB); the Land Commissioner's Department, the Department of Minor Export Crops (DMEC); and the Department of Animal Production and Health(DAPH).

Extension services for paddy, subsidiary crops, fruits and vegetables, and special programs for farm women and young farmers are carried out by the Department of Agriculture under the T & V system, supported by the IDA-financed Agriculture Extension and Adaptive Research Project. An Assistant Director heads the Gampaha extension service, assisted by three Subject Matter Officers (SMO), one each for headquarters, plant protection and women's farming activities. The district is divided into three wings, each supervised by an Agricultural Officer in charge of three SMOs, nine Agricultural Instructors (AI) and 30 Extension Officers (KVS). With an average of 60,000 farm households in each segment, the KVS to farmer ratio is currently about 1:2,000, which results in

inadequate extension coverage. This problem is further compounded by the fact that KVS rely on transport by bus or bicycle to carry out their extension work.

#### Training Courses

The Department has two training centers, one each at Walpita and Ambepussa, where several training courses, including new technology transfer are provided to the extension workers and farmers. There are additional training courses at Mahara, Mirigama and Galahitiyawa. However, training activities at the center are currently constrained by the lack of operational funds for lecture fees, training aid, building repairs and maintenance and training allowances.

#### Extension Work for Coconut and Rubber Cultivation

Extension work on coconut land is the function of the Coconut Cultivation Board (CCB). Field operations are spread over seven regions, one of which, Gampaha, is in Gampaha district. The regional office is headed by a Senior Coconut Development Officer (SCDO). The district field staff consists of 25 CDOs who are mostly Agricultural Diploma holders. Each CDO is assigned to an area covering 5,000 - 6,000 farmers. The staff is charged with the responsibility of extension, advisory work relating to plant protection as well as the management of various coconut development subsidy schemes. The technical back-up for extension is provided by the CRI. The work-load related to the various subsidy schemes is rather heavy. Also the CDOs are handicapped by poor mobility due to lack of transport as well as absence of village level workers. These factors have tended to keep the extension efforts of the staff to a minimum and incidental to their other activities.

Many of the needed improvements in smallholder coconut cultivation (replanting, soil conservation, expanded fertilizer application) and strengthening of coconut supporting services (research, training, extension) are being implemented under an Asian Development Bank (ADB)/IFAD-assisted Project.

Rubber is mainly grown on the steeper agricultural land and rolling hills in the estate sector. Some of the required improvements

for smallholders including supporting services are being implemented under the World Bank-financed Smallholder Rubber Project.

#### Inputs Distribution

The Coconut Cultivation Board and Rubber Control Department supply fertilizers directly to smallholders growing these crops. Fertilizer requirements for food, horticulture and minor export crops are met by the Ceylon Fertilizer Corporation, which sells to farmers mainly through Multi-purpose Cooperative Societies (MPCS) and Agrarian Service Centers (ASC). The Department of Agrarian Services has 26 ASCs in the district. The Committee consists of 8 Government staff and 6 farmers' representatives. The Center's principal activities are provision of fertilizers, services and guidance in fertilizer application by Cultivation Officers, collection of land tax, farmland registration and operation and maintenance of small irrigation schemes which cover less than 200 acres.

#### Credit

The major formal credit institution in Gampaha has failed to reach the majority of small farmers in the district because of ineffective supervision and the use of complex and costly procedures for loan processing. More than 80% of the farmers resort to informal channels, such as merchants, money lenders, landlords, and kinsmen. Credit discipline has been generally poor.

The main sources of institutional credit in Gampaha are the People's Bank (PB), lending directly to farmers and indirectly through the Cooperative Rural Banks; the Bank of Ceylon (BC), which lends directly to rural producers; and Thrift and Credit Cooperative Societies (TCCS) or village-based saving and loan associations. The Central Bank of Ceylon supervises the activities of the PB and BC, and re-finances some limited credit schemes for smallholders at subsidized rates of interest. Cooperative banks, including the TCCS, are registered, supervised, and audited by the Department of Cooperative Development.

As a result of the main banks' bias toward large urban customers in commerce and house construction, less than 10% of PB

loans outstanding in 1985 were for agriculture. The two banks (PB and BC) currently lack the field staff, transport, and training in rural finance required to undertake a broad and effective credit program for small farmers and entrepreneurs.

Table 2.3.8.1 PEOPLE'S BANK LOANS OUTSTANDING, GAMPAHA DISTRICT, 1985

Sector	Rs. Millions	%
Agriculture	23.4	6.7
Industry	19.4	5.5
Trade	157.4	44.8
Housing	151.3	43.0
Total	351.5	100.0

## (2) Problems

The number of farm households under the responsibility of a single extension worker is too great with regard to standard crops, coconuts, etc. Furthermore, extension workers lack transportation, and extension training facilities and equipment are inadequate.

The public, low interest farm credit system is underdeveloped, and small farmers rely on private, high interest financial sources.

## 2.3.9 Marketing

With the fragmented land holding pattern and hence the extremely limited quantity of products which individual farmers can afford to spare for the market, most of the agricultural products in the district are consumed by the producers households. Coconut, the dominant crop in the district, however, is marketed largely through fairly institutionalized channels, such as coconut processing mills run privately or by cooperatives, which collect raw coconuts through traders catering to smallholders or directly from larger holders.

Other main items marketed in significant volume are rubber, betel leaves, vegetables, pineapple, passion fruit, rambuttans, ginger, turmeric, etc. Only 5% of

paddy is reportedly marketed within the district, with the rest consumed by producers.

Betel leaves are grown mostly in homestead gardens. A small quantity is sold individually by a number of farmers, since viable producer cooperatives are not operating. Most of the betel leaves collected by middlemen are brought to Colombo and Katunayake, where domestic and export markets are located. It is believed that prices are not favourable to the producers who do not own transportation media or belong to cooperatives. However, the pricing mechanism is observed to be functioning fairly soundly due to competition among middlemen and the influence of broadcasted price information.

Vegetable production in Gampaha district is unstable, due to unstable weather conditions in the district. This instability adversely influences the farmers' position in the market, because large wholesalers are reluctant to collect vegetables in the district, and small traders who are at the lower rank in the market structure try to obtain lower prices.

Gampaha is the main producer in the country of pineapple, passion fruit and rambuttans. Despite being seasonal crops, farmers are not provided with proper storage facilities or processing plants of their own and they therefore suffer from a sharp price drop in the peak season. Cultivation of pineapple for export was once encouraged but quality was incompetent in the international market due mainly to poor quality control at both cultivation and post-harvest stages.

Ginger, turmeric, minor export crops and other cash crops are grown mostly in homestead gardens or small plots as inter-crops in coconut fields. Buyers of these crops are limited in comparison to that of producers, and the market balance is not favourable to the farmers.

While a more detailed look into the regional marketing mechanism seems necessary, the following tentative observations can be made:

- Marketing of major export crops like coconut is seriously affected by the current international price, quick recovery of which seems unlikely.
- While most of the cash crops from the district are perishable and seasonal, farmers do not have access to storage facilities or processing technology.
- The majority of farmers rely on buffalo or push cart for transport of produce, resulting in incompetent bids.
- Cooperatives' activities are strictly ruled by the out-dated Cooperative Act making farmers unwilling to organize

themselves. Means to collect producers' interests must be sought.



## 2.4 Social Infrastructure

### 2.4.1 Rural Society

#### (1) Administrative Units in Gampaha District

Sri Lanka is administratively divided into 9 provinces and 25 districts. Gampaha is one of the 3 western districts (the others are Colombo and Kalutara). Gampaha was previously a part of Colombo district, but as one aspect of administrative reform was made an independent district in October 1978 in response to rapid population increase.

Gampaha district comprises 13 AGA divisions (assistant government agent divisions: supplemental administrative and electorate divisions directly under the central government) and 444 Grama Sewaka. In addition, 1 municipal council (MC) and 6 urban councils (UC) are contained within the district. These councils are administratively of separate status from the AGA divisions. Rural administration is carried out jointly by the Assistant Government Agent (AGA) of the central government and the District Development Council (DDC) elected by the residents of the AGA division. Town councils (TC) and village councils (VC) were located below the UC, and function at present as sub-offices of the DDC. The smallest administrative units within the AGA divisions are the Grama Sewaka (village officer) areas (GS). The village officer maintains records of, population, marriages, births, deaths, residential and real estate information within his jurisdiction, in addition to the performance of other administrative duties.

Within the Grama Sewaka, the smallest community unit is the base hamlet. However, at present there is no planning to establish public facilities or social infrastructure at the base hamlet level.

As of 1981, the total population of Gampaha district was 1,390,862, of which 72% is rural population.

#### (2) Villager Organizations

In addition to the administrative organization, there exist villager organizations at the GS and AGA division (electorate) levels. At the GS level, these are referred to as Gramodaya Mandalaya (GM) which consist of the leaders of traditional village groups (temple, youth, women, etc.). In addition to providing a forum for discussion of village problems, the GM serve as a sounding board for consensus gathering by village level officers,

sub-officers and field staff of line ministries. Representatives of the GMs compose a Pradeshiya Mandalaya for discussion and representation at the AGA division level.

(3) Sphere of Daily Living Activity

The overall sphere of daily living activity is composed of various components, i.e. school, work, economic activity, transportation, government and local administration, etc. However, due to lack of availability of basic data, the daily living environment is examined here in terms of local administrative unit.

The composition of the daily living environment in Gampaha district is as follows:

- a) The smallest administrative unit is the Grama Sewaka (village) with an average population of 3,000 ~5,000. The GS boundaries generally encompass roughly a 2km (30min. on foot) radius from the village center. Each GS is headed by a single village officer. An AGA division comprises an average of 34 GSs. Facilities at the GS level are minimal.
- b) Rural communities consisting of larger villages or towns are referred to as village or town councils and comprise an average population of 40,000. Radius of such an administrative unit is around 6km (9min. by automobile). At present, village and town councils function as DDC sub-offices. These units constitute the primary living environment and are basically equipped with facilities for daily life.
- c) There are 13 assistant government agent divisions (electorates) in Gampaha district. Population per division is 94,000~120,000. Each division is headed by an AGA office. Division boundaries extend for a radius of around 10km (15min. by automobile) from the AGA office or largest city. The division constitutes the secondary living environment (week-cycle living sphere) and is relatively well equipped with social infrastructure.

Population of Gampaha district as a whole is 1.39 million. Distance from district boundaries to the centrally located Gampaha city is around 40km (one hour by automobile). The district comprises the month-cycle living sphere. At present, Negombo city is the largest and most infrastructured city in the district.

(4) Present Conditions in the Rural Area

Both urbanized sectors as well as purely rural sectors exist within the Project area. Towns such as Gampaha and Minuwangoda serve as

economic, social and administrative centers for the surrounding rural area. Village configuration within these urbanized areas is one of concentrated hamlets, composed of both farm and non-farm households. Purely rural areas, on the other hand, consist of dispersed hamlets.

Gampaha district comprises both upland and lowland. Lowland is utilized as paddy field, while upland serves as sites for dwellings and upland fields. Dwelling sites always include home gardens, wherein coconuts are generally cultivated. This combination of dwelling site and coconut grove is common not only in the rural area, but in urbanized areas as well. Consequently, densely residential locations are limited within even urbanized areas.

Roughly 70% of Gampaha district is farmland. Of this total, 82% is upland and 18% is lowland. Seventy five percent of upland is coconut groves, mostly adjacent to dwelling sites. Seldom are such coconut groves found at a distance from dwellings.

In terms of economic pattern, Gampaha may be classified into urban and rural zones. Area adjacent to GCEC as well as that closer to Colombo along national highway A-1 may be categorized as urban.

Labor population ratio in the mining and industrial sector in Gampaha district is 29.4%, and the mining and industrial sector population index is 218%. Farmland ratio in the district is 70%, and farm household ratio is 57%. Twenty percent of all farm households engaged solely in agriculture is 20%; the ratio for total households in the district so engaged is 6%. Average land ownership per farmer is 0.48ha. Sixty seven percent of farmers have holdings of 0.4ha. or less. Most farmers are engaged less than full time in agriculture.

Fifty six percent of lowland paddy field is irrigated, while the remainder is rainfed. In the case of paddy, field management is not carried out. Even where fields are located along main irrigation canals, secondary canals and farm ditches are not constructed and irrigation is by the over levee (plot-to-plot) method. There are no drainage canals. Fields are relatively fragmented, and land consolidation is not performed.

The road network within the district is relatively well developed, being second to that of Colombo. Although laterite paved roads are present in some villages, road network is sparse in paddy field areas.

Residents of the Project area obtain almost all their domestic water from shallow wells. In some instances, pumps have been installed at shallow wells to convey water to dwellings. Piped water service systems have been implemented in Gampaha city and Veyangoda town. As there exists no public sewage system, domestic wastewater is disposed of into nearby rivers by means of drainage ditches. Waste sludge disposal is by ground absorption.

Due to favorable land conditions, development has been in progress in Gampaha district for many years. As a consequence, fairly extensive social infrastructure construction has been undertaken. Nevertheless, in many cases facilities are superannuated and require urgent rehabilitation.

Despite the presence of the GCEC area and nearby Colombo, the unemployment rate in Gampaha district was a high 26.9% according to a government survey in 1981. Although recent data are not available, it is assumed that this rate has probably dropped somewhat judging from economic performance of the district over the past few years.

Farmer landholdings in Gampaha district are small, with a major portion of farmers working land less than 0.4ha in area. Eighty percent of farmers are part-time, with income outside of agriculture. Despite the supplementary off-farm income of most farmers, self-sufficiency in many cases is not achieved and food stamp reciprocity is widespread. An estimated 45% of rural households receive food stamps from the government.

#### 2.4.2 Roads

##### (1) Present Conditions

The road network in the Gampaha district is comparatively well developed due to its proximity to the capital, Colombo, and the high population density. Total road extension in the district is 1,503km while road density is 1.07km/km<sup>2</sup>, second only to the Colombo district (1.135km/km<sup>2</sup>). The national average road density is only 0.39km, indicating the high level of development in Gampaha. Roads in Sri Lanka are classified into four types according to purpose, average daily traffic volume, width and speed limit. Total road length for each road type is presented in the following table.

TABLE 2.4.2.1 ROAD KILOMETERAGE IN GAMPAHA DISTRICT

	A class	B class	C class	D class
Daily average traffic	3,000 or more	1,000~3,000	1,000 or less	30 or less
Pavement	8.0m	4.5m	3.5m	gravel
Driving speed	40km/h or more	25~40km/h	10~25km/h	10km/h or less
Extension	178km	484km	387km	454km

Maintenance of roads within the district has not kept pace with the rapid increase in traffic volume and number of automobiles due to lack of funds and equipment, as well as to continuous heavy rains during the monsoon season. Consequently the number of roads requiring repair is steadily increasing. In general, A class roads are in comparatively good condition; however, 40-45% of B to D class roads require at least some repair work.

(2) Traffic Conditions

Buses, either privately or publicly managed, play a major role in providing public transportation in Gampaha district. Buses operated by the Ceylon Transport Board, a public corporation, make a total of 800 round trips daily in Gampaha district alone, with over 100 round trips on major bus routes and about 50 round trips per day on other bus routes. Moreover, private buses have also been increasing in recent years and bus terminals have been established in the district's major cities.

Commuters to Colombo are numerous from the coastal and southern areas of Gampaha district and consequently traffic on the trunk roads in the morning and evening is heavy. The rapid increase in such heavy traffic is contributing to the deterioration of existing roads. Motorization has occurred extremely rapidly in Sri Lanka and the number of privately owned vehicles increased 2.5 times from 1977-1985, totalling about 524,000 vehicles in 1985. The number of traffic accidents in the district has correspondingly increased by 1.6 times in the five year period from 1977-81.

(3) Maintenance Conditions

The Road Development Authority under the Ministry of Highways is responsible for maintenance of roads in Sri Lanka. The Chief Engineer's

Office supervises development, repair and maintenance of roads in Gampaha district.

There are four branch offices, referred to as Executive Engineer's Offices, operating under the Chief Engineer's Office as well as 30 Road Maintenance Depots. These administrative agencies supervise technical level of maintenance work and management of funds, and are also responsible for rental of construction equipment. Actual labor is provided by private local construction companies. However, the amount of equipment available and the level of development of local construction enterprises is frequently insufficient to keep pace with the work load, and consequently, repair work in many cases is dependent upon manual labor. The effectiveness of road maintenance is thus less than desirable.

(4) Underlying Problems and Observations

The most pressing requirement is increased efficiency of maintenance of existing roads, and minimization of damage caused to these roads by the increasing traffic volume. For this purpose, it is recommended that a maintenance system be established with allocation of heavy construction equipment to the Chief Engineer's Office at the district level, and of light equipment to the four Executive Engineer's Offices.

Study of an integrated transportation system covering a wide area including the capital of Colombo, should also be studied for future implementation. There are about 175 bridges within the district. Replacement of those which have dangerously deteriorated is required, and it is envisioned that the construction of additional new bridges will also be required.

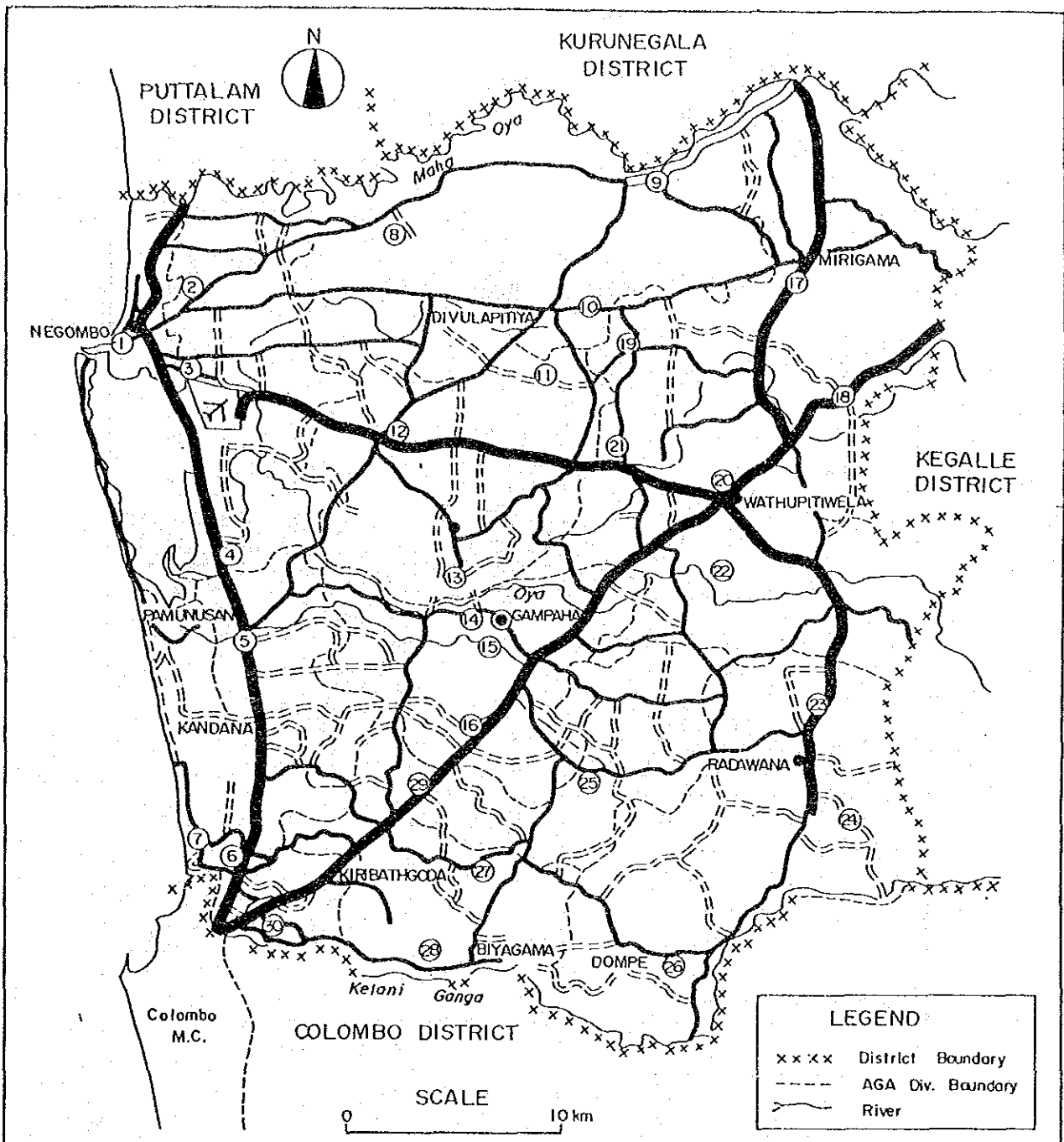


Fig. 2.4.2.1

Road Network and Maintenance Office



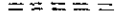



- |   |                                 |
|---|---------------------------------|
|  | A class                         |
|  | B class                         |
|  | C class                         |
|  | Chief Engineer's Office (1)     |
|  | Executive Engineer's Office (4) |
|  | Maintenance Depot (30)          |

Table 2.4.2.2 Road Conditions

		A class	B class	C class	D class
( A ) Total Length		178km	484km	387km	454km
Roughness	Smooth	60%	35%	10%	10%
	Fairly bumpy	40	55	50	50
	Very bumpy	—	10	40	40
Condition of pavement edges	Sound	80%	45%	30%	30%
	Minor damage	20	45	45	45
	Major damage	—	10	25	25
Potholes and patches	Few	40%	20%	10%	5 %
	Many patches and few potholes	60	70	75	75
	Many potholes	—	10	15	20
Permeability of surfacing	Impermeable	60%	30%	20%	15%
	Permeable in places	40	50	50	45
	Permeable	—	20	30	40
Drainage	Good order	30%	15%	10%	10%
	Minor defects	70	55	50	50
	Major defects	—	30	40	40
( B ) Improvement requirement		45km	195km	175km	180km
( B ) / ( A )		25%	40%	45%	40%

Source : Chief Engineer's Office, Gampaha, 1986



Table 2.4.2.3 Proposed Construction of Bridges

Bridge No.	Daily traffic	Existing Structure				Proposed structure		
		Span	Width	Width of Approach	Structure	Present conditions	Structure	Width
a 1/2 on SEEDUWA-UDUGAMPOLA	2,000	64.7 m	4.3 m	6.4 m	Concrete deck over R.S.J.J. with 6 piers	Deck vibrates while vehicles moving	Conc. bridge with P.S.C beams.	9.2 m
b 1/6 on KATUNAYAKE-VEYANGODA (W.B.Provides loan)	2,000	19.5 m	4.6 m	7.3 m	Concrete deck over R.S.J.J. with a pier of pile foundation	Deck damaged	- do -	9.2 m
c 1/1 on PALLIYAWATTA-LANSIYAWATTA	1,200	15.3 m	3.5 m	3.7 m	Concrete deck over R.S.J.J. with two conc. piers.	The abutments settled.	- do -	9.2 m
d 1/1 on VEYANGODA-RUWANWELLA	2,500	32.0 m	4.6 m	10.4 m	A steel bridge with decking plated & two piers.	Part of the deck & piers failed.	- do -	9.2 m
e 1/2 on VEYANGODA-KELANIYA	1,500	13.1 m	3.1 m	6.1 m	A timber deck over R.S.J.J.	The deck failed.	- do -	9.2 m
f 1/8 on KIRINDIWITA-GANEMULLA (W.B.Provides loan)	2,000	45.8 m	4.1 m	4.6 m	A bridge with a timber deck over R.S.J.J.	The deck failed.	- do -	9.2 m

### 2.4.3 Domestic Water Supply

#### (1) Present Status of Domestic Water Supply

Gampaha district is situated within a wet zone and within the catchments of the Attanagalu oya, Maha oya, and Kelani ganga. Good quality water is available in abundance, and residents obtain their domestic water from shallow wells. Generally, a distinction is made between wells utilized for drinking water, and those from which water for other household uses is obtained. Shallow wells are extensively located throughout the district. However, in recent years those located in urbanized areas have increasingly become contaminated with wastewater. In the course of the subject Field Survey, water quality analysis was conducted at several shallow wells located in areas of concentrated habitation. Test results indicated the presence of organic matter and turbidity believed attributable to the effects of wastewater. Such contamination serves as a vehicle for waterborne diseases and is of high concern from a health and sanitation viewpoint. This phenomenon is particularly aggravated during the dry seasons when water is less abundant.

#### (2) Rural Water Service

The rate of coverage by water service facilities in Gampaha district is 8.7%. This is lower than the national average of 17.3%. This is due to the fact that domestic water is relatively readily obtainable from shallow wells. At present, 9 cities and towns in Gampaha district have water systems either already established or at the planning stage. In the rural area specifically, the towns of Gampaha and Veyangoda have water service systems, while Minuwangoda, Nittambuwa, Maluwana, etc. have systems currently under planning. Furthermore, Mirigama, Yakkala, Divulapitiya, etc. are desirous of moving forward with planning of such systems in the near future. A comparison of piped water system priority for TC and VC including these areas is presented in Table 2.4.3.2 from standpoints of water pollution and disease prevention, community needs, construction cost, reduction of labor required for hauling water, and fire fighting effectivity.

Table 2.4.3.1 Sample Water Quality Analysis

Date	No	Sample	PH	Turbidity	Fe	NH <sub>3</sub>	Remarks
			(6.5~ 8.5)	(5.0) mg/ℓ	(0.3) mg/ℓ	(0.5) mg/ℓ	
July22	1	Mirigama Hospital Filtered Water (Shallow well)	<u>6.0</u>	5.0	0.1	<u>0.6</u>	Should be chlorinated
"	2	Mirigama Shallow well A.G.A Office	5.9	6.0	0.1	0.3	
"	3	Minuwangoda Shallow well Town Centre, market	<u>6.0</u>	<u>15.0</u>	0.2	0.3	
July23	4	Minuwangoda Shallow well Existing Water Supply	<u>6.2</u>	<u>20.0</u>	0.1	0.3	
"	5	Mirigama Shallow well Town Centre public well	5.8	<u>20.0</u>	0.1	0.3	
July25	6	Katunayaka Shallow well	<u>6.2</u>	<u>15.0</u>	0.1	<u>0.6</u>	☆ Should be chlorinated
"	7	Katunayaka Shallow well	<u>6.2</u>	<u>10.0</u>	0.1	<u>1.0</u>	☆ - do -
Aug. 4	8	Divulapitiya Shallow well A.G.A Office	6.4	<u>8.0</u>	0.1	0.1	
"	9	Divulapitiya Shallow well Town center	<u>5.7</u>	<u>10.0</u>	0.1	0.2	
"	10	Pallawala Shallow well Town centre	5.8	<u>5.0</u>	0.1	<u>1.0</u>	Should be chlorinated
"	11	Udgampala Shallow well Town council	<u>6.2</u>	<u>10</u>	0.1	<u>0.5</u>	- do -
Aug. 6	12	Ja-Ela Shallow well Gasoline Stand	5.8	<u>10</u>	0.1	0.2	☆
"	13	Pamung Shallow well A.G.A Office near the market	<u>5.8</u>	<u>8</u>	0.1	<u>0.8</u>	☆ Should be chlorinated
7	14	Yakkara Shallow well Town centre	<u>6.2</u>	<u>20</u>	0.1	0.1	

Underlined figures : in excess of WHO drinking water standard  
 ☆: GCBC Area

Table 2.4.3.2 Priority Area

Implementation	A	B	C	D	E	Total
Project Area	Water Pollution & Disease	Community Needs	Construction Cost	Water Fetching	Fire Fighting	Evaluation Points
Mirigama T.C.	◎ ( 50 )	◎ ( 20 )	○ ( 5 )	○ ( 5 )	○ ( 5 )	( 85 )
Divulapitiya V.C.	○ ( 25 )	◎ ( 20 )	△ ( 1 )	○ ( 5 )	○ ( 5 )	( 56 )
Yakkala V.C.	○ ( 25 )	◎ ( 20 )	◎ ( 10 )	○ ( 5 )	○ ( 5 )	( 65 )
Udugampala V.C.	◎ ( 50 )	○ ( 10 )	○ ( 5 )	○ ( 5 )	○ ( 5 )	( 75 )
Pallewals V.C.	◎ ( 50 )	○ ( 10 )	○ ( 5 )	○ ( 5 )	○ ( 5 )	( 75 )
Megodopotha V.C. Urapola Town	○ ( 25 )	○ ( 10 )	○ ( 5 )	○ ( 5 )	○ ( 5 )	( 50 )
Galahityawa V.C. Ganemulla Town	○ ( 25 )	○ ( 10 )	○ ( 5 )	○ ( 5 )	○ ( 5 )	( 50 )
Oyabodo Peruwa V.C. Thackaiya Town	○ ( 25 )	○ ( 10 )	○ ( 5 )	○ ( 5 )	○ ( 5 )	( 50 )

Remark

Implementation	A	50 point,	◎	high priority	100 %
	B	20 point,			
	C	10 point,	○	middle priority	50 %
	D	10 point,			
	E	10 point,	△	low priority	10 %

Example	Mirrigama	A × ◎	50 point × 100 % = (50) point
		B × ◎	20 point × 100 % = (20) point
		C × ○	10 point × 50 % = ( 5) point
		D × ○	10 point × 50 % = ( 5) point
		E × ○	10 point × 50 % = ( 5) point

Total (85)

(3) Administration, Operation and Maintenance of Water Service Projects

Water service projects in Sri Lanka fall within the jurisdiction of the Ministry of Local Government, Housing and Construction, and management is the responsibility of the National Water Supply and Drainage Board.

For the purposes of operation and maintenance of water service projects, Sri Lanka is divided into eight regions each headed by a regional office which oversees pump and treatment plant management. Gampaha district falls within the jurisdiction of the Kurunegala Region Office. Operation and maintenance of distribution pipeline and collection of tariffs is carried out by the local town and village councils.

(4) Consumption Standards for Water Service

Availability of water supply is absolutely essential, and 3.0ℓ/person/day is commonly considered the bare minimum requirement for domestic water supply.

Consumption standards applied in Sri Lanka and WHO standards for rural water service are compared in Table 2.4.3.3.

TABLE 2.4.3.3 WATER SUPPLY CONSUMPTION STANDARD

Community	Consumption ℓ/c/d	House Connection	Standpipe
Medium Rural (Population 1,000~1,500)	WHO	-	15~20
	Sri Lanka	-	45
Large Rural (Population 1,500~5,000)	WHO	70~250	20~50
	Sri Lanka	140	45
Small Urban (Population 5,000~10,000)	WHO	70~250	20~50
	Sri Lanka	185	45

As can be seen from the above table, consumption standards used in Sri Lanka surpass average values stipulated by WHO, underscoring the fact that Sri Lanka applies consumption standards which are above average for developing nations.

Potable water standards in Sri Lanka are determined by the National Water Supply and Drainage Board, and are in keeping with WHO standards.

(5) Problems Affecting Water Supply

Access to potable water is a prerequisite for daily life. As Gampaha district is situated within a wet zone, district residents have in the past been able to obtain potable water readily from shallow wells. As a result, shallow wells have proliferated and the piped water coverage rate is 8.7%, or only half the national average. However, with rises in standards of living, increasing numbers of households have achieved in-house water supply by outfitting shallow wells with lift-pumps which send water to tanks on house rooftops.

However, in recent years contamination from wastewater has begun to affect wells in areas of concentrated habitation. Thus in response to both sanitation and improved standard of living imperatives, piped water service projects have been pursued.

Although utilization of shallow wells as a source of domestic water poses no problem in most areas, some wells in urbanized areas have evidenced unacceptable levels of organic matter and turbidity. From a health and sanitation standpoint, measures to ensure a safe and stable domestic water supply in such areas are urgently required. A district-wide program should accordingly be formulated for water quality testing and a strategy drawn up for water purifying methods to rehabilitate shallow wells, as well as for the construction of piped water service systems.

At present, deep tubewell projects are not being conducted in Gampaha district. Nevertheless, the geologic profile of the district suggests the possibility for a certain degree of groundwater development, and this potential should be further explored in subsequent survey and study. Deep wells are an effective and readily implementable means of providing rural water supply.

#### 2.4.4 Rural Electrification and Communications

##### (1) Rural Electrification

###### 1) General

Rural electrification in Sri Lanka commenced in 1961 with the Fifty Village Scheme implemented by village councils with government funds. In 1969 the Ceylon Electricity Board was established and, since that time, this agency has been promoting electrification based on yearly plans. A rural electrification plan is presently being implemented under an ADB loan first allocated in 1980.

Gampaha is located adjacent to Colombo and electrification has been implemented in this area for a number of years, particularly in the GCEC area. Since 1983, 185 schemes have been implemented with financing from the ADB loan and the Government of Sri Lanka.

The electrification rate in Gampaha district at the Grama Sewaka (GS) level is 48.6% in the rural area and 80.3% in the GCEC area, while that at the village level is 44.6% and 82.8%, respectively. In the rural area, over half of the GS and villages lack distribution lines, and this trend is particularly evident in Mirigama AGA.

###### 2) Agencies Concerned with Electric Power

Activities related to electric power generation are undertaken by the CEB under the Ministry of Power and Energy, the Lanka Electricity Company (LECO) and Local Authorities. In Gampaha district, 15 Local Authorities are responsible for power distribution; however, recently, this responsibility has been transferred to LECO.

###### 3) Power Supply

At present there are 11 hydropower stations (capacity: 679.3MW) and 5 thermal power stations (capacity: 290MW) in Sri Lanka. Total energy generated in 1985 was 2464GWh. Of this total, 97% was provided by hydropower while only 3% was provided by thermal power. There is one thermal power station in Gampaha district with a total capacity of 80MW.

4) Electrification Rate

Data on power distribution by local authorities were unavailable and consequently, the electrification rate could not be clearly determined. The electrification rate was therefore estimated as the number of electrified households versus the total number of households amounting to a national rate of 22.5% for 1985. The rate for the entire Gampaha district was estimated at 52%, while that for the rural area was estimated at 20% and for the GCEC area at 83%. The electrification rate for the rural area is noticeably lower than that of the GCEC.

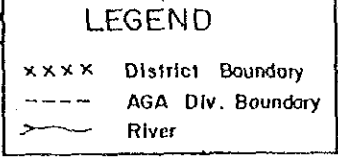
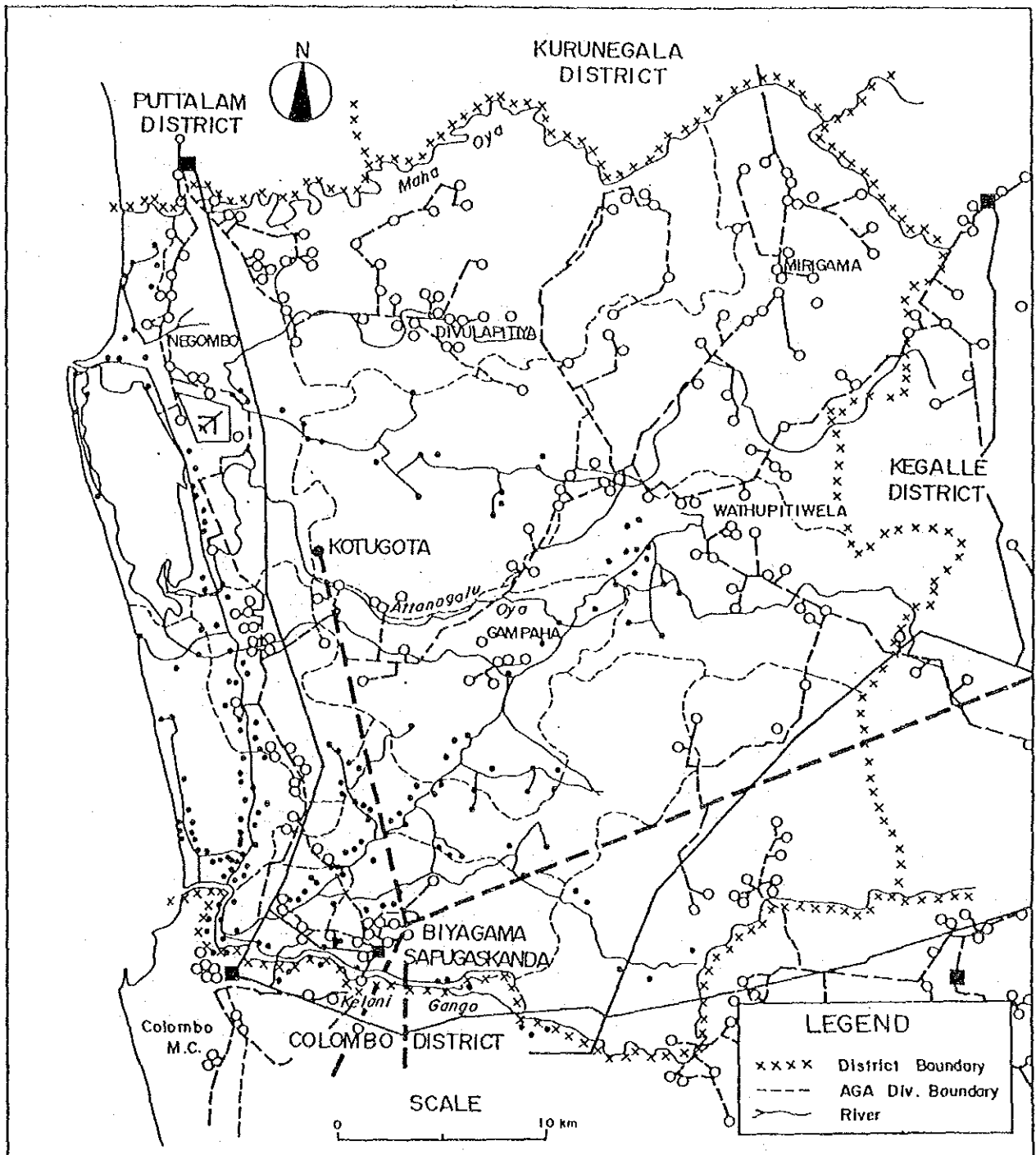
5) Problems and Observations

As with other basic infrastructures in Gampaha district, electrification was implemented numerous years ago and consequently, distribution facilities are superannuated and in poor condition. Although distribution facilities installed under the recent rural electrification scheme financed by the ADB loan are well constructed according to standard design, other facilities in the majority of areas require improvement.

At present, there are inconsistencies in the layout of the 33kV and 11kV high voltage distribution network. Moreover, the network is of low reliability and lacks distribution capacity. Similarly, low voltage lines are heavily overloaded during peak hours which results in poor voltage regulation and high energy losses. Thus it is considered necessary not only to extend rural electrification in the Study area but also to reinforce the existing distribution network to ensure high reliability.

In areas which remain unelectrified, kerosene lamps are used for lighting at a monthly fuel expenditure of about Rs40. This expenditure is similar to that required for electric rates, indicating that such rates are payable by local residents. The low electrification rate in rural areas is generally attributed to the low density of distribution lines. Under the present tariff system of CEB, new subscribers are charged for the overhead service connection including line extension, as well as the usual costs of house wiring,





LEGEND		
Distribution Line	Line	Station
---	220 kv	● 220 kv Sub Station
—	132 kv	■ 132 kv Sub Station
- - -	33 kv	○ 33 kv Sub Station
—	11 kv	• 11 kv Sub Station

Fig. 2.4.4.1 Power Distribution Network in Gampaha District

Table 2.4.4.1 Electrification Status in Gampaha District

Name of AGA Division	Area (km <sup>2</sup> )		No. of GS/ Rural Urban		No. of GS (Electrified)	Electrified Rate of GS (%)	No. of Village (Electrified)	Electrified Rate of Village (%)	
ATTANAGALLA	151.8		57	1	25	43.1	138	61	44.2
*BIYAGAMA	64.7		18		14	77.8	54	42	77.8
DIVULAPITIYA	193.0		44		23	52.3	125	58	46.4
GAMPAHA	94.8		36	1	21	56.8	121	64	52.9
*JA-ELA	65.3		20	3	18	78.3	65	58	89.2
*KATANA	114.7		35	1	25	69.4	70	50	71.4
*KELANIYA	23.1			18	14	77.8	30	26	86.7
MAHARA	103.3		33	1	22	64.7	70	42	60.0
MINUWANGODA	139.2		43	1	28	63.6	116	66	56.9
MIRIGAMA	190.0		56	2	17	29.3	212	60	28.3
*NEGOMBO	30.8		18	3	18	85.7	50	40	80.0
*WATTARA	63.9		18	3	21	100.0	56	53	94.6
WAKE	164.2		51		21	41.1	153	66	43.1
Total	1398.8		429	31	268	58.0	1260	686	54.4
Project Area	1036.3		320	3	157	48.6	935	417	44.6
FTZ	362.5		109	28	110	80.3	325	269	82.8
									137

\* : AGA Division in FTZ  
 1/ : including M.C., U.C. etc.

lighting facilities, etc. The initial cost is thus more than Rs3,000. Due to the low density of distribution lines and the distance of households from public roads, the cost of connecting households to the distribution system is much greater in rural areas than in urban areas, greatly inhibiting rural electrification.

(2) Telecommunications

1) General Conditions

Total number of working telephone lines in Sri Lanka as of the end of 1985 were 85,100, and the distribution of telephones is gradually spreading from public agencies to the average household. Due to superannuation of existing facilities and lack of sufficient new facilities, the number of telephones is inadequate to meet present demands.

A master plan for development of a national communications network by the year 2000 commenced with Japanese cooperation in 1985, and extension of telecommunications facilities is being promoted throughout the country. The master plan aims to i) meet 100% of telephone demand, ii) to complete a digital trunk network, iii) to introduce new technology and service, and iv) to eliminate disparity in telephone coverage and service between urban and rural areas.

There are 5,800 telephone lines in Gampaha district, only 19% of which are located in the rural area while 81% are located in the GCEC area. The coverage rate is 0.14phones/100 people in the rural area and 0.63/100 in the GCEC area. The coverage rate for the entire nation is 0.54/100 whereas that for Gampaha district is only 0.38/100, indicating that the coverage rate in Gampaha district is much lower than that in the rest of the country.

2) Agencies Concerned with Telecommunications

The Sri Lanka Telecommunication Department (SLDT) under the Ministry of Post and Telecommunication, is the sole agency responsible for telecommunication services in Sri Lanka. The three Engineer's Offices of the Western Region and the Metropolitan Region cover Gampaha district, and telecommunication in the rural

area is covered by the Gampaha Engineer's Office of the Western Region.

### 3) Problems and Observations

Superannuation and lack of facilities are the main problems in Gampaha district. Telephone lines in the form of cables are rare and the majority of lines consist of a pair of open wires strung along the main roads. The lines are strung on the opposite side of the road from the distribution lines to avoid interference; however, use of the existing distribution line poles upon establishment of a design standard should be considered as an alternative approach to extension. The latter method is more cost efficient than installation of separate poles for every telephone line.

There are only about 1,100 working telephone lines in the rural area and the majority of these are installed in public agencies. As telecommunications facilities are closely linked to rural economic development, extension of such facilities in the Study area is urgently required.

## 2.4.5 Health and Medical Services

### (1) Present Health Conditions

Health conditions in Gampaha district evaluated according to standard health indices such as crude birth rate, mortality rate, nutrition and health facilities, are comparatively good in reference to the national average. However, the percentage of vaccinations to prevent tetanus and polio in infants is lower than the national average and there is a high incidence of such diseases as hepatitis and cirrhosis of the liver. Moreover, the health service standards in the inland regions of Divulapitiya, Minuwangoda, Mirigama, etc. are particularly low, and the incidence of diarrhea, hepatitis and malaria in Divulapitiya and Minuwangoda is high.

### (2) Medical Services

Medical facilities in Sri Lanka are classified into 9 types according to facility scale, number of specialists, number of health care assistants, etc. Total number of medical facilities in Gampaha district is 58 (excluding

teaching hospitals), with a total of 2,605 beds. The number of beds per 1000 is thus only 2.0, lower than the national average of 3.3.

Gampaha district has the second-highest population density in Sri Lanka. The total number of patients in the district's 58 facilities (excluding teaching hospitals) in 1985 was 132,007 while the total number of outpatients was 2,373,776. The number of medical staff (including doctors, nurses, assistant medical practitioners, etc.) per 100,000 population is much lower than the national average and present staff are insufficient to meet the needs of the district's expanding population.

Moreover, doctors are generally concentrated only in the central hospitals. Consequently, patients also tend to gravitate towards the three Base Hospitals, the central facilities in the area. Not only are these hospitals crowded with outpatients during regular hours, but the occupancy rate is 120%. In contrast, the District Hospitals at the next level have an occupancy rate of only 70%. The desire of patients to travel longer distances in the hopes of receiving more professional care is understandable. However, even these central hospitals require urgent improvements in facilities and standards. An adequate number of doctors is a prerequisite to such improvement.

### (3) Health Services

In addition to medical facilities, health services aimed at disease prevention are also essential. It is reported that if adequate health services were provided, the majority of outpatient and 60% of regular patient diseases are preventable. It is also necessary to increase the people's awareness of health care and general hygiene within the home and environmental sanitation.

Health services staff centered in the M.O.H. Offices of Gampaha district include Medical Health Officers, Public Health Nursing Sisters, Supervising Public Health Midwives, Public Health Inspectors and School Dental Therapists. The district is divided into 9 health service areas and staff are assigned to visit each area. However, some regions such as Divulapitiya and Attanagalla have no Health Offices. Moreover, the 9 health service areas do not correspond with the existing political divisions (Regions), giving rise to administrative problems.

Public Health Midwives provide health instruction and consultation to each household; however, there are no permanent central facilities for their activities and consequently, it is all they can do to make the rounds of a small number of pregnant women patients, and they are often unable to meet the service needs of the entire area.

Better health management for combined medical and health services, a higher level of skill among health personnel and promotion of effective use of medical and health facilities are thus urgent requirements.

(4) Restructuring of the Medical and Health Service System

In order to correct the above deficiencies, a program to re-structure health care services has been formulated and adopted by the Government of Sri Lanka. The program envisages the provision of one Family Health Worker per 3,000 people for the Gramodaya Health Center (GHC), the most peripheral unit of the health care system. Through upgrading, strengthening and establishment of new institutions, it is planned to provide first level and second level referral units at Sub-Divisional and Divisional Health Centers. These together will compose the Primary Health Care Complex (PHC Complex).

The establishment of Primary Health Care in the rural area is one of the Government's policies which was stated in the election manifesto in 1977 as follows: "Restore the high standards of health care and health service particularly in the rural areas through both the Ayurvedic and the Western System."

The implementation plan for this program has been completed as presented in Fig. 2.4.5.2, but has yet to be applied.

(5) Administration of Medical and Health Services

Medical and health services in Sri Lanka are under the jurisdiction of the Ministry of Health, the Ministry of Women's Affairs and Teaching Hospitals and the Ministry of Indigenous Medicine.

(6) Problems and Observations

The basic problems concerning medical and health services in Gampaha district are i) inadequacy of the existing health system to keep pace with the increasing population, ii) unequal distribution of health

Table 2.4.5.1 Health Indicators

Indicator		Gampaha		Sri Lanka				
Birth and Death Rates	Crude Birth Rate(per 1,000) 1984	16.1		24.8				
	Crude Death Rate(per 1,000) 1984	5.8		6.5				
	Infant Mortality (per 1,000)	24.0 (1980)		29.5 (1981)				
	Maternal Mortality Rate	0.35 (1980)		0.6 (1981)				
	Life Expectancy at Birth(1979)	66.4		68.35				
Nutritional Status of Pre-School Children	Chronic Malnutrition	13.44 %		20.86 %				
	Acute Malnutrition	7.76 %		8.67 %				
	Concurrent Malnutrition	1.07 %		2.21 %				
Main Cause of Hospitalization	Ranking	Disease		No	%	Ranking	No	%
	1	Open wound and injury to blood vessels		7,787	5.6	1	109,525	4.6
	2	Intestinal infections		7,112	5.1	5	81,033	3.4
	3	Acute bronchitis and bronchilitis		4,971	3.5	3	97,546	4.0
	4	Other diseases of the digestive systems		4,149	3.0	8	56,964	2.4
	5	Influenza		4,071	2.9	—	NA	NA

Table 2.4.5.2 Sanitation Indicators

(Unit : %)

Indicator	Gampaha	Sri Lanka
Population with water at home or vicinity (1981)	74.3(%)	69.6(%)
Population with adequate sanitary facilities at home or vicinity (1981)	83.3	66.6
Infants immunized with BCG (1984)	62.1	66.8
Infants immunized with DPT (1984)	60.6	66.4
Infants immunized with GPV (1984)	67.7	65.4
Pregnant women immunized against Tetanus Toxoid (1984)	53.8	47.0
Women attended to by trained health staff during pregnancy (1980)	90.0	79.0
Number of deliveries at institutions (1980)	61.3	76.4
Babies up to one year old cared for by trained staff (1980)	—	80.0

Source : Annual Health Bulletin, Sri Lanka, 1984, Ministry of Health



Table 2.4.5.3 Medical Facilities in Gampaha

Category	Location	Bed	Cases of hospitalization	Visitor	Total	
					Unit	Bed
1. Teaching Hospital	Ragama (JA-BLA)	745	NA	NA	1	745
2. Provincial Hospital	—	—	—	—		
3. Base Hospital	Gampaha	337	27,844	237,302	3	1,003
	Watupitiwala (ATTANAGALLA)	333	28,847	164,842		
	Negombo	333	25,778	242,750		
4. District Hospital	Divulapitiya	98	8,177	110,294	4	469
	Mirigama	188	12,175	130,426		
	Minuwangoda	75	8,358	85,518		
	Dompe (Weke)	108	8,879	118,300		
5. Peripheral Unit	Radawaha (WEKE)	64	2,943	50,115	4	170
	Akaragama (DIVULAPITIYA)	12	615	17,218		
	Pamunugama (WATTARA)	24	NA	NA		
	Kiribathgoda (KELANIYA)	53	NA	NA		
6. Rural Hospital	Ja Ela	22	NA	NA	3	54
	Biyagama	12	NA	NA		
	Udupila (MAHARA)	20	NA	NA		
7. Maternity Homes & Central Dispensaries	MH + CD = 9 units MH = 2 units	164	—	—	11	164
8. Central Dispensaries	—				32	
9. Others	Branch dispensaries & visiting stations				NA	NA
	Private Hospital				NA	
Total (excluding Teaching Hospital)					58	2,605
M O H Area 9						

Source : Annual Health Bulletin — Sri Lanka, 1984

Table 2.4.5.4 Key Health Personnel, 1984

Key Health Personnel	Gampaha District		Sri Lanka	
	No.	Per100,000	No.	Per100,000
Medical Officer (Curative Service)	128	8.7	1,155	11.2
Medical Officer (Administrative Service)	3	0.2	194	0.6
Medical Officer of Health	12	0.8	102	0.6
Dental Surgeon	23	1.6	288	1.8
Assistant Medical Practitioner	70	4.8	984	6.3
Nurse	548	37.8	7,400	47.0
Public Health Nursing Sister	22	1.5	209	1.3
Public Health Inspector	59	4.0	916	5.8
Family Health Worker	256	17.4	3,001	19.1
Family Health Worker (Institution)	117		N A	
Pharmacist	17		N A	
Medical Laboratory Technologist	16		N A	
Dispenser	29		N A	

Source: Annual Health Bulletin, Sri Lanka, 1984, Ministry of Health  
Office of the RDHS, Gampaha.

Note: Personnel related to the Teaching Hospital at Ragama are excluded.

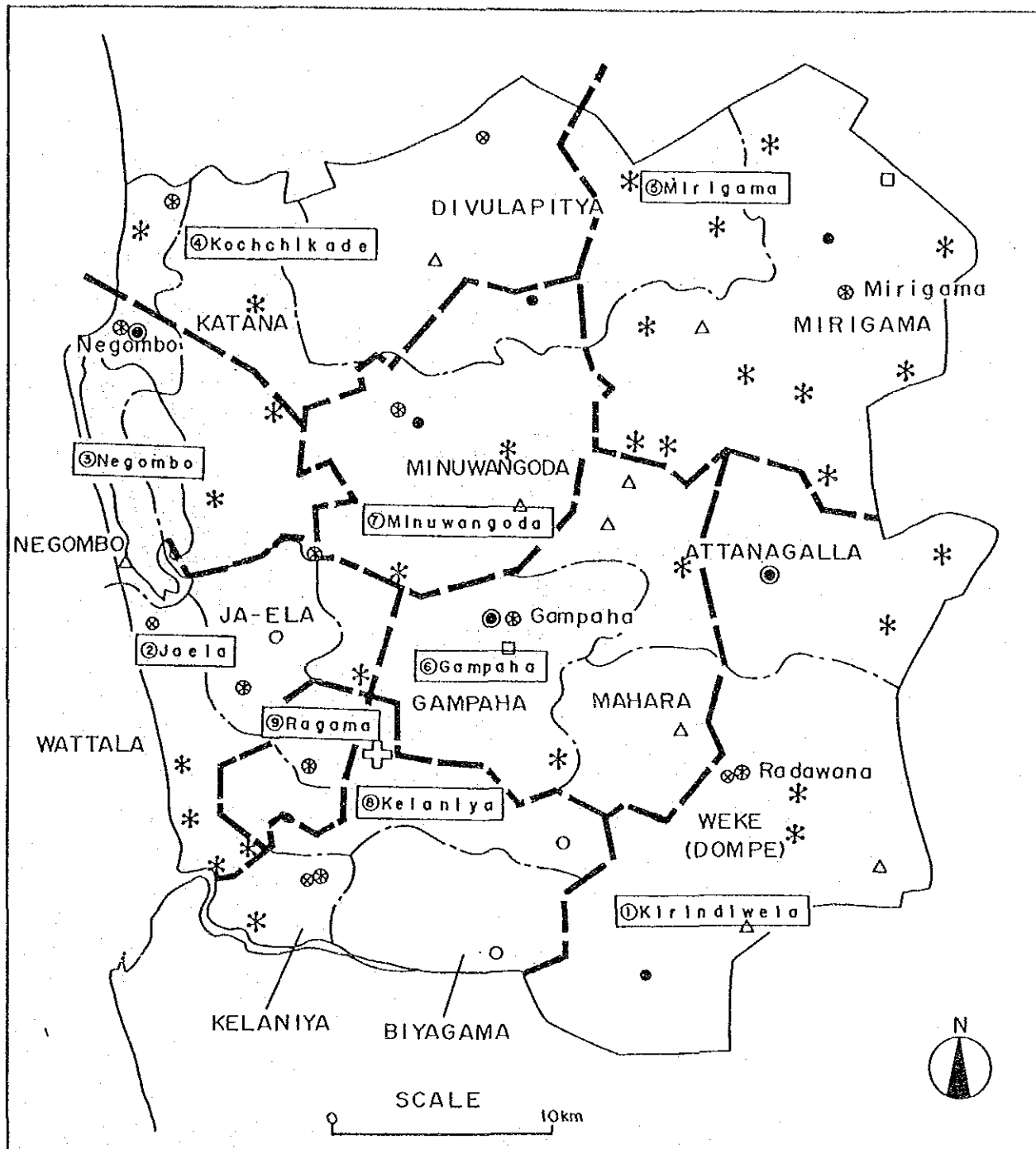
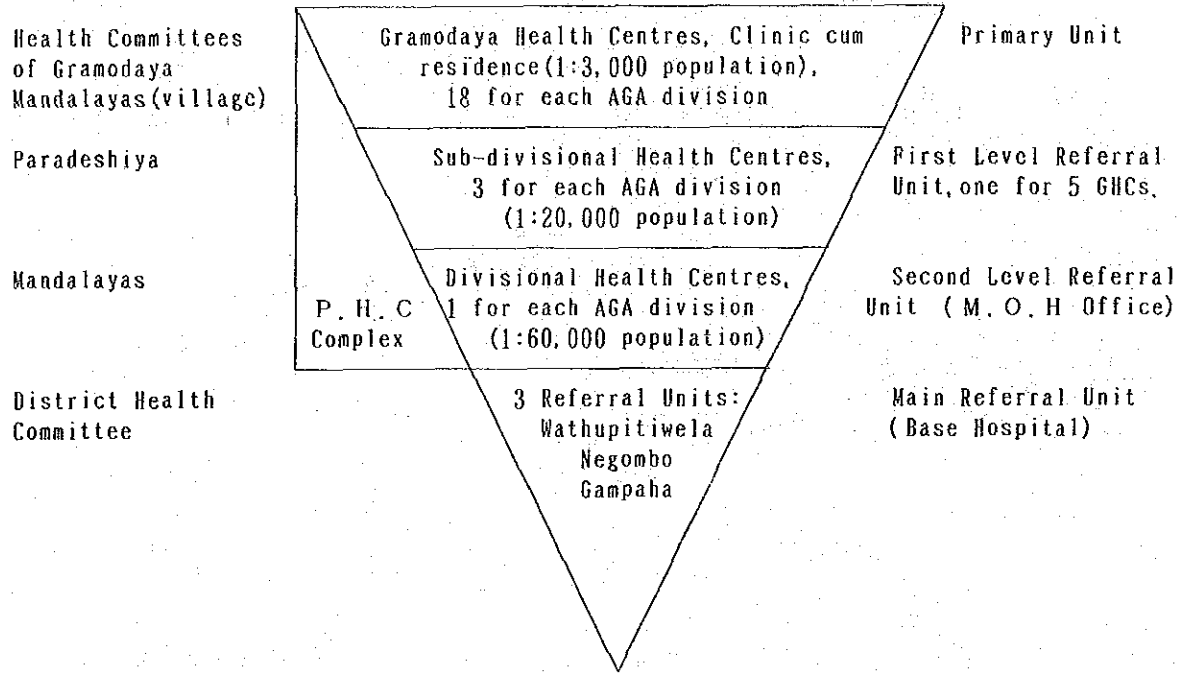


Fig. 2.4.5.1 Location of Medical Facilities

Legend

- |   |   |   |                   |
|---|---|---|-------------------|
| + | Teaching Hospital (1)                   | ⊗ | M.O.H. Office (9) |
| ⊙ | Base Hospital (3)                       | □ | M.O.H. Areas (9)  |
| ● | District Hospital (4)                   |   |                   |
| ○ | Peripheral Hospital (4)                 |   |                   |
| ○ | Rural Hospital (3)                      |   |                   |
| △ | Maternity Home + Central Dispensary (9) |   |                   |
| * | Central Dispensary (31)                 |   |                   |
| □ | Maternity Home (2)                      |   |                   |

Fig. 2.4.5.2 Proposed "Three Tier" PHC Complex



facilities in the district, and iii) lack of a coordinated system for preventative health care services and medical services.

As aforementioned, the population density in Gampaha district is the second-highest in Sri Lanka. The number of facilities and the existing system are insufficient to respond to the increased demands, and consequently, the number of hospitals, clinics, and medical staff is lower than the national average. Moreover, due to the lack of doctors in rural hospitals, patients are overly concentrated in the Base Hospitals. Unfortunately, the facilities in these base hospitals have deteriorated and it is difficult to provide adequate medical service. As for health care services, due to lack of permanent centers for the Public Health Midwives activities, adequate health care services in the 9 health service areas cannot be provided.

The Government of Sri Lanka has introduced the PHC Complex plan to alleviate these problems by establishing a health service system in the rural areas. Gampaha has been designated as the model district for introduction of the plan which has yet to be implemented. It is recommended that top priority be given to implementation of this plan in order to overcome the problems described above.

#### **2.4.6 Human Resources Development**

##### **(1) Present Conditions**

Education in Sri Lanka is divided into three categories; primary school (kindergarten-grade 5, age 5-10), junior secondary school (grades 6-10, age 11-15), and senior secondary school (grade 11-12, age 16-17) for a total of 13 years. As a result of reform of the general education system, kindergarten has been included in the primary school so that the system comprises 13 years rather than 12 grades. At the end of junior secondary school, students take the General Certification of Education examination for entrance into the senior secondary school. At the end of the latter, students take the GCE Advanced Level examination for entrance into university or higher educational institutions.

Children of school age in Gampaha district (from 5 and 19 years of age) number 434,638 as of 1981, comprising about 1/3 of the district's total population. The percentage of children of school age between the ages of 5

and 14 is 88.7% which is higher than the national average of 84.8% as well as the average for the district of Colombo (87.1%) indicating a high level of interest in education. The literacy rate is also very high in Gampaha district at 94.2% as opposed to the national average of 86.5%.

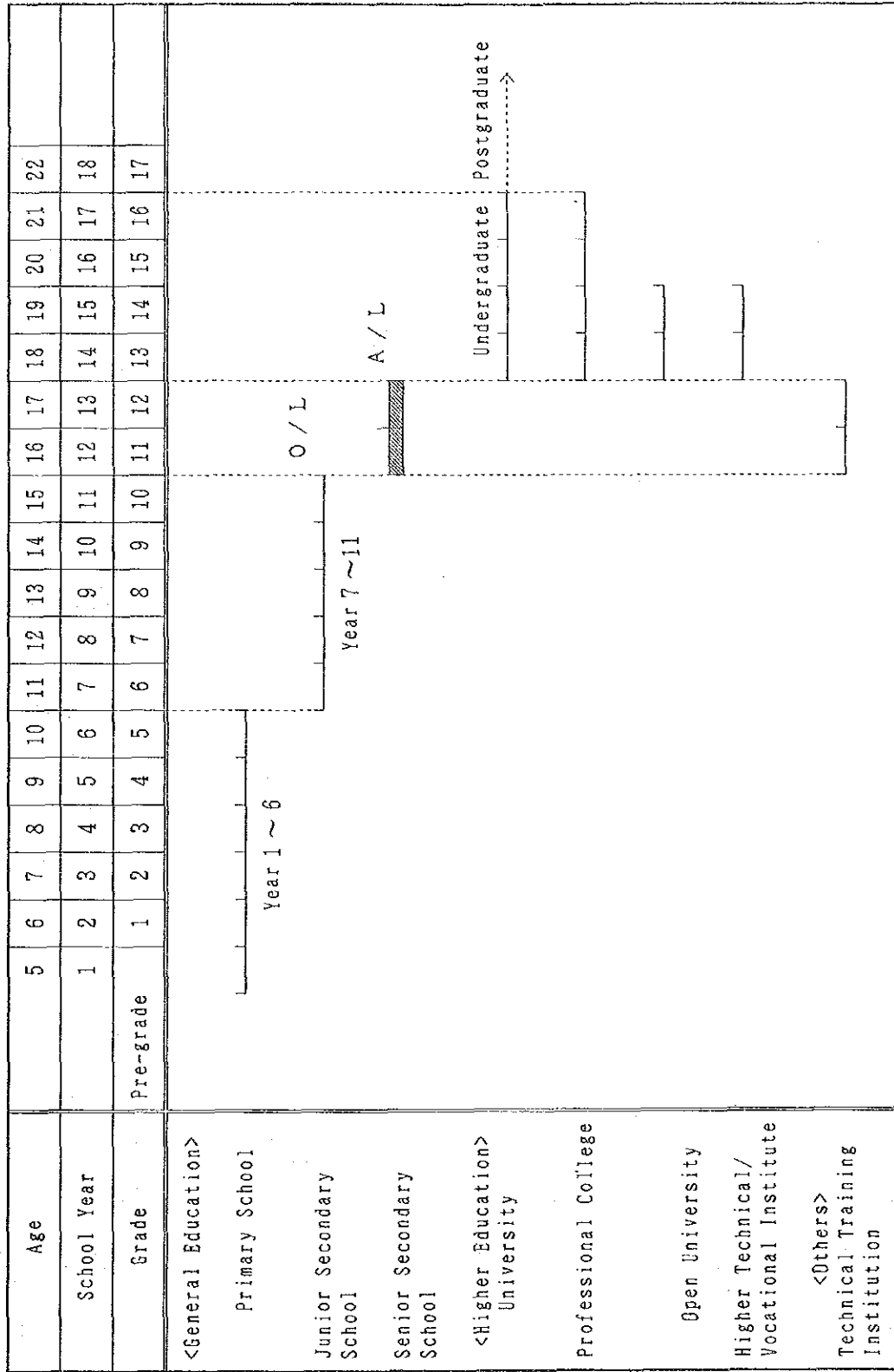
On the other hand, despite the fact that education up to the university level is free, the number of dropouts from years 1-5 of primary school in Gampaha district was 35,513, from years 6 of primary to 2 of junior secondary was 102,666 and from years 3-4 of junior secondary was 167,254. Thus only about 30% of total school age children attend school until the final year of secondary school. The other 70% quit school due to family situations or an inability to keep up with the school work. About 8,000 students a year graduate from high school and take the GCE Advanced Level required for entrance into institutions for higher education, and only about 500 of these students (about 1.7% of the total population within that age group) can be accommodated in universities and other institutions.

Due to the competitive education system, many students leave Gampaha district to attend better schools in Colombo. The educational standards of the science division in particular are low and 47.8% of science students go to Colombo to complete their education. Even within Gampaha district there is a general trend for students from remote rural areas to gravitate towards the larger schools in the urban areas.

## (2) Zoning and General Education Facilities

There are 15 educational circuits within the Gampaha district two of which are Tamil educational circuits having no boundaries. Recently, the cluster system has been implemented on a pilot basis with 26 model clusters within the Gampaha district. A cluster normally comprises 10-20 primary and secondary schools with a total pupil enrollment of approximately 3,000-10,000 and a teaching staff of 100-400. The largest secondary school with the most potential and an efficient principal is designated as the core school. The core school serves as the resource center of the cluster and all resources are available to every school within the cluster thereby reducing under-utilization and unnecessary duplication of equipment, facilities and teachers. In future it is envisioned that the cluster system will develop into a network integrating the 58 school zones in the district with core schools established in each zone.

Fig. 2.4.6.1 Education System of Sri Lanka



**Table 2.4.6.1 General Education in Gampaha District**

School Type	School Year	No. of Schools	No. of Pupils (A)	No. of Teachers (B)	No. of Class-rooms (C)	(A)/(C)	(A)/(B)
Grade 3 School	1~6	186	14,438	2,824	1,116	12.9	5.1
Grade 2 School	1~11	273	114,524	4,504	3,272	35.0	25.4
1C School	1~13	99	95,321	2,936	2,386	40.4	32.4
1A · B School	7~13	38	75,282	2,206	2,206	40.2	34.1
Total		596	299,565	12,470	8,646	34.6	24.0

Note : Generally Grade 3 schools are located in rural, remote areas and 1A · B school in urban areas.



Table 2.4.6.2 Core Schools in Gampaha District

BIYAGAMA	1	Biyagama M. M. V. School
	2	Daranagama M. V. School
	3	Sapugaskanda M. V. School
DOMPE	4	Kirindiwela M. M. V. School
	5	Dekatana Padmawathic M. V. School
MIRIGAMA	6	Mirigama D. S. Senanayake M. M. V. School
DIVULAPITIYA	7	Divulapitiya M. V. School
NEGOMBO	8	St. Mary's M. V. School
	9	Harischandra M. V. School
KELANIYA	10	Dharmaloka M. V. School
KATANA	11	Timbirigaskatuwa M. V. School
GAMPAHA	12	Madduma Bandara M. V. School
	13	Yakkala Chandrajothi M. V. School
	14	Galahitiyawa M. M. V. School
MAHARA	15	Kadawatha M. V. School
	16	Kendaliyaddapaluwa M. V. School
WATTARA	17	Mattumagala Karunarathna M. V. School
	18	St. Anthony's M. M. V. School
	19	Gonsalwes M. V.
	20	Good Shepherds Convent Nayakkanda
JA-ELA	21	St. Sebastian M. V. School
	22	Batuwatta M. V.
	23	Christ King College Tudella
ATTANAGALLA	24	Nittambuwa Sangabodi M. V. School
	25	Urapola
MINUWANGODA	26	Japalawatta M. V. School

In view of the above, facilities and equipment required for high level instruction in specific subjects, particularly the sciences, should be established in the core schools. Moreover, the overall standard of general education in Gampaha district should be improved to prevent the exodus of students to schools in Colombo.

(3) Higher Education

Institutions for higher education in Sri Lanka have been rapidly developed over the last 40 years. At present there are 18 institutions for higher education including 8 universities and one private medical college. There are several such institutions located in Gampaha district including Kelaniya University which has commerce, literature and science departments, a private medical college at Ragama, and 5 teacher training colleges.

(4) Technical and Vocational Education

There are 22 technical institutions and 5 affiliated technical units in Sri Lanka under the jurisdiction of the Ministry of Higher Education and Technical Education. Training covers many subjects such as automotive mechanics, radio and electronic mechanics, telecommunications, etc. Training courses are arranged for a variety of levels and training periods (usually 2 years), as well as full-time and part-time courses. Full-time craft level courses are offered to youth under 19 years of age who have passed grade 8, while part-time courses are offered to those who are already employed in a relevant field. Total enrollment in programs in the technical institutions was 21,798 in 1984 and enrollment according to level is shown in Table 2.4.6.3. The popularity of courses which provide a higher national diploma is apparent among the technical trainees.

The Ministry of Youth Affairs and Employment is also responsible for coordination of training programs which were formerly run separately by individual ministries and departments. The main activities of the Ministry of Youth Affairs and Employment are i) preparation of youth employment and training programs, ii) operation of a graduate placement service, iii) organization of guidance, training and facility schemes for self-employment, and iv) job training.

There are some small scale facilities for training in traditional industries such as woodworking, weaving and craft run by the Department

of Small Industries of the Ministry of Rural Development in Gampaha district but no facilities for technical or specialist vocational training.

TABLE 2.4.6.3 NUMBER OF TECHNICAL TRAINEES

Level	(A) 1980~81	1981~82	1982~83	(B) 1983~84	(B)/(A)
Craft	3,851	2,947	2,254	2,657	0.7
Certificate	6,336	9,280	10,105	1,039	0.2
Diploma	754	1,178	1,176	1,039	1.4
Higher National Diploma	1,163	3,776	4,059	4,030	3.5
Diploma of CIP	-	3,200	5,234	3,790	-
Diploma of NAB	-	-	566	609	-
Total	12,104	20,381	23,403	21,798	1.8

Source: Human Resources Development in Sri Lanka, 1985

(5) Pirivena and Nursery Schools

The Pirivena have a history of almost 110 years in Sri Lanka and provide teaching based on Buddhism. There are 46 Pirivenas in Gampaha district at which not only monks, but also children of Buddhist families study oriental languages such as Pali and Sanskrit in addition to the normal school curriculum. The facilities and equipment however, are superannuated and improvement of three pirivenas in particular is urgently required.

In the rural areas of Gampaha district many mothers work full-time and the older children are often kept home from school to look after the preschool children. Nursery schools would not only alleviate this problem but would also contribute to improvement in general health by providing family health workers who could instruct the mothers in basic nutrition, weigh the babies, etc. It is therefore necessary to establish at least one nursery school in every village.

(6) Administration

There are four ministries concerned with education at the national level. The Ministry of Education is responsible for the planning, implementation and maintenance of general education and teacher-

training programs. The Ministry of Higher Education and Technical Education which was established in 1978 is responsible for university and specialized technical education. The Ministry of Education Services was established in 1980 to oversee production and distribution of textbooks, equipment and furniture and construction of school buildings, as well as the school lunch program and library services.

The Ministry of Youth Affairs and Employment is responsible for vocational and technical training.

(7) Problems and Observations

Problems related to education in the Gampaha district include the following.

1) Outflow of Students to Colombo

The rate of school attendance is higher in Gampaha district than in the district of Colombo. In 1981, 88.7% of the population between the ages of 5-12 attended school versus 87.1% in Colombo District and 84.8% in Sri Lanka. This higher rate reflects the higher degree of educational competition in Gampaha.

In 1984, almost 5,137 students left Gampaha to attend schools in Colombo, including not only secondary pupils but also primary school students who commute to Colombo daily. A great deal of time and money are expended and the large number of students contributes significantly to traffic congestion at rush hours.

Of the total number of students (grades 0-12), 3.3% commute to Colombo. The number of commuters is particularly high among science majors (47.8%) and commerce and arts related majors (8.5%). Moreover, this trend is particularly noticeable in the circuits which are closer to Colombo including Kelaniya (9.0%), Gampaha (4.6%), Wattara (4.3%), and Mahara (4.3%). Similarly, the large number of students commuting from rural areas to urban schools within Gampaha district is also a significant problem. Circuits with comparatively large outflow of students are Mahara, Biyagam and Attanagalla.

The above trend is caused by i) lack of educational facilities and equipment particularly for science, commerce and arts classes for grades 11 and 12; and, ii) lack of prestigious schools which attract

not only the students but also teachers and parents. Moreover, there are no courses in agriculture offered in rural schools and there are few home economics classes for girls.

2) Dropouts from Smaller Remote Schools

Small schools are generally located in rural areas where the socioeconomic and educational levels of the inhabitants are comparatively low. The disadvantages associated with the poorer environment result in a larger number of repeaters and dropouts in remote village schools. Improvement of schools in rural areas such as Divulapiya, Mirigama, Attanagalla and Weke should therefore be considered.

3) Training Opportunities for Dropouts

Children of school age (5-19 years) in Gampaha district number 434,638 as of 1981, representing one-third of the district's total population. However, the number of school dropouts from grades 0-4 is 35,513, from grades 5-7 is 102,666 and from grades 8-9 is 167,254. Thus 70% of school age children dropout of school while only a small percentage succeed in entering senior secondary schools. Furthermore, nearly 8,000 students take the GCE Advanced Level exam but no more than 500 can be accommodated by the existing universities. Eighty percent of the original candidates qualify for admission, yet they are often unemployed due to lack of opportunities for their qualifications. There is thus a high demand for technical and vocational education for unemployed educated youth.

#### 2.4.7 Social Welfare

(1) Social Welfare Services

Social welfare schemes which have been undertaken in Gampaha district are as follows:

- 1) Social Welfare Assistance
  - a) Food Stamps Program

There are 130,000 households in Gampaha district which receive food stamps, according to the following income scale:

- ① If household monthly income is less than Rs.200, five members receive stamps.
- ② If household monthly income is between Rs.200 - 399, four members receive stamps.
- ③ If household monthly income is between Rs.400 - 599, three members receive stamps.
- ④ If household monthly income is between Rs.600 - 700, two members receive stamps.

b) Assistance for Disabled Persons

There are 23,350 households which receive this assistance.

c) Assistance for Tuberculosis Patients

There are 603 households which receive this assistance.

d) Assistance for Leprosy Patients

There are 122 households which receive this assistance.

2) Social Welfare Facilities

There are facilities for the elderly (8; 515 beds ) and the disabled (4; capacity of 327); however, all are run by non-Governmental Organizations (NGO) except Mirigama's home for the elderly (Government run). There is a training center for the disabled in Seeduwa.

3) Problems

Forty five percent of Gampaha households receive food stamps.

Superannuation of the existing social welfare facilities is marked, and improvement of these is required.

(2) Problems of Rural Women

According to the 1981 census, about 17% of all rural households in the district are headed by women, and about 14% of small farms are managed by women. Women dominate certain craft occupations including handloom weaving, sewing and pottery making. Female-headed households tend to be among the poorest in the district, because families

deserted by men often are subsequently ostracized by their extended families.

To assist disadvantaged female-headed households, the National Women's Bureau in 1981 introduced a special two-year pilot project for income generating activities, utilizing a small grant from the Norwegian Agency for International Development (NORAD). About 500 women established enterprises for banana cultivation, dairy production, goat rearing, sewing, and poultry keeping. While many of these were successful, others failed because of inadequate planning, technical support, and marketing assistance. Women's Bureau field staff, who are currently seconded MPI officers, lack the mobility, training facilities and technical back-up from other line agencies.

In order to assist the female headed households, improvement of income generation schemes such as establishment of a management model and strengthening of the extension systems is required.

## 2.5 Rural Industries

### (1) Present Conditions

Gampaha district is the most industrialized district in Sri Lanka. GCEC area where export-oriented industries were set up as a national policy has been contributing 36% of national industrial production.

A summary of the number of units in the entire district under eleven groups of industries and the number of employees in each group is tabulated below.

Table 2.5.1 INDUSTRIES AND EMPLOYEES IN GAMPAHA DISTRICT

Industry group	No. of Units	No. of Employees
1. Metal quarries	368	2,688
2. Food manufacturing	2,276	11,699
3. Tobacco manufacturing	532	1,571
4. Textile factories	1,409	36,039
5. Saw mills	581	3,443
6. Furniture	329	1,099
7. Paper and paper products	106	929
8. Chemicals, petroleum, rubber	665	8,77
9. Pottery, chinaware	2,189	11,063
10. Structural clay products	625	6,588
11. Others	768	1,862
Total	9,848	85,858

Source: Sri Lanka Industries Statistics, 1982

The table shows that there are 9,848 private sector industrial units, both large and small scale, with a total work force of 85,858. These include agricultural processing industries, copra, desiccated coconut, coconut oil and fibre mills, rubber mills and rice mills (a few large, and literally hundreds of small hullers) spread out over the entire district. In addition to these traditional industries a number of modern industrial units have been established during the last two decades, most of which are located in the coastal belt stretching from Kelaniya to Negombo and on the either side of the Colombo - Kandy (A-1) road.

Though there are some discrepancies with Table 2.5.1, rural industries in the district are as tabulated below.



Table 2.5.2 RURAL INDUSTRIES AND EMPLOYEES IN GAMPAHA DISTRICT

Industry Group	No. of Units	No. of Employees
1. Rice mills	445	816
2. Coir factories	192	3,118
3. Tile factories	10	506
4. Brick Kilns	952	3,265
5. Metal quarries	116	1,134
6. Copra mills	149	1,078
7. Hand looms	523	7,182
8. Saw mills	79	1,011
9. Sand collection	129	534
10. Batiks	87	780
11. Canework	33	190
12. Floriculture	26	135
13. Others	504	4,976
Total	3,245	24,725

(2) Vocational Training Centers

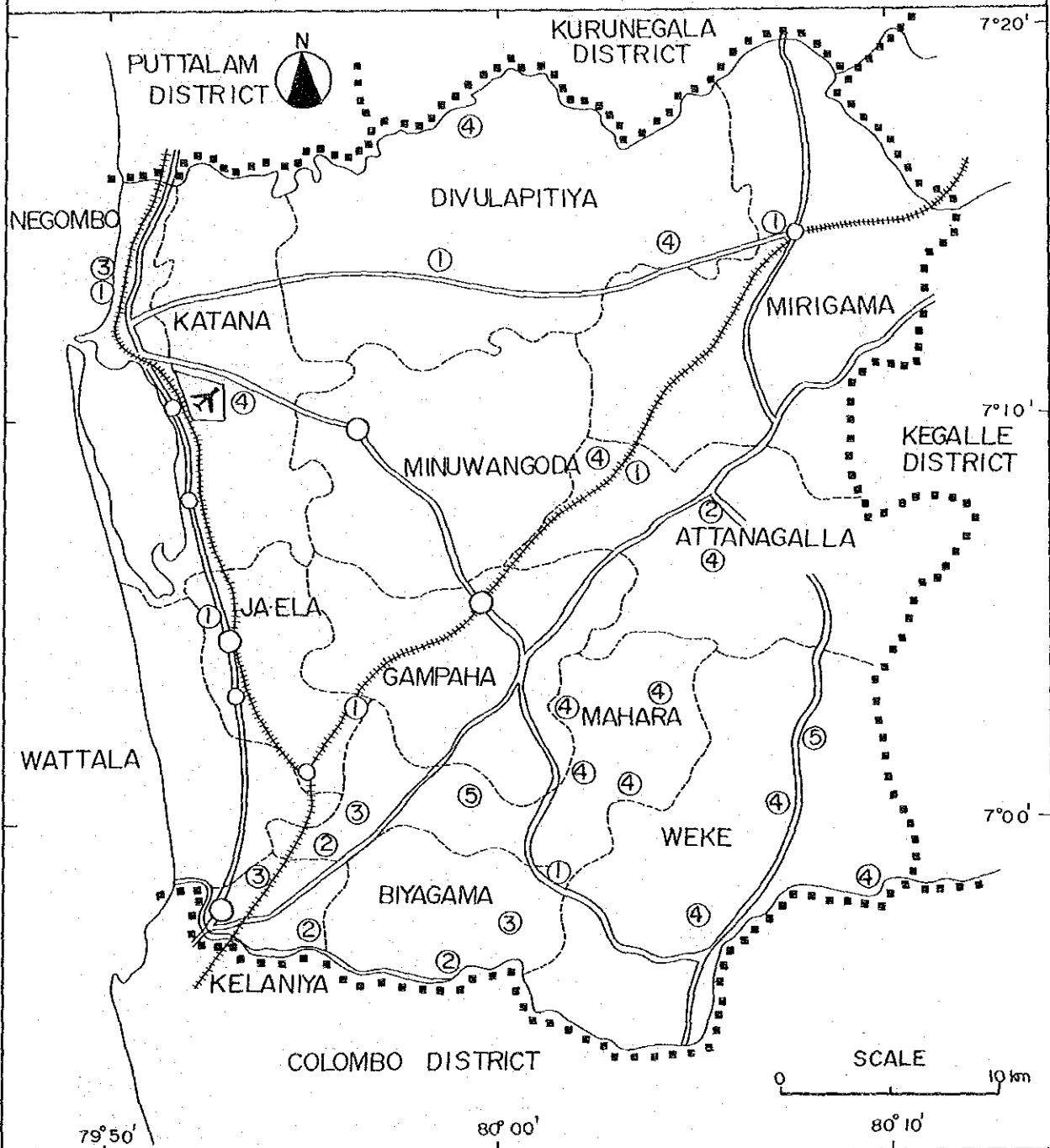
The Department of Small Industries is responsible for cottage industry development. Its main functions are to provide technical advice and to improve the production techniques of rural craftsmen. In Gampaha, DSI has 27 industrial centers and workshops such as carpentry centers (8), light engineering centers (2), ceramic centers (4), hand loom centers (3) and coir centers (10) which manufacture products and provide training facilities. At present DSI trains 500 trainees every year, but their facilities are old and require much improvement.

(3) Problems and Observations

Heavy concentration on petroleum products and garments is a salient feature of the present structure of industrial exports. Reliance on labor intensive activities such as the garment industry is a typical characteristic of early stages of industrial development; however, the

industrial sector is apt to face difficulties due to such factors as quota restrictions imposed by importing countries and the low value added nature of garment and petroleum products unless measures are taken to diversify the industrial structure. Successful industrialization also requires access to modern technological innovations and know-how so as to raise the productivity of this sector.

Fig. 2.5.1 Location of Small Scale Industries  
Training Centers



LEGEND

- District Boundary
- AGA Div. Boundary

- ① Carpentry schools (7)
- ② Ceramic centers (4)
- ③ Textile centers (4)
- ④ Coir centers (12)
- ⑤ Light engineering centers (2)



CHAPTER 3  
CONCEPTUAL APPROACH TO  
INTEGRATED RURAL DEVELOPMENT

3.1 Importance and Objectives of Integrated Rural Development

Integrated rural development emerged as a development strategy during the 1970s. Prior to this, focus had been given in Asian countries to the implementation of large-scale irrigation schemes emphasizing almost exclusively the establishment of agricultural production infrastructure and introduction of modern farming practices. This was in response to food shortages accompanying sharp population growth following World War II. Under such projects, high yield varieties, farm mechanization, agro-chemicals and various water use facilities were introduced, and the so called "Green Revolution" was pursued. Overall, these efforts contributed significantly to increased food production in Asia.

Nevertheless, this type of agricultural development in many cases benefited primarily the more economically upscale farmers in large-scale irrigation project areas with the financial resources to invest in farm inputs such as machinery, chemical fertilizers and agro-chemicals. The poorer small-scale and landless farmers often were largely excluded from the benefits of such projects. In areas not serviced by irrigation facilities, farmers continued cultivation according to traditional methods. In this manner, a sizeable portion of the rural population remained unable to participate in modern agriculture and continued to suffer in terms of living standards. This combined with growing development of industry and commerce in cities and towns resulted in a steadily widening gap in levels of economic and social well being between rural and urban areas. Integrated rural development consequently emerged in response to this need to comprehensively enhance rural life.

Consequently, integrated rural development is directed at the above mentioned small-scale and landless farmers, and at more backward areas for which modern agricultural practices have not been introduced. The basic objectives of this type of development are to increase farm production and farmer income, expand employment opportunities, and strengthen social infrastructure in rural areas. Towards this end, maximum cooperation and participation of farmers will be essential, as the success or failure of envisaged projects will rest ultimately on the active support of the farmers themselves.

### 3.2 Government Guidelines

The Government of Sri Lanka has expressed the following guidelines as appropriate in the pursuit of integrated rural development.

- a) The national goals of economic and social development to be reflected in the Master Plan are the achievement of rapid rates of economic growth and structural change, employment creation, improvement of the overall living standards of the people and better income distribution while maintaining financial and economic stability.
- b) Maximum flexibility is necessary in the choice of scheme activities to allow for taking specific rural needs into account. Flexibility should also prevail in the matter of planning procedure.
- c) Greater attention should be paid to more backward areas within the district.
- d) Intensive programs with active participation of the people aimed at specific target groups should be considered.
- e) The possibility needs to be examined of focusing IRDP programs so as to mitigate the impact on the poor of the removal of the food subsidies and the reduction in welfare programs through implementation of food and nutrition programs, and other such programs focused on the poor.
- f) No special authority should be created for implementing or executing or managing the planned activities. The existing governmental apparatus should be used.
- g) The long-term perspective envisaged for the IRDP approach is to develop a more comprehensive district plan.
- h) The scheme activities should be carefully selected taking into consideration the main economic problems and potential of the district.
- i) A short-term and medium-term outlook should be adopted, particular attention being directed at eliminating the critical

bottlenecks in the service delivery system and the production pattern.

- j) Scheme activities are to be of less capital intensive nature.
- k) Other direct income-generating activities outside pure agricultural production should receive due consideration.
- l) Scheme activities will be incremental to the other on-going and planned development measures under existing programs.

### **3.3 Problems Existing in Rural Area of Gampaha District, and Outline of Development Orientation**

Problems arising from current conditions in rural areas of Gampaha district are discussed below. Development potentialities are examined and development orientation is determined.

#### **3.3.1 Agriculture and Agricultural Production**

The economy of Sri Lanka is founded on agriculture, consisting mainly of the cultivation of rice and the three principal export crops of tea, rubber and coconuts. The agricultural sector accounts for 28% of the GDP, 60% of total export earnings and 55% of employment. About 76% of the country's population lives in rural areas.

The GCEC area, designed to promote export oriented manufacturing industries, is located along the coast in Gampaha district. Due to the district's location contiguous to Colombo, it is heavily influenced by urbanization. Nevertheless, most of the district area is rural. Although there has been a trend for some rural area to develop as residential area for persons commuting to the GCEC industrial area or Colombo, there is no question that agriculture remains the prime activity in the rural area.

In view of the scarcity of income opportunities other than agriculture in the rural area of Gampaha district, efforts to augment farmer income must be directed primarily at upgrading agricultural production. The two principal crops in the district are coconuts and rice. About 75% of farmland is utilized for coconut cultivation and 18% for paddy. Coconut and rice production is as follows:

Rice: Maha: 3.1t/ha. (national average: 3.5t/ha.)  
 Yala: 2.8t/ha. (national average: 3.3t/ha.)  
 Coconuts: 5,000/ha.(national average: 10,000/ha./year)

The above production figures for Gampaha are all below the national average.

Self-sufficiency in food production within the district is as follows:

Coconuts:	282.3%
Rice:	55.4%
Potato:	22.0%
Yam:	79.6%
Legumes, chili, etc.:	3~13%

Aside from coconuts, other items must be supplemented from outside the district. There accordingly exists room to upgrade agricultural productivity in Gampaha as well as the fact that demand exists for the agricultural products generated thereby.

Development in Gampaha has been underway for a long time, and basic infrastructure is relatively in place. Consequently there exists little potential for development of new agricultural land. Thus, efficient land use is necessary in order to improve agricultural productivity.

At present, Sri Lanka has roughly achieved self-sufficiency in rice production. It is therefore anticipated that agriculture in the country will shift from cultivation centered on rice to increasing crop diversification. Close proximity of the urbanized consumption centers of the GCEC area and Colombo can be expected to result in the growing emergence of a suburban-type agricultural structure in the district. Increasing of agricultural productivity under the subject Master Plan will require addressing the problem of optimized land use for farmland which is currently allocated 75% to coconut production and 18% to paddy. Towards this end, planning will be oriented towards the introduction of various export crops (coffee, cacao, pepper, etc.), fruits and vegetables to be cultivated as inter-crops in coconut fields, and the introduction of upland crop cultivation in paddy fields in addition to rice. In order to ensure effective production of these crops, modern agricultural technology will likewise be introduced, agricultural production infrastructure such as irrigation and drainage facilities will be upgraded, and farmer supporting organizations, farmer groups and marketing networks for agricultural products will be strengthened.



At present, farmers in Gampaha district have almost no experience in intercropping in coconut fields and the cultivation of upland crops in paddy field. Consequently, guidance, instruction and practical demonstration regarding the required agricultural technology will be essential.

Farmer landholdings in Gampaha district average 0.48ha. Holdings of farmers engaged strictly in paddy cultivation average even less at 0.35ha. Roughly 67% of farmers cultivate land of less than 0.4ha. As a result, 80% of farm households are engaged in other income producing activities in addition to agriculture in order to make ends meet.

The agricultural development project aims at maximum agricultural production for standard farmers (0.48ha) which occupy 80% of the farmland. In the case of small farmers, for whom it is difficult to live off agriculture alone, planning is oriented toward introduction, on a part-time farming basis, of additional crops to foster cash income and promote self-sufficiency.

### 3.3.2 Agricultural Infrastructure

Irrigation and drainage facilities have been constructed in Gampaha district to principally serve paddy field. Upland coconut fields, and rubber plantations receive the benefits of such facilities. As discussed in the previous section, agriculture in the district is increasingly shifting to a suburban type structure, and development planning is directed at intercropping of export crops, fruits and vegetables in coconut fields and the introduction of upland crops into paddy fields. In order to effectively accomplish this, agricultural production infrastructure requires strengthening. Specifically, rehabilitation and expansion of irrigation and drainage facilities is necessary.

In the case of coconut fields not currently served by irrigation facilities, emphasis will be placed to the extent possible on the intercropping of export crops, fruits, vegetables, etc. which consume small amount of water. In cases where upland crops of high water consumption are introduced, irrigation by shallow well would be the method of choice.

The Attanagalu oya irrigation scheme, minor irrigation schemes, flood control facilities, drainage pump stations, etc. have been implemented to service paddy field in the district. The Attanagalu oya irrigation scheme encompasses 34 anicut schemes with a total irrigation command area of 3,870ha. However, superannuation of facilities and inadequate operation and maintenance have

resulted in significant damage to structures and subsequent inoperability of almost all gates. As a result, the current irrigation practice in the area is to allow river level at the anicuts to rise to a point where inundation occurs over the adjacent farmland. Under such conditions, neither water nor farm management can be effectively carried out, and the unit yields in these fields are essentially the same as for rainfed paddy. In the case of most minor irrigation schemes, diversion is likewise by anicut, and the condition of facilities is identical with Attanagalu irrigation. Tank facilities are also utilized; however superannuation and damage make effective use impossible. During the Phase I Field Survey period, the Opatha anicut in the Attanagalu oya irrigation scheme area collapsed from what is assumed to be structural defect.

In the case of Minor Flood Protection (MFP) facilities, fields along the Kelani ganga are inundated as a result of broken valves at backwater sluices. Irrigation facilities are not present and these fields are rainfed. Pump facilities have been constructed in the Mudun Ela ~ Nathawa Ela drainage scheme area to remove rainwater and permit improved paddy cultivation. However, deterioration of pumping and drainage canal load carrying capacities have resulted in increasing inundation and reversion of cultivated fields to marshland.

Introduction of upland crops into paddy field will require rehabilitation and strengthening of the above described superannuated and damaged irrigation and drainage facilities. This will consequently be the orientation of planning to upgrade agricultural production infrastructure. At the same time, increased productivity will be striven for through the introduction of appropriate new cultivation technology in an effort to modernize agriculture in the area. Furthermore, as farmers in Gampaha district are unfamiliar with cultivation of upland crops in paddy field, it is recommended that a model area be selected within the Master Plan Study area for the establishment of irrigation and drainage facilities for demonstration purposes, and to facilitate instruction of farmers in effective water and farm management practices.

Specifically with regard to rehabilitation of facilities of the Attanagalu oya irrigation project area, such would increase the degree of inundation occurring at lower reaches of the river and consequently drainage and flood control countermeasures must be formulated for these downstream areas as well.

### 3.3.3 Employment Opportunities

Unemployment in Gampaha district is a high 26.9% which is twice the national average. According to a government survey in 1981, the unemployed numbered 127,000. However, it is considered that the unemployed rate has dropped off somewhat in recent years in response to economic growth. Persons of 15~35 years of age comprise 87% of the unemployed. These unemployed are largely the children of farm households where small land holdings and continued working ability of parents combine to preclude passing on of farmland to the entire younger generation. Roughly 79% of the unemployed have the equivalent of middle school education.

There exist some small-scale vocational training facilities for the unemployed. These are operated by the Small Industries Department and the Textiles Department and focus on traditional crafts (carpentry, textiles, handcrafts, etc.). Approximately 500 persons graduate from these centers each year, and either become self-employed or seek employment in local industries. However, these facilities are superannuated, and require urgent rehabilitation.

On the other hand, despite growing motorization and the increasing introduction of electrical appliances and various types of machinery into Sri Lanka, there is a shortage of personnel capable of repairing, maintaining and operating such equipment. Vocational training facilities to respond to this need are not present in Gampaha district. However, the present educational level of the unemployed in regard to engineering and the sciences is considered as placing a restraint on the development of human resources with the above described technical capabilities. Consequently, the science curriculum in schools requires upgrading.

Development of vocational training for the unemployed will be focused on producing technically qualified personnel to respond to repair, maintenance and operational requirements accompanying the increasing introduction of electrical, mechanical and electronic equipment, and on rehabilitation of existing training centers in traditional crafts. Strengthening of school facilities will likewise be given emphasis to upgrade the science and engineering related curriculum.

There are presently roughly 10,000 enterprises in the manufacturing sector in Gampaha district employing some 90,000 persons. Total employment in the manufacturing, commercial and service sectors is around 350,000.

Although intensification and diversification of agriculture will expand employment opportunities, there are limits particularly in view of the numbers of unemployed in the district. In regard to rural industries, large-scale generation of new employment opportunities is not anticipated given the current state of the economy, although specifics must be ascertained through subsequent survey on materials, technology, distribution, marketability, etc. on a per industry basis. Consequently, under the subject Master Plan, expansion of employment opportunities in the agricultural and rural industries sectors will not be viewed as the sole remedy for the unemployment problem, and instead a certain amount of expectation will be given the increase of employment opportunities in the GCEC area and Colombo.

#### 3.3.4 Social Infrastructure

As development has been progressing in Gampaha district over a long period of time, roads and other social infrastructure are relatively in place. However, these facilities are affected by superannuation aggravated by inadequate operation and maintenance. Furthermore, although the extension rate for social infrastructure district-wide is above the national average, that for certain aspects in the rural area alone is below the national average.

Social infrastructure strengthening will be oriented toward rehabilitation and elimination of geographical imbalance in the case of aspects of infrastructure whose extension ratio is at least the national average (unless some need for further upgrading of facilities is required in specific cases), and at upgrading of other categories of infrastructure to meet the nation-wide extension levels.

One of the targets for socio-economic development under the 5 year public investment plan of the government is the general improvement of living standards of the population. Gampaha district is in a position to assume a leading role in this effort, particularly given the high degree of familiarity of the district populace with the benefits to be derived from social infrastructures due to its close proximity to Colombo.

### **3.4 Basic Objectives of Integrated Rural Development in Gampaha District**

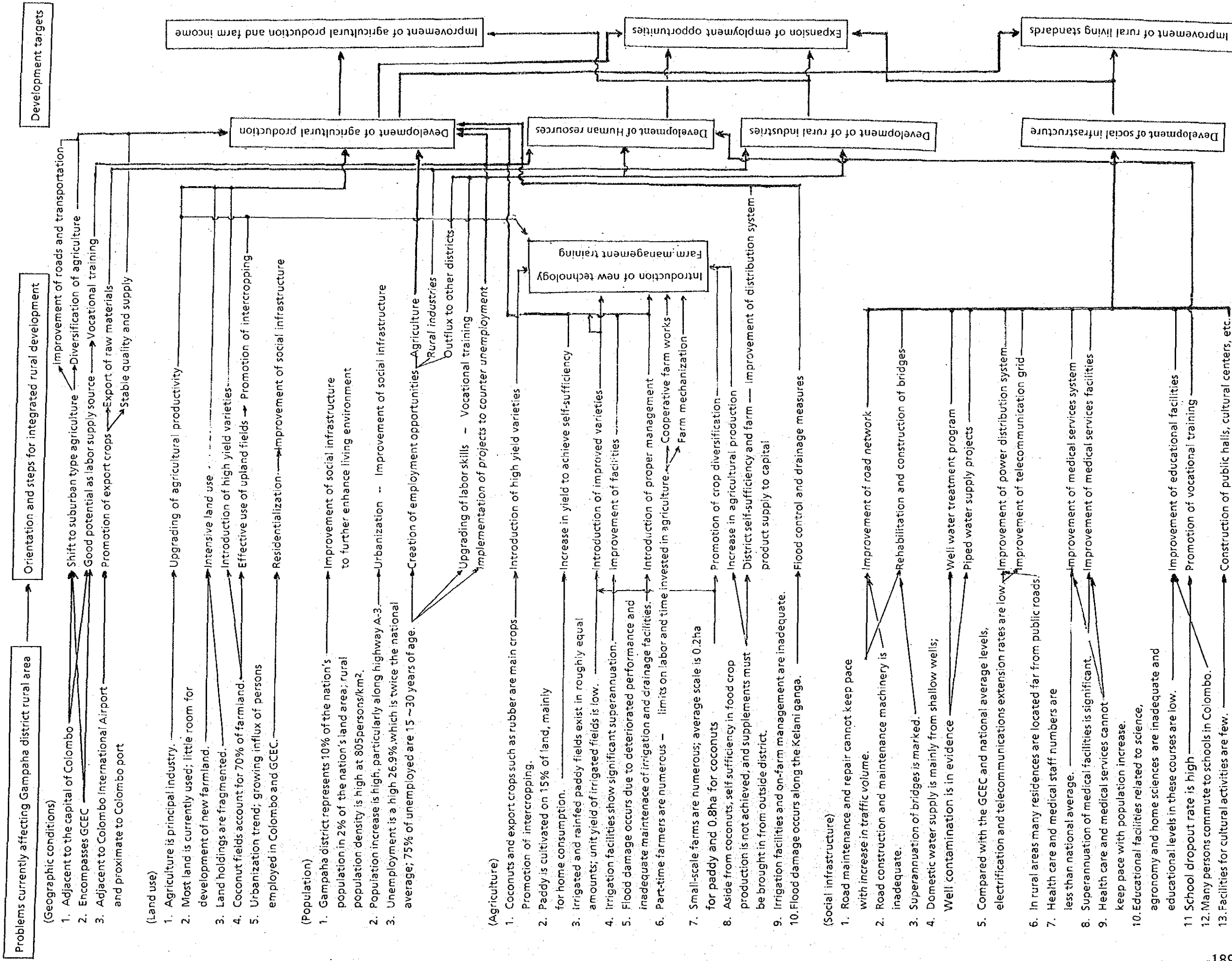
#### **3.4.1 Future Rural Concept**

The underlying thrust of integrated rural development is the alleviation of rural poverty. This poverty is manifested in low income, low agricultural productivity, and backwardness of social infrastructure development. In order to achieve the basic goal of integrated rural development, it is necessary to formulate a range of inter-related schemes which take into account unique conditions prevailing in rural areas. These schemes aim at enhancement of farmer income through increased agricultural productivity and expanded employment opportunities both inside and outside the agricultural sector, and at improvement of the daily living environment. Furthermore, integrated rural development seeks to maximize farmer cooperation and participation at all stages of project formulation and implementation. The ultimate goal is establishment of a rural structure within which farmers engage in economically rewarding agricultural pursuits, enjoy the comforts of an adequate physical environment, and mutually interact with a reinforced sense of community.

#### **3.4.2 Objectives of Integrated Rural Development in Gampaha District**

The objectives of integrated rural development for Gampaha were formulated so as to reflect the specific features and needs of the district's rural area as identified through comprehensive analysis of topography, geology, land use patterns, population, agriculture and social infrastructure. The process by which objectives were arrived at is depicted in Fig. 3-1.

Fig. 3.1 Formulation of Development Targets





Principal problems affecting integrated rural development in Gampaha district are outlined as follows:

- a) Land utilization rate is high, and there is consequently little new land available for development.
- b) Land holdings are small and fragmented. The majority of farmers are part-time, being unable to subsist off of agriculture alone. These part-time farmers depend heavily on income from non-agricultural pursuits.
- c) Agricultural productivity is low, falling below the national average.
- d) Superannuation of agricultural production and social infrastructures is significant, and in many cases outright reconstruction rather than mere rehabilitation is necessary.
- e) Unemployment, particularly among the youth, is widespread, despite the presence of the GCEC area and the contiguity of the district to Colombo.

On the basis of the above difficulties confronting the district, the following 4 basic objectives have been formulated for integrated rural development in Gampaha, with a view to improve rural income, expand employment opportunities and create an enhanced rural living environment for the future..

- a) To promote higher agricultural productivity through upgrading of agricultural technology, introduction of intensive cultivation practices and rehabilitation and strengthening of agricultural production infrastructure.
- b) To strengthen and expand technical training facilities towards greater human resources development.
- c) To promote suitable rural industries.
- d) To rehabilitate and expand social infrastructure towards enhancement of the rural living environment.

(1) Promotion of Agricultural Productivity/Rehabilitation and Strengthening of Agricultural Production Infrastructure

Despite the fact that urbanization of rural area continues to progress in Gampaha district due to strong socio-economic impact from nearby Colombo and the GCEC area, agriculture will continue to be the mainstay of rural life in these areas for the foreseeable future. Gampaha district is well located in terms of socio-economic and natural conditions. However, a high 70% of rural area is already farmland, leaving only very limited potential for further development of new agricultural land.



Consequently, efforts to increase agricultural production must be directed at introduction of higher yielding cultivation practices and crops, as well as more intensive farm management methods. To achieve this existing superannuated irrigation facilities must be rehabilitated, and new facilities constructed where necessary.

Increased agricultural production will be directed at self-sufficiency within the district and at demand for farm products within the GCEC area and Colombo. Specifically, increased agricultural production would stem primarily from introduction of intercropping of various export crops, upland crops, fruits, legumes, etc. in the 75% of farmland currently under coconut cultivation, and the introduction of upland crop farming in paddy fields. Introduction of intensive agriculture would be expected to increase farm employment opportunities.

Demonstration and farmer training in upland crop technology for paddy field will be essential, as farmers in the district have no experience in this regard.

Also, improvement of existing irrigation and drainage facilities for paddy field will be required.

## (2) Human Resources Development

Unemployment in Gampaha district is high at 26.9%. The large majority of unemployed are 15~35 years of age. As there are limitations to new employment opportunities which can be created in the agricultural sector, work possibilities must be stimulated in other sectors as well.

Education levels of the population of Gampaha are generally high. The district encompasses the GCEC and is adjacent to Colombo, areas of high economic activity. These conditions are suitable to training of a technical labor force for employment in sectors other than agriculture.

## (3) Promotion of Rural Industries

In addition to agriculture, promotion of suitable rural industries is essential to stimulation of the rural economy. The potential for such industries must be thoroughly explored, with survey conducted on factors of type of work generated, raw materials, technology, distribution, markets, capital, etc.

## (4) Rehabilitation and Strengthening of Social Infrastructure

The rural area of Gampaha district is subject to increasing socio-economic impact from Colombo and the GCEC area. The number of rural area residents commuting to jobs in these areas is anticipated to steadily grow. Urbanization of the rural area will also continue. With these trends will coincide a strong demand for enhanced living environment. In order to achieve this there will be a need to rehabilitate, strengthen and expand social infrastructures towards rectifying imbalances existing between urban and rural areas. These include facilities for health care, sanitation, water and electrical supply, education, transportation, telecommunications, etc..

### 3.5 Basic Strategy for the Integrated Rural Development Project for Gampaha District

In order to succeed, it is crucial that integrated rural development projects garner the active support and participation of the rural population through prompt realization of tangible benefits. Although measures are essential to improve conditions for landless farmers and unemployed, initial efforts must out of necessity be focused on expansion of income through specific development of the agricultural land comprising the holdings of the vast majority of the rural population.

In order to achieve the objectives of integrated rural development in terms of increased agricultural production, introduction, demonstration and extension of new agricultural technology will be necessary. Administrative, research and extension agencies established to perform such tasks currently exist in Gampaha district. Nevertheless, these entities in many cases lack the necessary facilities and institutional strength to fulfill their designated functions. In light of this situation, basic strategy for integrated rural development in Gampaha district will encompass the following:

- a) Rehabilitation of existing agencies engaged in the promotion of agricultural production to a level where they can effectively perform their intended duties.
- b) Rehabilitation and/or construction of facilities necessary for the introduction of intercropping in coconut fields, and upland cropping in paddy field. Agriculture in Gampaha district is currently centered on coconut and paddy production. Efforts at

increasing agricultural production must be aimed at maximizing effective use of this farmland.

- c) Rehabilitation and strengthening of agencies and facilities relevant to promotion of human resources and social infrastructure development.
- d) Implementation of new development projects following restoration of agencies and facilities to intended capacities.
- e) Restoration and strengthening of agencies and facilities taking into account future as well as present capability requirements.

### 3.6 Points for Careful Consideration in Project Formulation

The underlying goal of integrated rural development is the alleviation of rural poverty. In order to best achieve this, a series of linked schemes aimed at increased agricultural production, expanded employment opportunities and strengthened social infrastructure are formulated for phased implementation. Implementation scheduling is designed to maximize the beneficial interaction between individual schemes.

Bearing in mind the basic objectives and strategies of integrated rural development, a development concept is formulated for each sector, priority schemes within each sector are identified, and the selected schemes are integrated into an overall master plan for rural development.

Points for careful consideration in scheme formulation are as follows:

- a) Under integrated rural development, the primary objective is increase in agricultural production and subsequent growth in farmer income. Consequently efforts should be directed initially at a basic achievement of this objective, to be followed in successive stages with steps to further modernize agriculture and social infrastructure.
- b) Unemployment cannot be addressed solely through increased production and employment opportunities in the agricultural sector. Expanded work possibilities must be created in other sectors as well.
- c) Schemes should be formulated which benefit the broadest range of farmers possible, and which involve technology which can be extended readily to farmers.

- d) Introduction, development and extension of new agricultural technology suitable to farmers of the area will be necessary to upgrade agricultural productivity.
- e) Schemes are to be formulated so as they can be effectively managed given the nature of existing agencies and organizations to be newly established.
- f) Schemes should be formulated to maximize not only benefits of the individual scheme itself, but beneficial interaction among schemes as well.
- g) Maximum participation of farmers in scheme planning is desirable as their acceptance of the schemes is essential to success.
- h) Institutional strengthening of local entities and training of personnel responsible for development schemes is necessary.
- i) Schemes are to be congruent with other development programs at the district and national levels.
- j) As integrated rural development is to be implemented over the long-term, scheme planning must be flexible enough to allow for future modification where required.

### **3.7 Participation of Farmers and Other Rural Residents**

The farmers and other rural residents themselves will be the major factor in the success or failure of the schemes to be implemented under the Master Plan. Their acceptance, cooperation and active support of the envisaged schemes are essential. Accordingly, the participation of farmers and other rural residents will be maximized at all stages of project formulation and execution.

Nevertheless, as integrated rural development will involve the introduction of new agricultural technology with which the area farmers are not familiar, implementing agencies will of necessity have to assume a leadership role. Demonstration of scheme benefits and farmer training must be pursued at the outset to prepare farmers for more active participation in subsequent projects.

Increase of agricultural production will ultimately depend on the performance of the individual farmer. Introduction of new technology will require not only training, but acquirement of know-how through actual cultivation. Such practical experience will likewise serve to stimulate farmer incentive to pursue the recommended cultivation practices.

