

**BASIC DESIGN STUDY REPORT
ON
THE INTEGRATED RURAL DEVELOPMENT PROJECT
FOR
GAMPAHA DISTRICT
IN
THE DEMOCRATIC SOCIALIST REPUBLIC OF SRI LANKA**

MAY 1989

JAPAN INTERNATIONAL COOPERATION AGENCY

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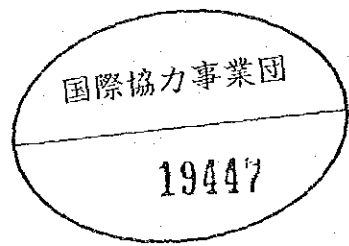
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国際協力事業団

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PREFACE

In response to a request from the Government of the Democratic Socialist Republic of Sri Lanka, the Government of Japan has decided to conduct a Basic Design Study on the Integrated Rural Development Project for Gampaha District and entrusted the study to the Japan International Cooperation Agency (JICA).

JICA sent to Sri Lanka a survey team headed by Mr. Hajime Takeuchi, Director, Planning Department, All Japan Engineers' Association for Irrigation, Drainage and Reclamation from January 9 to February 20, 1989.

The Team exchanged views with the officials concerned of the Government of Sri Lanka and conducted a field survey in Gampaha District. After the team returned to Japan, further studies were made. Then, a mission was sent to the Sri Lanka in order to discuss a draft report and the present report has been prepared.

I hope that this report will contribute to the development of the Project and to the promotion of friendly relations between our two countries.

I wish to express my sincere appreciation to the officials concerned of the Government of the Democratic Socialist Republic of Sri Lanka for their close cooperation extended to the team.

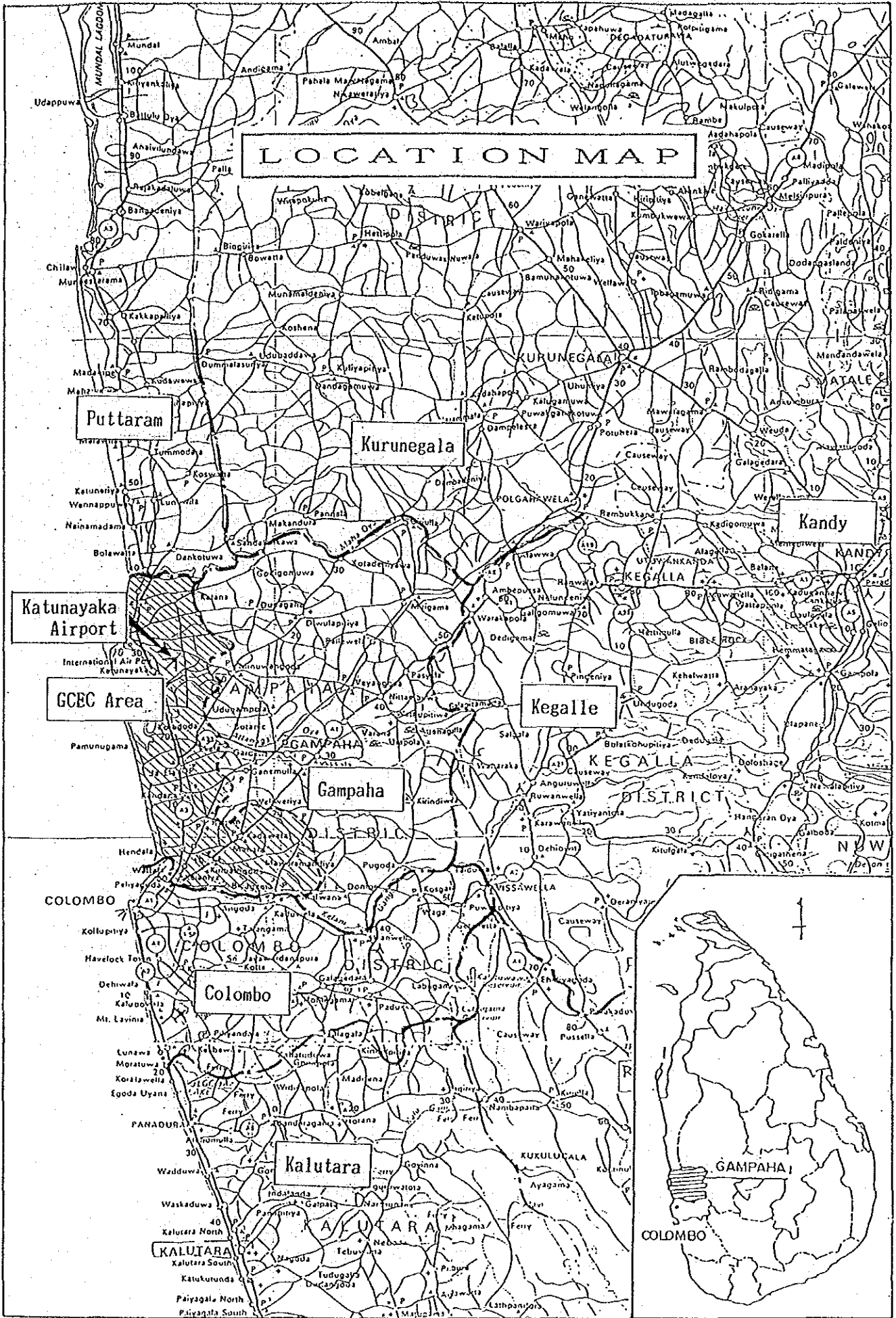
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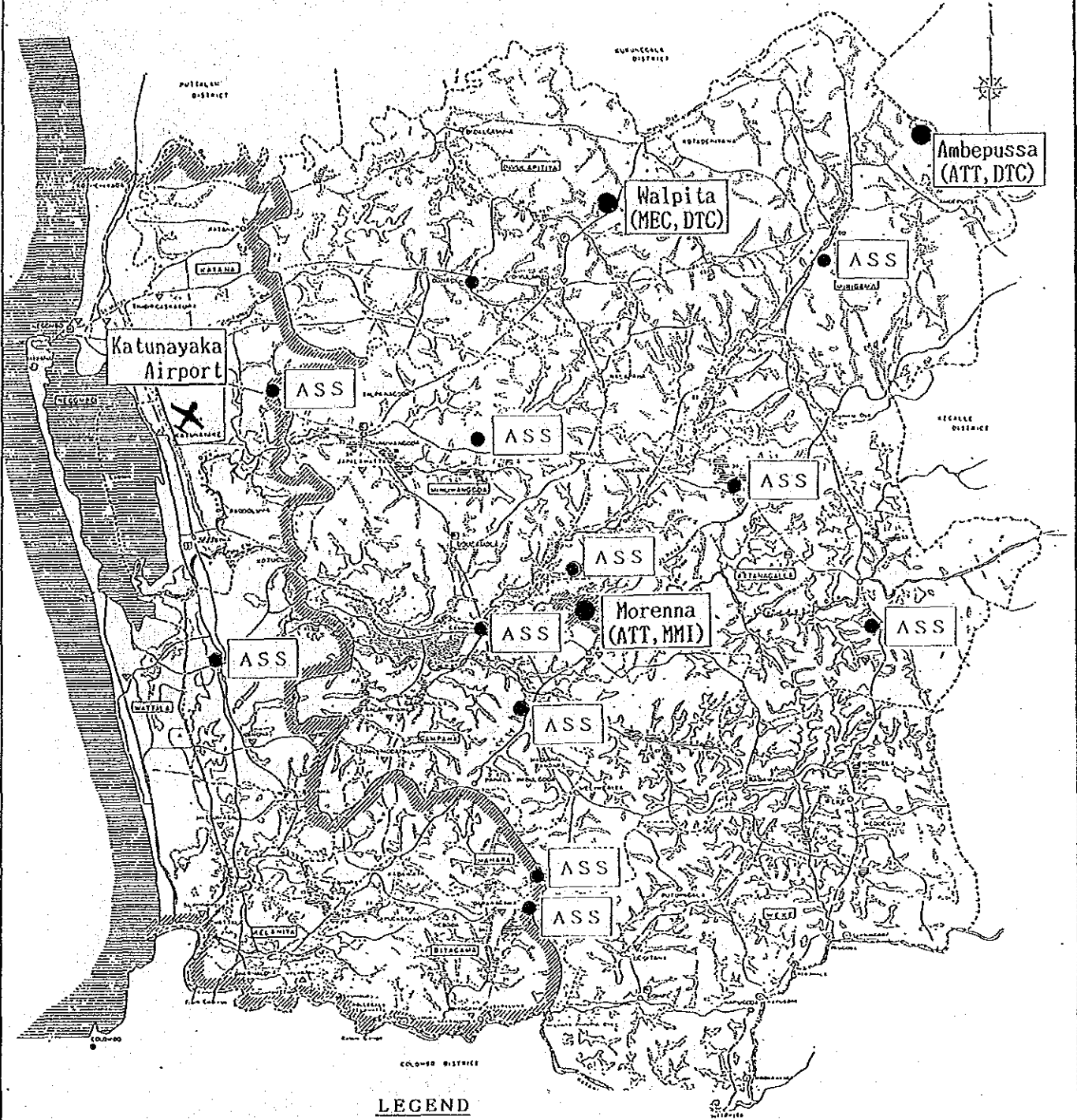
Kensuke Yanagiya

President

Japan International Cooperation Agency



PROJECT SITE



LEGEND

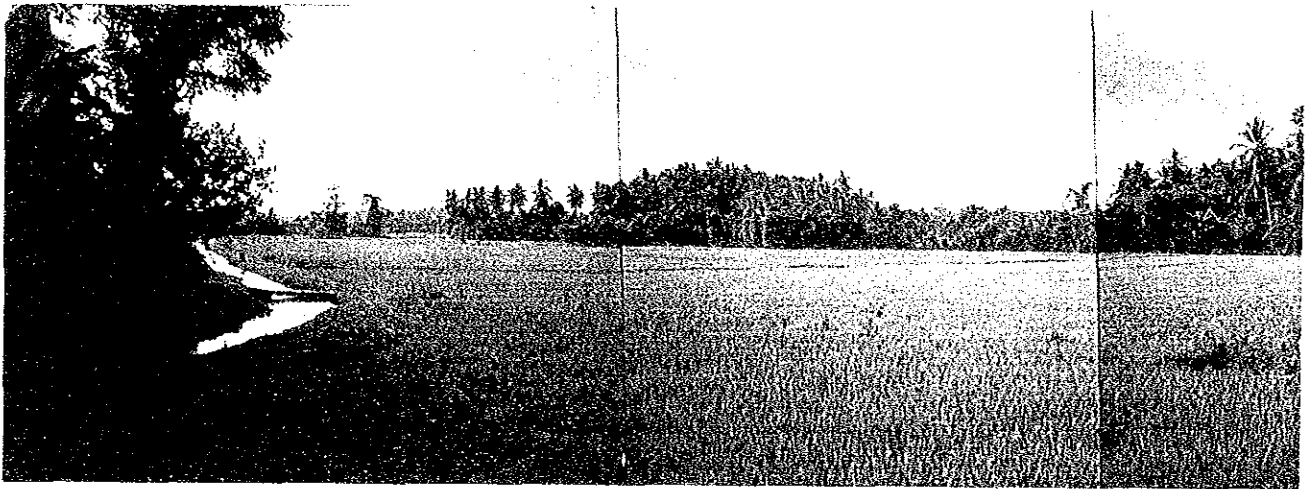
●	Project Site
(ATT)	Agricultural Technology Transfer Scheme
(MEC)	Minor Export Crops Promotion Scheme
(MMI)	Morena Model Irrigation Scheme
(ASS)	Scheme for Improvement of Agricultural Sporting System
(DTC)	Scheme for Improvement of Agricultural Training System

ATT SCHEME

Site of ATT Main Building



Morena Site of Paddy Intensive Cropping Model Farm



Ambepussa Site of Upland Crops Model Farm

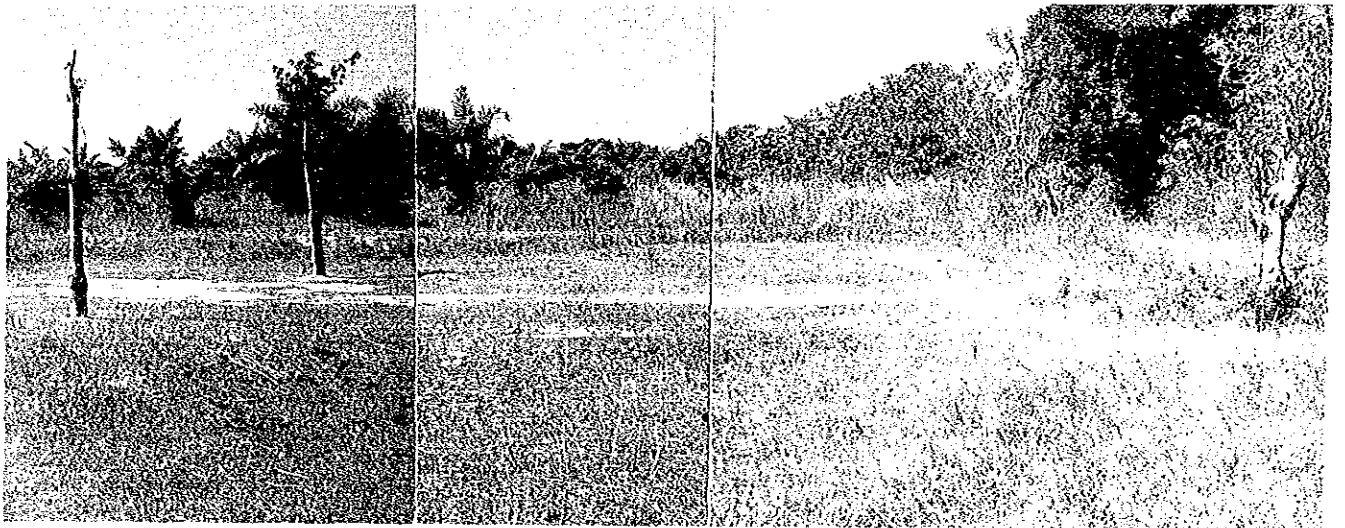


Morena Site of Improved Drainage Model Farm



MEC SCHEME

Site of Walpita Seedling Center

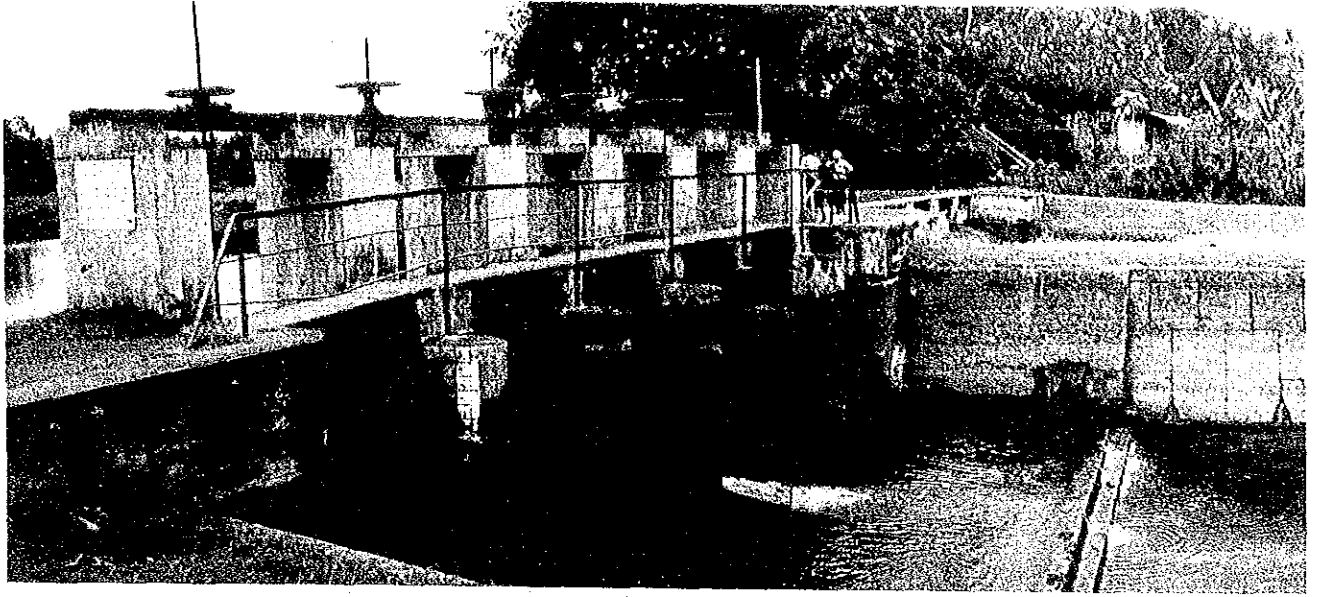


Site of Walpita Seed Farm

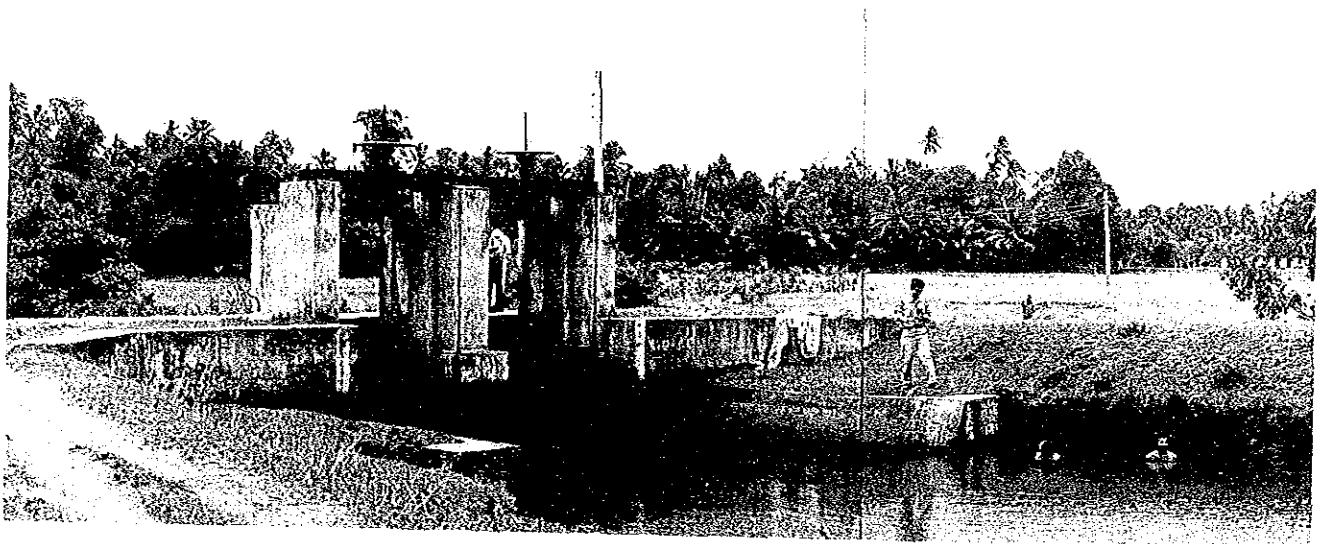


MMI SCHEME

Morena Anicut



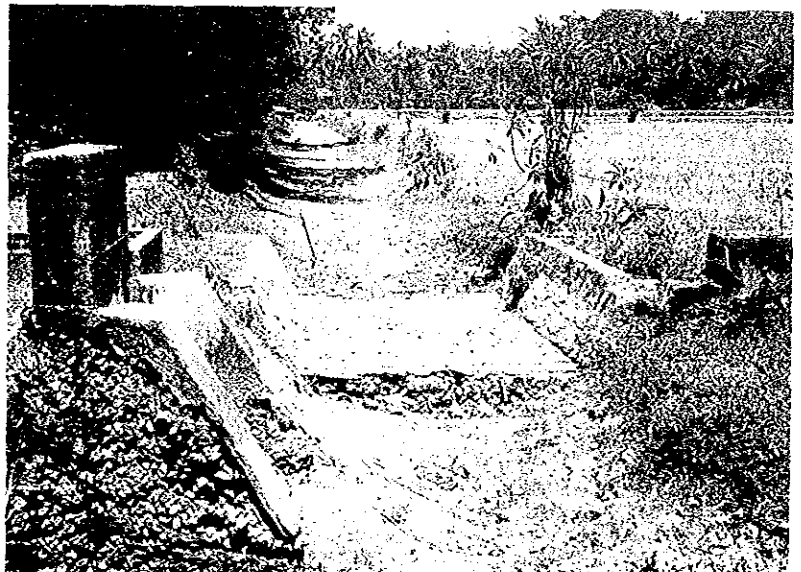
Palu Oya Anicut



Out-let

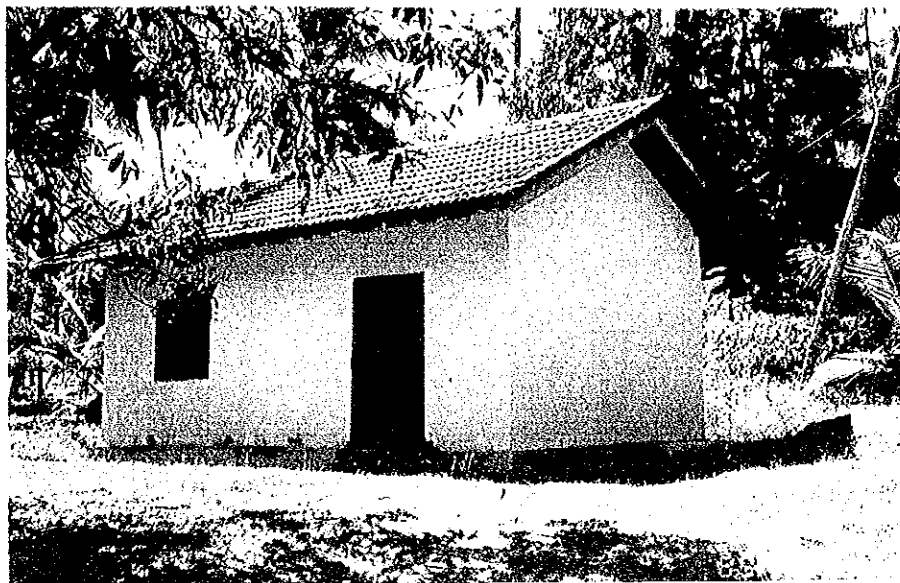


Main Channel



ASS SCHEME

Existing Store House (Pasyala AS.Center)



DTC SCHEME

Ambepussa DTC



Walpita DTC



Executive Summary

The Sri Lankan Government has been carrying out integrated rural development projects (IRDP's) since 1979. As of the present, such projects have been carried out in 15 districts. The need for an IRDP for Gampaha District has been recognized, and towards this end, the Sri Lankan Government made a request to the Japanese Government for technical cooperation. In response to this request, a Master Plan Study was carried out by the Japan International Cooperation Agency in 1986-87. The Master Plan for Gampaha IRDP was submitted to the Sri Lankan Government in September 1987.

The Model for the Improvement of Agricultural Production is one of the priority projects under the Master Plan. It was selected after study by the Sri Lankan Government as warranting the most prompt implementation, and a request was made to the Japanese Government for Grant Aid towards realization of this specific Project. A Preliminary Study Mission was dispatched by JICA to Sri Lanka in June 1988 to identify the general scope of the Project.

On the basis of the findings of the Preliminary Study, a Basic Design Study Team was dispatched by JICA from January to February 1989 for discussions with Sri Lankan officials and a field survey.

The Team carried out further work on the Study upon its return to Japan, and this Draft Final Report prepared as of mid-April 1989 embodies the findings of the Team's study. A Mission for Explanation of the Draft Report was dispatched from April 20 to 29 to brief the Sri Lankan side on the basic design components. Comments received are to be subsequently reflected in the Final Report.

Gampaha District is north of and adjacent to the capital of Colombo. Area is 1,399km². Population was 1.39 million (as of 1981). Elevation at the eastern border with Kegalle District is around 150m, and gradually drops westward, with most of the district under 30m. The northern boundary of the District is the Maha Oya, and the southern boundary is the Kelani Ganga. The Attanagalu Oya flows through the center of the District. Gampaha District belongs to the wet zone. Annual rainfall is 2,000 ~ 2,600 mm, falling predominantly in the two rainy seasons in April ~ June and September ~ November. Temperatures range 23 ~ 31°C, and are lowest in December ~ January and highest in March ~ April.

Development of farmland for cultivation in the District has essentially reached the saturation point, and there is little room for establishing new agricultural land. Land holdings are highly fragmented. Holdings of 3 acres (1.2 ha) or less comprise 90%. Those of 1 acre (0.4 ha) or less comprise 67%. Full-time farmers are few. Most households engaged in agriculture augment their income from other sources.

Since earlier times as well, development has progressed along the Attanagalu Oya. The Attanagalu Oya irrigation project encompasses 34 anicuts and 115 km of

main canals. However, the facilities are old and require rehabilitation, as they were constructed half a century ago.

The GCEC Free Trade Zone for the promotion of export-oriented industries is located on the west coast of the District, and is the largest industrial area in the nation. The Colombo-Gampaha industrial belt accounts for 64% of the nation's industrial output, and 32% of its employment. However, unemployment in Gampaha District is 26.9% (1981), which is twice the national average.

Implementation of an IRDP is desirable to address the problems sited above of regionally skewed income levels and superannuated social infrastructure in the District.

The IRDP addresses not only purely agricultural matters, but spans as well social infrastructure and other aspects crucial to stable rural life. The IRDP type project focuses on rehabilitation of existing agricultural facilities, farm management improvement, and strengthening of social infrastructure. It has the merits of low investment, prompt results, and good labor intensity.

The Gampaha IRDP consists of:

- ① Model Project for Improvement of Agricultural Production
- ② Development of Human Resources
- ③ Development of Social Infrastructure

The current request has been made for cooperation in implementing the Model Project for Improvement of Agricultural Production. The Project can be readily carried out as it focuses on rehabilitation of existing structures, and restoration of institutions and services to their originally intended levels. Benefits of the Project will extend to farmers throughout the District.

Increasing agricultural production and employment opportunities will require effective use of existing farmland. This will be achieved under the Project through intercropping of minor export crops, other upland crops and fruits in coconut fields, and the introduction of high yield rice varieties as well as upland crops into paddy fields. This is to be achieved through the following 6 schemes under the Project.

- ① Agricultural Technology Transfer Scheme (ATT Scheme)

Under the ATT Scheme, an intensive cropping model farm for paddy, and upland model farm and a drainage improvement model farm will be used to demonstrate effective land use as a means of improving farm production and creating employment opportunities.

- Intensive cropping model farm in paddy field (Moreenna, 2.1ha, new construction)
- Upland cropping model farm (Ambepussa, 5.8ha)
- Improved drainage model farm (Moreenna, 3.5ha)

- ATT Center and appurtenant structures (main building, farm office, workshop)
- Farm machinery, vehicles, office equipment, soil testing kit

② Minor Export Crops Promotion Scheme (MEC Scheme)

Under the MEC Scheme, effective coconut field use will be striven for by production of good quality seedlings of coffee and pepper for intercropping. Seedlings will be distributed to farmers throughout the District. The scheme will contribute to increased farm income and foreign exchange earnings.

- Seedling production center (seedling beds: 34 houses, 7,605.8m²)
- Farm office and appurtenant structures
- Seed farm and mixed cropping model farm (2.43ha)
- Procurement of farm machinery, office equipment, and vehicles for production activities

③ Morena Model Irrigation Scheme (MMI Scheme)

Under the MMI Scheme, cropping technology developed at the ATT Center will be demonstrated at the individual farmer's level. Superannuated irrigation facilities will be rehabilitated to allow for appropriate water management.

- Benefit area: 390ha
- Rehabilitation of anicuts (Morena and Palu Oya)
- Rehabilitation of main canals (11.4km)
- Procurement of vehicles for water management and O/M

④ Scheme for Improvement of Agricultural Supporting System (ASS Scheme)

Under the ASS Scheme, vehicles for distributing production materials and equipment to farmers will be procured and storehouses constructed to restore the intended effectiveness of the extension activities of the Agrarian Services Department and the Agricultural Department. Vehicles will also be provided to the Agricultural Development Authority to strengthen its extension and coordination activities.

- Storehouses (14 units, fertilizer and seed storage)
- Hauling vehicles and staff vehicles for extension activities

⑤ Scheme for Improvement of Agricultural Training System (DTC Scheme)

Under the DTC Scheme, the facilities at the Walpita and Ambepussa DTC's will be strengthened for effective training of young future farmers and housewives in farm households in home gardening of vegetables, etc. Technical levels of farmers throughout the district will be raised through introduction and

training in new cropping technologies developed under the various model farms and at the ATT Center of the Project.

- Appurtenant facilities
- Training farm irrigation and water supply facilities
- Procurement of farm machinery, horticultural equipment, laboratory equipment, teaching equipment, seed preservation equipment, and vehicles

⑥ Establishment of a Project Office

A Project Office will be established to carry on the subsequent work of operating and monitoring the above schemes.

The Executing Agency for the Project is the Regional Development Division of the Ministry of Policy Planning and Implementation. MPPI will establish steering committees at the national and district levels to coordinate the activities of these various related agencies in carrying out the Project. Land acquisition for the Project will not be necessary as all sites for construction are Government owned.

As with the 15 IRDP's implemented to date, the Gampaha IRDP will be carried out on a project office basis. The Project Office is to be established under the RDD of MPPI. MPPI is well experienced in this type of implementation.

Operation and maintenance of facilities constructed under the Project are to be as follows:

- ① ATT Scheme: Agricultural Department, Ministry of Agricultural Development and Research
- ② MEC Scheme: MEC Department, Ministry of Agricultural Development and Research
- ③ MMI Scheme: Irrigation Department, Ministry of Land and Land Development
- ④ ASS Scheme: Agrarian Services Department, Ministry of Agricultural Development and Research
Extension Section, Agricultural Department, Ministry of Agricultural Development and Research
Agricultural Development Authority
- ⑤ DTC Scheme: Training and Education Section, Agricultural Department, Ministry of Agricultural Development and Research
- ⑥ Project Office: Regional Development Division

If the Project is carried out under Japanese Grant Aid, construction will be done in 2 stages due to the construction work to be performed in rivers. During the first stage, the MEC Scheme, rehabilitation of the Palu Oya anicut and the left bank main canal under the MMI Scheme and strengthening of DTC facilities will be carried

out. Under the second stage, the remainder of the ATT and MMI schemes will be completed and the ASS Scheme carried out. Rehabilitation of the larger Morenna anicut will require full utilization of the long dry season during the second stage, beginning with coffering work from September. Measures will thus be necessary such that as soon as cooperation commences, construction may be started immediately.

The first stage construction is to be 12.0 months and the second stage 14.0 months.

Under the Project, capital cost to be borne by the Sri Lankan Government is estimated at around Rs 22.3 million (¥ 88 million). Operation and maintenance costs which the Sri Lankan Government will bear for the facilities and equipment under the Project are calculated at Rs 5.94 million (¥ 23 million) per annum.

The following Project effects are anticipated from the Project.

① Increase in Agricultural Production and Farm Income

Three model farms will be operated under the ATT Scheme. Under the guidance of assigned agricultural experts, intensive cropping techniques will be developed that will improve productivity in paddy field by 1.5-2 fold. Crops such as okra and beans would be introduced for dry season cropping in paddy field, further increasing productivity. Model cropping pattern would be introduced into the Morenna model irrigation area for demonstration at the individual farmer's level. Through the above, income per household would be estimated to increase from an average Rs 2,800/year to Rs 35,000/year. This benefit would accrue directly to 5,643 persons on 395.6ha. However, demonstration effects will reach farmers throughout the District. Intercropping of coffee and pepper in coconut fields will increase farm income an estimated Rs 13,800 ~ Rs 28,000/ha.

② Increase in Employment Opportunities

Work opportunities and incomes will increase through intensive cropping of paddy and upland fields, and intercropping of MEC's and upland crops in coconut fields. The upland crops model farm will increase income by creating 40 employment opportunities.

③ Ripple Effect

By virtue of its integrated nature, the Project will bring indirect benefits as well as the direct ones cited above. Farmer support services of the Agriculture Department, Agrarian Services Department, Agricultural Development Authority, etc., will be strengthened for the extension of new cropping techniques developed under the Project to farmers outside direct benefit areas.

Strengthening of DTC's will increase the capability for the training of young future farmers in modern cropping to enhance Gampaha agriculture in the years to come. Graduates of the institutions will form a knowledgeable base of farmers prepared to receive the technology to be promoted under the Project. This will increase the demonstration effect of the model farms and the Morena model irrigation area.

④ Other Effects

It is anticipated that improved farmers' income will stimulate rural and district economies, and thereby encourage farmers' self help initiatives, which will further promote rural development.

On the basis of survey and analysis, Project effects are considered to be great as discussed above. The ATT, MMI and MEC schemes will not only accord direct benefits to the farmers involved, but have demonstrative impact on farmers throughout the District. The Project is accordingly deemed appropriate for inclusion under Japan's Grant Aid Program.

However, ensuring that these effects are realized will require the vigorous efforts of the concerned agencies in the Sri Lankan Government. In particular, farmer support activities will be crucial during the initial stage of the Project, including the subsidy program by the MEC Department.

Japan is in a good position to provide effective technical cooperation due to extensive domestic experience with cropping technologies applicable to the Project area, including wide experience in semi-rural agriculture.

It is anticipated that the Sri Lankan Government will vigorously move to allocate site areas, take the necessary measures for budgetary layouts and expedite the import of equipment towards the smooth implementation of the Project.

The Japanese Government looks forward to implementation of the Project as a chance to further deepen the ties of friendship between Japan and Sri Lanka.

TABLE OF CONTENTS

Preface		
Location Map		
Executive Summary		
Chapter 1 Introduction		1
Chapter 2 Project Background		3
2-1 Integrated Rural Development		3
2-2 Related Projects		5
2-3 Outline of the Request		9
Chapter 3 Project Area		13
3-1 Location		13
3-2 Natural Conditions		13
3-3 Land Use		19
3-4 Society and Economy		20
3-5 Social Infrastructure		29
3-6 Agricultural Development		30
Chapter 4 Project Components		35
4-1 Objective		35
4-2 Study and Examination on the Request		37
(1) Project Suitability and Urgency		37
(2) Implementation and Operating Plan		39

(3)	Relationship to Other Projects	39
(4)	Project Components	40
(5)	Study of Request Components	42
(6)	Need for Technical Cooperation	48
(7)	Basic Orientation for Cooperation	48
4-3	Project Description	49
(1)	Executing Agency and Operational Structure	49
(2)	Project	52
(3)	Location and Status of Project Area	57
(4)	Facilities and Equipment	59
4-4	Operation and Maintenance Plan	67
4-4-1	Project Office	69
4-4-2	Agricultural Technology Transfer Scheme	72
4-4-3	Minor Export Crops Promotion Scheme	84
4-4-4	Morena Model Irrigation Scheme	96
4-4-5	Farm Management	105
4-4-6	Scheme for Improvement of Agricultural Supporting System	109
4-4-7	Scheme for Improvement of Agricultural Training System	111
4-4-8	Operation and Maintenance Cost	115
4-5	Technical Cooperation	119
Chapter 5	Basic Design	121
5-1	Basic Design Orientation	121
(1)	Design Orientation	121

(2)	Design Criteria	123
5-2	Facilities Plan	130
5-2-1	Facilities under the ATT Scheme	130
5-2-2	Facilities under Minor Export Crop Promotion Scheme	146
5-2-3	Facilities under Morena Model Irrigation Scheme	152
5-2-4	Facilities under Scheme for Improvement of Agricultural Support system	168
5-2-5	Facilities under Scheme for Improvement of Agricultural Training System	170
5-3	Equipment Plan	176
5-3-1	Agricultural Technology Transfer Scheme	176
5-3-2	Minor Export Crop Promotion Scheme	179
5-3-3	Morena Model Irrigation Scheme	180
5-3-4	Scheme for Improvement of Agricultural Support System	180
5-3-5	Scheme for Improvement of Agricultural Training System	181
5-3-6	Project Office	183
Chapter 6	Project Implementation	185
6-1	Project Implementing Agency	185
6-2	Construction Plan	186
6-2-1	Construction Conditions	186
6-2-2	Construction Orientation and Method	188
6-2-3	Construction Plan	194
6-2-4	Supervisory Plan	206

6-2-5	Scope of Construction Work	.....	210
6-2-6	Material and Equipment Procurement Plan	.....	213
6-2-7	Implementation Schedule	.....	213
6-2-8	Project Cost	.....	215
Chapter 7 Project Evaluation and Conclusion			..... 217
7-1	Benefit of the Project	.....	217
7-2	Conclusions and Recommendations	.....	220
Appendices:			
	1.	Members of Survey Team	
	2.	Survey Schedule	
	3.	Member List of Sri Lankan Party	
	4.	Minutes of Discussion	
	5.	Basic Design Drawings	

ABBREVIATIONS AND ACRONYMS

AGA	-	Assistant Government Agent
ADB	-	Asian Development Bank
AI	-	Agricultural Instructor
ASC	-	Agrarian Service Center
BC	-	Bank of Ceylon
DAS	-	Department of Agrarian Services
DCB	-	Decentralized Capital Budget
DCC	-	District Coordinating Committee
DDC	-	District Development Council
DLG	-	Department of Local Government
DMEC	-	Department of Minor Export Crops
DSI	-	Department of Small Industries
DTI	-	Department of Textile Industries
ERR	-	Economic Rate of Return
ESCAP	-	Economic and Social Commission for Asia and the Pacific
FAO/IC	-	Food and Agriculture Organization/Investment Center
FOB	-	Free on Board
GOSL	-	Government of Sri Lanka
GDP	-	Gross Domestic Product
GPS	-	Guaranteed Price Scheme
IFAD	-	International Fund for Agricultural Development
LETI	-	Light Engineering Training Institute
MEC	-	Minor Export Crops
MLG	-	Ministry of Local Government
MPCS	-	Multi-Purpose Cooperative Societies
MPI	-	Ministry of Plan Implementation
NORAD	-	Norwegian Agency for International Development
O&M	-	Operation and Maintenance
PB	-	People's Bank
RDD	-	Regional Development Division
RD	-	Rural Development
SMO	-	Subject Matter Officer
TCCS	-	Thrift and Credit Cooperative Society

G L O S S A R Y

anicut	-	stream diversion scheme or its headworks
district	-	principal administrative unit in the country; there are 25 districts in Sri Lanka
maha	-	northeast monsoon season (October to February)
paddy	-	unhusked rice
tank	-	impounding reservoir for irrigation
yala	-	southwest monsoon season (April to September)

CURRENCY EQUIVALENTS

US\$ 1	=	Rs 32.80	=	¥ 129.56
Rs 1	=	US\$ 0.0305	=	¥ 3.95

WEIGHTS AND MEASUREMENTS

1 long ton = 2,204 pounds (lb)	=	1.016 metric ton
1 hundredweight (cwt)	=	50.8 kg
	=	112 lb
1 bushel (bu) of paddy	=	46 lb
1 kilogram (kg)	=	2.205 lb
1 acre (ac)	=	0.405 hectare (ha)
1 mile (mi)	=	1.609 kilometers (km)
1 square mile (sq. mi)	=	640 ac (259 ha)
1 foot (ft)	=	30.5 centimeters (cm)

GOSL FISCAL YEAR

January 1 - December 31

CHAPTER 1 INTRODUCTION

The Sri Lankan Government requested cooperation from the Japanese Government in the formulation of an integrated rural development project for Gampaha District. In response to this request, the Japanese Government dispatched a study team through the Japan International Cooperation Agency (JICA) to prepare a Master Plan for integrated rural development. The Master Plan was presented to the Sri Lankan Government in September 1987.

The Sri Lankan Government has concluded that the Model Project for Improvement of Agricultural Production, which is targeted at revitalization of agriculture and the creation of employment in the District, warrants the highest priority under the Master Plan for the Integrated Rural Development Project for Gampaha District, and on this basis made a request to the Japanese Government for Grant Aid in the construction of facilities and structures required under the Project.

In response to this request, JICA dispatched a Preliminary Survey Mission (Team Leader: Hajime Takeuchi, Planning Department, All Japan Engineers' Association for Irrigation, Drainage and Reclamation) in July 1988 for 11 days. The mission met for discussions with the concerned officials of the Sri Lankan Government, and carried out site inspections and surveys of related facilities. The necessity of the Project as well as its appropriateness for Grant Aid were identified, and an exchange of notes was made regarding implementation of the Basic Design Study.

On the basis of the findings of the Preliminary Survey Mission, JICA dispatched a Basic Design Study Team to establish the optimum components, facilities and equipment for the Project. The Study Team visited Sri Lanka from 1 January to 20 February 1989 (43 days) during which time team members carried out discussions with concerned personnel of related government agencies, and surveys of facilities and construction sites (Basic Design Study Team members, Study schedule, concerned officials in the Sri Lankan Government, and Minutes of Discussions are contained in the attached Appendices). Findings of the field surveys and subsequent analyses were compiled in a Draft Final Report.

The Mission for Explanation of the Draft Report (headed by Toshio Okubo, Deputy Director, Design Department, Agricultural Structure Improvement Bureau, Ministry of Agriculture, Forestry and Fisheries) visited Sri Lanka for 10 days from April 21 to brief the Sri Lankan Government on the contents of the basic design. Comments obtained from the Sri Lankan Government have been incorporated in this Final Report.

CHAPTER 2 PROJECT BACKGROUND

2-1 Integrated Rural Development

The Sri Lankan Government has embarked on a program of integrated rural development projects (IRDP) on a district basis since 1979. These projects are aimed at increasing agricultural production and improving living standards in rural areas.

The Public Investment Plan accords priority to these projects equivalent to that of large scale irrigation and resettlement projects such as the Mahaweli Ganga Development Project. To date, IRDP's have been undertaken for 15 of the nation's 25 districts by related government agencies with assistance from various Western European countries. (see Table 2-1, Fig. 2-1)

IRDP's are aimed at creating a prosperous and stable rural society, through increasing farm production and income, expanding employment opportunities and improvement of the rural living environment. The projects encourage maximum farmer participation and initiative, and seek to rectify skewed levels of development within the project area.

To achieve the above, IRDP's focus on the following:

- ① Direct production investment
- ② Maximum participation of area population in project
- ③ Rectification of regional imbalances in development
- ④ Extension of benefits to maximum number of beneficiaries
- ⑤ Labor intensive, promptly effective rehabilitation schemes as opposed to new construction.

Particular emphasis is given to rehabilitation of existing structures which has the merits of low costs, high labor intensity and rapid realization of benefits, as well as improvement of farm management, daily living infrastructure, and identification of latent development potential.

IRDP's undertaken to date are not simply improvement of facilities and structures. This is only the starting point from which subsequent long-term development of rural organizations and services is performed. Assistance from foreign countries and international agencies is accordingly also long-term.

At the initial stage of IRDP implementation, the function of existing agencies and organizations is restored through rehabilitation and, where necessary, new

construction of facilities. This includes project offices, district offices for various concerned agencies, farmer training centers, storehouses, irrigation facilities, hospitals, bridges, etc.

At the middle stage of the IRDP, emphasis is placed on expanding services and extension activities of concerned agencies. In the final stage, farmer participation is promoted and new development projects are implemented.

Although IRDP's tend to be low-key in profile, they yield steady results at the district level, and contribute significantly to the improvement of the living environment in rural areas.

IRDP's do not solely address agricultural problems, but widely embrace improvement of education, transportation, marketing, welfare, water service and sewerage, employment, etc., which are central to life in rural areas.

Although in the above respects the Gampaha IRDP is identical to previously implemented IRDP's, it is somewhat different in character in that it is aimed at an area which is not purely rural, but rather which can be better described as semi-rural. This is due to factors such as its proximity to Colombo, and the presence of the GCEC zone within the District.

Under the current request, the basic design is limited to the Model Project for Improvement of Agricultural Production which primarily focuses on agricultural aspects. At a subsequent stage, however, it will become necessary to implement projects targeted at socioeconomic infrastructure such as education and human resources development, roads, etc., to achieve the true benefits of IRDP.

The Model Project for Improvement of Agricultural Production comprises comparatively readily implementable identification of latent development potential and restoration of organizational functions, and its target area encompasses the whole of Gampaha District. It is anticipated that the successful implementation of the Project will serve as a model for other IRDP's in semi-rural areas near large urban centers.

2-2 Related Projects

Since the time of the previous prime minister, J.R. Jayewardene, the Government has vigorously pursued a policy of emancipation of the population from poverty. To this end, investment under the 5-year National Investment Plan has been largely directed at socioeconomic development.

Specific objectives under the National Investment Plan are ① food self-sufficiency, ② promotion of exports and ③ improvement of rural income. To achieve these, the National Investment Plan is carried out based on forecasts which are updated annually. At present, the 1988-92 National Investment Plan is in progress.

High priority under agricultural development is accorded to the Mahaweli Ganga Development Project. Three large dams have been completed under the project, and focus is now on downstream resettlement of systems B and C. Under the current National Investment Plan, 25% of investment is targeted at the agricultural sector, of which about 60% is ear-marked for the Mahaweli project.

The master plan for the Mahaweli project was drawn up in 1965-68 under cooperation from UNDP and FAO. The project envisages use of the largest river in Sri Lanka (the Mahaweli Ganga) to develop downstream systems through:

- ① Employment opportunities (alleviation of unemployment)
- ② Grain production (food self-sufficiency)
- ③ Power generation (stabilization of energy supply)

Priority projects under the master plan were structured into an Accelerated Mahaweli Ganga Development Project, for which implementation was commenced in 1977. To date, Victoria Dam (Great Britain), Maduru Oya Dam (Canada), Kotmale Dam (Sweden) and Randenigala Dam (West Germany) have been completed. Irrigation and resettlement projects for downstream system B, C, G, and H are now in progress. (see Fig. 2-2)

Other irrigation projects such as Kirindi Oya and Nilwala Ganga are currently being implemented. These projects place a large emphasis on the rehabilitation of existing structures.

IRDP's in contrast have been aimed at more backward areas which do not receive the benefits of the large-scale projects under Mahaweli development. In view of their complementary effect in distributing the benefits of development, IRDP's are accorded priority equivalent to that of the Mahaweli development program.

Table 2-1 Integrated Rural Development Program

District	Aid organization	Implementation Schedule							
		1979	80	81	82	83	84	85	86
1. Kurunegala	World Bank (L)								
2. Katara*	SIDA (G)								
3. Hambantota*	NORAD (G)								
4. Nuwara Eliya*	Netherlands (G)								
5. Matale	World Bank (L)								
6. Puttalam	World Bank (L)								
7. Badulla	IFAD (L)								
	SIDA (G)*								
8. Mannar	World Bank (L)								
9. Vavuniya	World Bank (L)								
10. Moneragala*	NORAD (G)								
11. Ratnapura *	Netherlands (G)								
12. Kegalle	IFAD (L)								
13. Mulliattivu*	Netherlands (G)								
14. Kalutara	SIDA (G)								
15. Kandy	W-German (G)								

* Funds provided on annual basis. * Open ended.

Notes L : Loan

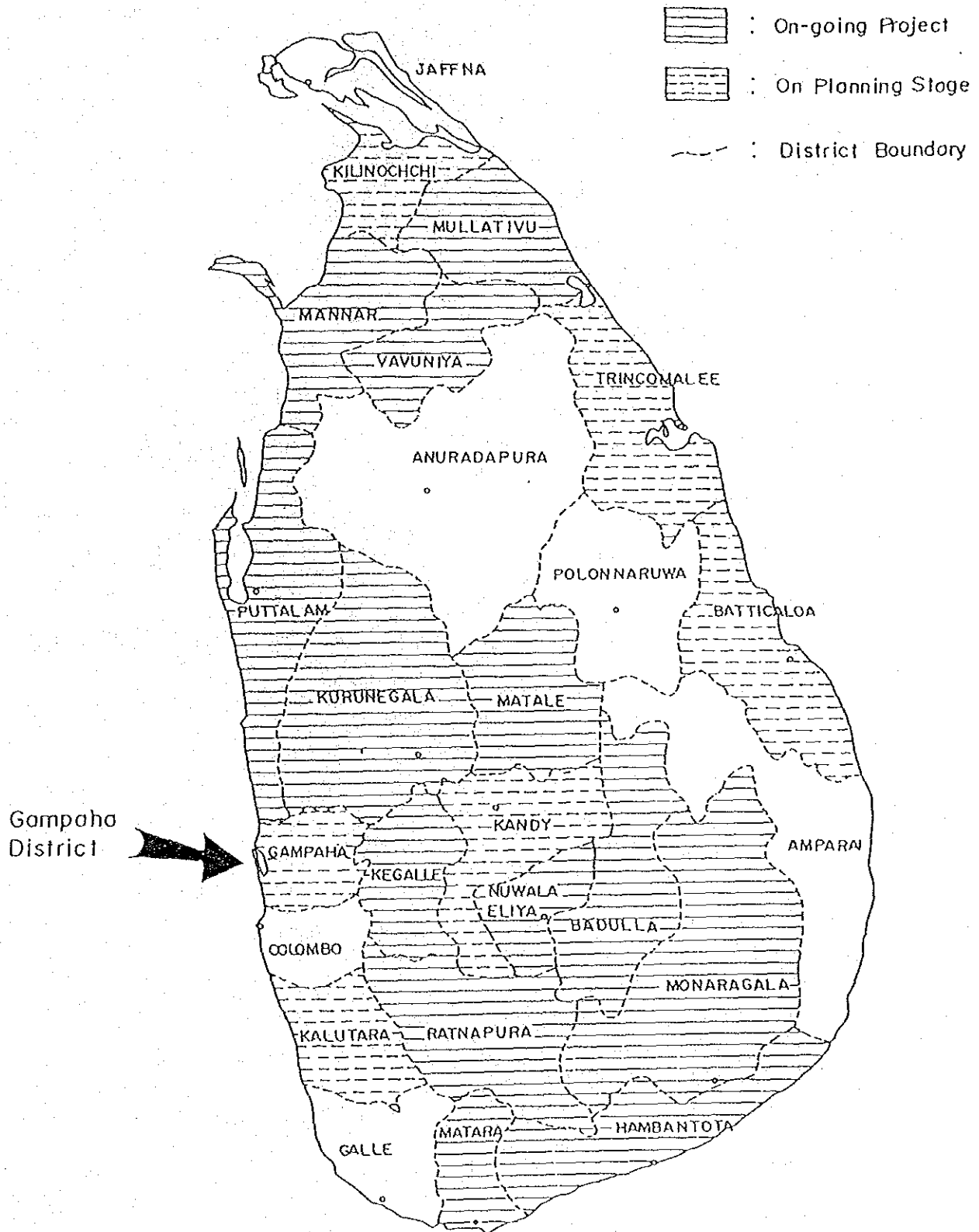
G : Grant

SIDA : Swedish International Development Agency

NORAD : Norwegian Aid for Development

IFAD : International Fund for Agricultural Development

Fig.2-2 Districts under the Integrated Rural Development Project



2-3 Outline of the Request

(1) History

Sri Lanka is an island in the Indian Ocean at the southeast edge of the Indian subcontinent. The climate is tropical. Land area is 65,600km² and population is 16,360,000.

The nation's economy is agricultural based, supported primarily by exports of tea, rubber and coconuts, and the cultivation of rice. The primacy of the agricultural sector is indicated by the fact that it accounts for 1/4 of the GDP, 2/3 of total export value, and 70% of employment. Roughly 80% of the population lives in rural areas.

The Sri Lankan Government has vigorously pursued economic development through such projects as ① the Mahaweli Ganga Development Project, ② expansion of exports and promotion of export oriented manufacturing industries, ③ residential and urban development, and ④ integrated rural development. The Mahaweli Ganga Development Project is a large-scale irrigation and resettlement program with targets of food self-sufficiency, power generation and creation of employment. The 1988-92 Public Investment Plan allocates 25% of its investment to the agricultural sector, recognizing the importance of the Mahaweli Ganga and similar large scale irrigation development projects, as well as the high priority for integrated rural development programs for more backward areas not benefited by the Mahaweli Ganga Development Project.

Integrated rural development projects have been undertaken for 15 of the 25 districts in the country. In the past, such programs have been directed primarily at purely rural areas. However, in recent years, attention has been focused as well on semirural areas in the proximity of urban centers. Since 1987, integrated rural development projects have been underway in Kalutara (cooperation from Sweden) and Kandy (cooperation from West Germany) districts at the periphery of the Colombo metropolitan area.

Gampaha District is considered as a semirural area in light of its former inclusion in Colombo District and the fact that it is the site of a free trade zone. However, although the overall level of social infrastructure development including education, industry, etc., is higher than the average throughout Sri Lanka, rural areas in the District have not benefited from the same development investment as the urban and industrial areas of Gampaha. This has resulted in significantly skewed development between rural areas and the rest of the District.

In 1986-87, the Japan International Cooperation Agency dispatched a study team to Sri Lanka at the request of the Sri Lankan Government to formulate a Master Plan for the Gampaha IRDP. The Master Plan was presented to the Sri Lankan Government in September 1987. The Sri Lankan Government selected the

Model Project for Improvement of Agricultural Production as the highest priority project for implementation under the Master Plan. A request for Grant Aid for the implementation of the Project was made to the Japanese Government in 1987.

(2) Request Components

Under its request, the Sri Lankan Government selected the Model Project for Improvement of Agricultural Production as the priority project for implementation under the Master Plan for IRDP. The Project aims to increase farmers' income and employment opportunities in rural areas through the effective use of paddy and coconut fields.

Specifically, Project objectives are: ① effective use of paddy field through introduction of high yield paddy varieties and upland crops and ② effective use of space within coconut fields through introduction of intercropping of minor export crops, other upland crops and fruits.

In order to achieve the above, the following schemes are proposed:

1. Agricultural Technology Transfer Scheme (ATT Scheme)	Morena intensive cropping model farm (2.1 ha). Morena improved drainage model farm (3.5 ha). Ambepussa upland crops model farm (5.8 ha). Morena agricultural technology transfer center.	Establishment of model farm. Establishment of drainage facilities and roads. Main building construction. Procurement of farm machinery.
2. Minor Export Crops Promotion Scheme (MEC Scheme)	Walpita minor export crop seedling nursery.	Preparation of seed beds. Preparation of seed farm and mixed cropping model farm. Construction of farm office.
3. Morena Model Irrigation Scheme (MMI Scheme).	Establishment of irrigation facilities to extend cropping technology under the ATT scheme to the farmer level.	Rehabilitation of anicuts. Rehabilitation of diversion and canal works. Road construction.
4. Scheme for improvement of Agricultural Supporting System (ASS Scheme)	Extension of cropping technology under ATT, MEC and MMI schemes to farmers throughout Gampaha.	Procurement of vehicles for extension work. Construction of storehouses.

5. Scheme for Improvement of Agricultural Training System (DTC Scheme)	Farm training for young farmers.	Construction of classrooms and dormitories. Preparation of training farm. Procurement of farm machinery.
6. Establishment of Project Office	Implementation of IRDP Coordination with other agencies and monitoring	Procurement of vehicles for extension work. Procurement of office equipment.

(3) Executing Agency

The Regional Development Division (RDD) of the Ministry of Policy Planning and Implementation (MPPI) is responsible for IRDP's.

At present, IRDP's in all of the 15 districts are being carried out under MPPI. Nevertheless, by virtue of the nature of IRDP's, MPPI works in close coordination with the various agencies related to irrigation, roads, education, etc. MPPI's role is hence principally one of coordination and monitoring of the activities of concerned agencies. For this purpose, MPPI establishes steering committees at both the national and district levels. Under the Project, concerned agencies are the Ministry of Agricultural Development and Research, Ministry of Lands and Land Development and the Agricultural Development Authority.

CHAPTER 3: PROJECT AREA

3-1 Location

Sri Lanka is a pear shaped island in the Indian Ocean at the southeastern edge of the Indian subcontinent. Land area is 65,600km². Location is between 5.5° and 9.5° north latitudes, and 79.4° and 81.5° east longitudes.

Gampaha District is north of and adjacent to the capital Colombo in the southwestern part of the island. The District is square in contour, with an area of 1,399km². It is 40km north to south, and 35km east to west.

The Free Trade Zone designated by the Greater Colombo Economic Commission is situated on the west coast of the District to promote export oriented industries. Colombo International Airport as well as two investment promotion zones (Katunayaka and Biyagama) are included in the area.

National Highway A-1 (Colombo-Kandy Road) runs from southwest to northeast through the center of the District. National Highway A-3 runs from south to north along the coast, passing the international airport. The district capital of Gampaha City is located in the center of the District about 25km from Colombo. (see Fig. 1)

3-2 Natural Conditions

(1) Topography and Geology

A hilly area around EL. 150 is situated in the eastern part of Gampaha on its border with Kegalle District. Moving westward, land elevation steadily decreases with lagoons and marshland in the vicinity of the coast. With the exception of the one above mentioned section in the east, most parts of the District are under 30m in elevation. Low areas along rivers and their tributaries are paddy field. The Maha and Kelani rivers flow along the northern and southern borders, respectively, and the Attanagalu River courses through the center of the District. These rivers and their tributaries dissect the District, establishing an undulating topography.

The Study area can be broadly classified into alluvial lowland along the major rivers (Maha Oya, Kelani Ganga, etc.) and their tributaries, and hilly terrain well dissected by these flows. Hilly terrain roughly features two types of topography whose dividing line is an axis running NNW-SSE connecting Kotadeniyawa and Bopagama. To the west of this line, erosion is well advanced

and the topography is consequently extremely gentle. To the east, the topography is sharper and characterized by monadnocks.

West of the above line, rivers meander gently as they flow westward, while to the east sharp changes in river course direction occur. The topography of the eastern portion is delineated by folding and faulting. To the east of this topographical dividing line, alluvial lowlands are less often present.

The geology of Sri Lanka consists of Precambrian ~ Neocene (Miocene) strata overlaid by Quaternary formations. These geologic units are referred to as the Highland series (Precambrian), Vijayan series (lower Paleozoic), Southwest group (upper Paleozoic), etc. Geologic classifications are shown in Fig. 3-1.

As indicated in Fig. 3-2, the Southwestern group is distributed in the west of the Study area, the Highland series in the east, and the Vijayan series in the north. The NNW-SSE dividing line discussed above with regard to topography can be considered as comprising the boundary between the Southwestern group and the Highland series, and between the Highland series and the Vijayan series.

The Highland series consists primarily of charnockite interbedded with quartzite, schist and gneiss.

The Southwest group comprises mainly granite and granite gneiss. As outcropping of this formation in the Study area was limited, details on the precise structure and continuity of the formation were not discernible.

The Vijayan series is largely gneiss. Limited deposits are found on a NNW-SSE axis in the vicinity of Witagedara, consisting of biotite hornblende gneiss.

Surface bedding of the above discussed formations in the Study area displays advanced weathering, and consist of reddish sandy silt - sandy clay. This condition particularly applies to the hilly area to the west of the topographical/geological boundary line.

(2) Soil

Sri Lanka is divided into the following three agro-ecological zones on the basis of factors of rainfall, vegetation, soil and land use.

- Wet zone
- Intermediate zone
- Dry zone

Fig.3-1 Geological Map

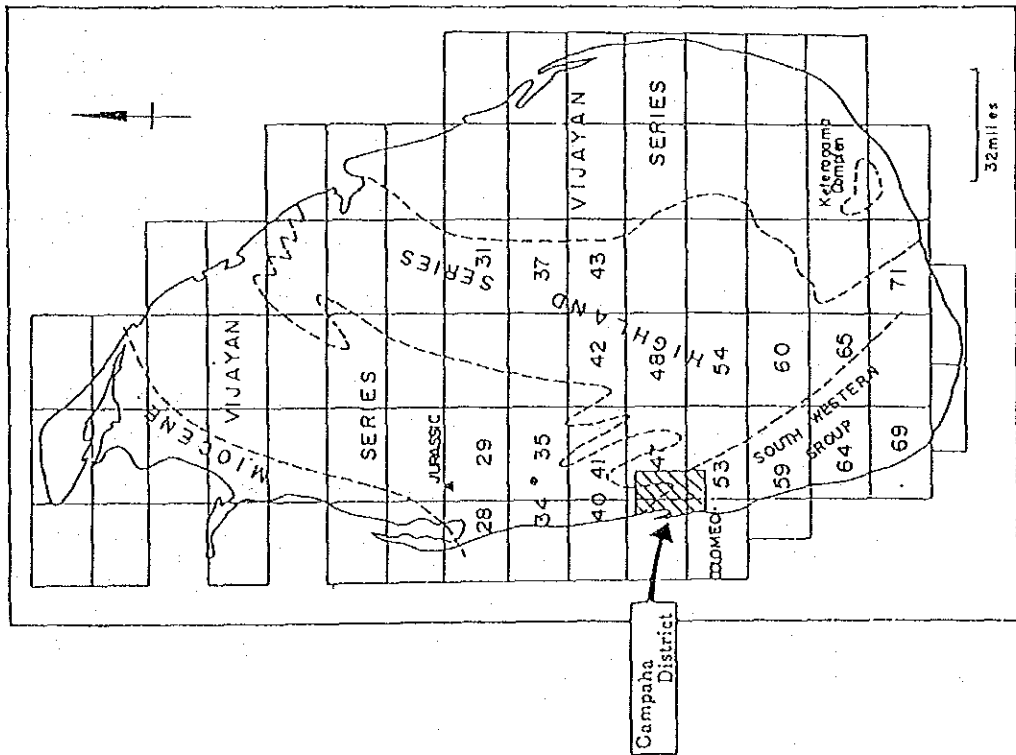
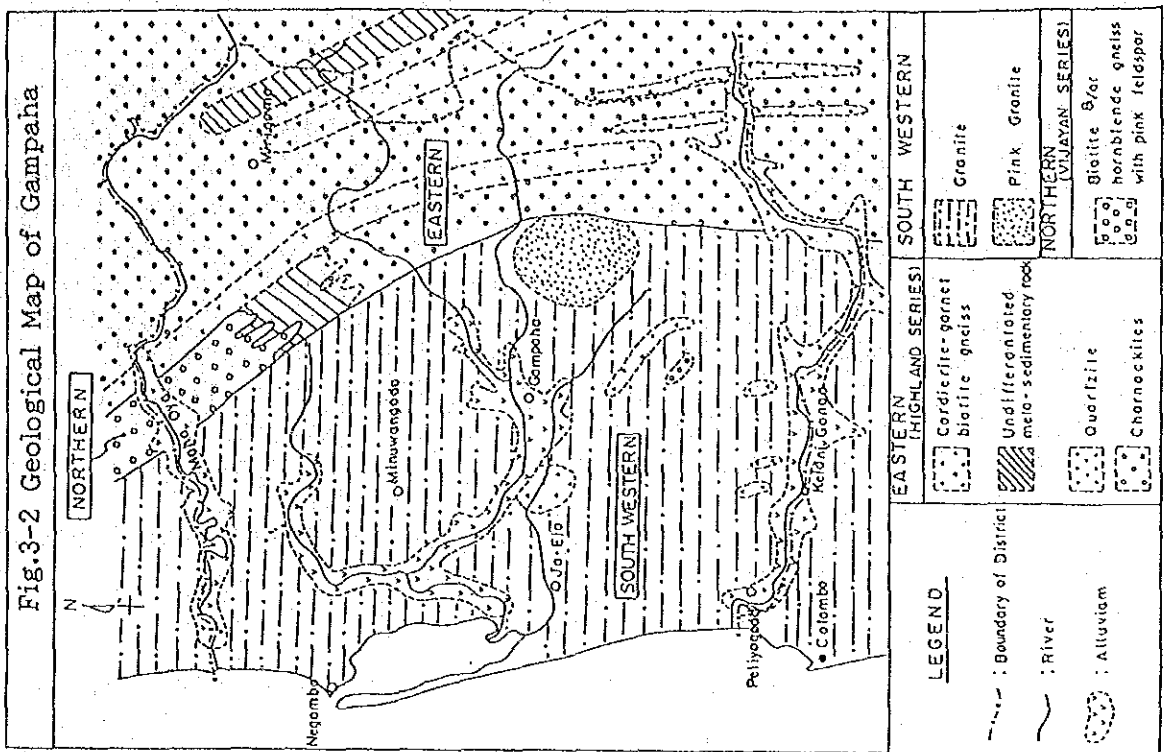


Fig.3-2 Geological Map of Campaha



These zones are further subdivided into six agro-ecological regions: very wet, wet, semiwet, semidry, dry and very dry

The entirety of Gampaha District lies within the wet-zone. Most of the district belongs to the WL3 (wet-lowland, laterite region) classification. However, the extreme eastern portion is WL2, while the lagoon and estuary area in the extreme western portion of the District is WL4 (wet lowland, ill-drained region)

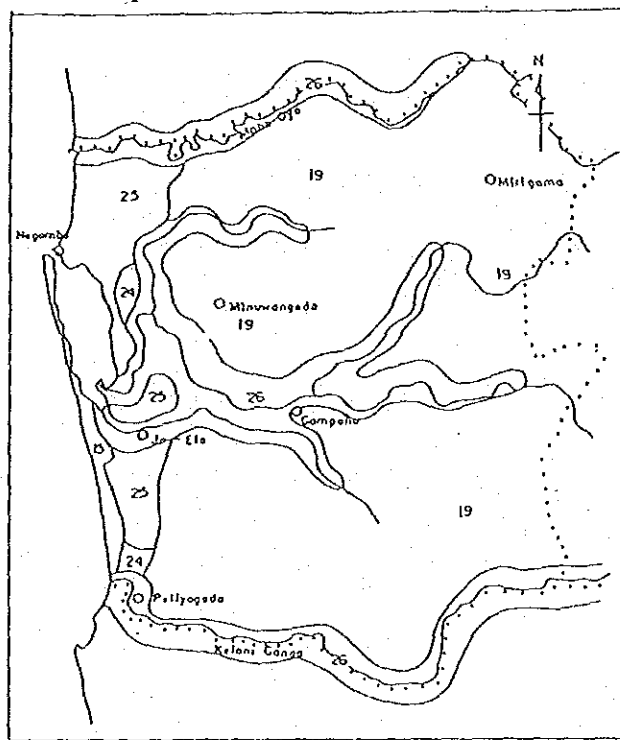
Soil in Gampaha District falls within the three following classifications:

- Regosols: distributed in coastal area (sand dune, etc.)
- Alluvial soil: distributed in lowland along rivers and streams
- Red-yellow podzolic soils: widely distributed throughout the District with the exception of the central area and coastal area in the west

In addition to the above, bog and half bog soils, and reddish latosols are also present.

A soil classification map for Gampaha district is shown in Fig. 3-3.

Fig.3-3 Soils of Gampaha



- 15 Regosols on Recent beach and sand dune sands, flat terrain
- 19 Red-Yellow Podzolic soils with soft or hard laterite, rolling and undulating terrain
- 24 Bog and Half-bog soils, flat terrain
- 25 Latosols and Regosols on old red and yellow sands, flat terrain
- 26 Alluvial soils of variable drainage and texture, flat terrain

(3) Meteorology and Hydrology

(i) Meteorology

Sri Lanka is located within the tropical climatic zone. Temperatures and rainfall are governed by the monsoons. The northeastern and southwestern monsoons are referred to as Maha and Yala, respectively. Temperatures throughout the year are warm and fluctuate only slightly.

Gampaha District falls within the wet zone, with annual rainfall at 2,000-2,600mm. Rainfall occurs primarily during the two yearly monsoons. The Maha from October to December accounts for 40% of annual rainfall, while 30% occurs during the Yala from April to June.

Meteorology at Katunayaka is shown in the table below.

TABLE 3-1 RAINFALL AND TEMPERATURE AT KATUNAYAKE

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
Katunayake rainfall (mm)	36	76	145	187	327	189	65	102	159	337	376	100	2,099
Daily maximum temperature (°C)	31.4	32.2	32.3	32.1	31.1	30.3	30.1	30.2	30.3	30.1	30.8	30.6	31.0
Daily minimum temperature (°C)	21.6	21.8	23.0	23.9	25.0	25.1	24.8	24.8	24.2	23.6	22.7	22.3	23.6
Humidity (%)	78	79	80	80	81	80	80	73	80	81	80	79	79
Gampaha UC rainfall (mm)	97	116	160	235	425	287	96	133	213	320	368	150	2,600

(ii) Rivers

There are three large rivers in Gampaha District. These are the Maha Oya flowing along the northern boundary of the District, the Kelani Ganga coursing along the southern boundary, and the Attanagalu Oya which flows from south to west through the center of the District. Features of these rivers are presented below.

TABLE 3-2 RIVER CHARACTERISTICS

	Attanagalu Oya	Maha Oya	Kelani Ganga
Catchment area (km ²)	727	1,510	2,278
Catchment area in Gampaha (km ²)	688	409	302
Annual precipitation ($\times 10^6\text{m}^3$)	1,850	3,644	8,658
Annual runoff ($\times 10^6\text{m}^3$)	740	1,260	5,570
Runoff rate (%)	40	34	64
Gauge station	Karasnagala	Badalgama	Hanwella
Catchment area at the station (km ²)	53.0	1,360	1,782
Daily average flow (m ³ /s)	5.01	51.99	188.7
Average maximum flow (m ³ /s)	141.4	698.8	1,601.2
Average minimum flow (m ³ /s)	0.59	1.36	23.1
Maximum flow (m ³ /s)	458.8	1,574.4	2,348.5
Minimum flow (m ³ /s)	0.11	0.17	8.5

The Attanagalu Oya is the largest river in western Sri Lanka, and is the water source for the Attanagalu irrigation project with a benefit area of 3,850ha.

3-3 Land Use

About 97,300ha (70%) out of a total area of 139,900ha is farm land. Of this, a predominant 73,000ha is coconut fields. Paddy fields are next at 17,070ha (17.5%). Rubber accounts for 5,000ha (5%) and perennial fruits and other general upland crops for 2,300ha (2.4%). The remaining land is forest, residential areas, roads, rivers, mangroves, and marshland.

Table 3-3 Land Use

Land Use	Area (ha)
1. Cultivated land	97,370
(1) Upland field	80,300
Coconut	(73,000)
Rubber	(5,000)
Others	(2,300)
(2) Paddy field	17,070
Major irrigation	(3,870)
Minor irrigation	(5,600)
Rainfed	(7,600)
(3) Others	42,530
	139,900

3-4 Society and Economy

(1) Administration of Gampaha District

Sri Lanka is divided into 9 provinces and 25 districts. Gampaha District is located in the Western Province. The Western Province consists of Colombo, Kalutara and Gampaha districts. Gampaha was made an independent district from Colombo in October 1978.

Gampaha District is divided into 13 Divisions and 44 Grama Sewaka. There are 1 Municipal Council (MC) and 6 Urban Councils (UC) in the District. MC's and UC's are administratively equivalent to Divisions.

Administration is two tiered, being represented by i) the Government Agent (GA) who is appointed by the Ministry of Home Affairs, and 13 presiding Assistant Government Agents (AGA's stationed in the 13 Divisions) and ii) the District Development Council consisting of representatives elected from each Electorate Division.

Citizens' groups exist at both the Grama Sewaka (GS) and AGA Division levels. At the Grama Sewaka level there is the Gramodaya Mandalaya (GM) comprised of the leaders of the various traditional groups at the village level (religious, youth, women, etc.). The task of the GM is to elicit resident opinion regarding common problems and proposals by government agencies.

A Pradeshiya Mandalaya, comprised of the representatives of the GM, performs the same task as the GM, but at the Division level.

(2) Rural Conditions

Gampaha is the most industrialized district in the country. Nevertheless, farmland accounts for 70% of district area. Even in the case of the GCEC industrial zone for export oriented industries located on the coast, the majority of area is farmland. In rural areas, there is interspersing of households engaged in agriculture and those who gain their livelihood in other sectors.

The District comprises both upland and lowlands. Lowlands consist of paddy fields, and uplands are the site of residences and upland fields. Dwellings maintain home gardens and are surrounded by coconut fields.

82% of farmland is upland. Of this, 75% is coconut fields. Land holdings are fragmented, and the average farm size is 0.48ha. Holdings of 1 acre (0.4ha) or less are 67%. Full-time farmers are few. The majority of households engaged in agriculture supplement their income from other sources.

Gampaha District is north of and adjacent to Colombo, the capital. Close proximity to the capital has resulted in the development of roads, power and other infrastructure at a relatively early date. Although the degree of development of such infrastructure is higher on the average than for other districts, development is markedly skewed by region within the District itself. Furthermore, facilities are largely superannuated.

(3) Industry

Gampaha is the most industrialized district in the country. It is the site of the GCEC zone. The Gampaha-Colombo industrial belt accounts for 64% of industrial production and 32% of employment in Sri Lanka.

Employment in the District is 13% in the agricultural sector, 30% in the industrial sector, 15% in the commercial sector and 42% in the service sector. Farming is mainly of coconuts. The district is not food self-sufficient.

Manufacturing in the chemical, petroleum products (Gampaha is the site of the only refinery in the country) and rubber industries totals Rs 12.5 billion (78% of the national total), and that in the numerous textile and clothing industries in the GCEC is Rs 1.7 billion (31% of the national total). Other manufacturing industries include food products, tobacco, etc.

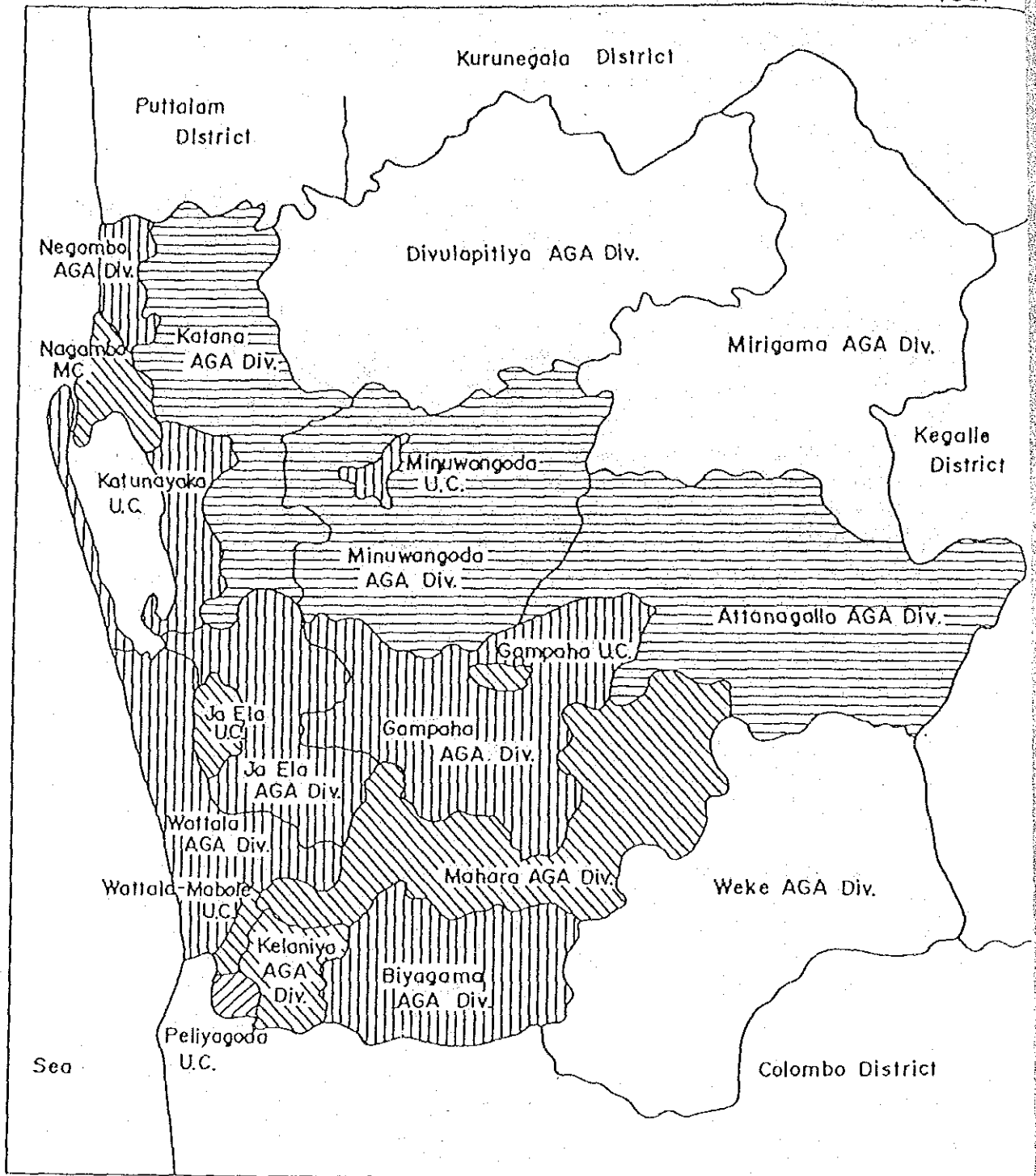
(4) Population

The National Census of 1981 indicated a population in the District of 1.39 million, which is 9.4% of the national population of 14.8 million (national population in 1987 was estimated at 16.4 million).

The population density of 994 persons/km² is second highest in the country after Colombo. However, population distribution is uneven. It is low in the northeast and high in the southwest.

Fig. 3-4 Population Density In Gampaha District
by AGA Division and Urban Council

1981



— District Boundary
— AGA Div. Boundary

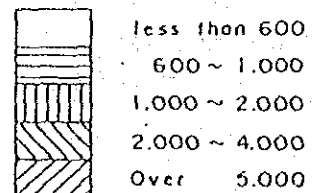


Table 3-4 Census of Gampaha -- 1971 and 1981

<u>AGA Division</u>	<u>Area (km²)</u>	<u>1971</u>	<u>1981</u>	<u>Growth per year (%)</u>
Mirigama	190.0	70,056	111,294	4.7
Divulapitiya	193.0	82,113	96,746	1.6
Minuwangoda	139.2	103,049	107,277	0.4
Attanagalla	151.8	65,007	105,781	5.0
Weke	164.2	85,080	98,575	1.5
Gampaha	94.8	151,084	116,297	4.0
Mahara	103.3		108,391	
Wattala	63.9	99,254	109,635	1.0
Ja-Ela	65.3	122,012	119,520	-0.2
Negombo	30.8	157,080	103,706	3.1
Katana	114.7		109,476	
Biyagama	64.7	239,836	94,237	-1.6
Kelaniya	23.1		109,927	
TOTAL	1,399	1,174,571	1,390,862	1.7

SOURCE : Department of Census and Statistics

Note: Gampaha District was separated from Colombo District in 1979, before that there were 10 AGA Divisions (Electorates). However, changes in division boundaries (except for the separation of 3 Divisions) did not take place. It is considered that any decrease or extreme increase of population was derived from erroneous sampling or other unknown reasons.

Table 3-5 Distribution of Operational Holdings

Gampaha District (Average : 1.2)		Number of holdings		Area (acre)	
		Number	percent	Area	percent
Less than	1/8	13,257 (13,257)	(8.0)	1,026 (1,026)	(0.5)
1/8 to less than	1/4	27,048 (40,305)	(24.5)	4,063 (5,089)	(2.6)
1/4	— 1/2	37,350 (77,655)	(47.1)	10,397 (15,486)	(7.8)
1/2	— 1	32,496 (110,151)	(66.8)	19,471 (34,957)	(17.6)
1	— 2	27,984 (138,135)	(83.8)	35,181 (70,138)	(35.2)
2	— 3	10,943 (149,078)	(90.4)	24,969 (95,107)	(47.8)
3	— 4	5,169 (154,247)	(93.6)	16,993 (112,100)	(56.3)
4	— 5	3,009 (157,256)	(95.4)	12,905 (125,005)	(62.8)
5	— 7	3,239 (160,495)	(97.4)	18,339 (143,344)	(72.0)
7	— 10	1,849 (162,344)	(98.5)	14,893 (158,237)	(79.5)
10	— 20	1,941 (164,285)	(99.7)	25,406 (183,643)	(92.3)
20 and over		550		15,380	
All holdings		164,835	100	199,023	100

Source : Census of Agriculture, 1982.

Note : Figures in brackets are cumulative.

Gini Coefficient : 0.652

Table 3-6 Agricultural Land Holding - Gampaha District. (Area in acres)

AGA divison	All Operational Holdings				Paddy Holdings			Gini Coeff.	
	Number	Area	Average area	Holding/Population (%)	Agricultural Land/Total Land (%)	Number	Area		Average area
Weke	17,075	27,825	1.63	17.3	75.1	5,725	4,959	0.87	0.443
Divulapitiya	16,654	26,002	1.56	17.2	77.0	4,637	3,965	0.86	0.435
Minuwangoda	17,139	26,172	1.53	16.0	81.3	5,298	4,920	0.93	0.446
Mirigama	18,789	27,373	1.46	16.9	73.2	7,131	5,313	0.75	0.472
Attanagalla	15,218	22,084	1.45	14.4	72.8	5,755	4,221	0.73	0.446
Gampaha	13,866	15,334	1.11	13.1	67.1	4,376	4,176	0.95	0.448
Mahara	14,744	15,402	1.04	13.6	65.8	3,375	2,960	0.88	0.310
Katana	11,734	12,035	1.03	10.7	57.1	1,143	1,462	1.28	0.452
Biyagama	10,086	9,086	0.90	10.7	58.1	1,865	1,819	0.98	0.431
Ja-Ela	9,670	6,169	0.64	8.1	42.3	967	1,041	1.08	0.500
Kelaniya	3,784	2,259	0.60	3.4	39.6	270	400	1.48	0.518
Negombo	8,722	5,110	0.59	8.4	70.5	101	202	2.00	0.568
Wattala	7,353	4,173	0.57	6.7	27.3	402	581	1.45	0.467
District	164,834	199,024	1.21	12.1	67.6	41,045	36,019	0.88	0.458

Source : Census of Agriculture, 1982

Table 3-7 Income Distribution for Gampaha District

Average : Rs. 926

Income group	Number of households		Income	
	Number	Percent	Amount (Rs. '000)	Percent
Less than 200	9,170	3.3	1,137	0.4
200 — 400	46,170 (55,340)	(19.9)	15,131 (16,268)	(6.3)
400 — 600	63,422 (118,762)	(42.6)	31,542 (47,810)	(18.5)
600 — 800	50,204 (168,966)	(60.7)	34,606 (82,416)	(32.5)
800 — 1,000	31,424 (200,390)	(71.9)	27,781 (110,197)	(42.7)
1,000 — 1,400	34,736 (235,126)	(84.4)	40,671 (150,868)	(58.5)
1,400 — 1,800	20,318 (255,444)	(91.7)	32,356 (183,224)	(71.1)
1,800 and over	23,110		74,619	
All groups	278,554	100	257,843	100

Note: Figures in brackets are cumulative.

Source: Income Statistics, Gampaha

Gini Coefficient: 0.394

Table 3-8 Employed Population
Gampaha 1981

	District		Urban		Rural	
		(%)		(%)		(%)
Agriculture	46,626	13.4	4,346	4.2	42,280	17.4
Mining	2,485	0.7	129	0.1	2,356	1.0
Manufacturing	80,874	23.3	24,346	23.3	56,528	23.3
Electricity, Gas, Water	2,419	0.7	814	0.8	1,605	0.7
Construction	16,002	4.6	3,805	3.6	12,197	5.0
Commerce	53,162	15.3	20,791	19.9	32,371	13.3
Transportation	34,137	9.8	11,046	10.6	23,091	9.5
Money and insurance	8,128	2.3	3,383	3.2	4,745	2.0
Services	67,340	19.4	22,576	21.6	44,764	18.4
Others	35,798	10.3	13,052	12.5	22,746	9.4
Total	346,971	100	104,288	100	242,683	100

Source : Census of Population and Housing 1981

Table 3-9 Employed Population in Agricultural Sector
Gampaha District, 1981

	<u>District</u>	<u>Urban</u>	<u>Rural</u>
<u>Agricultural & Livestock production</u>	39,468	1,231	38,237
Paddy (rice) cultivation	14,493	384	14,109
Other field grains	611	19	592
Vegetable and fruit	4,104	153	3,951
Tea cultivation	66	24	42
Rubber cultivation	3,037	44	2,993
Coconut cultivation	8,488	191	8,297
Cinnamon cultivation	99	2	97
Cocoa, Cardamon & Pepper	9	2	7
Tobacco cultivation	236	6	230
Citronella cultivation	9	1	8
Other crops	7,245	204	7,041
Toddy tapping	297	60	237
Livestock production	774	141	633
<u>Agricultural Services</u>	1,015	57	958
<u>Hunting, Trapping & Game propagation</u>	1	-	1
<u>Forestry</u>	53	4	49
<u>Logging</u>	127	2	125
<u>Fishing</u>	5,962	3,052	2,910

Source: Census of Population and Housing, 1981

3-5 Social Infrastructure

Development of social infrastructure has progressed since relatively early times due to the District's proximity to Colombo. However, facilities are old and require rehabilitation.

The road network is relatively well developed. Laterite surfaced roads are present in villages. However, roads are few in paddy field areas. Class-wise, roads are as follows:

①	Class A: 1st class national highway	164.6km
②	Class B: Major roads	468.4
③	Class C: Town and village roads	461.2km
④	Class D: General roads (motorable in dry season)	479.9
⑤	Class E: Motorable only by 4W drive	<u>5.4km</u>
	Total:	1,579.5km (1987)

Domestic water supply in rural areas is almost totally by shallow well. However, many wells are without pumps for water supply into the dwellings. Piped water supply projects are being carried out at present only in limited areas such as Gampaha City, Veyangoda and areas immediately adjacent to Colombo.

In the absence of public sewerage facilities, waste water from dwellings is drained by ditch into rivers. Toilet waste is disposed of through underground percolation.

The power grid has been developed from earlier years due to the presence of the GCEC zone in the District. At the GS level, electrification is 48.6% in rural area and 80.3% in the GCEC zone. At the village level, it is 44.6% in rural area and 82.8% in the GCEC zone. (1985)

Base hospitals are located at Gampaha City, Negombo and Attanagalu. District hospitals under these are at 4 locations, clinics at 4 locations, and various other facilities for a total of 58 locations. Total bed space is 2,600. This is a low rate of 2.0 beds per 1,000 population.

There are 596 general schools in the District for lower education. At the higher education level, there is 1 general university, 1 agronomy college, and 5 teachers colleges. Enrollment rate for 5-14 year olds is 88.7%, which is higher than the national average of 84.8% and the rate for Colombo of 87.1%. The literacy rate is 94.2%, which is the highest in the nation (national average is 86.5%). However, the

drop out rate at a later age is high, with only 30% eventually graduating from middle school.

3-6 Agricultural Development

Cultivated land in the district is 97,000ha which is 70% of the total of 139,900ha. Major farm products are coconuts, rice and potatoes. Self-sufficiency has been achieved only for coconuts. Food is imported from other districts and abroad.

82% of farmland, or 80,000ha, is coconut fields. 18%, or 17,070ha, is paddy. Paddy fields are dispersed between uplands and lowlands along rivers and streams. 3,870ha is irrigated under the Attanagalu Oya Irrigation Project. Another 5,600ha is irrigated under minor irrigation schemes. The remainder is rainfed paddy.

The Attanagalu Oya flows through the center of the District from east to west. There are 10 irrigated areas along the river comprising the Attanagalu Oya Irrigation Project. The total benefited area is 3,870ha. Diversion is by anicut at 34 locations. The main canal totals 115km. However, facilities are superannuated and gates are inoperative. Consequently, backwater occurs during the rainy season, reducing yield. Features of the Attanagalu Oya Irrigation Project are shown in Table 3-11.

The Attanagalu project is the largest irrigation project in southwest Sri Lanka. It is under the jurisdiction of the Ministry of Land and Land Development.

There are 750 minor irrigation schemes in the District, utilizing the discharge from small rivers. Water use facilities include anicuts, ponds and regulators. These schemes are under the jurisdiction of the Ministry of Agricultural Development and Research.

45% of farmland is rainfed. Such fields make use of runoff from higher coconut fields and springs. Lack of irrigation and drainage facilities has a destabilizing effect on farming.

Flood protection schemes are located in poorly drained area and along the Kelani Ganga.

Table 3-10 IRRIGATION CANAL AND DESIGNED DUTY OF WATER UNDER THE ATTANAGALU OYA SCHEME

	Name of Anicut	Benefited Area (ha)	Length of Canal (km)			Designed Duty of Water (m ³ /s)	Unit Duty of Water (ℓ/s/ha)
			Main	Branch	Total		
DIYAELLA OYA	1. MURUTHANBLA MALLEHAWA GAL AMUNA PALLEWELA HAMBEY AMUNA	110 63 109 293 -	11.82 - - - -	0.77 - - 3.74 -	12.59 - - 3.74 -	1.62	2.82
	2. KUMBALLOLWA UKULAWELA ALUGOLLAPITIYA MOLE AMUNA	140 97 41 41	5.55 - 1.86 0.36	1.43 0.11 - -	6.98 0.11 1.86 0.36	0.98	3.08
	3. PANUGALA MA-OVITA BEMMULLA DORANAGODA	155 51 23 41	8.19 0.15 2.37 0.15	1.87 - - -	10.06 0.15 2.37 0.15	1.18	4.38
	4. IDELLAWALA	391	9.11	3.76	12.87	0.70	1.79
	(SUB-TOTAL)	(1.555)	(39.56)	(11.68)	(51.24)	(4.48)	Average 2.89
ATTANAGALU OYA	5. MORENNA PALU OYA PATHAKADA	254 124 75	5.49 3.24 0.64	3.05 1.00 1.60	8.54 4.24 2.24	0.53	1.17
	6. KETAWALA ALUTH ELA	506 117	5.87 -	5.58 -	11.45 -	0.11	1.77
	7. TAMMITA KAUDANGAHA BELUMAHARA GALWETIYA KOTUGODA	133 81 12 93	5.76 1.97 - 1.60	1.88 0.66 - 1.60	7.64 2.63 - 2.20	0.53	1.66
	8. OPATHA	81	2.61	-	2.61	0.31	3.83
	(SUB-TOTAL)	(1.476)	(27.18)	(14.37)	(41.55)	(1.48)	Average 1.00
URURAL OYA	9. KINIGAMA GALWETIYA GALKALA AMUNA KEENAGALA PILLDEWA ORUTOTA GALWETIYA BOGAHAPITIYA	64 58 43 86 - 62	5.21 - 1.75 0.85 - 1.28	3.94 - 2.18 - - -	9.15 - 3.93 0.85 - 1.28	1.15	3.68
	10. WELIKADA MAGURUWALPITIYA PAULUSEEYAGE PUNCHIMELIYA	468 37 3 18	5.90 - - 0.66	1.04 - - -	6.94 - - 0.66	1.26	2.40
	(SUB-TOTAL)	(839)	(15.65)	(7.16)	(12.81)	(2.41)	Average 2.88
TOTAL	3,870	8.39	33.21	115.60	8.37	2.17	

Table 3-11 LIST OF ANICUTS UNDER THE ATTANAGALU OYA SCHEME

Name of Anicut	Completed Year	No. of Bays	Lifting Style	DIMENSION OF GATE		Spill Way (Length)
				Size of Gate (width×height)	wooden or Steel	
1 MURUTHAWELA	1955	3	Screw type	2.13 × 1.98	wooden	(2) 4.57
a) Mallehawa	1972	3	- do -	1.83 × 1.83	- do -	-
b) Gal-Amuna	1969	3	- do -	(2) 1.98 × 1.67	- do -	-
c) Pallewela	1955	8	- do -	(1) 1.98 × 2.13	- do -	(3) 1.52
d) Hambey Amuna	1970	3	- do -	1.83 × 1.52	- do -	(2) 1.82
2 KUMBALOLUWA	1950	3	- do -	1.67 × 1.98	- do -	-
a) Ukulawela	1973	3	- do -	2.13 × 1.67	- do -	(1) 6.09
b) Alugollapitiya	1972	4	- do -	1.07 × 1.67	- do -	-
c) Mole Amuna	1973	4	- do -	2.13 × 1.83	- do -	-
3 PANUGALA	1951	4	- do -	1.67 × 2.13	- do -	(2) 1.67
a) Ma-Dvita	1958	7	(5) Screw type	1.83 × 2.13	- do -	(1) 3.04
b) Bemulla	1952	6	(2) Planks	(5) 1.67 × 2.74	- do -	-
c) Doranagoda	1973	4	Screw type	(2) " × "	- do -	-
4 IDELLAWALA	1947	5	- do -	2.13 × 1.83	- do -	-
5 MORENNA	1934	6	- do -	1.98 × 2.13	- do -	-
a) Palu Oya	1934	2	- do -	1.98 × 2.28	- do -	(1) 17.06
b) Pathakada	1922	4	- do -	2.13 × 2.13	- do -	-
6 KETAWALA	1943	A:4 B:3	- do -	1.67 × 2.13	- do -	-
a) Aluth Ela	1971	10	- do -	1.83 × 2.28	- do -	(1) 55.47
7 TAMMITA	1981	10	- do -	1.67 × 1.52	- do -	(1) 9.14
a) Kaudangaha	1981	3	Stop Planks	(8) 2.13 × 1.98	- do -	-
b) Belumbara Galwetiya	1950	4	Screw type	(2) 3.12 × 1.98	- do -	(1) 1.98 × 1.21
c) Kotugoda Bolanda	1890	3	Stop Planks	1.98 × 1.67	- do -	-
8 OPATHA	1970	1	Gear wheel system	1.98 × 3.20	- do -	-
9 KINIGAMA	1945	3	Screw type	3.35 × 1.98	- do -	-
a) Galwala Amuna	1960	4	Stop Planks	6.10 × 3.05	Radial gate	(2) 7.62
b) Galwitiya	1947	6	(1) Screw	1.83 × 1.07	wooden	(2) 1.82
c) Keenagala Pilledewa	1973	5	Screw type	1.52 × 1.22	- do -	(1) 4.57
d) Oruthota Galwetiya	1965	-	-	1.52 × 1.67	- do -	(2) 1.82
e) Bogahapitiya	1968	6	Screw type	1.52 × 1.98	- do -	-
10 WELIKADA	1948	5	- do -	1.52 × 1.98	- do -	-
a) Maguruwalpitiya	1972	2	- do -	1.67 × 2.44	wooden	(5) 1.82
b) Pauluseeyage	1969	3	Planks	2.13 × 2.13	- do -	(5) 3.04
c) Punchimeliya	1969	5	Planks	1.67 × 2.44	- do -	-

Table 3-12 Minor Irrigation Scheme in Gampaha

A. G. A. Division	Tank	Number of Facility		Benefited area	No. of Cultivators
		Anicuts	Regulators		
Divulapitiya(8)	6	54	48	920	2.245
Attanagalla(6)	11	56	02	469	2.484
Minuwangoda(11)	01	77	03	624	2.862
Mirigame (7)	03	111	-	717	4.599
Weke (4)	15	95	04	913	3.847
Gampaha (6)	05	41	01	332	2.128
Mahara (9)	14	42	11	470	1.171
Kelaniya (2)	-	08	-	140	305
Katana (1)	02	60	02	395	1.278
Walala (2)	-	01	-	10	41
Biyagama (10)	02	35	04	471	1.510
Ja-Ela (4)	04	32	-	444	2.393
TOTAL	*(70)	63	75	5.905	23.863

8% 82% 10% (14.592 acres)
 * Proposed for rehabilitation
 750 : 100% 0.25 hectare/cultivator
 (0.61 acres)

CHAPTER 4 PROJECT COMPONENTS

4-1 Objective

The current status of rural areas in Gampaha can be summarized as follows:

- ① About 70% of the entire district has been developed as farmland. There is no room for further expansion of cultivated land.
- ② Land ownership is extremely fragmented. Holdings of 3 acres (1.2ha) or less account for 90% of the total. Holdings of 1 acre (0.4ha) or less account for 67%.
- ③ The trend towards part-time farming is strong since livelihood is not possible from agriculture alone due to fragmented holdings and low productivity. However, employment possibilities outside farming are severely limited, and the unemployment rate is twice the national average.
- ④ Although irrigation facilities have been in place for a long time, structures are superannuated and deteriorated. Farming hence relies on traditional, under productive methods. Under present conditions, farm income cannot increase.
- ⑤ Although social infrastructure is relatively well developed, facilities are superannuated and deteriorated, and require urgent rehabilitation.
- ⑥ Coconut production in the District ranks second nationwide. The District is not, however, self sufficient in food production.

Despite the fact that Gampaha is the site of the largest industrial zone in the nation and accounts for 36% of all industrial production value, large areal and sectoral disparities in income exist. Superannuated agricultural production and social infrastructures require urgent restoration. Fragmentation of land holdings has discouraged full-time farming, and residential patterns are characterized by interspersment of farm households, and households supported by other activities. Agricultural production and social infrastructures are superannuated and require urgent rehabilitation.

It is clear that a broad approach IRDP is necessary to effectively address the above problems which span numerous aspects crucial to rural life.

As discussed in Chapter 2, IRDP is fundamentally targeted at stabilization of rural life and alleviation of poverty through increasing farm income and employment opportunities, and improving the rural living environment.

The targets of increased farm income and employment opportunities must be achieved through the effective use of limited land resources. Under the Model Project for Improvement of Agricultural Production, space within coconut fields is to be effectively used through introduction of intercropping of minor export crops, other upland crops and fruit trees. Paddy fields are to be more effectively utilized through introduction of high yield paddy varieties as well as upland crops.

In achieving the above, components under the Project will encompass (i) preparation of model fields, (ii) rehabilitation of anicuts and irrigation facilities, (iii) construction of a seedling production center, storehouses and farm training facilities, and (iv) procurement of necessary farm machinery, training equipment and materials, vehicles, etc.

4-2 Study and Examination on the Request

(1) Project Suitability and Urgency

The purpose of the Project is stabilization of rural life and alleviation of poverty through increasing farm income and employment opportunities, and improving the rural living environment. Targeted beneficiaries are all full and part-time farmers in Gampaha District.

Specific measures to achieve objectives under the Project are:

① Agricultural Technology Transfer Scheme

An intensive cropping model farm will be established in paddy field at Morenna. Increased productivity of the paddy fields will be achieved through combined cultivation of varieties of high-yield paddy and upland crops. An upland crops model farm will be established at Ambepussa. The farm will demonstrate and transfer technology for cultivation of upland crops and fruit trees in coconut fields and highland areas. An agricultural technology transfer center will be established at Morenna for transfer of the above new technology and farm management skills. The center will directly manage the intensive and upland model farms.

② Morenna Model Irrigation Scheme

A model irrigation scheme is to be established in the Morenna area to demonstrate and extend at the individual farmer's level the cropping patterns developed at the intensive cropping model farm. Necessary irrigation and drainage facilities are to be rehabilitated, farmer organizations promoted, and guidance provided in farm management.

③ Minor Export Crop Promotion Scheme

High quality seedlings will be produced for promising minor export crops (coffee, pepper, etc.) to be intercropped in coconut fields. Seedlings will then be distributed to farmers in the District with an aim to augment farm income. For the above purpose, a minor export crop seedling production center will be constructed at Walpita.

④ Scheme for Improvement of Agricultural Supporting System

The scheme aims to provide guidance and extension activities through 26 Agrarian Services Centers in the District for new cropping techniques developed under the above Agricultural Technology Demonstration and Transfer Scheme, the Morenna Model Irrigation Scheme and the Minor Export Crop Promotion scheme. In addition, the

centers will distribute fertilizers, agro-chemicals and seeds, as well as seedlings for minor export crops, and provide guidance in farm management directly to farmers. The scheme will serve to extend the benefits of the above schemes equally to all farmers in the District.

⑤ Scheme for Improvement of Agricultural Training System

This scheme will serve to prepare both young future farmers, and provide a knowledge base among existing farmers that will facilitate the transfer of new technology to be developed under the model farm programs. As there are no formal agricultural schools in the District (or elsewhere in the country), the existing District Training Centers at Walpita and Ambepussa will play a major role.

Since these facilities were constructed during World War II (as army barracks), they are in urgent need of rehabilitation and will accordingly be improved and expanded under the scheme.

⑥ Project Office

In order to realize the full effects of each of the above schemes and ensure that benefits accrue to farmers throughout the District, a Project Office is to be established to coordinate the efforts of the numerous concerned agencies. The Project Office will ensure that schemes are mutually compatible and fully integrated. Similar project offices have been established for the 15 IRDP's undertaken to date in other districts.

The Model Project for Improvement of Agricultural Production constitutes one of the projects under the Gampaha IRDP, the other two being Development of Human Resources and Development of Social Infrastructure. The selection by the Sri Lankan Government of this Project for initial implementation is considered highly compatible with the overall envisaged implementation for the IRDP.

The Model Project for Improvement of Agricultural Production is comprised of a number of schemes with their respective independent yet complimentary objectives. Integrated implementation of the schemes, however, will serve to magnify their effects. The envisaged construction and rehabilitation of structures will adhere to standard scales and specifications applied for other IRDP's, and the types of machinery and equipment to be procured are modest.

In this regard, the request by the Sri Lankan Government is judged to be well formulated and highly realistic.

(2) Implementation and Operating Plan

Upon approval of the Project for inclusion under Japanese Grant Aid, the Sri Lankan Government will establish a Gampaha IRDP Project Office. This is the same format by which IRDP's have been pursued in other districts.

The implementing agency for the Project, the Ministry of Plan Implementation, must act in close concert with the other concerned agencies, such as the Ministry of Agricultural Development and Research, and the Ministry of Land and Land Development, as the Project comprises schemes spanning numerous administrative jurisdictions.

The Ministry of Plan Implementation and the Project Office are the central organs for implementation at the national and district levels, respectively. A steering committee and an agricultural sector implementing committee are set up to coordinate and monitor activities. The Gampaha IRDP is not anticipated to pose any unusual problems in implementation given the extensive experience of MPI and related agencies with this type of project.

Each year, the Government allocates through its National Investment Plan 400-500 million rupees for IRDP's. Approximately 80% of this originates from foreign sources, while the remaining 20% is procured internally. Since IRDP's are under implementation in 14 districts at present (the Kurenegala IRDP was completed in 1987), an average 7 million rupees is available per district. However, as allocation of the budget is made in accordance with actual costs incurred under each IRDP, there is some variation in the amount for each district.

Operation and maintenance costs for the Project are calculated at an annual Rs 5.94 million. It is judged that implementation of the Project will be well within the administrative and budgetary capabilities of the Sri Lankan Government.

(3) Relationship to Other Projects

IRDP's have been undertaken to date in 15 out of the 25 districts in the country. These projects have been funded by Western European countries such as Sweden, Norway, Holland, etc., and various international agencies such as the World Bank, International Fund for Agricultural Development (IFAD), etc. Funding assistance is long-term as it covers not only facility construction, but activities conducted under the IRDP as well.

In addition to the Model Project for Improvement of Agricultural Production, the Gampaha IRDP comprises projects for development of human resources, social infrastructure, economic infrastructure, welfare facilities, etc. It is anticipated that these other projects will be the subject of cooperation from Japan as well.

(4) Project Components

The Model Project for Improvement of Agricultural Production, a priority project under the Gampaha IRDP comprises the following schemes.

Scheme	Function
1. Agricultural Technology Transfer Scheme (ATT Scheme)	Model cropping of paddy and upland fields on model farm. This scheme is the center piece of the Project and will demonstrate to farmers increase in income and employment opportunities through effective utilization of existing farm land.
2. Morena Model Irrigation Scheme (MMI Scheme)	Extension through model area of intensive cropping technology development under ATT Scheme. For this purpose, water use facilities will be rehabilitated/constructed to permit effective water management.
3. Minor Export Crops Promotion Scheme (MEC Scheme)	Production of high quality seedlings for MEC for inter-cropping in coconut fields, and distribution of the same to farmers through the ASS Scheme. Scheme will contribute to increased farm income by providing cash source.
4. Scheme for Improvement of Agricultural Supporting System (ASS Scheme)	Strengthening of existing Agrarian Service Centers, and extension to farmers throughout the District of cropping technology developed under ATT and MMI schemes. For this purpose, facilities will be strengthened and vehicles procured.
5. Scheme for Improvement of Agricultural Training System (DTC scheme)	Training of young future farmers and extension of cropping technology developed under the ATT, MMI and MEC schemes. For this purpose, facilities will be strengthened, and training equipment and materials will be procured. Although not directly related to immediate increase in production, the scheme will be indispensable for stable future agricultural development.
6. Project Office	Coordination of efforts of the numerous concerned agencies in order to realize the full effects of each of the above schemes and ensure that benefits accrue to farmers throughout the District, as well as to ensure that schemes are mutually compatible and fully integrated. It is judged that the role of the PO will be effective due to experience of MPI on IRDPs in 15 districts to date.

Broadly, the Project is aimed at alleviation of poverty and stabilization of rural life. This is to be achieved through increased farm income and employment opportunity. Strengthening of rural society is addressed from a multi-sector, integrated approach in order to touch the variety of aspects crucial to rural life.

The above is to be achieved under the Project through the effective utilization of existing farmland. This is imperative as development of farmland in Gampaha has essentially reached the saturation point. Expansion of cropped area is accordingly not an option.

Goals of the Project are likewise compatible with the economic targets of the Sri Lankan Government, i.e., ① food self-sufficiency, ② reduction of unemployment and ③ promotion of exports and reduction of imports.

As discussed in 4-2 (1), the following schemes will be implemented.

1. Agricultural Technology Transfer Scheme (ATT Scheme)
2. Morena Model Irrigation Scheme (MMI Scheme)
3. Minor Export Crops Promotion Scheme (MEC Scheme)
4. Scheme for Improvement of Agricultural Supporting System (ASS Scheme)
5. Scheme for Improvement of Agricultural Training System (DTC Scheme)
6. Project Office

Paddy productivity will be increased through well managed water use and introduction of dry season cropping of upland crops. However, as cropping techniques under the Project will be largely unfamiliar to area farmers, they will be demonstrated at model farms under the ATT Scheme.

Cropping practices developed at the model farms will be demonstrated at the farmer level through their introduction into the Morena model irrigation area of 390ha.

Intercropping of MEC's (coffee, pepper) in coconut fields will contribute to increased farm income due to their high cash convertibility. The seedling production center to be established under the Project will play a major role in this regard.

The farm support activities of such agencies as the Agricultural Department, Agrarian Services Department, and the Agricultural Development Authority will be strengthened to extend cropping technology developed under the above 3 schemes to farmers throughout the District. This will be performed under the ASS Scheme

through strengthening of facilities and procurement of equipment for extension activities.

Agricultural training will be strengthened under the DTC Scheme. This is done to train young future farmers, and create a farmer base sufficiently familiar with modern cropping techniques to make extension activities effective. The current 2 DTC facilities are deteriorated, inadequately equipped and do not provide an adequate learning environment. Accordingly, teaching equipment and materials will be procured, and facilities rehabilitated to effectively fulfill their intended functions.

A Project Office will be established to ensure the integrated and mutually compatible implementation of the above schemes. The PO will coordinate and monitor the activities of the concerned agencies to ensure that benefits accrue equitably to farmers throughout the District.

Due to the interrelated nature of the above schemes, their integrated implementation under the IRDP format will enhance their cumulative effect, much more so than would their implementation on a one by one basis.

(5) Study of Request Components

Requested facilities and equipment and their intended function under the Project are summarized in the table below.

TABLE 4-2 Request Components (Facilities/Equipment)

Scheme	Facilities/ Equipment	Function/need
<p>1. Agricultural Technology Transfer Scheme</p>	<p>① Intensive cropping model farm (2.1ha)</p>	<p>Demonstration of intensive cultivation in paddy field. Function of model farm is pivotal for overall Project</p>
	<p>② Upland crops model farm (5.8ha)</p>	<p>Demonstration of intensive cultivation of upland crops. Important function of demonstrating effective use of upland fields.</p>
	<p>③ Drainage improvement model farm (3.5ha)</p>	<p>Effect of improved drainage on production within the District</p>
	<p>④ ATT Center main building (772.3m²)</p>	<p>Management of the above model farms and guidance for farmers by experts. Adequate facilities and equipment are necessary.</p>
	<p>⑤ Ambepussa farm office (72m²)</p>	<p>Office at site for operation and management of the upland crops model farm located in Ambepussa. Necessary as Ambepussa is 30km from Morenna.</p>
	<p>⑥ Workshop (300m²)</p>	<p>Repair and maintenance of farm machinery. Necessary for daily maintenance of farm machinery procured for model farms.</p>
	<p>⑦ Drying yard (120m² + 150m²)</p>	<p>Required for post harvest crop drying and outside working in upland cropping.</p>
	<p>⑧ Shed (50m²)</p>	<p>Required for farm work requiring protection from rain such as fertilizer mixing, etc.</p>
	<p>⑨ Farm machinery</p>	<p>Required for farming, transport and application of agro-chemicals.</p>
	<p>⑩ Vehicles</p>	<p>Necessary for operations</p>
	<p>⑪ Equipment for extension/office work</p>	<p>Equipment required for extension activities, technical guidance, etc. at the ATT center. Copy of materials and reports, preparation of materials and reports, and filing/storage/analysis of materials.</p>

Scheme	Facilities/ Equipment	Function/need
2. Morenna Model Irrigation Project	<p>① Morenna anicut rehabilitation</p> <p>② Palu Oya anicut rehabilitation</p> <p>③ Main canal rehabilitation</p> <p>Right bank channel rehabilitation L = 3,450m</p> <p>Middle channel rehabilitation L = 1,318m</p> <p>Left bank channel rehabilitation L = 3,100m</p> <p>④ Drainage canal rehabilitation</p> <p>⑤ Vehicles for management</p>	<p>Rehabilitation of existing facilities is necessary to allow gate operation and flood control. Crest at right bank and middle channel intake will be raised.</p> <p>Same as above. Crest at left bank intake will be raised.</p> <p>Rehabilitation of superannuated canal and intake facilities to permit proper water management. Farm road to be constructed along canal berm.</p> <p>Prevention of field inundation through improved drainage. Necessary for stable paddy cultivation.</p> <p>Necessary for transport of equipment for O/M of main channels, and for inspection patrols.</p>
3. Minor Export Crop Promotion Scheme	<p>① Seedling Production Center office (175.9m²)</p> <p>② Seedling farm Seedling beds: (0.81ha) Shade net</p> <p>③ Seed farm (1.17ha)</p> <p>④ Mixed cropping model farm (1.19ha)</p> <p>⑤ Sheds/Soil Treatment Yard (150m² × 2 houses)</p>	<p>Necessary for operation and management of the seedling center.</p> <p>Necessary for seedling production</p> <p>For superior seed production</p> <p>Demonstration of mixed cropping of coffee, pepper, etc.</p> <p>Necessary for farm work requiring protection from rain such as mixing of fertilizer, preparation of seedling bed soil, etc.</p>

Scheme	Facilities/ Equipment	Function/need
4. Scheme for Improvement of Agricultural Supporting System	⑥ Drying yard (228 x 2m ²)	Post harvest drying of coffee, pepper, etc.
	⑦ Greenhouse (32m ²)	Necessary for superior seedling production and pest control testing
	※ ⑧ District Office (295m ²)	Required for implementing the minor export crop administration in Gampaha. Should be born by the Sri Lanka side, as it is the regular facility for administration by the Sri Lankan Government.
	※ ⑨ Farm machinery	Necessary for general farm work
	⑩ Office equipment	Preparation and copying of materials, reports. filing, storage and analysis of materials. equipment for extension activities at the farm.
	⑪ Vehicles	Necessary for operation of seedling production center. To be used for operational activities. Transport and delivery of materials and produced seedlings.
	⑫ Fertilizer storehouse (45m ²) 6 units	Necessary for temporary storage of fertilizer to be delivered to farmers. Added to the AS center. Not capable of accommodating seeds.
	⑬ Seed storehouse (45m ²) 8 units	Necessary for temporary storage of seeds to be delivered to farmers. Added to the AS center. As distribution of seeds is concentrated just before the Maha and Yala seasons, these facilities are required. (Vehicles are also necessary.)
	※ ⑭ Bemmulle AS center 1 unit	The activities started in 1988. An old building belonging to another agency has been leased. Its own AS center is required for more substantial activities. Site is not yet determined, still in the B/D stage.
	⑮ Hauling vehicles	Truck for hauling fertilizers, seeds, etc., from central storehouse to 26 AS centers, and 2w tractors for delivering them from AS centers to each farmer are required. Hauled amounts will total 4,000t of seed and 3,000t of fertilizer.

Scheme	Facilities/ Equipment	Function/need
5. Scheme for Improvement of Agricultural Training System (Ambepussa and Walpita DTCs)	⑤ Staff vehicles	Necessary for extension activities and services for farmers (for supplement). Number of motorbikes was decreased (to 26 units) as there are some still usable.
	⑥ Farm equipment	For lending to farmers for spraying agro-chemicals. This is required for pest control to ensure stable harvests.
	※ ⑦ Plant cage (26 places) (12m x 10m)	For temporary storage of seedlings of vegetables, coffee, pepper, fruit trees, etc., to be delivered to farmers. It can be born by the Sri Lanka side judging from its low cost.
	※ ⑧ Seed Paddy Processing Unit (2 places)	Aiming at seed production. Request considered premature due to unclear need and scale.
	※ ⑨ Motorbike for KVSN Officer (extension worker) (50cc, 85 units)	For extension workers from Agricultural Department. Together with extension workers from Agrarian Services Department, number of extension workers will amount to more than 1,200. So area assigned to each worker becomes very small and a motorbike is judged not to be necessary.
	※ ⑩ Shallow well (12 AS centers)	Water supply to the center. Considered appropriate to be born by the Sri Lanka side.
	※ ① Classrooms (2) 396m ² , one building.	Necessary for training. Existing facilities are 50 years old and unsuitable for learning environment. Modern facilities are required. Facilities are simple, and their construction should be borne by the Sri Lankan side.
	※ ② Hostel (w/ canteen) for 60 persons, 1 building, 565.5m ²	For trainees lodging. as the existing facility is not sufficient. Facilities are simple, and their construction should be borne by the Sri Lankan side.
	③ Workshop (w/ tools) one building, 162m ²	For maintenance and repair of farm machinery, and practical training of maintenance/repair
	④ Irrigation and domestic water supply	Necessary for irrigation supply to training farm and water supply to dormitory, office, etc. The existing facilities are not sufficient.
⑤ Farm machinery	Necessary for farm training. Emphasis will be on mechanized farming at Ambepussa.	

Scheme	Facilities/ Equipment	Function/need
6. Project Office	⑥ Training equipment	Horticultural, carpentry, home science, lab, seed preservation equipment, etc. are necessary for training purposes. Existing equipment is either old, inoperable or lacking.
	⑦ Office equipment Copy machine (1 unit)	Necessary for copy of materials, reports and training.
	⑧ Vehicles Jeep (1 unit) Motorbike (2 units) ※ Minibus (1 unit)	For operations. Minibuses procured for the Project Office will be utilized under this scheme as well.
	※ ⑨ Reconstruction of the existing hostel and office	Superannuated and requiring reconstruction. Reconstruction work should be borne by the Sri Lankan side.
	※ ⑩ Project Office main building (650m ²)	Sufficient activities including meetings, storage and preparation of materials for suitable operation and management of the IRDP in Gampaha are difficult in leased space in Kachcherin. However, administrative space should be borne by the Sri Lankan side.
	⑪ Staff vehicles Minibus (26 passengers, 2 units) Jeep (2 units) A/V car (1 unit)	Necessary for extension activities, technical guidance, and operational activities. Management at the PO of the numerous vehicles to be provided under all the schemes would not be effective. Consequently, the concerned agencies will manage the vehicles for the schemes under their jurisdiction. However, in the case of the minibus and A/V car, those to be deployed at the PO will be used for the other schemes as well in the early stages of the Project due to lesser initial demand for these vehicles.
	⑫ Office equipment	Necessary for preparation and copying of materials and reports.

※ Items included in the request by the Sri Lankan Government, but subsequently excluded by the Japanese Government after study.

(6) Need for Technical Cooperation

The Sri Lankan Government has requested technical cooperation from the Japanese Government for the implementation of the Project. The application of the envisaged technologies under the Project, i.e., cropping, fertilizers, agro-chemicals, farm management, water management, etc., will require, despite their modest nature, technical guidance to maximize their effect.

As the Project comprises one link of a larger IRDP, technical guidance will also be anticipated as necessary to ensure a smooth progression to subsequent stages of the IRDP.

A combination of direct technical guidance in the form of the dispatch of Japanese experts to Sri Lanka, and training of selected Sri Lankan personnel in Japan, would be considered effective.

(7) Basic Orientation for Cooperation

The Project is judged appropriate for inclusion under Japanese Grant Aid in view of Project orientation, implementation approach, Project components, Project effect, practicality, administrative and budgetary capabilities of the Sri Lankan Government, and compatibility with the goals of the Japanese Grant Aid Program.

Hence, Project components have been studied and the basic design performed on the assumption that the Project will be implemented under Japanese Grant Aid.

4-3 Project Description

(1) Executing Agency and Operational Structure

The subject Model Project for Improvement of Agricultural Production is one part of a larger integrated rural development project. In Sri Lanka, overall implementation of IRDP's falls under the jurisdiction of the Ministry for Plan Implementation. Nevertheless, the MPI must work in close concert with numerous agencies due to the fact that the IRDP spans a variety of sectors.

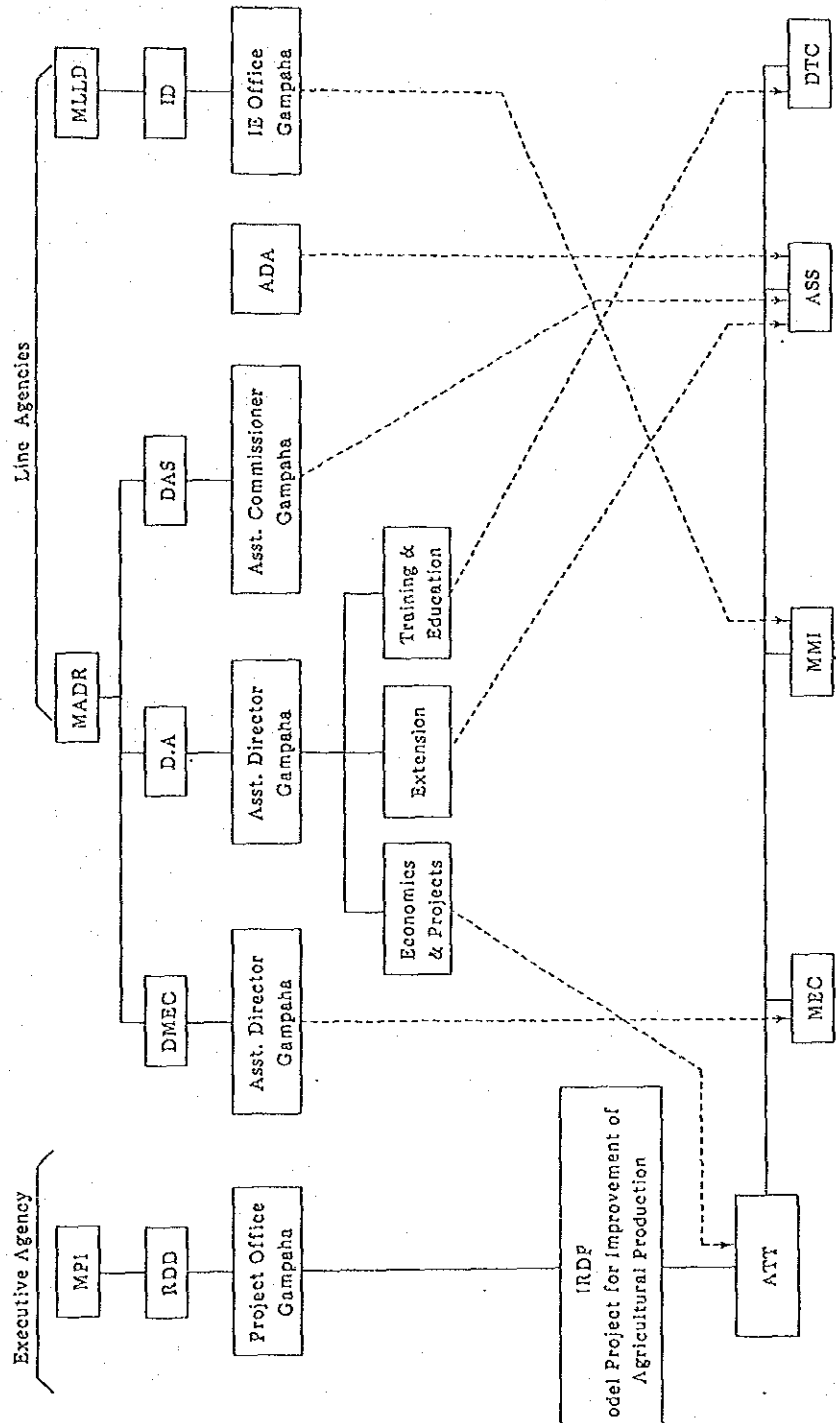
During the implementation period under Grant Aid, in other words construction and procurement, the Regional Development Division of MPI is the responsible agency.

Following completion of construction and procurement, the Gampaha District Project Office takes over as the principal operating agency. (Details are discussed in Section 4-4, (1)). However, completed facilities and procured equipment are supervised by the respective agency concerned. This relationship is as follows:

- | | | |
|---|--|---|
| ① | Management and Supervision of IRDP: | Gampaha Project Office under the Regional Development Division of MPPI |
| ② | Agricultural Technology Transfer Scheme: | |
| | Implementation: | Agriculture Department of Ministry of Agricultural Development and Research |
| | Others: | Irrigation Department of Ministry of Lands and Land Development; Agrarian Services Department of Ministry of Agricultural Development and Research; Agriculture Development Authority; Land Reform Committee. |
| ③ | Morena Model Irrigation Scheme: | Morena subcommittee of District Agricultural Committee |
| | Principal committee members: | Agriculture Department and Agrarian Services Department |

- of Ministry for Agricultural Development and Research; Irrigation Department of Ministry of Land and Land Development; Agriculture Development Authority; Farmer representatives
- ④ Minor Export Crop Promotion Scheme: Minor Export Crops
Department of Ministry for Agricultural Development and Research
- ⑤ Scheme for Improvement of Agricultural Supporting System: Extension Section of Agricultural Department of Ministry for Agricultural Development and Research; Agrarian Services Department of Ministry for Agricultural Development and Research; Agricultural Development Agency
- ⑥ Scheme for Improvement of Agricultural Training Scheme: Training and Education Section of Ministry for Agricultural Development and Research; Ambepussa DTC and Walpita DTC

Fig. 4-1 IMPLEMENTATION STRUCTURE



(2) Project

(i) Agricultural Technology Transfer Scheme

The objective of the scheme is to demonstrate, through actual farming, increased agricultural productivity by effective utilization of paddy and upland fields. Under the scheme, 3 model farms will be established: i) intensive cropping model farm, ii) upland crops model farm and iii) improved drainage model farm.

The Morenna area of the Attanagalu Irrigation Project has been selected as the site for the intensive cropping model farm. The reasons for this are i) good anticipated demonstration effects, ii) central location in the District, iii) availability of irrigation water, iv) readily procurable national land, and v) farmland suitable for implementing at the individual farmer level the cropping patterns to be developed at the model farms. The upland crops model farm site, however, has been selected at Ambepussa due to the lack of suitable government owned upland in the vicinity of the Morenna area.

The 2.1ha of paddy to comprise the intensive cropping model farm at Morenna is considered ample for the demonstration purposes under the scheme. The model farm will serve as an effective base for technical guidance at the individual farmer level in the surrounding Morenna model irrigation area. The intensive cropping model farm will focus on 16 households which rent farmland in the area to develop a cropping pattern based on rice with supplementary production of highly cash convertible upland crops as well as crops for increased food supply. The cropping plan will be determined by experts to be assigned under the ATT Scheme and members of the ATT Operation Committee to be newly established.

The Ambepussa upland crops model farm will comprise 5.8ha of currently unused land. The farm will employ area farmers for cultivation of upland crops including fruits and flowers. Farmers will in addition to receiving a salary, learn new upland crop farming techniques. Salaries will be paid from the proceeds of crop sales from the model farm.

In the case of the upland crops model farm, which is currently not farmland, it will be necessary to prepare fields and construct irrigation facilities and farm roads.

The improved drainage model farm is aimed at increased production through rehabilitation of drainage facilities in poorly drained areas. The farm will encompass 3.5ha and be sited close to the intensive cultivation model farm. The farm will provide direct instruction in cropping to the 22 farm households currently on the land.

Under the improved drainage model farm, existing drainage canals will be rehabilitated.

The intensive cropping model farm is sited at the upstream portion of the benefit area of the Morenna Model Irrigation Scheme. Irrigation is readily available. However, modernization of agriculture in order for the area to serve as a model will require construction of farm roads, separation of irrigation and drainage facilities, land leveling, plot preparation, etc.

An Agricultural Technology Transfer Center will be constructed in the Morenna area to serve as the base for activities involved with the various model farms. The center structure will include a manager's office, an accountant's office (accountant to also function as assistant manager), 7 experts offices, soil laboratory, general office (for about 8 staff), large guidance/conference room (for meetings of experts and operating committee), small meeting room, audio room, staff room, storeroom, lunch room, corridors, bathrooms, etc. A workshop, garage, and watchman's quarters will be attached to the main building.

At the Ambepussa farm, an office, sheds, watchman's quarters and irrigation facilities will be constructed.

Under the scheme, farm machinery (4w and 2w tractors, etc.) AV equipment (projector, TV, video, etc.), copy machine, and vehicles (jeep, motorbike, etc.) will be provided for the execution of activities. A personal computer has been eliminated from consideration under the Project. It is judged that it would be more appropriate to provide such at a later date when need, intended use, etc. become clear.

(ii) Morenna Model Irrigation Scheme

The MMI Scheme aims to demonstrate at the individual farmer level new intensive paddy cropping technology developed at the ATT Center. For this purpose, main canals, turnouts, and intakes from the main canals are to be rehabilitated to permit suitable water management. Roads (2.5m width) are to be constructed along canals to permit effective water management. At present, there exist only paths traversable on foot, which greatly hinder water management activities. The roads would also be utilized for general farm work.

The water source for the Morenna model irrigation area is to be the anicuts at Morenna and Palu Oya. However, due to the fact that both facilities are superannuated, structurally deteriorated and with poor gate operation, ample discharge cannot be passed and flood damage occurs upstream of the structures. Consequently, the Morenna and Palu anicuts are to be rehabilitated, and properly functioning gates installed.

The total main irrigation canal length of 11.4km is to be rehabilitated. Diversion from the canals is presently performed at 80 points. In order to improve water management, this number is to be reduced to 29 locations.

(iii) Minor Export Crop Promotion Scheme

The anticipated benefits of intercropping of minor export crops (coffee, pepper, etc.) in coconut fields are anticipated to be great. The increase in farm income is predicted to be significant. As discussed in Section 4-4-3, the 15 year target for cultivation of MEC in Gampaha District is 15,500ha. Under the scheme, seedling production facilities (20 houses for coffee, 14 houses for pepper) of 4,080m², a seed production farm and a mixed cropping model farm are to be constructed to meet targets for the first 5 years (phase 1). Extended area for cultivation of MECs under the scheme for the first 5 years is 3,000ha, which is an annual increment of 600ha.

The seedling production center is to be constructed on government land at Walpita. In addition to the above seedbed and farms, a farm office, sheds, greenhouse, watchman's quarters and irrigation facilities are to be constructed.

The office building is to include a manager's office, experts' offices, general office, guidance room, lunch room, etc.

Farm machinery (4w and 2w tractor), vehicles for transport of equipment and produced seedlings (3.5t truck, pickup), and general use vehicles (jeep, motorbike) will be provided.

(iv) Scheme for Improvement of Agricultural Support System

The ASS Scheme will restore the intended functions of agencies concerned with farmer support activities, such as the Extension Section of the Agriculture Department, Agrarian Services Department, Agricultural Development Authority, etc., through rehabilitation and strengthening of existing facilities and services. The scheme will also be responsible for extension and farm support activities under the Model Project for Improvement of Agricultural Production. Storehouses will be constructed and vehicles provided for timely delivery of production equipment, seeds and fertilizer to

farmers. Due to intensive utilization of vehicles during periods of distribution of farm inputs, communal use of vehicles by concerned agencies will not be feasible. Consequently, separate vehicles will be procured for these concerned agencies.

Vehicles for transport of personnel involved in extension and technical guidance activities will be provided to the Gampaha offices of the Agriculture Department, Agrarian Services Department and Agricultural Development Authority.

(v) Scheme for Improvement of Agricultural Training System

Training of young future farmers and upgrading technology levels of district farmers are crucial to development of rural areas in the District. This scheme accordingly assumes great importance, particularly in view of the fact that there are no agricultural schools in Gampaha District.

A basic familiarity with modern farming techniques is also essential for successful extension under the ATF Scheme.

Unlike the other 4 schemes under the Project, the DTC Scheme is not directly linked to increased agricultural production, and hence its benefits are more difficult to gauge. However, an IRDP must not focus solely on the readily tangible goal of improved farming productivity, but on latent development potential as well which will yield future benefit. Education and training are important aspects of the latter.

There are District Training Centers in Gampaha at Walpita and Ambepussa. These facilities are former army barracks constructed during the 1940's and are badly deteriorated. Training materials and equipment are also old and outdated. The district office of the Agriculture Department has formulated a plan to expand farmer training from the current 15,000 man-days per year to 50,000 man-days per year. The Department hopes by this plan to make a significant contribution to the extension of modern cropping technology to farmers. The plan divides the year into 4 terms, with 10-12 curricula per term. Courses range in duration from 3 days to 3 months.

The present training program avoids the busy farm seasons. However, due to high demand, the plan intends to run training programs year-round. The DTC's at Ambepussa and Walpita are designated to respond to this demand.

Irrigation facilities must also be constructed for the training farm to permit the cultivation of vegetables.

Farm machinery (4w and 2w tractor, etc.), horticultural equipment, carpentry equipment, teaching equipment (O/H projector, TV, video), a

copy machine, and vehicles (jeep, motorbike, etc.) will be procured for execution of training activities.

The 2 minibuses to be deployed at the Project Office for the overall IRDP will be available through prior scheduling for transport of students.

(vi) Project Office

IRDP's are under the overall jurisdiction of the Ministry of Policy Planning and Implementation. However, the IRDP spans numerous sectors, and the various concerned agencies are responsible for the respective related activities under the Project. MPPI must accordingly work closely with these agencies in project implementation.

MPPI evaluates and approves the various projects and schemes under the IRDP and draws up the financial plan for the Project. Each concerned agency is then responsible for construction and O/M for the scheme or project under its respective responsibility. Agencies must submit monthly progress reports to MPPI for the duration of the IRDP.

A National Project Steering Committee (NPSC) at the national level, and a District Coordination Committee at the district level are set up to coordinate the above activities.

Construction and equipment procurement for the Project are to be performed by MPPI, which will be the contracting entity. However, O/M for the schemes under the Project following construction will be carried out by the concerned agencies, as has been the practice for other IRDPs. Nevertheless, as the overall implementing agency, MPPI performs budgetary planning, coordinates the total IRDP, and supervises and evaluates O/M carried out by the concerned agencies. Agencies report regularly to MPPI on the status of projects and schemes under their responsibility.

MPPI establishes a Project Office at the district level which serves as the center for MPI activities with regards to that district's IRDP.

Under the above format, IRDP's have been carried out for 15 districts. MPPI accordingly has ample experience in the execution of such projects.

The Project Office will play a pivotal role in the implementation of the Project, and it is essential that it be planned such that it can fully carry out its functions. Under planning by the Sri Lankan side, it is intended to have the director of the Planning Unit assigned to the Gampaha Kachcheri take over management of the Project Office.

The Project Office will be equipped with vehicles (jeep, etc.), office equipment (copy machine, typewriters, etc.) and equipment to be communally used (minibus, A/V car) by the concerned agencies under the various schemes.