

添 付 資 料

長期調査レター



Colombo, September 2, 1993

Mr. R. Pasakaralingam  
Secretary,  
Ministry of Policy Planning  
and Implementation

Dear Sir,


The long term survey team (hereinafter referred to as "the team" on the proposed project type technical cooperation (the project) for Integrated Rural Development Project in Gampaha District (Gampaha IRDP) has been dispatched for collecting detail information in order to formulate the project framework by Japan International Cooperation Agency (JICA).


The team conducted the survey through the series of discussion with official concerned and field survey by the points of view of respective fields during the period of 60 days from July 8, 1993 to September 4, 1993.


It is our pleasure to submit herewith the summary report on the survey results. The team will convey and report all the information obtained throughout the study and will have further discussion in order to formulate the project with authorities concerned in Japan.

All the member of the team sincerely wish to extend heartfelt gratitude to you, your staff member, all the official concerned the Gampaha IRDP, official in the local governments and farmers for the kind cooperation provided to the team during the survey.

Sincerely yours,

  
\_\_\_\_\_  
Osamu TAKAHASHI  
Agricultural Extension  
Long-Term Survey Team, JICA

  
\_\_\_\_\_  
Teruhiko WIBE  
Agronomy/ Technical Cooperation

  
\_\_\_\_\_  
Yoko ANDO  
Technical Cooperation

Copy to;

Mrs. S. Kuruppu : Director General, Department of External Resources  
Mr. Senarath Dissanayake : Chief Secretary, Western Provincial Council  
Dr. S.P.R. Weerasinghe : Director, Department of Agriculture  
Dr. S. Kathirgamathaiyah : Director, Department of Export Agriculture  
Mrs. Kamalini Wijeratne : Commissioner, Department of Agrarian service  
Dr. R. Mahindapala : Director, Coconut Research Institute  
Mr. S.A. Jinadasa : Chairman, Agricultural Development Authority  
Mr. Lesly Pupaeinghe :  
Mr. Hiroyuki Kinomoto : Second Secretary, Embassy of Japan  
Mr. Yoshiaki Sakamaki : Resident Representative, JICA Sri Lanka Office

The Summary Report of the Long Term Survey  
on  
The Project Type Technical Cooperation  
for  
Integrated Rural Development in Gampaha District

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ANNEX 1 - Outline of the Project

## I. Introduction

The Government of Social Republic of Sri Lanka requested a project type technical cooperation to the Japanese government for Integrated Rural Development Project in Gampaha (the Gampaha IRDP) in July 10, 1990.

Based on the request proposal, Japan International Cooperation Agency (JICA) has dispatched the preliminary survey team with the aims to study the scope and to clarify the objectives and priority of subjects, and possibility of project-type technical cooperation program (the project) for eleven days from February 22 to March 4, 1993.

The long term survey team (the team) was dispatched through JICA based on the recommendation of the preliminary survey team and the series of discussion in Japan. The team purposed to obtain a detail information regarding farmer life, farming system, agricultural production, marketing system and organization and function of agriculture extension as well as government policy on agriculture production and rural development.

And the team has outlined the project framework based upon the result of the survey as shown in ANNEX - 1.

## II. Field and Duration of the Member

- |  |   |
|--|---|
| 1) Rural Sociology<br>(from July 23rd to August 21st.)                 | Mr. Kunio TSUBOTA<br>Manager,<br>Developing Economies Division 1,<br>Overseas Dept., National Institute of<br>Agriculture, Ministry of Agriculture,<br>Forestry and Fisheries           |
| 2) Water Management<br>(from August 5th to August 22nd.)               | Mr. Hitoshi UMETSU<br>Chief, Village Consolidation,<br>Agriculture, Forestry and Fisheries<br>Department, Yamagata prefectural Government   |
| 3) Agronomy/Technical Cooperation<br>(from July 8th to September 5th.) | Mr. Teruhiko NIBE<br>Technical Advisor (Agronomist),<br>Agricultural Development Cooperation<br>Dept., JICA   |
| 4) Agricultural Extension<br>(from July 8th to September 5th.)         | Mr. Osamu TAKAHASHI<br>Former Extension Specialist,<br>Agricultural Production and Extension<br>Division, Dept. of Agriculture, Forestry and<br>Fisheries, Kyoto Prefectural Government |
| 5) Technical Cooperation<br>(from July 29th to September 5th.)         | Ms Yoko ANDO<br>Staff, Agricultural Technical Cooperation<br>Division, Agricultural Development<br>Cooperation Dept. JICA   |

The Summary of The survey  
(Rural Sociology)

1. Overview of Gampaha District

Gampaha District, adjacent to Colombo in the South, has developed as the most industrialized district in Sri Lanka. Its western coastal areas along the Colombo-Airport road has been gradually transformed into a moder industrial zone. Areas nearby Colombo-Kandy road stretching from south to northeast in the District have also attracted many small factories an offices. Total population grew by 25% to 1.7 million between 1981 and 1991 but unemployment rate dropped from 27% in 1981 to 18% in 1985/86. Agriculture sector including forestry and fisheries accounted for 20% in total employment in 1985/86. The rate is likely to be lower today. Northern and eastern part of the District largely remained as agriculture area with coconuts and paddy as major products.

2. Village Community

Village communities surveyed have about 200 households in one village including non-farm households. Almost all population (99%) are Sinhalese, leading to a very high Buddhist ratio of 95 %. Communities remains basically agriculture oriented society but ones can find many non-farm occupations in the village; shop keeper, trader, carpentry and masoni, factory hands, office clerk, teacher, government officer, businessman. There are many primary and secondary schools in the village. Many villagers are blood-related in one sense or another except in few villages where settlement schemes have brought new people from other areas.

Villagers seem to have two ambivalent faces on community activities; natural and trusted on social aspects, passive and suspicious on economic fronts. Relatives and neighbors help each other in various occasions culminated at a time of wedding and funeral. Money and farm input are often rent without interest or at free charge. Poor children are adopted by richer uncles. Villagers organize funeral societies for mutual assistance. Various social/religion groups are found in many villages; village development society, farmers society, women's society, youth group, temple society. Some of them actively undertake social activities such as village road maintenance. Sinhala-Tamil New Year, Wesac and Poson (both are Buddhist holy days) are celebrated with full participation and corporation among villagers.

Nevertheless, village communities studied have not proved its competence to unite people for taking up new economic and business activities. Only one in 19 villages has agricultural cooperative, running solely credit service. No formal/informal groups sell their products jointly except few milk producer's cooperatives. Some women's groups have recently begun small saving schemes, handy craft, coconut collecting under the guidance of village officers but with limited scale and accountability. Generally speaking, villagers attitude remains "cautious" towards rapid changes.

However, subtle but steady changes seem to be creeping into village life. Many households (about fifty percent) have TV set (mostly black and white) at home. Younger generation are getting higher educations than their parents. Increasing number of youth work in factories/offices rather than in coconut fields. Old farmers often hesitate to express their hope that farming will be continued by sons and daughters. Mini-bus services have extended their reaches to once remote areas as roads has improved. Motorcycle has become an ordinary commodity for well-off X.

Local government locates one officer called "Grama Niladali" in each village. This village officer (VO) work as a contact point between the government and villagers in many aspects. His role covers so many aspects of villagers life including advice in farming, assisting application for food stamps or Janasavia subsidies, dispute settlement, village security, election preparation etc. Some VOs are ex-KVS who once worked as assistant extension workers under agricultural instructors.

### 3. Farm Households

One of the most striking findings from the survey is a very high ratio (70%) of the "part-time" households in the total despite of the fact that the samples were selected only from "farm households" in agriculture oriented areas. This can be still modest, compared with a similar survey conducted in 1988/89 which counted 87 percent of farm households as receiving less than half of total household income from agriculture. Income sources are indeed well diversified; salaries from factories, offices and local government, earnings from own shop or cottage industry, wages as workers, pensions and welfare grants from the government. Monthly expenditure including farming costs amounted at 4000 Rps. on average.

Household size varied from one to ten with a median of five. In many cases three generations live together. Number of children per family are relatively low for developing country reflecting the good performance of family planning and welfare policy of the government. Decision maker of the family is normally a male member who is financially most powerful. The role of house keeping goes to wife although she works in farming as well. Almost all family members of economically active age have got at least primary education although younger generations tend to have higher educational background.

Farmland owned by a farm household ranges from zero to 50 acres with substantial divergence. Actual distribution of farm households by farmland size cannot be derived because of disproportionate sampling method but mission's field visits confirmed the existence of large number of small and landless farm households. It was reported that farm households with less than one acres of own farmland accounted for about 67 % of the total in 1988/89. The rate goes up to 90 % if farmland size is raised to three acres per farm. Landless farm households make up 8 percent in the total. It is reported that family members sometimes make specific arrangements to avoid subdivision of already small farmland by heritage; youngest son inherits all farmland and takes full responsibility of taking care of parents. If necessary, other sons/daughters receive monetary compensation.



Roughly 30 percent of the households are entered into lease contracts on farmland. The leasers are relatives, large farm households and temples. Contract period is mostly 7 years. As for paddy fields, land owner usually takes 50 percent of harvested crops in return for providing fertilizers and sometimes agro-chemicals and seeds. In upland, contracts vary depending on conditions of coconuts planted. Annual cash payments plus planting new coconut in the beginning of contract period seems to be a standard contract but some owners want to share coconut and intercrop harvests when fertilizers and other farm inputs are given.

#### 4. Agriculture

##### (1) Land Use

Most farm households cultivate both upland and paddy fields. Labor constraint and water shortage make upland size much larger than paddy cultivated by a farm household. Paddy fields, mostly rainfed, are located in low places among upland fields. Some areas situated along rivers and streams get irrigation water during rainy seasons. In this Yala season, however, as much as 35 percent of paddy land in the District are left uncultivated because of delayed monsoon rain. Only few farmers produce crops other than rice in the paddy field. Only one in 83 farmers replied he produced crops in the paddy field in dry seasons.

Upland is covered with largely coconut trees and to much lesser extent with rubber. Land under coconut trees remains uncultivated or underutilized. Farmers release cattle there for grazing. Intercrops, though done by most farmers, occupy only 10 to 20 percent of coconut land. For many farmers who own some coconut land, lack of profitable intercrops rather than size of farmland seems to be more serious problem.

Many crops are planted as intercrops. Among them are bananas, cashew, coffee, arecanuts, mango, rambutan, lemon, cinnamon, jackfruit, passionfruits, pineapples, pepper, clove, betel leaf, manioca, yam, ginger, tarmelic and vegetables including egg plants, chilies, okura, beans and peas, pumpkins, squash, snakegoud, scintilla, local spinach and kunkun. An average farmer produces, however, limited number of intercrops for commercial purposes. They include bananas, pineapples, rambutan, cashew, betel, pepper, ginger, tarmelic. Some farmers have tried to produce temperate zone crops such as tomatoes, potatoes, cabbages, peas but with little success due to pests and insects, high temperature/moisture or dryness. But a few farmers tell that they can grow some of them if well managed.

No particular pattern of crop rotation was identified because (1) most intercrops are of perennial or semi perennial nature and (2) land size is not a major constraint for many farmers. However, in order to avoid over-exploitation of scarce elements in soil, farmers rotate or shift land for intercrops in a long run perhaps every 5 to 7 years depending on crops.

##### (2) Agricultural Inputs

**Fertilizers and Chemicals:** Farmers use chemical fertilizers and pesticides/insecticides for paddy and high return crops such as betel and pineapples, but not so for coconuts and other tree crops. "Compound" for specific crops and "NPK" are most popular fertilizers followed by single

element types. They are readily available at cooperatives, agrarian service centers and retail shops in the village or nearby town. Farmers unanimously claim that fertilizer prices have become too expensive in the last two years since the government abolished fertilizer subsidies in 1991. Current prices are about 500 Rs per 50 kgs, two and half times higher than two years ago. Government recent report says that fertilizer consumption in Sri Lanka has been stagnant these years.

Some farmers produce manure from animal waste in their farm because about 70 percent of surveyed farm households raise one to four cows/buffaloes per farm. Others release animals under coconut trees for increasing fertility of land as well as for grazing. A farmers group has recently launched production of organic compost from weeds available in a pond.

*Farm machineries:* For ordinary farmers farm machines are simply too expensive and too large for their land size. A two-wheel tractor costs more than 100,000 Rs. Some rich farmers have tractors and vehicles. Buffaloes play more important role in paddy cultivation. Bicycles and Motorcycles are major means of transportation.

### (3) Labor

Family labor can meet moderate labor requirement for most intercrops unless crop acreage being excessively high. But intensive labor requirements for paddy during land preparation, transplanting and harvest periods necessitate even tenant farmers to hire labor or tractor services. Some large farmer also employ yearly or seasonal workers for their upland crops particularly for pineapples. Wage rates for farming range between 65 to 100 Rs per day of male labor with breakfast or lunch. Woman's rates are 20 Rs less. Tractor fees are about 600 to 1000 Rs per acre.

It should be noted that a traditional labor (and animal) sharing scheme among a few, close farm households still functions as a means to reduce peak labor for a farm. In the scheme about ten persons from four to five farm households work together for a unit of paddy land of one family for two or three days and shift to other family's units one after another. All bulls possessed by member families are also mobilized.

These observation suggest that labor availability might become a bottle neck in introducing or expanding new labor intensive crops for a farm household. This would be further crucial if the current trend of gradual exodus of young labor force from agriculture continues.

### (4) Profitability

Not many upland crops promise high returns under the current market conditions. Farmers favor (1) coconuts because of low requirement for labor and inputs, (2) pineapples and betel for higher market prices and export opportunities (3) rambutan and ginger for high domestic demand. However, prices of these products fluctuate seasonally or yearly, owing to weather, harvests in other region, and volatile international markets. For example, coconut prices hit a peak of 10 Rs per nut last year while 3.5 Rs this season. Betel prices fell from last year's high of about 200 Rs per 1000 leaves to 75 Rs this year. Pineapple prices which stood at about 10 Rs per large piece in

April went up to 22 Rs in July. In drought year it shot up to 50 Rs. Prices of rambutan, currently 2 Rs each, would fall sharply in future because so many farmers have planted them recently.

#### (5) Training and sources of information

Farmers reply that they have learned basic farming skills from their parents or by themselves. Some farmers had opportunities to attend training courses on agriculture held in Morenna or other places. Attendants regard them as useful though mostly one day courses. Other farmers say that they have not been given opportunities although so wished. Courses demanded are diversified reflecting current status of their agriculture. Many farmers also have visited demonstration farms in Walpita, Ambepussa and Morenna but visiting alone does not seem to have satisfied them. Some betel farmers claim that their skills are better. Farmers get information on new technologies and varieties from different sources. Large farmers have more chance to receive advice from agricultural instructors or village officers. Advanced farmers are also important sources of information while traders convey real market information. It is notable that many farmers say TVs and Radios provide equally useful information on farming.

#### 5. Marketing

**Farmers:** In many cases farmers sell their products at the farm. Small traders visit farmers once in a while and pick up small quantities of fruits, vegetables and seasonings. Some wholesalers or exporters harvest pineapples by themselves in farmers fields to select best quality products suitable for export. Farmers also bring small quantities of products to traders or retailers in nearby town or villages. A limited number of farmers sell their products in local fairs which are held once or twice a week in certain places. Farmers seldom grade their products because traders would not offer higher prices for graded ones. Exception is betel leaf. Farmers grade harvested leaves into three or four categories by color and size and separately pile into a 1000 leaf pile. Each pile is wrapped by banana leaves, put into a specific net baskets and transported by farmers to local fairs where traders exporters are expected to come. Other products are transported as they are or packed in jute bags or baskets. Farmers often blame traders for profiteering and exploitation but no farmers cooperatives or joint marketing groups have been found in all 19 villages.

**Traders/ Wholesalers:** Traders transport farm products by lorry/trucks to rural towns, Colombo and Kandy wholesale markets, or exporters warehouses. Grading is made for some products including pineapples before shipping but not for other fresh fruits or vegetables. Poor packing, excessive squeezing, careless handling, bad road conditions and heat result in high rates of loss during transportation/storage for many fresh farm products. Some estimated them as 30 to 40 percent of original weight at harvest. Colombo central wholesale market looks very old and congested. Facilities to store or display are almost nothing. Traders often trade on the lorries parked or platform floors. Little attention is paid to the quality of products; size and freshness are neglected. A specific wholesale/retail market in Colombo allegedly said to target wealthy and foreigners has only several shops selling limited numbers of fruits vegetables including imported ones. It appears market size for high

quality and value-added products is so small and a age of mass consumption of these products has yet to come.

#### 6. Exporters' View

Two large exporters seem to be very cautious and somewhat skeptical about the idea of expanding exports of fruits, vegetables and other minor crops. Followings are their views.

- Major importers of Sri Lanka's products are Maldives, Pakistan and Middle East countries, suggesting that her competitiveness is limited. In fact expatriated Sri Lankan workers and low income populations in Middle East countries are the major buyers of these products.

- Competition with other exporters such as India, Malaysia, Indonesia, Thailand is harsh. Even betel leaves which Sri Lanka has comparative advantage now will be taken over by India in five years time.

- Sri Lanka fruits and vegetables have three basic disadvantages for export; high production costs, low quality and unstable supplies. Production by small producers result in high costs. Little attention is paid to produce/market high quality products. Production is unstable being affected by weather and as a matter of worse, farmers sell their products in the domestic markets lured by high prices at a time of short supply. Nothing is left for export.

- To overcome these problems, exporters have started vertical integration. Some farms have been established to produce export quality products on a regular basis. Technical staff have been recruited.

**The Summary Report of the Survey  
(Water Management)**

**1. Observation**

**(1) Soil**

Soil type in Gampaha district is mainly Red-Yellow Podzolic Soils. This type of soil is distributed in the district except western coast and central areas. Top soil layer which is important on moisture holding was 5 to 10 cm and solidified at many of surveyed area. These soil condition means less water holding capacity and rainfall runs off without penetrating into the soil.

**(2) Climate**

Sri Lanka belongs to tropical zone and it is with less variance of temperature at high level throughout year. Temperature change and rainfall are depend on monsoon. Monsoon from north east is called Maha season from October to February and south west monsoon called Yala season from April to September.

Agro-Ecological zone of Gampaha is in the wet zone and majority of the area is shared by the WL3 (Wet Low Land, Laterite region). There are the area of WL4 (Wet Low Land) in the west and WL2 (Wet Low Land) in the east.

Annual rainfall is in the range of 2000 mm to 2600 mm, 40% in Maha season and 60% in Yala season.

**(3) Hydrology**

There are three major rivers as a source in the district, Maha Oya in the norther border, Attanagallu Oya in the central and Kelani Ganaga in the southern border.

Those rivers are providing water for paddy irrigation and causing the stagnated areas in the basins at Yala season.

Underground water as a source is described in the "The Irrigation National Atlas of Sri Lanka" published by the Survey Department. Considerable number of deep tube wells are found in the alluvium in the district and it could be estimated abundant of water deposit.

Shallow wells utilized in the rural area were dug by man power in the depth of 20 to 30 feet and rarely found around 60 feet with 5 to 6 feet in diameter. Water level was varied at 2 to 7 feet and many farmers answered being dried up of water in the dry season. It was happen to observed in the survey time of digging shallow well, the cost of digging was Rs.100 per foot.

**(4) Upland Irrigation**

All the shallow well observed during the survey were for the purpose of house use and 70% of farmhold used for watering upland crops in the dry season. The well only for irrigation was seldom.

Small pump were normally used of 25 to 50 mm pipe and suction head of 6 m and no submergible type pump were observed. There were some advanced farmer

believed the profitability of irrigation on upland crops by spending Rs 50 per day for electricity, however about 70% of them were watering by hand.

(5) Ambepussa Model Demonstration Farm

Through the survey in the farm and the District Training Center, it was found that newly established shallow well for 6 hectares of the farm was dried up in Maha season this year. It was designed for the farm as well as DTC's facilities. It would be important on the function of the facilities.

It was difficult to estimate water use in the each facilities due to no record of watering in the field except electric bill. Budget allocation for electricity in the both facilities was Rs 20,000 and expenditure was Rs 17,000 in 1992.

## 2. Recommendation

Intensively planned farming by increasing efficiency of land use by strengthen intercropping and crop rotation systems is essential condition for agricultural development under the condition of Gampaha district. It also required to consider the countermeasure for climatic disaster in the dry season. Irrigation on profitable upland cultivation is essential on positive approach for crop selection, yield increase and flexibility of planting time.

The principal of upland irrigation is to guarantee soil moisture for the best condition of plant growth and water must be supplied required quantity as necessary. This technology would be established by the study of the mutual relations among climate, soil, crop and civil engineering etc.

(1) Ambepussa

Importance was recognized of maintain water source and supply throughout year for carrying out the roles and functions of their facilities. As alternative water source, to study Maha Oya which located near by the facilities and also the potential of deep well is recommendable to satisfy the demand of the facilities.

Technical guidance of water use and management of water supply would be necessary to maximize the capacity.

(2) Upland irrigation on Model Demonstration Plots in the Villages

Water source should not be considered uniformly. River, pond(tank) or well are to be considered as the source during the survey. As a model case of deep tube well construction by the project is recommendable at model demonstration plot in the alluvium zone to study its stability of water supply and economical feature for future development.

In the other hand, not only engineering approach but also input organic matter, expansion of effective soil layer and mulching by the farming effort are to be practiced in order to reduce water consumption in the field.

(3) River and Pond(tank)

In case of utilize river as the source, it is necessary to determine the water intake point with consideration of the change of water level by the seasons

unless water flow in the dry season meets the demand. This source should be used for upland irrigation where there are not alluvium zone.

(4) Deep Tube Well

Although deep well is not intervene water flow of existing shallow well, cost of construction is depend on the depth and the diameter of tube. Therefore consultation of geologist is required. Fixed cost of this type of well is highest due to use submergible pump.

(5) Shallow Well

As the source of water for upland irrigation, handy type submergible pump could be recommended for any depth of existing shallow well and vinyl pipe will be enough for a water way to the field. Fixed cost will be the cheapest in this method.

(6) Irrigation Method of Upland

Fixed piping method for watering is not feasible by the production cost, vinyl hose is suitable enough on minimize the distance and handy to move.

(7) Maintenance Cost

Large portion of the cost of maintenance will be an electric fee. It is essential being understood to employ the irrigation method to upland cultivation.

The Summary Report of the Survey  
(Agronomy)

1. Observations

(1) Present crop production technology

The technology of crop production was studied through interview, observation and documentation.

Coconut Research Institute is carrying out various research at station and on-farm levels and over 40 intercropping patterns are introduced as potential crops such as coffee, pepper, cacao, banana, pineapple, passion fruit, cinnamon, clove, ginger, turmeric etc. Economical analysis was applied on major cases. Basic technology and crops suitable for intercropping are described in "Coconut bulletin" and Advisory Circular". Recently detail information concerning adaptability of intercrops on soil types is published.

Technology development, training and administration are carried out by the Department of Export Agriculture. Crops in the category is out of major export crops such as cacao, coffee, cinnamon, pepper, cardamon, clove, nutmeg, citronella, vanilla, betel leaf and betel nut (Arecanut). Cultivation technic concerning new planting, replanting and maintenance are established. Seedlings are continuously produced as planned at Walpita Nursery center which granted by Japanese government. Demand of coffee and pepper seedling are decreased due to price down in the export market.

Other crops except minor export crops and plantation crops such as coconut, tea and rubber are under the responsibility of the Department of Agriculture. The department is carrying on research and extension and training. Extension and training are decentralized to provincial council due to recent reorganization. Cropping system by climatological zones and administrative divisions are published by the department in "Crop recommendation for adoption in Grama Niladari Division of Sri Lanka, 1990". Recommendation for crop cultivations are described in "Crop Recommendation Technoguide, 1990" published by the department for two kind of cereal crops, four of legume crops, seventeen of vegetables and eight of other economical crops. These crops as intercropping in the coconut cultivation are recommended eleven patterns in the period of five years to twenty five years of coconut age. twenty four patterns of mix cropping are also introduced by geographical elevation and rainfalls.

Research work for Gampaha district is covered by Makandura research center and Bombwela research center.

(2) Production in the Villages

Crops Production: Many kinds of crops were observed as intercrops in the coconut cultivation in Gampaha. However according to the statistic, intercropped area was only 10% of the coconut cultivation and total 50% of the area is used including pasture or cattle grazing. Pineapple, betel leaf, ginger and banana are cultivated with farmer's interest as economical crops



and less concern was seen on pepper and coffee due to marketing or price. Vegetables were grown at home garden mainly for home consumption and sold when produced more. There are few farmer at some village cultivated intentionally as cash crops. Popular vegetables in the survey area were Egg plant, chili, okra and leaf vegetable such as gotugola, kankun and local spinach. Fruits were planted mainly as home consumption such as mangoes. Rambutan cultivation increased rapidly due to high price ( Rs.2-3/fruit). Flowers and ornamental plants were grown at most of the farmers in the pots or in the garden, no farmer has sold them although many selling stalls are running business along the main road.

Through the survey, productivity of most of the farming were not high enough however in some farmer practiced advanced farming with excellent knowledge of cultivation on cropping system and effective land use.

Quality Control and Marketing: Betel leaf was the only crop that farmer themselves were grading by size and color of leaves. Pineapple was harvested by size, maturity and place of cutting according to the market demand by trader or exporter, however for domestic market, farmer harvest and sold to traders by size. In the case other crops, most of the products were sold at farm gate to traders. There were farmers sold their product to called "Boutique" nearby town or village when small quantity.

Conclusion: Agriculture in Gampaha was run by farmers who had other sources of income. Except some crops, it seemed that production system considered market oriented farming to meet the demand is not practiced. Because the geographical advantage is not taken that Colombo as the country's biggest market is nearby. In the other hand, it is estimated that drastic increase of market demand is not seen due to size of market size. Moreover concerning export market, according to the hearing of exporter, generally the price of domestic market of agricultural product is high and the quality is not enough to compete in the export markets.

In order to promote a profitable farming for Gampaha farmers, effective land use is required to diversify by economical crops on the advantage of the location adjacent to the city market. At the same time intention of improve farm management should go not only to increase income from a crop but from entire farming by improvement of yield, quality and production cost.

## 2.Recommendation

### (1) Crops

It is difficult to determine the crops to be approach in the project.

Selection of crops in the project should be focus on the following criteria by study the case of advanced farmers and market demands;

A. Cropping system by combination of perennial, semi-perennial and annual crops is to be considered for splitting the market risk and sustainable farming.

#### B. Market oriented crops

- easy marketing crops
  - a. crops consumed large quantity
  - b. storable crops

- c. substitute crops of off-season crops
  - high value crops
    - a. crops and quality for high income consumers
    - b. off-season crops
  - introduction of new crops to the new potential market
- C. Exportable crops should not approach at initial stage of the project until establishment of the production system to meet the demand of export market.
- D. Flowers and ornamental plants should also be consider as economic crops.

(2) Technology development

Following subjects are considered to be approach;

- A. Crops in the project should be approached in wide range
- B. To study the crop adaptation in the variation of solar radiation according to the age of coconut tree.
- C. Effective fertilizer application to meet farmer's technical level and soil fertility
- D. Effective pest control
- E. Establishment of technical improvement system by the cooperation with research institutions

(3) Marketing

Selection economical crops and establishment of production system would be important factors for successful project implementation.

In order to increase farmer's income by introducing profitable cropping system based on selecting crops by market information, and to create a mind of marketing on farming through training and extension work to agriculture extension staffs and farmers should be attempted in the project.

It is recommended to set some subjects as follow;

- A. Collecting market information
- B. Improvement of marketing technic

**The Summary Report of the Survey  
(Agricultural Extension)**

**1. Observations**

**(1) General View of Village**

Generally many of the coconut cultivation has no intercropping, and even when intercropping is introduced most of their productivity is still low level. However some farmers was observed conducting advanced intercropping. It could feel the hope for future by the fact that there were groups of farmers around who were learning the improved farming from the advanced farmer.

**(2) Farmer's Organization**

There are some organizations that all the farmers belong or all the residents belong in each village, however normally it seems to be not so active. It was seen the problem on agricultural development that very few organization for production purpose to solve particular subject was existing.

**(3) Source Information**

Farmers normally obtained various information through mass media including agriculture technology and market and also by attending training courses and visiting demonstration farms. However these information was not effectively utilized or practiced due to not adaptable for their own farming. Farmer's opinion on the function of agriculture instructor as a source of information was varied.

Advanced farmer was obtaining information for set purpose. Considerable number of farmers around get the information from the advanced farmer and improving their farming were observed and there was many answers that the information exchange among the farmers is useful.

**(4) Agricultural Extension**

Agriculture Instructor (AI), Development Officer Agrarian Services (DO), Coconut Development Officer (CDO), Export Agriculture Extension Officer (EAO) and Village Officer (VO) have an effect on agricultural guidance. AI, as a core of technical guidance, was generally seen on their activities that content of guidance is not deep enough, activity is in fixed form and also the attitude of teaching. It is probably due to large number of responsible area. However some of the outstanding AIs are carrying out the work with learning through their activities such as contacting with advanced farmer, supporting production group and conducting demonstration plots. Although VO is not function for transferring technology due to their administration role, they have full knowledge of village and have full reliance of farmers. They are expected on the role of mobilize production groups.

**(5) Agrarian Support**

There are two sources of supports in the form of subsidies for development of productions. Department of Export Agriculture has new planting, re-planting and rehabilitation of six kinds of minor export crops. And Coconut Cultivation Board has re-planting, underplanting and rehabilitation of coconut cultivation

and intercropping of cacao, coffee, pepper and pasture. Both subsidies are effectively utilized, however criticism in the survey was that time is consumed from application to approval and qualification or regulation is too strict.

(6) Farmer Training

Two District Training Centers (DTC) in Ambepussa and Walpita, Agricultural Technology Transfer (ATT) Morrenna and Export Agriculture Crop Nursery Center in Walpita were surveyed on farmer training. Each centers were conducting many course and maintaining training field under the condition of small number of the staff and insufficient facility. However similar subject were applied in each centers and their role was not quite clear.

(7) In Service Training

In Service Training Institute (ISTI) in Gannoruwa and other four were studied on their training plans. Each institutes are conducting the well prepared training programs in every cropping seasons. Als in Gampaha attended to the training five times a year for ten days in average and this training is major technical source for them. However the question is remained how much the needs of farmer is reflected in the contents of training.

2. Recommendations

(1) Application of Village Model Demonstration Plots

- A. each of the plot management is to be carried out by active farmer's leader with group of farmers around.
- B. crops applied at initial stage should be familiar crops and gradually introduce new crops.
- C. VOs will take a role of facilitator on formation of production group and AI with the cooperation of DO, CDO and EAO will take a part of technical guidance. The guidance should be carrying out based on supporting the group's self-motivation.
- D. existing subsidy systems will be positively utilized.

(2) Training

- A. objects of training are AI, VO and leaders of production groups.
- B. contents and schedule of the training are as attached core curriculum, ANNEX-1
- C. method of training is based on "On The Job Training" which recurrent alternating training of with groups and at the field for five years. Purpose of a group training that to clarify and to solve the facing problem of trainees and of field training is the practice and evaluation of trained subject.

(3) Others

- A. activities and result of the model demonstration plots should be prepared for training materials for other training institutions.
- B. activities and results of the model demonstration plots should be released to mass media as the function of public relation.
- C. strengthen staff personnel and improvement of training and dormitory facilities are necessary as the site for the model demonstration farm and training center.

ANNEX-1. Core Curriculum of The Project

Training subject (Time of Implementation)	Objectives	Place of Training	Training Method	Object of Training	Remarks
1. Framework & object of the training (late 1994)	Understanding entire picture of the project and role of AI & VO	-DTC -Field	-Lecture -Observation	AI VO	-List up of 2,3 cases
2. Understanding of responsible area (late 1994)	Clarify the crop cultivation and seek a possibility of organizing group in the responsible area	-DTC -Responsible area	-Lecture -Survey	AI,VO VO	-Survey method -Questionnaires preparation
3. Analysis of actual situation and sample area (late 1994)	understand importance of grasp the situation and list up planned farmer's group	-DTC  -Responsible area	-Lecture  -Presentation -Practices  -Confirmation	AI & VO	-Analysis method of surveyed group  -Contents of survey  -Analysis of the group  -Discussion with target group
Setting up Core Model Demonstration Farm at Ambepussa Farm					
4. Group mobilization with model demonstration plot (early 1995)	Understanding the necessity & method of group mobilization and role of AI & VO	-DTC  -Responsible area	-Lecture  -Case study -Trial	AI & VO	-Framework of the plot, expected technic mobilizing method -Prepare 2,3 cases -Discussion with target group with a plan
5. Setting up Extension Plan (early 1995)	Understand that frame of contents of the plan must be set up with farmers	-DTC  -Responsible area	-Lecture  -Demonstration -Discussion  -Observation	AI	-Theory of extension planning & method -Preparation of the form & procedure -Review the plan with target group -Planing of each AI
Setting Up Five Model Demonstration Plots in the Villages					

Training subject (Time of Implementation)	Objectives	Place of Training	Training Method	Object of Training	Remarks
6. Technic & method of guidance of planned Crops (early 1995)	Increase ability of practical guidance technic and the guidance method	-DTC	-Lecture -Practice -Demonstration -Observation	AI	-Basic technic of material production -Field practice for understanding technology -Teaching material contest -Select advanced model cases
7. Training by visiting the model plots (late 1995)	Refer to future guidance and management by visiting & observing the other plots	-ATT -Demonstration plots DTC	-Lecture -Observation -Discussion	AI & VO Model farm	-Point of observation -Explanation by farmer, AI, VO -Evaluation of observations
8. Effective method of supporting group with model plots (late 1995)	Level up of ability through exchanging experience of activities	-DTC	-Presentation -Discussion -Lecture	VO	-ALL the member -Case study -Vo, group, farmer's activity record
9. Crop demonstration technic and guidance method (late 1995)	Level up of ability through exchanging experience of activities	-DTC	-Presentation -Discussion -Practice -Demonstration -Lecture	AI	-All member -Case study -Practice of field technology -Teaching materials contest -Activity record -Activity record technic, marketing & AI
Gradually recurrent training for grade up the contents of marketing, build up soil, new crops introduction etc. during 1996 - 1997					
10. Evaluation of group activity with the demonstration plot	Evaluate the 4 years' activity of farm of model plot by them selves and clarify the future action	-DTC	-Presentation -Discussion -Observation	Model farms	-Presentation by the record -Clarify problem & future plan -Model farm in DTC

Training subject (Time of Implementation)	Objectives	Place of Training	Training Method	Object of Training	Remarks
11. Evaluation of group activity with the demonstration plot (early 1998)	Evaluate the 4 years' activity of VO by themselves and clarify the future action	-DTC	-Presentation -Discussion -Observation	VO	-Presentation by the record -Clarify problem & future plan -Model farm in DTC
12. Evaluation of group activity with the demonstration plot (early 1998)	Evaluate the 4 years' activity of AI by themselves and clarify the future action	-DTC	-Presentation -Discussion -Observation	AI	-Presentation by the record -Clarify problem & future plan -Model farm in DTC
13. Evaluation of the entire project activity (late 1998)	Confirmation of the extension method promoted by the project and clarify the future action by Sri Lankan counterparts	-DTC	-Presentation -Slide presentation -Discussion  -Awarding -Memorial photographing	Govt. official Farmers' group, AI, VO, others	-Farmer, AI, VO from the model areas. -Occasional slide record of model plots  -Panel discussion by farmers, VOs, AIs & the project staff -Official to farmers -All the participants

### Outline of the Project

As the result of the survey, the following technical cooperation plan would be recommended according to principal policy of Sri Lanka with the introduction of Japanese technology and experience.

#### I. Background of the project

Gampaha district is geographically located in the north of Colombo district and belongs to Western province together with Colombo and Kalutara districts administratively.

Industrialization and urbanization are accelerated in the area of the Great Colombo Economic Commission (G.C.E.C.) in the western and southern part of the district. However there is conventional farming with coconut cultivation as main crop, so called the part of coconut triangle, is extended in the rest of area where shares over half of the district.

The farm size in the district is smaller than of the other district. It is 99.7% of farmers hold less than 20 acres and 66.9% of entire farmer belongs to the class of less than 1 acre. Those small scale farmer maintain low income level from their agriculture activities and also the profitability of their upland farming is affected by climate and market conditions.

To improve farmer's income level under these circumstance; (1) effective land use by introducing intercropping in the coconut cultivation, (2) introduction and expansion of a production method of high productivity crops, (3) establishment of crop production and marketing systems for stable farm management, are essential.

Agriculture policy of the Sri Lankan government focuses on crop diversification, promotion of export crops and introduction of high value crops for improving management of small scale farmers.

In order to achieve the above targets, however, following conditions are to be fulfilled; (1) improvement of production system with quality improvement, low cost production and stable supply systems for competitive international market, (2) improvement of crop production technology and marketing system to meet on demand, (3) improvement of extension system of cultivation technic and improved variety developed by research institutions.

Improvement of organization and methodology of extension activities would be situated as an important element. This task is handled by agricultural extension agencies and the "Training and Visit" method which introduced by the world bank and was carried out by agriculture instructors, which was not effective enough to transfer technology to farmers in spite of large number of personal intent. The reorganization of extension system in recent



decentralization bore the situation that an agriculture instructor takes average 6000 farmholds in one's responsibility and in the other hand, an attempt of improvement of the national finance by the advice of the World Bank and IMF which may cause the reduction of extension system. New approach is started as "The Second Agriculture Extension Project" by the cooperation of the World Bank changing extension method from top-to-bottom to bottom-to top and technology transfer to self-motivated farmer's group in order to achieve to increase an efficiency of activities.

## II. Objectives of the project

In order to improve farm management system and productivity, introduction of commercial crops and improved crop production technology are necessary by means of intercropping in the coconut cultivation.

The purpose of the project is, as model extension method, to demonstrate the effect of the village model demonstration plot through the training, based on the results of the core model demonstration plot, to agriculture instructors and leaders of production groups which are organized by self-motivation. The result of the model extension method is expected to be extended in the district.

### Note:

Production Group is a combined body of farmers who have common problem and intend to take actions in order to solve.

Core Model Demonstration Plot is a demonstration plot that set up in purpose to introduce sets of cropping pattern to Village Model Demonstration Plot based on the result of farm trial at Ambepussa model demonstration farm or nearby under the similar condition of farmer.

Village Model Demonstration Plot is a demonstration plot set up in the Production Group in purpose to extend cultivation technique and cropping system adaptable to the area's situation from the results of Core Model Demonstration Plots.

## III. Activities of the project

### 1. Development of Extension Materials

- 1) Improvement of cultivation technic
- 2) Introduction of new crops and new varieties
- 3) Improvement of cropping system of economical crops
- 4) Improvement of water management
- 5) Improvement of basic marketing technology
- 6) Demonstration of improved productive cropping system at the core model demonstration plot
- 7) Demonstration of productive farming at the village model demonstration plots

### 2. Improvement of Extension Method

- 1) Introduction of agriculture extension by the means of "Bottom up"

method

- 2) Improvement of promotion method of the production groups
  - 3) Demonstration of the effect of extension activities by the means of the village model demonstration plots
  - 4) Evaluation of extension activities
3. Training and Development of Training Materials
- 1) Training of extension method to agriculture instructors and village officers
  - 2) Training of crop production technic to agriculture instructors and leaders of the production groups
  - 3) Development of training materials

#### IV. Project sites

1. Gampaha IRDP office will be the project administration office
2. The project will be implemented the activities under the Agriculture Technology Transfer (ATT) scheme of Gampaha IRDP. Ambepussa District Training Center and ATT Upland Demonstration Farm will be the site for transferring technology and training on the above activities except items 1-6), 1-7) and 2-3).
3. Core model demonstration plot set up and managed by ATT in Ambepussa will be the site of activity for item 1-6).
4. Several village model demonstration plots set up and managed in the district by the production groups will be the site for activities of items 1-7) and 2-3).

#### V. Sri Lankan authorities concerned

1. Government agency of overall responsibility is the Ministry of Policy Planning and Implementation (MPPI)
2. Executive agency is the Chief Secretary Office, Western Provincial Council
3. Project coordination and control by Gampaha IRDP

#### VI. Term of technical cooperation

Five years starting from the date mentioned in the Record of Discussion

#### VII. Measures to be taken by the Japanese side

1. Experts dispatch
  - 1) long term experts  
around 6 long-term experts will be dispatched in order to achieve outputs of the project
  - 2) short term experts  
some short-term experts annually will be dispatched supplementally on necessary field in order to achieve the outputs of the project

2. Acceptance of counterpart personnel for training in Japan  
2-3 counter part personnel shall be accepted annually in Japan
3. Provision of equipment  
Necessary machinery, equipment and tools for the project implementation will be provided in the allocated budget

#### VIII. Measures to be taken by the Sri Lankan side

1. Provision of office space, local training facilities and demonstration field for the project activities (including storing space necessary for machinery and equipment provided to the project)
2. Management of the land for the core model demonstration plot in Ambepussa and several village model demonstration plots
3. Assignment of counterparts and administrative personnel for implementing the project activities  
At least 2 personnel with suitable qualification for each expert
4. Budget allocation for the smooth implantation of the project

#### IX. Administration of the project

1. The Secretary of Ministry of Policy Planing and Implementation will take overall responsibilities of the project implementation.
2. Chief Secretary, Chief Secretary Office, Western Provincial Council will take managerial and technical responsibilities on the project activities.
3. The Director of Gampaha IRDP will take responsibilities on the project administration.
4. The Japanese Team Leader will provide necessary recommendations and advice on technical and administrative matter concerning the project implementation.
5. The Joint Coordinating Committee will meet at least once a year and whenever necessity arises. and its function are follows;
  - 1) To give direction and guidance to the activities carried out by the Project and to coordinate inter-related activities within Ministry of Policy Planning and Implementation and other related agencies.
  - 2) To review and approve the Annual Work Plan of the Project to be formulated under the framework of the Record of Discussions:  
*according to*
  - 3) To review the overall progress of the technical cooperation program as well as the achievements of the Annual Work Plan;

- 4) To review and exchange views on major issues arising from or in connection with the technical cooperation program.

The members of the committee are as attached

Chairman : Secretary,  
Ministry of Policy Planning and Implementation (MPPI)

Secretary: Director, Regional Development Division, MPPI

Members : (Sri Lankan Side)

Director General, MPPI

Deputy Secretary Planning, Office of Chief Secretary,  
Western Provincial Council

Secretary, Chief Minister's Office, Western Provincial Council

Secretary, Ministry of Agriculture, Land, Local government and  
Cooperatives, Western Provincial Council

Director of Agriculture, Western Provincial Council

Deputy Commissioner, Department of Agrarian Service

Provincial Director, Agricultural Development Authority

Representative, Department of Export Agriculture

Representative, Coconut Cultivation Board

Representative, Department of External Resources,  
Ministry of Finance

Director of Gampaha IRDP

Other Officials appointed by the chairman, if necessary

(Japanese Side)  
Japanese Experts

Representative of JICA, Sri Lanka Office

Personnel concerned to be dispatched by JICA, if necessary

Observers: Officials of the Embassy of Japan

6. The project operation committee will be organized under the chairmanship of the director of Gampaha IRDP for smooth implementation of the project as follows;

The duties of the committee are

- 1) to prepare the operation and financial plans for the project
- 2) to monitor the operation of the project
- 3) to coordinate the concerning official agencies as ATT operation committee

The member of the committee are ;

Chairman : Director, Gampaha IRDP

Secretary: Director, ATT Moreenna

Member : (Sri Lankan Side)

Secretary, Chief Minister's Office, Western Provincial Council

Secretary, Ministry of Agriculture, Land, Local government and Cooperatives, Western Provincial Council

Director of Agriculture, Western Provincial Council

Assistant Director of Agriculture, Gampaha District

Assistant Director of Export Agriculture, Gampaha District

Agronomist, Coconut Research Institute

Regional Manager, Coconut Cultivation Board, Gampaha

Deputy Commissioner, Agrarian Services, Gampaha

Deputy Provincial Director, Agriculture Development Authority

Assistant Director, Training, Department of Agriculture, Peradenia

Agriculture Officer, DTC Ambepussa

Engineer, Irrigation Department, Gampaha

(Japanese Side)

Japanese Experts

#### X. Schedule of implementation

Tentative implementation Plan is as attached;

#### XI. Preconditions

The following preconditions shall be satisfied before starting the project:

- 1) The organization, personnel and function of the project are clearly defined.
- 2) Necessary number of counterpart personnel with qualification are assigned for each Japanese expert.

- 3) Cooperation from the organizations concerning the project is secured.
- 4) Necessary budget for the project is secured.
- 5) Necessary office space for the Japanese experts is secured.

It is kindly requested to forward to JICA when above conditions are confirmed by Oct 30, 1993.

**XII. Other**

The title of the project will be decided later.

**Attached : Tentative Implementation Schedule**

Activities	1st year	2nd year	3rd year	4th year	5th year
1. Development of Extension Materials	*****				
1-1. Improvement of cultivation technic	*****				
1-2. Introduction of new crops and new varieties	*****				
1-3. Improvement of cropping system of economical crops	*****				
1-4. Improvement of water management	*****				
1-5. Improvement of marketing technology	*****				
1-6. Demonstration of improved profitable cropping system at the core model demonstration plot	*****				
1-7. Demonstration of profitable farming at the village model demonstration plots	*****				
2. Improvement of Extension Method	*****				
2-1. Introduction of agriculture extension by the means of "Bottom up" method	*****				
2-2. Improvement of promotion of the production group	*****				
2-3. Demonstration of the effect of extension by means of the village model demonstration plots	*****				
2-4. Evaluation of extension activities		**	**	**	*****
3. Training and Development of Training Materials	*****				
3-1. Training of extension method to agriculture instructors and village officers	*****				
3-2. Training crop production technic to agriculture instructors and leaders of the production groups	*****				
3-3. Development of training materials	*****				

**Note:**

Method of evaluation for the input evaluation will be discussed by the operation committee.



