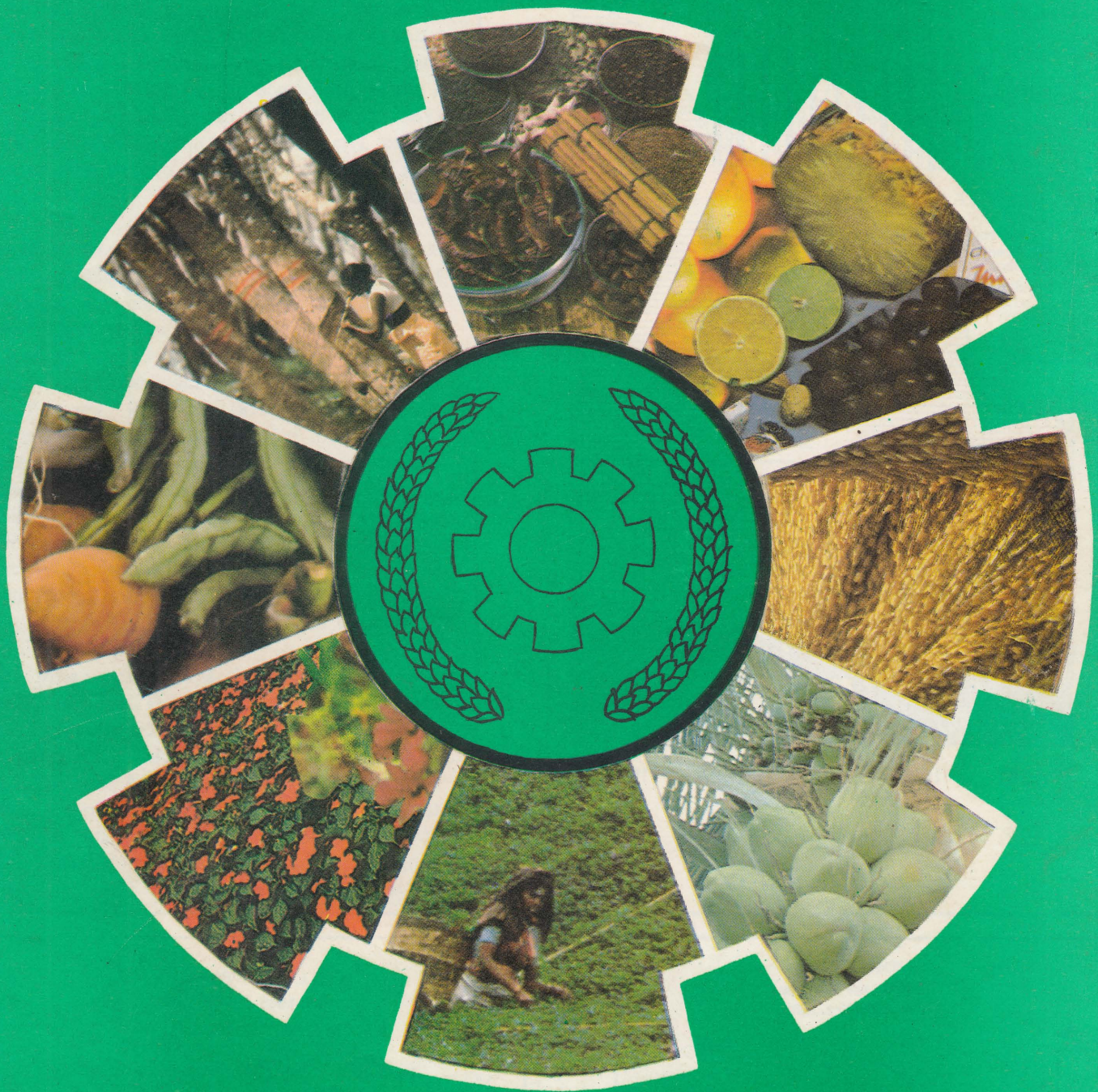
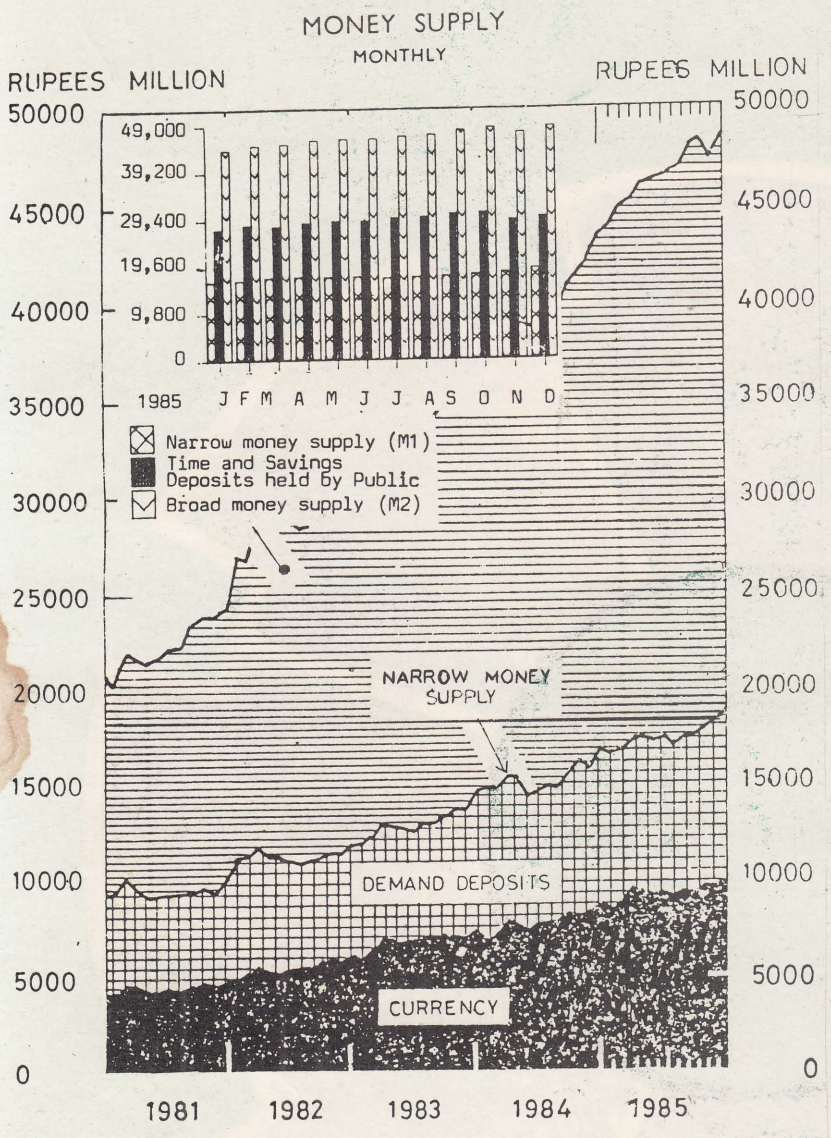
ECONOMIC REVIEW

May
1986



AGRO - INDUSTRIES

A PEOPLE'S BANK PUBLICATION

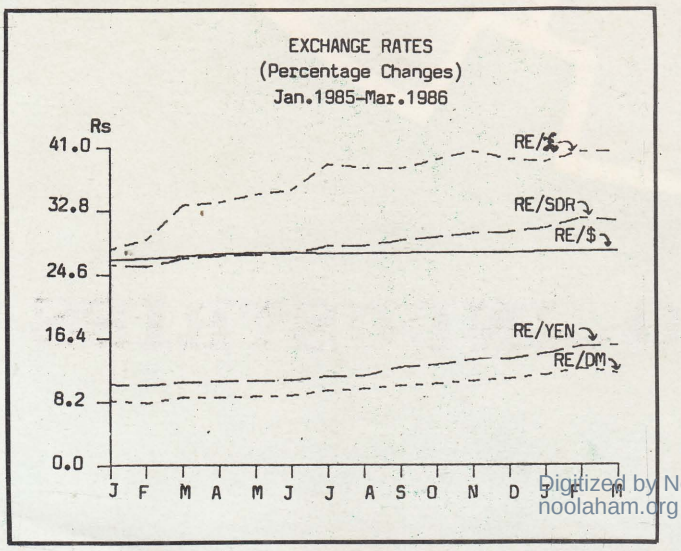


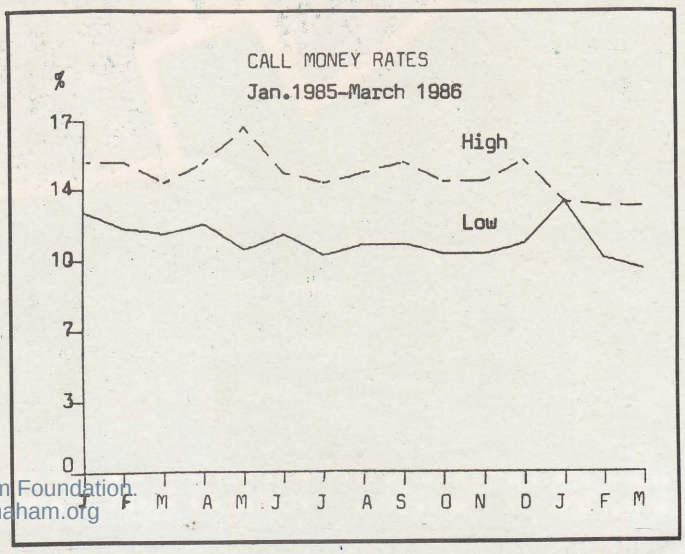
ECONOMIC INDICATORS

The budget deficit in 1985 was nearly twice that of 1984 as a result of the decline in the tea ad-valorem tax and export duties,and the steep rise in government spending on defence related activities.In order to finance this deficit the government was compelled to resort to expansionary sources of financing; particularly a heavy recourse to bank credit.This sharp growth in net credit to government had a major influence on monetary developments from early 1985.In order to cope with the excess liquidity position in 1985 the Central Bank continued with its restrictive monetary package.

But since the commercial banks were unable to lend to non-priority sectors with the credit restrictions in force,and the low demand for credit from the private sector the excess liquidity situation was further aggravated. These restrictions on commercial bank credit for non - essential imports were further strengthened by extending restrictions over finance companies activities.The transactions in the inter-bank call money market were a reflection of this excess liquidity position experienced by the commercial banks.With the slackened demand for short term credit,transactions in the inter-bank market continued to register a drop.

The depreciation of the Sri Lanka rupee against all major currencies continued through 1985 into 1986.The cummulative changes since 1977 showed that by the end of February 1986 the Rupee had depeciated by 42 percent against the U.S. Dollar,28.3 percent against the Pound Sterling,57.4 percent against the Japanese Yen,42.8 percent against the Deutsche Mark and 40.7 percent against the SDR.





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THE ECONOMIC REVIEW is intended to promote knowledge of and interest in the economy and economic development process by a many sided presentation of views & reportage, facts and debate.

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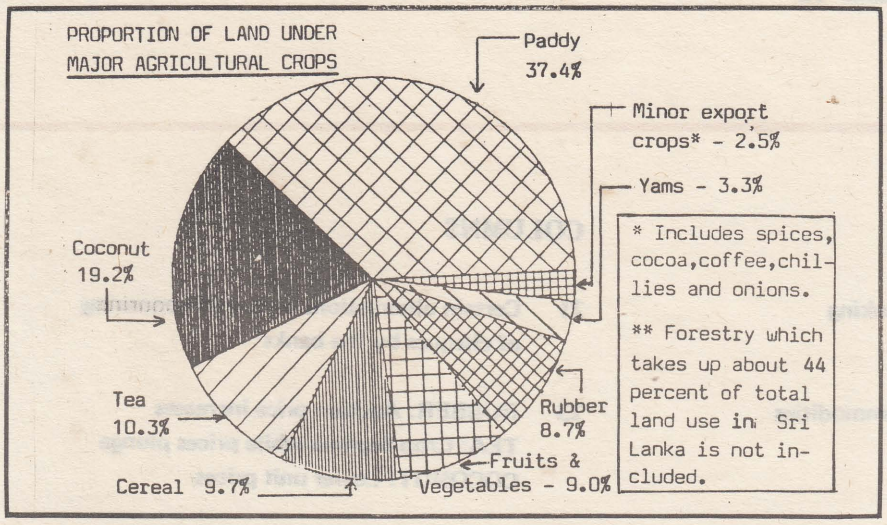
NEXT ISSUE

*A Special Double Issue on 25 years of the People's Bank – a symposium on its origins, objectives, operations and role in the economy from 1961 to 1986.

COVER
Sepalika Fernando

ACKNOWLEDGEMENT
In our Special Report on Women & Development in the January 1986 issue of the 'Economic Review' the contributions by Swarna Jayaweera and Savithri Gunasekera were extracts from the CENWOR Studies published in the "UN Decade for Women: Progress and Achievements of Women in Sri Lanka".



AGRO-BASED INDUSTRIES

Agriculture has traditionally been the base of the Sri Lankan economy, yielding a major part of the national income and providing the chief means of livelihood and subsistence for its largely rural population. With its natural agricultural resource endowments there is no reason why by now Sri Lanka should not have had a developed agro-industry sector, but this rich potential has continued to be in a state of comparative neglect for a variety of reasons. The main export agricultural commodities have continued for nearly 100 years to be exported in primary form and much of their available surpluses have been channelled into the country's social services and for developing the non-export agricultural sector. Little of these surpluses, however, have been diverted to the industrial sector nor have constructive and organised measures been adopted to move away from the stage of primary agricultural production to that of agro-processing. A broad over-view of why this has not happened indicates that the various factors required for planning and implementation of such a programme have not been harmonised at different levels. For instance, agricultural credit, marketing and supplies, together with irrigation and scientific methods of cultivation have to be closely inter-linked to provide agricultural produce in sufficient quantitires and quality to make agro-processing feasible. But this has failed to materialise.

The potential for establishing agro-industires have been explored for several decades. The CISIR in its annual reports in the mid 1960's records its investigations into a wide range of vegetable and fruit processing, sugarcane products, wood products and cocoa products and spices. The experiments conducted by Sri Lankan scientists and specialists in the leading research institutes dealing with agricultural produce have uncovered many promissing products, but unfortunately most of these have not moved from the laboratory stages to that of commercial production.

Many of the country's development plans have also focussed on the potential in the agro-industries sector. A typical example is The Five Year Plan 1972 - 76, which states: "One of the main drawbacks of earlier industrial programmes was their negligible impact on the rural sector, with regard to both employment and the utilisation of raw materials originating in that sector. The regeneration of the rural sector through a programme of agro-based and other small-scale industries constitutes a major element in the Plan strategy".

There is no doubt that the wide variation of climate and rainfall in Sri Lanka is conducive to the cultivation of a large range of tropical, sub-tropical and temperate fruits, vegetables and other crops. Although the development of these resources has been planned for over three decades upto now a major constraint has been both the lack of supply for buyers and an excess of supply for producers. The problem over the years has been connected with helping the cultivator with the disposal of his produce at a reasonable price, while making this produce available to the consumer also at a reasonable price. It has been widely accepted that no marketing scheme, however, could be complete unless it is closely connected with the production programme; namely of: (1) collecting produce at the growers end, (2) grading, packing and transporting of produce, (3) providing wholesale and retail facilities for distribution, (4) offsetting seasonal fluctuations through processing or preserving and also through planned production. The lack of linkages between production, processing and marketing has therefore been identified as a primary cause for the constraints in the development of the agro-industrial sector in Sri Lanka. These constrainsts have had strong disincentive effects on the farmer since he is never assured of a reason-

able return when producing for the agro-industy sector. Connected with this lack of incentive has been high cost of inputs or lack of it altogether particularly seed material, fertilizer and extension services.

In many respects the technology and practices in Sri Lanka's agro processing industries are still in a basic stage and have not been adopted to more recent and advanced techniques available internationally in this sector of industry. Generally, production in this sector has aimed at the domestic market and with few exceptions can hardly compete in the export market or substitute for imported products.

Another constraint in the development of this industrial sector has been in the limitations of the local market. Other problems areas for a systematic development of this sector are the non-availability of qualified food scientists and technologists, the lack of sufficient research and development, and absence of technology transfer, the high cost of imported packaging material and equipment for processing, and general lack of official support and commitment for development of this sector.

In recent years the opportunities for further development of this sector have come Sri Lanka's way more frequently particularly with promising markets opening up in the Middle East and in the developed market economies. The new emphasis on export markets has encouraged farmers, processors and exporters to concentrate on quality, variety and attractive packaging in order to compete in the international market. The opportunities for investment in this sector of industry are also wide-ranging as shown in the list (at right) compiled by the FIAC. The following three papers carry different perspectives on the resources, problems and potential in the agro-industry sector.

PROJECT IDEAS FOR AGRO-INDUSTRIES

The Foreign Investment Advisory Committee (FIAC) of the Ministry of Finance and Planning drawing attention to the investment opportunities in Sri Lanka has compiled the following list of project ideas for joint ventures based on agricultural produce.

1. Tea Sector
   - Manufacture of green tea, flavoured teas and herbal teas.

2. Rubber Sector
   - Manufacture of high technology rubber-based automotive components.
   - Manufacture of rubber components used in civil engineering works (eg. gaskets for underground water pipes, bridge bearings, anti-vibration mounts, floor mats, sealing etc.)
   - Manufacture of natural rubber-based health care products.

3. Coconut Sector

   Kernel Products
   - Concentrated coconut cream
   - Desiccated coconut in consumer packs
   - Refined coconut oil in consumer packs

   Non-kernel Products
   - Rubberised coir fibre for automobile industry, coir mats and mattings
   - Coir mats for soil conservation
   - Coir yarn/twine for coir-netting
   - Coir briquettes

4. Fruits and Vegetables Sector
   - Cultivation and preservation of ginger, cucumber, aubergine (egg plants) and other vegetables
   - Processing a range of tropical fruits into cordials, jams, tropical fruit salads, etc. and canning and packaging into ready-to-use packs
   - Processing and blending of passion fruit juices
   - Papain-cultivation of papaw and the production and processing of papain

5. Other Agro-based Products
   - Sugar-cultivation and processing of sugarcane
   - Soya bean-cultivation and processing of soya bean
   - Cocoa-manufacture of confectioneries (e.g. chocolates)
   - Mushrooms-cultivation and canning of mushrooms
   - Tomato-manufacture of tomato paste etc.
   - Manufacture of sesame consumer products (eg. sesame paste)
   - Processing of pulses in pre-germinated consumer packs (e.g. black and green)

6. Foliage and Flowering Plants
   - Cut flower/plants
   - Cultivation of carnations, chrysanthemums, anthuriums for export
   - Cultivation of a range of tropical and sub-tropical indoor and outdoor plants

7. Wooden Products
   - Manufacture of educational toys and reproduction of antique furniture

AGRO - INDUSTRIAL DEVELOPMENT IN SRI LANKA

Ariya Abeysinghe
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BACKGROUND

The need to "Modernize Agriculture" in Sri Lanka was stressed by Sri Lanka's President in his speech at a recent seminar held to commomerate the golden jubilee of the Land Development Ordinance. The Land Use Commission of 1967 in its report (Sessional Paper No. XI of 1968) made a significant remark on agro industries when they said " Though land use does not cover aspects of crop utilization for industrial purposes by activity which will ensure the farmer a more remunerative price for his produce, as, for example, the setting up of small scale agri-industrial ventures in the area that will use these raw materials, should be considered as contributing to sound land use, and hence a measure to be encouraged. This policy is particularly suited to Ceylon's conditions where agricultural workers in rural areas are only partially employed. We warmly endorse this policy" (p.74) The Land Commission of 1958 in their report (Sessional Paper X of 1958) made passing remarks on land use with reference to agro-based industries with no recommendations except for what they thought land alienation policy should be (pp. 64-82). A Presidential Commission on Land Policy (Govt. Gazette Extraordinary 342/5 of 28.3.1985) is now looking into "the strategies for conservation and development of land and related natural resources" which obviously would cover agro-based industrial development. The recurrent cycles of agricultural surpluses creating problems of marketing have given some food for thought regarding agro-processing. The Budget proposals of the Minister of Finance and Planning (1983-1984 Budget speeches) have elucidated several incentives for the creation of a climate for investments in agro-industries. The completion of the Headworks in the giant Accelerated Mahaweli Development Programme, including irrigation and settlement implementation in the command areas, together with the need to create off farm employment for the second generation settlers in the various Mahaweli Systems, in the Walawe and Gal Oya Systems and in the 103 Major Irrigation schemes, has attracted the attention of entrepreneurs to go into investments in river valley zones like the Mahaweli. The Minister of Lands and Land Development and Mahaweli Development has also stressed the need to attract an envestment flow into the Accelerated Mahaweli areas. The Minister of Agricultural Development and Research and Food has also expressed the need to process agricultural produce to enhance value in production areas and has hence invited the private sector to play its part.

The Problem of Definition

Agricultural based industries is a broad term, which includes industries related to agriculture, that is inputs, transport, storage and infrastructural requirements on the one hand, and the industrial processing of the agricultural raw materials on the other. Agro-industires can be defined as " not merely industries based on agricultural raw materials nor does the term refer to the suppliers of such auxiliary materials as pesticides, fertilizers, and agricultural machinery. Agro-industry is a much wider concept involving the integration of marketing, processing and agricultural production under a comprehensive management responsible for the production, harvesting, processing and marketing of the products by the most direct means. Thus, from the very inception, agro-industrial production is a highly planned and streamlined process serving a common interest, ie. the production of marketable goods from minimum inputs to obtain maximum outputs" (UNIDO).

This from of production involves either a high degree of specialization or a wide range of products, a characteristic feature being the utilization of all by-products by other sections in the integrated enterprise or association of enterprises. A further advantage of an agro-industrial system is the close relationship it establishes with the various markets.

Planning Agro-Industries in a Developing Country

The establishment of an agro-industry does not start with an analysis of agricultural production nor with the underutilized production capacities in the relevant industrial branches. The only admissible first step is an exact analysis of existing and potential markets at home and abroad of possible commodity range. Thereafter, a survey of agronomic conditions and capacities, size of holdings, mode and level of production etc is needed. Thirdly, an industrial survey will have to be carried out of the existing and potential establishments to establish the profile of the factories needed to meet the demands of the target markets analysed.

This stage is then followed by agricultural considerations in depth and of the selection of agricultural branchs as raw material suppliers to the planned programme. Whereas this market oriented approach would inevitably reject certain items, new products would be introduced on the basis of improved utilization of by-products, land or human resources and capacities. A second market analysis would be

necessary to confirm the suitability of the programme selected and by means of regular checks an optimum agro-industrial development programme can be elaborated for both limited and broader areas of application.

This close correlation between marketing, industrial processing and agricultural production or importation of raw materials does not end with the establishment of planned methodology. Given below is a brief summary of other major problems which have to be resolved for the promotion of agro industrial development.

Long range agro-industrial development planning

Agro-industrial development should be planned carefully in order to achieve:

1. Rapid economic results;
2. Rapid rural development;
3. Large scale settlement of unoccupied developable areas;
4. Optimum utilization of capital intensive irrigation facilities both in large/village irrigation schemes, including the Mahaweli, Walawe, Gal Oya and the 103 Major irrigation schemes in Sri Lanka. Solution of socio-economic and political problems including creating employment amongst second generation settlers and providing off farm seasonal employment in the major and minor irrigation schemes; if any;
5. Minimizing post-harvest losses;
6. Achieving best export results.

Careful planning is also necessary to avoid:

(i) competition with on going economic and or political measures;
(ii) dissatisfaction with existing industrial and agricultural sectors;
(iii) economc failures.

Planning could be effected stepwise and limited to one region at a time. Furthermore, it must be adapted to the political structure or administrative organization prevailing in each region, for example, Integrated Rural Development Projects (IRDPs), Mahaweli areas in Sri Lanka, etc.

Agro-Industrial Engineering Techniques

Agro-industires are characterized by the very close relationships in terms of time, distance, economic interests and management between marketing and industrial processing on the one hand, and between processing and agricultural production on the other. Such relationships constitute the most significant advantage of the integrated process. Yet to derive maximum benefit, appropriate techniques and engineering must be applied.

It is an undisputed fact that in a fully integrated sugar cane enterprise agricultural production, havesting activities and processing can be timed and coordinated in such a manner as to ensure minimum quantitative and qualitative losses. Therefore, in an efficiently integrated agro-industry certain crops will have to be harvested and transferred to the processing line in a short time. Furthermore, a fully integrated agro-industry closely observes market behaviour at all stages of operation so as to be able to derive the greatest and/ or short term benefits . Consequestly, particular importance has to be attached to the discussion of appropriate techniques and the engineering approach to be adopted in the distribution, processing and prodution sectors of agro-industry.

Agro-Industrial Management

There are numerous management problems peculiar to agro-industrial production, Special accounting systems are needed for the precise price structures of each operation and for each management unit in the production, processing and marketing sectors. Such systems must meet the requirements of the various participants in the integrated process contributing to the effectiveness of their contribution.

In most cases, profits are to be seen at the end of the long process that is, on the markets themselves. Hence, the profit redistribution systems are very important. Other management problems are:

a. the establishment of common services in the agro-industrial enterprises;
b. the position of quality control throughout the processing line;
c. upgrading of participant skills;
d. private farmers and their cooperation with agro-industry;
e. establishment of checklists and time schedules throughout;
f. the planning of balanced comprensive investment programmes;
g. the introduction of modern mangement systems into agro-industrial enterprises.

Agro-Industry and Rural Development

Agro-industry has a major influence on the regional development of backward areas in need of industrial and agricultural assistance. Certain aspects of integrated agro-industrial enterprises which have an impact upon rural development are:

a. the raising of regional economic standards;
b. labour intensity,
c. the bankability of projected investments;
d. the time needed for such projects to materialize;
e. pre-investment and production costs;
f. infrastructural requirements.

Agro-Industry and the Cooperative System

The need to establish farmer cooperatives with a view to rationalize production, providing their members with low priced imputs, and improving current distribution and marketing systems are vital areas to be

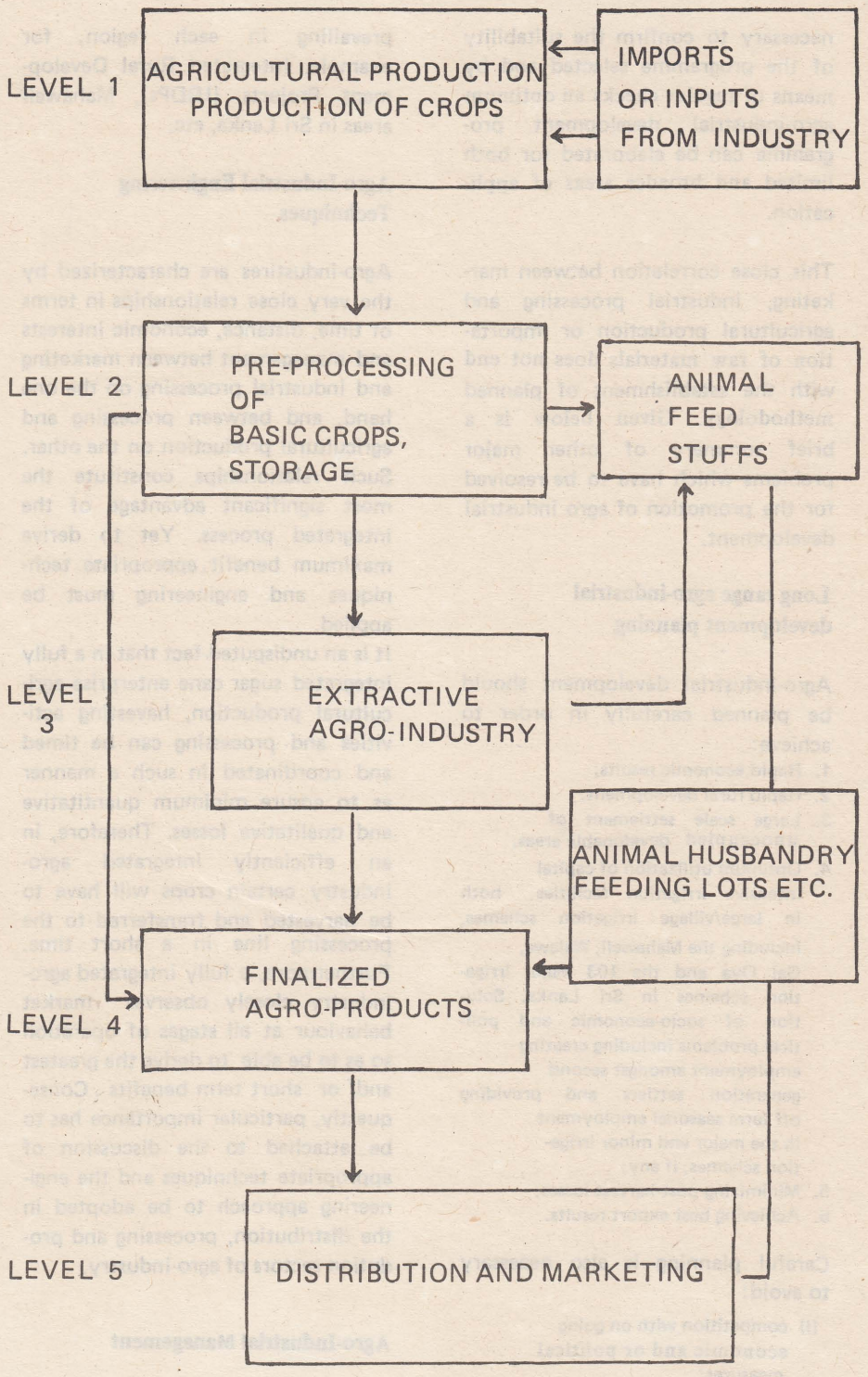
studied. The need and possibilities for the Cooperative Movement to be restructured into larger associations and cooperative organizations which could in turn contribute significantly to the establishment of their own independent industrial enterprises and distribution network using the Cooperative Wholesale Establishment (CWE) and the Sri Lanka Cooperative Marketing Federation (Markfed) needs careful analysis.

This stepwise integration can of course, be planned as a single operation in areas where the cooperative system is more desirable than any other organisation of an integrated agriculture.

Planning an agro-industry on a cooperative basis, as a possible alternative to ownership of the land by the industry in cooperation with private farmers has specific features and advantages which are worthy of analysis in a specific case and for a specific area.

The integrated structure as a criterion for agro-industrial planning

The technological process of an integrated agro-industry has a very specific structure which is normally sub-divided into the following five levels.



The following problems arise from an evaluation of this flow diagram.

a. Is the stepwise development of an integrated structure such as this possible ?

b. At what level should one start, 1 or 5, and under what circumstances is it preferable to start at level 5?

c. How are the different levels interrelated?

Undoubtedly from the point of view of the network analysis level 1 and 2 have to be established together and it is quite clear that capital flow can be more easily obtained for investments at level 4 than level 3.

d. At what level should central planning and management be introduced?

Higher Forms of Agro-Industrial Integration

An agro-industrial system is often not large enough to take over a whole settlement programme, establish factories and national marketing networks or to compete in foreign

markets as a serious supplier and exporter. Moreover, the merging of agro-industrial enterprises with different social structures and production programmes from different regions, raises several problems.

BENEFITS TO BE DERIVED FROM AGRO–INDUSTRIAL DEVELOPMENT IN SRI LANKA

The rich land and water resources bestowed on Sri Lanka by nature, the strategic location in relation to target markets, the availability of trained human resources at comparatively cheaper rates, the availability of infra-structure including energy resources from the Mahaweli headworks, and the new development possibilities in the Trincomalee region as a future development centre, obviously makes agro-industrial development an important area of development. The investment climate and adequate investment opportunities are available in the country due to governmental policies. Agriculture is the most important sector of the economy accounting for a major contribution to the GDP,a major share of the total national employment and a substantial slice of export income. Even in the manufacturing sector agricultural processing represents a major part of the national manufacturing output in that food , beverages and tobacco constitute a high proportion of domestic industral out put, producing for local and export markets.

The benefits to be dervided by establishing agro-industries in Sri Lanka may be listed as follows:

a Agro-industrial development projects can be established in only a few years;
b. Agro-industrial projects are bankable
c. Agro-industial projects can be implemented in regions which are at different stages of development
d. Agro-industrial projects could raise long term employment levels higher than any other rural development scheme;
e. Agro-industial projects need not be permanently subsidized as they can be made self sufficient and are conducive to the creation of domestic and foreign markets;
f. Agro-industrial projects could solve marketing problems in glut reasons and absorb all surpluses for value added processing in producer areas;
g. Agro-industial projects have forward and backward linkages and create markets for other auxillary industries like cold storage, packa ging, marketing etc.;
h. The increased industrial processing of agricultural raw materials generates employment opportunities as they are invariably labour intensive, earn increased foreign exchange and could also meet the domestic requirements of consumer products; and
i. Agro-industries whilst adding value, value, produce convenient foods which would save time, effort, labour and energy and obviously create more time for people to spend on other productive efforts and leisure. It could thus, bring about more sophisticated consumer tastes and preferences, whilst upgrading the quality of life.

EXISTING AGRO BASED INDUSTRIES IN SRI LANKA

Tea

The three primary commodities exhibit quasi-characteristics of agro-based industries. The tea industry is a good case of an agro-industry which is integrated from production to marketing. The industry whilst concentrating on the production of bulk tea for export markets has not kept pace with the new innovations in other countries and hence, obviously lost its position to other competitors.. An examination of the present cost of production structure of tea reveals that 40 percent and packing and 30 percent field costs. There are other aspects the most obvious of which is to bring out a product which a changing market will demand. For instance there are tea bags. However, decaffinated tea, instant tea, flavoured teas and herbal teas are goodpotential in the highly competitive beverage markets and have to be taken up for product development. If the industry is not working from the stage of markets it may be too late for Sri Lanka to enter the race.

Rubber

The rubber industry is a case of an agro industry which is semi-industrialized, in that only 12 per cent of the total rubber production is locally processed in industry; while 88 percent is being exported as a primary commodity in semi-processed form. Rubber seeds are a base used for producing rubber seed oil and alkyd resins in the paint industry. Similarly rubber wood is used in the construction and the furniture industry. It must be noted that we are importing Rs.300 million worth of rubber products to a country growing and exporting natural rubber mainly as a primary commodity.

Coconut

Coconut is the other major industry where there is a certain amount of industrialization even though the level of technology is low. The Dessicated Coconut industry (69 mills) has technology which is village built, needs technology modernization and rationalization of units. The coir industry (600 mills) is yet another case for modernization. The coconut oil industry (64 mills) also uses a low level of technology.New innovations have occured in products of coconut wood and the coconut shell beyond charcoal, activated carbon, vinegar, coconut cream, soap and margarine, whereas there are many other possibilities. There is a need to bring the coconut industry too under a rational and systematic agro-industrial development programme instead of orienting it towards the shipping and the brokering interests of the coconut trade.

Paddy/Rice

Paddy/Rice milling is yet another

major agro-industry prevalent in the country. There are 4,370 custom mills or hullers at village level in Sri Lanka. There are 28 mills owned by the Paddy Marketing Board, and 920 commercial mills in the country. The mills can be classified into traditional,semi-modern and modern types. The traditional type of mills consists of minimal machinery for rice milling, that is, one or more steel hullers which perform both hulling and polishing operations. Nearly 80 percent of the rice mills in the country are of the traditional type and have several disadantages associated with them. They are broadly:

a. Since both hulling and polishing are performed by the same machine a high pressure is exerted on the grain resulting in grain breakage and high milling losses.
b. These mills can process only rice in parboiled form
c. The rice produced by these mills is of poor quality with a high degree of discolouration and uneven bran removal.
d. The processed product has a high level of impurities since cleaning of grain is not done at any stage in these mills.
e. The by-products obtained,especially of rice bran, are of inferior quality
f. For operation of a steel huller a high power requirement of 15-20 Hp is required. However, they are popular because of low investment costs.

The second type of rice mills are the semi-modern type. These mills have the following characteristics:

a. the dehusking operation is performed by a seperate improved machine called the rubber roll sheller and the polishing operation is done by one or two steel hullers.
b. prior to milling the paddy is subjected to a cleaning operation using a cleaner which seperates impurities by sieving and air-aspiration.

Therefore, they have the following advantages over the traditional type

i. Since dehusking and polishing are done by seperate machines the grain breakage and milling losses are low
ii. Contamination of the by-product rice bran with husk is less than the traditional mills
iii. The level of impurities in the final products is low since the paddy is subjected to a pre-cleaning operation.
iv. The power requirement for the rubber roll sheller is 5-7 HP. Thus, the power requirement for this mill is approximately 30 per cent less than the traditional type of mill. The investment and operational costs of a semi-modern mill is higherthan the traditional mill.

The Modern Rice Mill is the third type of mill. Here the rice mill has a number of machines each specialising in a specific operation.They are:

i. Pre-cleaning
ii. Dehusking by a rubber roll sheller
iii. Seperator seperates unhusked grain from brown rice
iv. Brown rice is then polished by a series of abrasive type polishers
v. Polished rice sent through a sieve aspirator which seperates any particles adhering to the grain.

The Modern Rice Mills are mechanically handled by elevators and thus save labour. In the traditional and semi-modern type of mills grain handling is done by manual labour. Another advantage of modern mills is that polishing is performed by a series of abrasive polishers which exerts a very low pressure on the grains and therefore grain breakage and milling losses are minimal.Moreover unlike the steel hullers, there is less of a temperature build up within polishing machines and therefore, grain discoloration is less. Furthermore, in the modern mills there is an even polishing of grains.

Thus, it is obvious,that although the investment cost of a modern mill is higher, the high milling returns compensate for that high investment cost together with high quality rice and the rice by-products produced.

Nearly 70 percent of the total paddy production in Sri Lanka is subjected to the process of parboiling. Parboiling is in fact a pre-treatment given to paddy so as to make the parboiled rice grains harder than raw rice and hence build resistance in order to minimize breakage during milling.Parboiling in simple terms is soaking paddy for a heat treatment and causing the geletinizing of the starch within the grains, by drying, to lower the moisture content to a level suitable for milling. Parboiled rice is reputed to be nutritionally superior to raw rice.

There are few areas for technological innovation in paddy milling.
They are:

a. Improving the traditional method of parboiling which is time consuming and resulting in uneven parboiling and giving colour to the grains;
b. Modernize the existing mills by lowering investment costs and lowering high-energy consumption
c. The need to introduce cleaning devices to completely remove impurities from rice, including destoring. There is a need to fabricate a low cost destoring machine locally;
d. The need to improvise low cost boilers to be used for improvement of the parboiling operations;
e. The need to introduce more efficient mechanical driers than the present mechanical dryers which are suitable for drying parboiled paddy only;
f. The introduction of low energy usage by developing a husk fired furnace for efficient use of the by-product paddy husk as a fuel and
g. The introduction of new innovations and technology for new products.

Sugar

Sugar is another agro-based industry that is being developed in Sri Lanka. The annual consumption or sugar at present is about 270,000 to 300,000 tons annually while local production is only 45,000 tons, showing a gap of around 225,000-255,000 tons per year. The acreage

under sugar cane in 1985 was as follows:

Kantalai	- 6,000 acres
Hingurana	- 9,000 acres
Sevanagala	- 5,000 acres
Pelawatte	- 4,000 acres
Private Growers	- 6,000 acres

(Koslanda, Haldamulle, Moneragala and Buttala areas)

There are three sugar mills and two mills are to be commissioned in 1986 (Jan) and March, 1986.

The capacity and production of these mills is as follows:

	tons cane per day	Sugar Production
Kantalai	1,200	20,000 tons
Hingurana	2,000	30,000 tons
Moneragala	2,000	43,000 tons
Pelawatte(March'86)	28,000	47,000 tons
Sevanagala (Jan'86)	1,200	27,000 tons
		167,000 tons

Thus, even with these anticipated developments there is yet a short fall of 103,000 tons. The industry employs about 25,000 workers. There are two important aspects to be noted.

1. At Hingurana factory only 50 per cent of capacity is utilized. If it is fully utilized with cane supplies there would be a 40 percent cost reduction and the COP per kilo will be Rs 7-8 compared to Rs 11/50 at present. With a wholesale price of Rs.11/50 and a retail price of sugar at Rs.13/25 per kilo the return in the industry becomes very marginal. Hence, economies will have to be found to keep the industry viable without depending on subsidies.

ii. Sugar yields at present are 2½ tons to 3 tons per acre under irrigation and 2½ tons per acre under rainfed conditions. There are only a few varieties grown locally. The average cane yields in the two state plantations are approximately 58 tons per hectare; well below the technical potential for the lands. The local cane cultivation is mainly based on the use of one major variety.(CO 775). Dependence of the industry on a single variety and few minor varieties is faught with serious commercial hazards. The most productive cane can be grown in the dry zone. However, in the dry zone land is comparatively scarce and cane must compete with rice and other irrigated crops for these resources.

The non traditional commercial crops namely, the spices, beverages and oil grass crops known together as Minor Export Crops are potential several agro-based industries. Cinnamon based cinnamon bark and leaf oil using steam distillation stills, citronella oil distillation units, cardamom and clove essential oil and oleoresin manufacturing units, cocoa fermentation units, coffee grinding units, cashew decortication and roasting, units, sericulture based natural silk weaving units, palmyrah and kitual based units are important agro-based industires having much potential.

The total acreage under minor crops is 165,000 and about 200,000 people are dependent on it. At present minor crops earn 5 percent of the country's total foreign exchange earnings and exports are mainly as commodities or raw materials. There is immense scope for development of agro-industries in this sub-sector.

Fruits and Vegetables

Sri Lanka now grows many varieties of fruits and vegetables, and its climate and growing conditions are suitable for many other varieties There are 500,000 to 950,000 private small holder units growing fruits and vegetables in about 500,000 acres and employing approximately 250,000 additioanl for labourers. At primary (farm) level there are around 50,000 private traders, assembly agents, and commissions agents serving the small holders. There are 15 private processing firms and one state owned processor with two plants, producing approximately 5,000 metric tons of processed fruits annually. There are private wholesalers operating principally in the Colombo, Jaffna and Kandy markets, controlling almost 100 percent of the fresh fruit and vegetable trade. There are a large number of private stall holders retailers and pavement vendors selling to consumers at market centres, village and urban fairs and roadside stalls. There are about 105 private shippers or processors who control virtually the entire fruit and vegetable exports. These include what is termed subsidiary food crops (soya, groundnuts, black gram, sesame, ginger, turmeric, chillies, spice seeds, pulses, onions etc.) The fruit and vegetable industry suffers from a lack of understanding of the market and marketing requirements, a lack of scheduling of processing with production and sufficient techical support for the industry (like an extension service, inadequate quality control laboratory support, inadequate R & D support, inadequate food processing expertise), and lack of quality standards and grades and a liberalized import policy without sufficient protective measures to enable the local processor units to remain viable. A further shortcoming is inadequate packaging technology.

Dairy Industry

Another agro-industry that exists in Sri Lanka is the dairy industry. The dairy sector is an integral part of the overall livestock sector of the Sri Lankan economy, contributing about 2 percent to the Gross Domestic Product (GDP). Livestock contributes an estimated 8 percent to the gross value of agricultural production. The actual contribution could

be considerably higher if the value of manure,hides, and skins and animal draft power is taken into account.

More than 95 percent of the cattle are located on farms of less than 4 hectares and many farmers keep 1to 3 cows to supply milk for personal needs and small quantities for sale. Processing of imported powdered milk and imported butter fats to ice cream, youghurts, curd, butter milk, tanning of hides and skins are some of the many existing small scale agro industries. The present milk production is estimated at 216,000 litres per day and at present 60 percent of the milk collected originates from the Hill and Mid-country areas, where only 13 percent of the cattle are located. There are two major feed mills in the country producing 7,000 metric tons of feed or 85 percent of all feed used. There is one modern milk food plant in the country in the Lanka Milk Foods Ltd. and three groups - National Milk Board, Nestle and Lanka Milk Foods Ltd. control the dairy sector. Several smaller groups process milk into ice cream, yoghurt and cheese. The largest of these is Ceylon Cold Stores. The existing processing capacities in the National Milk Board is 440,000 litres per 16 hour day with a present production of129,700 litres. (Narahenpitiya 160,000 litres, Pallekelle 40,000 litres, Ambewela spray dry - 240,000).They have planned capacities for an additional 30,000 litres (per 16 hour day) (Kilinochchi - 20,000 litres and Galle 10,000 litres). Nestle's have an exsiting capacity of 50,000 litres a the Polonnaruwa Condensary with a present production of 26,800 litres and has a planned capacity of 240,000 litres at Pannala Plant. Lanka Milk Foods has a repacking Plant capacity of 1,120,000 litres in Colombo and has a production of 375,000 litres at present. The others have an exsiting capacity of 75,000 litres with a present capacity of 50,000 litres. This means, the existing total capacity is 1,685,000 litres and present production is 581,500 litres and the planned capacity is 270,000 litres. Thus there is a need to increase milk production in order to meet existing capacities. At present condensed, powdered, or sterilized milk products, ice cream, bottled/ pasteurized milk,butter, yoghurt, ice cream, cheese or ghee are being produced through all these items and are also being imported. Imports of Milk Powder and other milk based products amounted to Rs. 656 million in 1984.

Meat, meat products, eggs and poultry are other agro based industries that exist in Sri Lanka but have much greater potential.

Wood Industries

Forestry and forest based agro-industries are another important sector in Sri Lanka. There is no private forestry and forest management in Sri Lanka (except that of a minor Ceylon Tobacco Co. Ltd forestry project).The ForestResources (1956) Survey estimated that 32.2 million acres or 44 percent of the nation's land cover,was forest cover. At present, due to rapid deforestation, indiscriminate felling, fires and planned agricultural projects,the forest cover has declined to about 25 percent of the nations total end area. Reforestation has expanded to a level of 17,300 acres per year in 1982 when it should be 30,000 acres a year if total timber demand is to be met. Total demand for industrial Foods is expected to double from 1 million cubic metres at present, to 2 million cubic metres by the year 2000. Approximately 42 percent of the timber is used by the State Sector and 35 percent by the construction industry with 19 percent used by the furniture and 4 percent in other manufacturing industry. It is estimated that Sri Lanka will have a deficit of 200, 000 cubic metres of industrial round wood by the year 2000.

Other existing agro industrial projects include agriculture and floriculture and the growing and exporting of medicinal herbs.

Existing Climate for Agro-Industrial in Sri Lanka

The agro-industrial sector had to date been hampered by a series of impediments including:

a. a relatively lower rate of return on investment compared to trade commerce and urban property development;
b. a restrictive land policy that inhibited economies of scale;
c. high import duties on certain essential inputs;
d. libralized trade which does not offer significant protection to local industries;
e. high input cost of services eg. electricity for cold storage;
f. fairly high risk rating attached to this from of investment by both bankers and enterpreneurs;
g. shortage of technological know how, regarding processing techniques;
h. lack of information on incentives, market opportunities, alternative technologies, etc.
i. lack of differential incentives for higher risk areas like agro-industries to attract entrepreneurs away from other tax protected areas like tourism etc.
j. inadequate marketing and distribution network, including lack of price support schemes;
k. dependence on high cost technologies when low cost appropriate technologies in other Asian countires were not available.
l. lack of soft investment credit windows;
m. lack of a policy package for agro-industrial investment;
n. procedural and administrative bottlenecks for potential investors in this sector and multiplicity of official agencies dealing with the sector;

o. Agro-industrial development has not been the responsibility of any one Ministry. The Agricultural Ministry concentrated on production and research. Other Ministries attended to specific aspects of cultivating, processing and trade. The Agency Houses and plantations concentrated on the colonial production process and catered to demand in the industrial centres not needing any significant innovations. The primary objectives of developing the sector has always been lost sight of;

p. Credit institutions tailored their credit policies to import-export trade rather than to agro-processing industries.

Issues, Conclusions and Recommendations

A predominantly agricultural country like Sri Lanka has several agro-based industries. Tea, rubber, coconut and spices and beverage crops have been developed as export oriented agro-based industries.Even in tea there is scope for new product possibilities like tea seed oil, caffene,tea 'cola in place of coca cola. In the cocout sector, the complete range of agro-based industries have not been utilized. In spices, beverage crops and oilyielding grasses Sri Lanka is yet a raw material supplier and with the exception of cinnamon, Sri Lanka is not a significant exporter. Even in cinnamon where Sri Lanka is the largest producer in the world, the country has not attempted to develop new products from this commodity through R &D but has been satisfied with being a mere raw material supplier. So is the case with medicinal herbs. Hence whilst supplie s is a major constraint to any agro-based industries, the lack of a national agro-based industrial development policy in itself is one of the fundamental reasons for the unsystamatic development of this sector.

Secondly, there is a lack of an integrated national technology policy towards the food processing sector. In a predominatly agricultural country there are no specific Institutes for Food Technology nor higher degrees for areas such as agro-industries or food sciences. The largest food sector is not developed as an industry as is clearly evident from a study of the country's paddy sector. Hence, its potential is not fully utilized. The development of new innovative commodity utilization technologies is now becoming more urgent as markets for primary commodities are less remunerative and the country's agricultural sector is moving towards self sufficiency in rice and secondary crops (due especially to the Accelerated Mahaweli Programme). If new markets are to be opened, appropriate technology for processing and marketing of new products based on agro raw materials must be identified and developed. Moreover with rising living standards product acceptance and convenience will become important elements in consumer decision making, Well-aimed research and development efforts should pay serious attention to the question of possible new uses for existing crops, the functional and quality characteristics of food crops, and the development of feasible processing and marketing systems for new products. There is thus, a need to centralize in one existing research agency for instance (CISIR) all R & D activities.

The Food Technology Division of the Department of Agriculture could also be expanded to carry out food product research whilst R & D is being carried on elswhere or within the same agency. At present, responsibility for food science and food technology is dispersed over several public sector agencies. For instance, the Paddy Marketing Board's Rice Processing Research and Development Centre (RPRDC) located in Anuradhapura is responsible for post-harvest technology development for rice. It has existed since 1976 but its success in technology and product development has so far been limited because: (a) the rice sector is not developed as an industry, (b) subordination of RPRDC to PMB which is not in a position to provide technical guidance to RPRDC's researchers, (c) lack of effective incentives for the improvement of their performance.

Two other public institutions involved in agro-industrial research are the Soyabean Food Research Centre administered by the Department of Agriculture at Peradeniya and the Central Agricultural Research Institutes's Food Technology Research Unit (FTRU) at Gannoruwa, Peradeniya. The former has developed a dehydrated soya milk product and is working on several other food additive uses of soyabeans. The FTRU is conducting research into methods of preparing nutritious foods from such crops as green gram, finger millets etc. but has not yet obtained any significant results. The following factors have acted as contraints to the effective performance of these institutions:

a. lack of national food and agro-industrial policy and strategy,
b. lack of staff at all levels,
c. inadequate finacial resources
d. poor inter-agency cooperation and cordination,
e. lack of a dynamic interaction with private sector agro-industries.

There is a strong case for strengthening and reorienting the agricultural research system towards the building of an efficient and modern food technology research system for the proper development of agro-industries in Sri Lanka. This factor is of much importance today since there is a growing emphasis towards greater agricultural diversification and more efficient utilization of both domestic and export market potential. A Food Research Institute linking RPRDC,FTRU and the Soyabean Foods Research Centre would be more appropriate for better coordination and cooperation.

In addition the Food Products Division of the CISIR conducts research into specific areas of agro-

industries while specialised institutions like the TRI and CRI conduct research into their own special products.

There has been no proper and systematic sector indentification, and locational analysis of possible agro-industries linked to a crop development programme; which has been a major issue and constraint to the systematic development of an agro-industrial sector in Sri Lanka.

The many problems in the supply of commodities or raw material to feed installed capacities in industries (eg. fruits, vegetables, maize, soya) has been a severe contrainst to their development because of the past-harvest problems in transport and storage.There are large quantities of fruits and vegetables being produced in the glut season in different rural areas which are under-utilized or go waste. A planned programme of development of suitable processing technologies for preserving these raw materials for use in the off season or establishement of regional cold rooms could give good dividends. For instance, many chena farmers could be encouraged to high quality vegetables if they had a ready market and just returns. This is where R & D could help the CISIR's successful experiments on dehydrated vegetables are a good example.

Another reason for the slow growth in agro-industrial development in Sri Lanka was the lack of adequate incentives to attract private sector investors. Tourism, urban development, import-export trade and gemming became more lucrative than agro-industries under the liberalized trade and economic policies. No special banking credit packages were available. There was also the problem of finding land for cultivation. The incentives suggested that for a period, development of agro-industries include concessional credit, tax, exemptions, facilities for import of necessary machinery and materials, land leases on a long term basis, minimum official control and interference, provision of infra structure facilities particularly roads, housing, and transport. To accelerate the process, the government could consider a package of incentives by extending facilities for infrastructure, concessional credit and exemption from tax expenditure on R & D and imports of necessary machinery and material.

Another reason for the uneven development of agro-industries in Sri Lanka is the limitation of the vision to a mere satisfaction of local market demand. There has been no concerted effort to boost crop development except in the case of rice. Sometimes a particular crop received a fillip as a result of a temporary, import shortage, but as soon as the crisis passed the situation has reverted back to its earlier position. Under these circumstances the cultivators themselves were baffled and uncertain of their future and therefore agro-processing industries could not develop out of such a background. Hence it is not suprising that whatever agro-processing industrial development is visible in Sri Lanka is confined to crops with a policy commitent - a commitent to export or a commitent to self reliance.

Another area is the pricing of agricultural commodities. It is a truism that probably anything can be exported provided the price is right. "Right price" means the price of the crop will have to be the price appropriate for the quality of the product. Therefore any commodity will have to be produced in such a manner that it can be attractively priced while giving a reasonable profit. The object should be to keep productivity high and cost of production low in order to get a reasonable margin though this depends on several scientific, technical and industrial policy decisions. However, the more important and complicated aspect is organization and management of the production system.

Any strategy towards the development of agro-processing industries in Sri Lanak requires amongst other things:

a. A market oriented approach, particularly for export oriented industry;
b. Selection of industrial technology consistent with product quality and packaging;
c. Import of appropriate technology;
d. Research and Development of indigenous technologies where appropriate as regards capacity; mechnization etc.

There is a need also to cross pollinate ideas and bring better coordination for agro-industrial development by inviting the private sector to participate in the national effort. There are a large army of resource personnel in the private sector with adequate industrial experience who could be cooped appropriately to reduce research time and costs and minimize the gap between technical viability and commercial feasibility of a project. There is also a need to link universities to industry in the field of agro-industrial research. Moreover, R & D in the private sector should also be encouraged by granting such activity tax free or taxholiday status.

In conclusion, it is important to repeat that agro-industrial development is a means to modernize agriculture in Sri Lanka. It is complementary to the development of agriculture. It plays an important supporting role for agricultural production by generating remunerative prices for the produce and reduces post harvest losses. It promotes various backward and forward linkage industries and services. Hence, it is time that the country made sufficient and concentrated efforts towards the development of agro-based industries, particularly in the major irrigation schemes like Lunugamvehera, Muthukandiya, and in the various management systems under the Mahaweli Development Programme.

SEMI PROCESSED OR STORED FRUITS AND VEGETABLES AS RAW MATERIALS IN THE FOOD PROCESSING INDUSTRIES AND THE CATERING SECTOR – Market opportunities in Sri Lanka

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Fruits and vegetables grow abundantly in Sri Lanka and are used either for direct consumption or processing into secondary products for the consumer market. Cultivation is seasonal, depending on the rains, there being two seasons of production namely the Maha extending from October to April and the Yala from May to September. Large quantities of produce are then available in all parts of the country, but is has been estimated that 20-30% of the country's production goes waste each year due to losses caused by several factors along the post harvest chain.

These include harvesting at an incorrect state of maturity, poor handling practices, unsatisfactory packing, lack of proper packaging, transport delays, inadequate distribution channels and unsuitable storage condition till sale.

During seasons of glut large quantities of fruits and vegetables have been seen to perish at the distant sites of production where supply rapidly exceeds the demand and distribution facilities are not available. Producer prices fall very low and in contrast in the urban areas consumers are unable to obtain their requirements of fruits and vegetables and are often compelled to pay high prices for the poor quality often deteriorating produce which reach the urban markets. This situation is even more serious in the off seasons, when large scale consumers like the fruit and vegetable processing industries, hotels and catering establishments experience considerable difficulties in obtaining their requirements of raw materials.

1. FAO Report Rome, Italy, Analysis of an FAO survey of Post Harvest crop losses and developing countries 1977

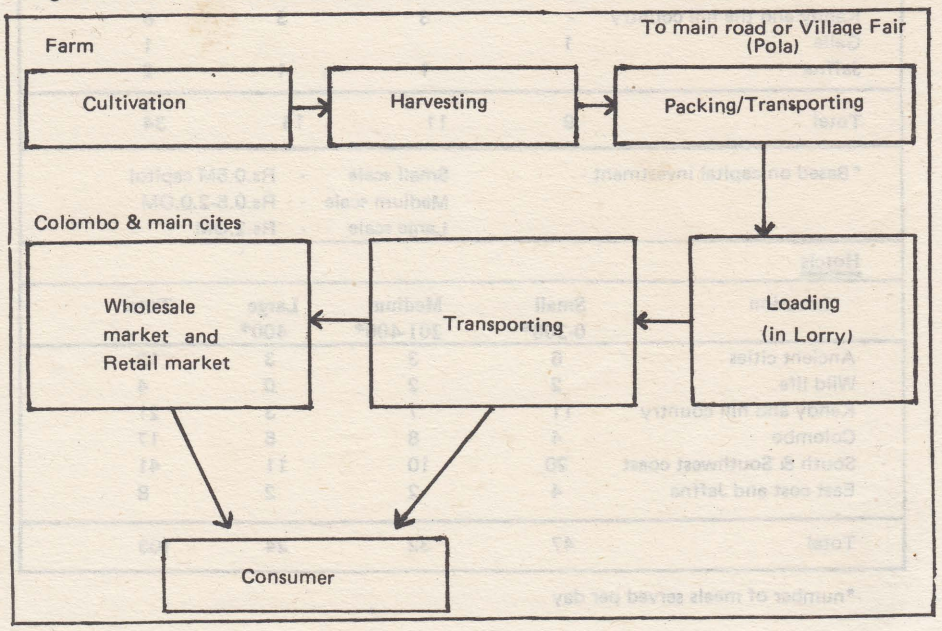
Objectives and Methodology

The CISIR with support from the International Development Research Centre, Canada carried out a survey of selected Fruit and Vegetable processing industries and Hotels (categorised as Industrial consumer establishments) with a view to firstly determining whether these consumers experienced any difficulties and problems in obtaining their necessary requirements of raw materials, and thereafter to seek their response to the possibility of utilizing an alternative source of supply namely preserved or stored fruit and vegetable raw material for processing/cooking. Special techniques for the conservation and preservation of fruits and vegetables are available today which are being used in many countries. These could be introduced at the sites of production in distant areas. This leads to the concept of establishing small scale primary processing centres for the conservation or preservation of all excess produce in these different districts of production.

Briefly the techniques for preservation/conservation include:

1. Prolonged storage in the natural form-by controlled atmosphere storage, prepacking and wax coating techniques. This raw material could be utilized for processing to all types of products and has wide application.
2. Storage in the form of fruit/juice or fruit pulp - by chemical preservation or freezing techniques. Products could be utilized for the manufacture of cordials, squashes, jams, preserves, chutneys and sauces.
3. Storage as whole or sliced fruit - using steeping presevation techniques. Products could be utilized for the manufacture of chutneys, pickles and preserves.
4. Storage as sliced dehydrated fruits or vegetables - using techniques of

Figure 1 FRUITS AND VEGETABLES – THE POST HARVEST CHAIN



solar and hot air drying. Products could be used for the manufacture or chutneys, pickles and preserves

5. Excess produce could be also processed at village level into simple products such as fruit bars, fruit leather, candies etc. which would ensure maximum utilization of these raw materials.

The necessary information in this survey was obtained by means of questionnaires, personal visits to consumer organisations and follow up by telephone and mail wherever necessary. Information on fruit and vegetable production, existing marketing channels and price variation data were obtained from the Department of Census and Statistics, Ministry of Agricultural Research, Markfed organization. Marketing Department, Central Bank and by interview with traders, commission agents, transporters and middlemen from the large wholesale markets of Colombo and Kandy.

The consumers surveyed initially included 34 industrial establishments and 103 hotels distributed as in Table 1.

The information obtained regarding supplies and purchasing pattern of fruits and vegetables by these organisations included the following:

- fruits and vegetables utilised and products prepared.
- quantities consumed
- sources of purchase
- frequency of purchase
- location from where they were supplied
- storage period prior to use
- problems of spoilage if any in the raw materials prior to use and extent of spoilage.

The response/reaction of consumers to the newly suggested supplies of raw materials was ascertained by personal interview with production managers of 30 selected industries and with the food and beverage managers or the chefs in 30 selected hotels.

TABLE 1 - CONSUMER DISTRIBUTION

Industries

Location	Small scale *	Medium scale *	Large scale *	Total
Colombo	6	5	3	14
Ja-ela, Hanwella,Kaduwatha	2	2	7	11
Kandy and the hill country	-	3	3	6
Galle	1			1
Jaffna		1	1	2
Total	9	11	14	34

*Based on capital investment - Small scale - Rs.0.5M capitol
Medium scale - Rs.0.5-2.0.OM
Large scale - Rs.2.OM

Hotels

Location	Small 0-200*	Medium 201-400*	Large 400*	Total
Ancient cities	6	3	3	12
Wild life	2	2	0	4
Kandy and hill country	11	7	3	21
Colombo	4	8	5	17
South & Southwest coast	20	10	11	41
East cost and Jaffna	4	2	2	8
Total	47	32	24	103

*number of meals served per day

Fruit and Vegetable Production and Distribution

Cultivation and production data obtained was mainly based on target estimates. However it enabled the identification of the major areas of production for differnt fruits and vegetable in the country. (see table 2)

An analysis of the existing marketing system is schematically represented in Figure 2 and mainly applies to the produce which enters the trade channels. There is also a considerable quantity of produce in the rural area which is consumed by the growers and rural people and which is difficult to assess accurately.

Primary producers customarily bring their fruits and vegerables by carrying them as a head load, or on a bycycle or by lorry to the main road or to the village fair or pola on specified days of the week. Generally there is no grading or sophisticated from of packaging and wholesale traders, commission agents, transport contractors, cooperative officers, Markfed officials, Marketing Department officials and individual private consumers inspect and purchase the goods. These are then despatched to Colombo and othher main towns. Poor packing of produce, overloading and improper storage till sale often contributes to the increase of spoilage and shortens the shelf life of the raw materials.

Fruit and Vegetable Supplies to Industries and Hotels

Sources

The main sources of supply of fruits and vegetables to processing industries are through the middlemen or transport agents or nearest wholesale market or in a few instances the grower himself. In the 34 industries surveyed it was found that trans-

2. Dept. of Census & Statistics Agricultural Information Division.

porters or middlemen supplied raw materials to 22 industries (4 entirely and 18 partly). 17 industires (50%) had been regularly adopting the practice of purchasing produce from the nearest wholesale market and among these 7 were totally dependent on the market while the others were to some extent reliant on the middlemen and in one instance total supplies were from the grower himself. The majority (25) of the industries were located in Colombo and its suburbs and were therefore greatly dependent on the middlemen and the wholesale markets for their supplies. In contrast industries in the hill country and outstation had greater contact with the grower.

Hotels were mainly supplied by agents, that is regular suppliers who function in purchasing raw material from many sources, sort, select and grade the produce and sell them at different prices to hotels according to quality and grade. For example Grade I produce is sold at approx. 300% their cost while lower grades are priced proportionately less.Hotels also purchase produce from the nearest wholesale markets. Among the 103 hotels surveyed it was found that 48 (14%) used both sources. It was also found that hotels in the south and southwest coast of Sri Lanka relied to a greater extent on the regular suppliers while Colombo hotels obtained supplies equally from both sources. A point to be noted here is that produce reaching the consumer in the above manner has travelled through the post harvest chain and is being redistributed once again and the auality and condition of the produce would be greatly affected by the conditions prevailing and methods used during handling, packing, transport and storage prior to sale. The main point of concern being the existing gap or lack of contact between the primary producer and the end user and the lengthly channel it has to travel to reach the consumer,

TABLE 2 - MAJOR PRODUCING AREAS OF FRUITS AND VEGETABLES IN SRI LANKA

Fruit/Vegetable of Imprtance*	75% PRODUCTION AND ABOVE		
	Wet Zone(District)	Intermediate Zone (Districts)	Dry Zone (District)
Ash Plantain	Ratnapura, Kandy,Kegalle	Kurunegala	Monaragala, Hambantota
Beans*	Kandy, Nuwara-Eliya Ratnapura	Badulla, Matale	---
Beetroot*	Kandy, Nuwara-Eliya	Badulla	Jaffna
Bitter Gourd	Ratnapura, Gampaha, Kegalle	Kurunegala	Hambantota
Brinjal	Ratnapura	Badulla, Kurenegala	Hambantota, Monaragala
Cabbage*	Kandy, Nuwara-Eliya Ratnapura	Badulla	Jaffna
Chillies*	Kandy	Kurunegala, Matale	Anuradhapura, Jaffna, Polonnaruwa
Cucumber*	Ratnapura, Kandy	Kurunegala,	Hambantota, Moneragala
Ginger*	Gampaha, Kegalle	Kurunegala	----
Knol Kohl	Nuwara-Eliya,Kandy, Ratnapura	Badulla	----
Leafy Vegetables	Colombo, Galle, Gampaha	----	Batticaloa, Hambantota
Leeks*	Kandy, Nuwara-Eliya, Ratnapura	Badulla	----
Mustard*	Ratnapura	matale	Anuradhapura,Puttalam Moneragala
Okra	Gampaha,Kandy	Kurunegala	Batticaloa,Hambantota
Onions red*	Ratnapura	Kurunegala,Matale	Jaffna, Mullativu
Potatoes*	Nuwara-Eliya	Badulla	Jaffna
Pumpkin Ash*	Ratnapura	Kurunegala	Hambantota, Moneragala
Pumpkin Red*	----	Kurunegala	Hambantota, Moneragala, Anuradhapura, Amparai
Raddish	Kandy,Matara, Nuwara-Eliya	Badulla	Hambantota
Snake Gourd	Kandy, Ratnapura, Gampaha	Kurunegala	Hambantota, Moneragala
Tomato*	Kandy	Kurunegala, Matale	Hambantota, Moneragala
Fruits			
Bread Fruit	Galle,Kandy Kegalle, Matara	----	Hambantota
Cashew	Kalutara, Ratnapura	Kurunegala	Hambantota
Jak*	Gampaha, Degalle, Ratnapura, Galle	----	Hambantota

Fruit/Vegetable of Imprtance*	75% PRODUCTION AND ABOVE'		
	Wet Zone(District)	Intermediate Zone (Districts)	Dry Zone (District)
Lime*	Ratnapura	Kunegala	Hambantota, Moneragala Amparai
Orange*	Gampaha	Kurunegala,Matale	Hambantota, Moneragala Puttalam
Orange*	Ratnapura, Kegalle	----	Hambantota, Moneragala
Papaya*	Ratnapura	Kurunegala,Matale	Hambantota, Moneragala
Passionfruit*	Kalutara, Gampaha, Galle	Badulla	
Pineapple*	Gampaha,Kegalle, Galle	Kurunegala, Matale	Hambantota
Plantain	Kandy, Kegalle, Ratnapura.	Kurunegala,Matale	

* Produce in demand by processing industries and hotels.

Source: 1978-1982 Department of Census & Statistics -(Agricultural Information Division).

Storage of Produce and Spoilage Problems

Produce once purchased is not utilized or consumed immediately but may be stored for a short period prior to use. It was found that 28 of the industries stored purchased raw materials for over 2 days and 21 (62%) indicated serious spoilage problems. The greatest spoilage encountered by industries were with tomato, papaya, passionfruit, lime, mango and pumpkin ranging from 5-26% of the material purchase. Hotels too store raw material for short periods and all had experienced problems of spoilage. The highest spoilage was encounted with tomato, leafly vegetables such as leeks, cabbage, lettuce, cauliflower and fruits such as papaya, plantain and pineapple. The extent of spoilage ranged from 2% to 10%.

Supplies in the Off Season

It was confirmed that these consumer organisations had many problems in the off seasons when prices of fruits and vegetables increased due to the shortages. Hotels were totally dependent on their suppliers and had no means of long term stroage. They were compelled to pay the higher prices demanded or as an alternative remove the corresponding product from the menu.

It was significant to note that processing industries had made some problems. 9 industries had already adopted the practice of using preserved juice and pulp manufacfactured during the season. 4 of these industries completely met the demand in this manner while the others in addition utilized excess (production stocks or purchased) material at the higher price. It was also significant to note that among the industries utilizing preserved raw material 3 industries purchased it from a common supplier of preserved raw material thus demonstarting that the objectives of this study were already in practice. The main items which were currently being preserved by some industries for the off season in the form of

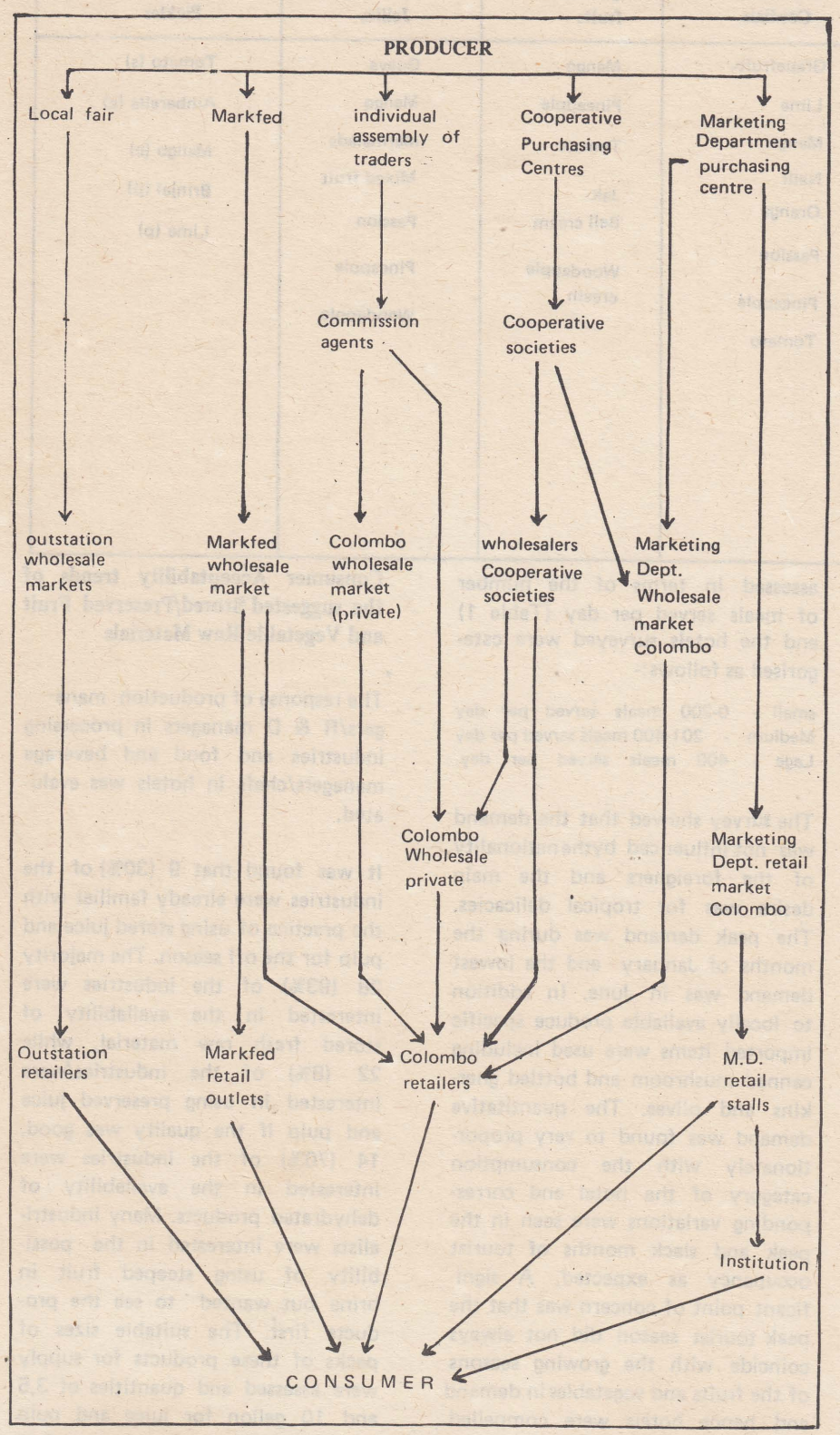
TABLE 3

FRUITS AND VEGETABLES PROCESSED BY INDUSTRIES TO DIFFERENT PRODUCTS

Fruits Juice Based Products			Fruit Pulp Based Products		Fruit Whole and Sliced		
Canned Juice	Ready to drink beverage	Cordials	Jams/Jellies	Chutneys/Sauces	Canned Fruit	Preserves	Pickles
Passion	Passion	Passion	Passion	Tomato	Pineapple	Red-pumpkin	Lime
Pineapple	Pineapple	Pineapple	Pineapple	Mango	Mango	Ash-pumpkin	Garlic
Mango	Mango	Mango	Mango	Ambarella	Papaya	Ginger	
Tomato	Woodapple	Papaya	Tomato		Jak	Chow	
Papaya	Beli	Lime	Papaya				
Woodapple		Orange	Pumpkin-Red				
Beli		Woodapple	Pumpkin-Ash				
		Beli	Woodapple				
		Nelli	Marmalade				
			Orange				
			Strawberry				
			Mulberry				

Figure 2 -

EXISTING CHANNELS OF DISTRIBUTION OF FRUITS AND VEGETABLE IN SRI LANKA



Source: L A C Alles et al, Report of a Workshop on Post Harvest Food Losses in Sri Lanka, February,1980.

juice and/or pulp included pineapple, mango, tomato, passionfruit, lime, woodapple and pumpkin.They were preserved using sodium metabisulphite and stored in 3 or 5 gallon PVC containers.

Apart from the above, it was found that 2 industries managed solely on excess production stocks to meet the demand while 1 industry stopped production and sales in the off season. It was important to note that 21 of the industries purchased raw material at a higher price during the off season to meet the demand. It is a possibility that these industries would be interested in utilizing the alternate preserved supplies suggested

Demand for Fruits and Vegetables by Industries and Hotels

This was assessed in terms of the nature and quantities of raw material processed or consumed, the types of products manufactured and the maximum capacities for production in industries or in terms of the quantum of meals served by hotels.

Fruits and vegetables processed by industries were classified in accordance with their utilization in different categories of products (Table 3). Fruit juice based products included cordials, squashes, canned juice and ready to drink beverages (eg. fruit nectar), fruit pulp based products included canned fruit, preserves and pickles. The fruit in greatest demand by most industries was passionfruit followed in decreasing order by pineapple, mango, lime, woodapple, tomato, marmalade orange, pumpkin, papaya, chow chow and ginger. The maximum quantities required by a single plant were as high as 6000 metric tons per annum for passionfruit and 200 tons for tomato, pineapple and mango. Extremely large capacities for production were available in some industries but were under-

TABLE 4 - FRUITS, VEGETABLES AND THEIR PRODUCTS UTILISED BY HOTELS

Vegetables	Fruits	Fruit Juices and Cordials	Canned fruits	Jams and Jellies	Souce, Chutney Pickles
Beans Beetroot Brinjal Cabbage Carrots Cauliflower Celery Chillies Cucumber Garlic Ginger Okra Leeks Lettuce Mushrooms Onions Potatoes Spinach Tomato Tamarind	Avocado Pears Banana Grapefruit Lime Mango Mangosteen Melon(water) Orange Papaya Pineapple Woodapple	Grapefruit Lime Mango Nelli Orange Passion Pineapple Tomato	Mango Pineapple Tomato Jak Beli cream Woodapple cream	Guava Mango Marmalade Mixed fruit Passion Pineapple Woodapple	Tomato (s) Ambarella (c) Mango (c) Brinjal (p) Lime (p)

utilized for various reasons predominantly the lack of good raw material and the need for a wider market. The maximum capacity available in one of the largest processing industries was 7000 bottles/day for cordials, 18,000 bottles/day for jams, 10,000 units/day of canned juice, 6000 units/day of canned fruit and 7000 units/day of sauces. The products in greatest output were jams, cordials and fruit juices and to a lesser extent for chutneys, sauces and pickles. Canned products were mainly confined to the few export oriented industries.

Hotels consume a wider range of produce which include fresh fruits and vegetables, fruit juices, canned fruit, jams and jellies, sauces, chutneys and pickles (see Table 4). The specific demand varied with the number and types of consumers patronizing the hotel. The local populace consume many of the tropical vegetables while foreigners requirements were influenced by their nationality and background.

Consumption demand in hotels was assessed in terms of the number of meals served per day (Table 1) and the hotels surveyed were categorised as follows:-

small - 0-200 meals served per day
Medium - 201-400 meals served per day
Lage - 400 meals served per day.

The survey showed that the demand was not influenced bythe nationality of the foreigners and the main desire was for tropical delicacies. The peak demand was during the months of January and the lowest demand was in June. In addition to locally available produce specific imported items were used including canned mushroom and bottled gherkins and olives. The quantitative demand was found to vary proportionately with the consumption category of the hotel and corresponding variations were seen in the peak and slack months of tourist occupancy as expected. A significant point of concern was that the peak tourist season did not always coincide with the growing seasons of the fruits and vegetables in demand and hence hotels were compelled to often purchase produce at high prices during the off season.

Consumer Acceptability trends of the suggested Stored/Preserved Fruit and Vegetable Raw Materials

The response of production managers/R & D managers in processing industries and food and beverage managers/chefs in hotels was evaluated.

It was found that 9 (30%) of the industries were already familiar with the practice of using stored juice and pulp for the off season. The majority 28 (93%) of the industries were interested in the availability of stored fresh raw material, while 22 (8%) of the industries/were interested in using preserved juice and pulp if the quality was good. 14 (70%) of the industries were interested in the availability of dehydrated products. Many industrialists were interested in the possibility of using steeped fruit in brine but wanted to see the products first. The suitable sizes of packs of these products for supply were assessed and quantities of 3,5 and 10 gallon for juice and pulp supply found to be appropriate for supply.

Hotels

The possibility of providing semi-processed/preserved supplies to hotels was also similarly assessed. All hotels were interested in a supply of stored raw material in the natural form. The response to the idea of supplies of preserved juice was also very good as most hotels now utilize cordials and squashes (725 ml bottles) as their main source of juice. The juices in greater demand were passionfruit, mango, tomato and grapefruit, lime and pineapple. An encouraging response was also obtained for pulp from tomato and tamarind and lime Juice for use in culinery preparations. Requests were received for supplies of specific products which included mushroom in steeped liquor, pickled olives, onions and gherkins and for dehydrated carrot as garnishing/and ash plantain chips as snacks. convenient packs for supply determined as before were as follows:-

Fruit juices	-	1-3 gallon packs
Muschrooms	-	1-3kg packs
Tomato pulp	-	0.5 gallon packs
Tamarind extract	-	bottles (725 ml)
Dehydrated products	-	2kg packs.

Conclusions and Recommendations

It was established that there were many problems in the supply of the fruits and vegetable raw materials to industries consumers. Most of these problems were due to the existing post harvest problems in transport and strorage which are difficult to control. The response to an alternate source of supply of stored/preserved raw material was good. There are large quantities of fruits and vegetables being produced in the glut season in different rural districts which are under-utilized and go waste. It is recommended that programmes be planned to develop suitable semi-processing technologies for preservation of these raw materials for use in the off season. These programmes could be carried out in small scale fruit and vegetable processing centres set up in the different districts of production in Sri Lanka.

ROLE OF AGRO-PROCESSING INDUSTRY IN SRI LANKA'S DEVELOPMENT

T.K.G. Ranasinghe

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At the time of independence,Sri Lanka had one of the highest per capita incomes in Asia.Since then, many countries in the region have far surpassed us,leaving Sri Lanka only marginally better than the least developed countries.

We know that Sri Lanka's economy is heavily dependent on agriculture (which contributes 25-30% of the GNP) and though the economy may be diversified, we would continue to depend on agriculture for many years to come. Sri Lanka's development will have to lean heavily on the utilization of it's resources to develop agriculture. Much of the infrastructure necessary for this purpose has been built in the recent past and the time has now come to produce a return on this investment through agriculture and agro-processing industry.

Development of agro - processing industry is one of the most important aspects in our development effort as it is complementary to development of agriculture.It plays an important supporting role for agriculture production by generating remunerative prices for the produce,reducing post harvest losses and absorbing fluctuating agricultural outputs to meet demand.It also promotes various other related activities and thus develops the rural economy which in turn reduces migration to urban areas.

With the land to man ratio declining steadily from about 100 persons per sq k in the 1980's to about 250 persons per sq.km.today due to population growth, the employment opportunities from farming alone will be inadequate particularly for the second generation of settlers on small holdings.It may be possible to generate one unit of employment from off-farm activities per unit of on-farm employment,if there is a sustained effort at development of agro-processing industry and related activities.

Agro-processing industry could also help save foreign exchange through import substitution in food and non-food items, and enhance foreign exchange earnings through exports of higher added value products.

Agro-processing is not new to Sri Lanka as our major crops have been processed in some manner or other before export and it has been so, for the locally consumed products as well.However, much of the exports have been in the form of primary processed products.This may have been good enough 50 years or even 25 years ago but today we are behind time because,what we do and how we do things are related to a time frame. It is similar to the imported products such as cars,machinery,electrical or electronic equipment or medicines their designs and performance are constantly becoming obsolete and new products and concepts evolve all the time.The decline of British industry has been due to similar reasons in not changing with the changing markets and changing circumstances with respect to time.

An examination of the purchasing power of exports from Sri Lanka reveals that this has been reduced to half every 12 years or so.This means,that (say) one metric tonne of coir fibre or any other primary

processed products generally,when exported earns only half of what it could import by way of industrially produced goods every 12 years.In other words, every 12 years we have to double our unit export prices through added value or double our export volumes or halve our import volumes if we are to offset this disadvantage. We have been consoling ourselves by stating that developing countries like ours do not have the power to determine export prices or import prices and hence these factors are beyond our control. HOwever,we can increase export prices through further processing of our agricultural produce and adding value.For adding value,we need technology in addition to all other requirements and facilities we all know about.

Agro-processing industry appropriate for Sri Lanka has to be assessed from many view points. Firstly,if we consider the major export crops such as Tea,Rubber and Coconut,any improvement in the present range of products or through innovation of new products and processes;will result in substantial export earnings due to the large volume involved.Secondly, the scope for development of paddy/rice based agro-industry is tremendous both in quality and quantity and the industry must get to the final stage of producing instant foods not only to absorb the supply peaks during harvest but also to save time for the housewife. The other crop also offer tremendous scope, both in terms of exports and import substitution.Appropriateness in terms of technology and management must take into consideration the local environment and other aspects whilst recognising the high level of hygienic requirements for food factories and packaging,particularly for exports to sophisticated markets.

The government has taken various steps in promoting export oriented and import substitution agrobased industries. Investment relief, profit tax holidays,turnover tax exemptions etc.are available for investors. Foreign investment including joint ventures and inflow of technology have been encouraged.Bank financing for projects have been made available though not strictly development finance for new entrepreneurs. These efforts have to be combined with development of indigenous technology and management capability.Indigenous technology has to be developed for some industries whilst for some industries tested, foreign technologies could be used,where appropriate.The role of technological innovation and management in development of the agro-processing industry has not been stressed adequately.At present there is a dearth of appropriately educated and trained personnel responsible for technology and management in the agro-processing and similar fields.

What I have said so far has been easy to say but not easy to achieve.If we are to achieve any significant levels of development, we need a new effort and a will to accept change consistent with what all this demands.I would like to leave a few thoughts with you.

Development of agro - processing industry requires:

1. A market oriented approach, particularly for export industry.

2. Selection of industrial technology consistent with product quality and packaging.

3. Import of technology where appropriate,particularly when this can be negotiated through joint ventures.

4. Research and Development of indigenous technology where appropriate as regards capacity,mechanization etc.particularly for small and medium scale industry. For this purpose the following are relevant.

4.1 Government research institutes should make use of resource personnel from the private sector with industrial experience to reduce the gap between technical viability and commercial viability and thus reduce research time and costs.

4.2 Make use of Universities-to gear MSc degree research projects and even BSc degree projects to tackle problems of a national nature or of a particular industry.Faculties of Science,Engineering,Agriculture and Medicine may be useful for this purpose.Here again tie up with resource personnel with practical industrial experience is very important.

4.3 Formulate a scheme of servicing all private industry to carryout inhouse Research and Development using resource personnel with industrial experience.A financial package is considered necessary here.

4.4 Extension Services for improvement of technology,productivity and management of industry to enlist personnel experienced in industry.This is to highlight the fairly common situation where in Sri Lanka,most people engaged in promoting and adivsing industrial development are academicians with little or no industrial experience.

5. Develop the agricultural sector to gear to agro - processing industry by -

5.1 Transforming the subsistence farming of smallholders to highly productive commercial farming wherever feasible.

5.2 Transforming rain fed farming to irrigated farming particularly in the Dry and Intermediate Zones where feasible.

5.3 Promoting regional specialization as in the highly organized agricultural and processing industry overseas (and like our tea,rubber,coconut),by setting up planned processing centres and nucleus estates.We do have agro ecological conditions to grow a wide range of crops but if they are scattered all over the country there is difficulty in collection,storage and transport to processing units.

5.4 Breeding special varieties which facilitate processing, maximise yields and make processing profitable.

Finally before I conclude,I wish to encourage my fellow engineers to think of serving in productive or wealth creating sectors such as agro - processing industry because, you will realise that the possibilities I have indicated require engineers of calibre to achieve.Since Sri Lanka is in its infancy where industry and technology are concerned, most of our engineers have been trained to,and serve in development of infrastructures and service sectors,and left the rest to others.It is time for our engineers to contribute towards using these infrastructures to create wealth for Sri Lanka by involving themselves in multidisciplinary exercises,making decisions in management and offering strong leadership in development affairs of this country.

BANKING

CERTAIN OBSERVATIONS ON THE DISHONOURING OF CHEQUES BY THE BANKS

Banker customer relationship entails mutual contractual obligations and duties as well.When a customer draws a cheque on his account in the Bank he has to ensure that the cheque is "honourable" by the drawee bank.

As is known a cheque to be valid has to conform to certain norms and legal requirements which have become acceptable in the banking world.

To briefly enumerate, the cheque has to be drawn neither post dated nor to be ante-dated beyond the time span the would make it invalid. It should not be beyond 30 or 60 days after the date of drawing if indicated as valid for 30/60 days. It should not be ante-dated six months since a cheque is valid for six months and the Bank may use its discretion and return it if it is not presented for over three months. If post dated the cheque will not be honoured, and a polite request will be made to reprsent it on or after the date. On such occasions the Bank will use the normal remarks like 'post dated';'obsolete'; irregularly dated' especially if the dating is not regularly done.

For instance, a bank returned a cheque for failure on the part of the customer to write the date according to international practice viz. year, month and date; When the very cheque leaf provides for writing out the date month and lastly the year by printing the first two digits of the current century. (Such howlers should be avoided)

There are other material parts of the cheque like amount of the cheque. This has to be written in both words and figures and both should express the same amount. If not it would be returned with the remark "amount in words and figures differ" Certain banks permit the writing of the amount in words giving the cents part in figures instead of words.

Payee can be 'cash' , named person or institution, the last two being either for 'order' or'bearer'. If bearer is cut off it is construed as intended for order, if cash or 'order' is drawn it behoves the drawer to call in person and draw cash. The question of endorsement comes in when the cheque is payable to a named person or his order and he wishes to transfer same.

Another material part of the cheque is the signature of the drawer. It has to agree with the specimen already lodged as part of the mandate. When it differs or is incomplete by failure to place the relevant stamp or seal, if furnished when submitting the mandate, could also lead to dishonour.

There are certain crossings which when used restrict the transferability to the extent of the directions contained in the crossing itself. For example, if crossed, that is drawing of two transvere lines it cannot be encashed by non-bankers. If crossed specially to a bank it cannot be collected by anybody other than the named institution or its agent for colection. If the "account payee only" direction is included it cannot be collected to a party other than purported payee. If "not negotiable" is added or stated alone, it is enured that a person who has no title to it does not get the proceeds by mere possession of the instrument. In such cases the bank returns cheques with the appropriate remarks.

There are circumstances when the bearer cheques can be altered to order cheques, in such instances either direct credit or proper endor-

sement is expected to restore its bearer status. If direct credit is intended the collecting bank guarantees fate with the appropriate guarantee duly signed by its authorised officer. In case of irregularities collecting banks refuse to collect and return, and if under certain circumstances (especially when endorsements are not satisfactory or appropriate) the paying bank also returns the cheques dishonoured.

Complaints have been received from payee's that the banks have invalidated the bearer cheques and returned them calling for endorsements by merely cutting the word bearer. This is a sad reflection if there is connivance to use a technical reason, to return, a cheque drawn without funds.

These legitimate dishonours are done to safeguard the interest of the customer as well as that of the bank. The drawer is the customer and the bank is bound to safeguard the interest of its custtomer,sometimes inspite of himself.

His carelessness or inappropriate drawings, contrary to the mandate may place the bank in an embarassing position of having to return a cheque which may impair his credit. In certain circumstances he may purposely draw the cheque in such a manner that the Bank will have to return it. Thus his intention is fulfilled indirectly, through the Bank.

Bank returning of cheques could be broadly categorised into two. One is for technical reasons. The reasons enumerated above fall under this category. The most important other category is that of returning for want of funds. It may be insufficiency or non-availability at the time of presentation.

It is interesting to note that in view of the confidentialily of the banker /customer relationship the Bank unless on request, custom, compulsion of law or state requirement does not disclose and is precluded from disclosing the state of the account.

The remarks used when returning for want of funds is "Refer to Drawer". This remark is what it means and was intended to refer the cheque back to the drawer may be for want of funds or may be even for some other even technical reason which the bank does not wish to convey or reveal to the third party who is not a party to the subsisting contractual relationship. This confidential communication which is meant to refer the cheque back to the drawer has come to mean lack of funds. One reason for this is all others are obviously seen on the cheque and even when returned are expressly stated, therefore it is by a process of elimination, so to say that it has come to mean lack of funds. There are other remarks also to indicate lack of funds. " Funds drawn against not received", "Exceeds arrangements". "not arranged for", "effects not realised". These to a certain extent reveal the state of the account and a prudent banker avoids all these and uses the remarks "Refer to drawer". It is what it means and nothing more to all others as banking authorities contend. In practice transactions have attributed this meaning namely "Want of funds" when returned with the remarks, "Refer to Drawer".

This is an area where bankers have to exercise greater caution, namely safeguard the customers "credit worthiness" or his ability to meet bills or his reputation. If by other means the payee gets to know the deficiency he makes good the amount and represents his cheque to the bank which will have no alternative but to pay although the customers intention of avoiding payment in time questionable will not be realised, and he may stand exposed.

There will be occasions when the bank has to return a cheque for both lack of funds and for technical reasons. Some banks adopt the easy course of stating the technical or proximate reasor on the cheque or the attached slip and not the financial or the ultimate reason. Certain banks still consider cheques returned for want of funds as a serious disqualification and close the account once 3 or more cheques are returned within the first six months and more than five after six months and more that ten when there is a loan commitment.

Certain banks have ceased to consider this as a serious disqualification though they continue to recover the penalty at a flat rate, though the rate in the context referred to above is on a graduated scale ending up in closure of the account.

Though the accepted banking practice is to metion the remark on the instrument certain banks use an attached slip and no remark is made on the cheque itself. This is contrary to law and more customer oriented and does not facilitate the maintenance of high standards of financial discipline.

Non-use of other remarks, indicative of lack or insufficiency of funds has been observed, by prudent bankers by confining their remarks to the innocuous phrase "Refer to Drawer". This is sufficiently expressive without disclosing something which a bank is not expected to do. Though "Refer to Drawer" has come, in normal parlance,to indicate lack of funds it should be used more frequently as an all embracing remark to include wherever possible certain technical errors or extraneous constraints on payments.

This note is not intended to be an exhaustive analysis of dishonour of cheques in all its aspects but to draw attention to certain aspects of current interest. R.S.

RUBBER: Auction Price Increases

The increase in rubber prices continued throughout the first five months of 1986,with Latex crepe fetching much higher prices than Sheet rubber.The average Colombo Market price during the first five months of 1986 for Latex crepe was Rs 22.72 per kg as against Rs 16.17 per kg during the same period in 1985.The price of RSS No 1 averaged Rs 16.44 per kg during Jan-May 1986 as against Rs 15.76 per kg during the same period of the previous year;while in the case of Scrap crepe prices declined during this period from Rs 14.03 per kg in 1985 to Rs 13.56 per kg in 1986. (See table 1).

The increase in prices is seen more clearly in the monthly Colombo Market average prices where in 1986

Latex crepe No IX - Rs 26.92
Scrap Crepe - Rs 15.50

Data recently released for last year shows that total export earnings from rubber in 1985 were Rs 2,566 million (SDR 93 mn),which was a decrease of 27 percent in SDR terms compared to the previous year.Also the average FOB price decreased by 23 percent in SDR terms from Rs 26.16 (SDR 1.00) per kg in 1984 to Rs 21.34 (SDR 0.77) per kg in 1985.

In spite of a fall in export (FOB) prices in all grades,the Colombo market price of RSS 1 increased by 8 percent.Small holders and private small estates may have benefitted from this increase in local market prices to a small extent.But in the case of the public sector estates and large private sector estates the increase was not sufficient to offset the increase in their cost of production,according to Central Bank findings.

The Central Bank has warned that rubber production has approached a plateau in terms of production, yield per hectare and extent in bearing. In view of the limited scope for expansion of the area under cultivation,the future prospects for increasing production would depend,to a greater extent,on increasing productivity,while maintaining an effective level of replanting.To this end,the expansion in the use of high yield varieties and the maintenance of cultural practices including fertilizer application at desired levels are vital.However,the low incomes of the small holder dominated rubber sector precludes a more widespread adoption of better cultural practices.

Small holders are also constrained by insufficient processing facilities and are sometimes made to carry latex for processing over a long distance. Crudely processed latex in the absence of better processing facilities fetches low prices making their plight even worse.Therefore,the Bank suggests that some incentives are necessary to revive this vital sector of the economy.

Table 1 Colombo Market Price-Rubber(Monthly Average)

(Rs per kg)

Year	RSS No 1	Latex Crepe IX	Scrap Crepe No 1
Jan-May			
1984	15.31	18.03	11.39
1985	15.76	16.72	14.03
1986	16.44	22.72	13.56

Colombo Rubber Trader's Association

RSS No 1 moved up from Rs 15.74 per kg in January to Rs 15.82 in May, while the price of Latex crepe increased from Rs 19.65 per kg in January to Rs 13.52 per kg in May. Prices of Scrap crepe have also continued to increase during the first five months of 1986,as seen in Table 2 below.

In the last weekly sale for May 1986 maximum prices per kg at the Colombo auctions were as follows:

RSS No 1 - Rs 16.86

Table 2 Colombo Market Prices Rs (Per kg)

1986	RSS No 1	Latex IX	Scrap Crepe No 1
January	15.74	19.65	12.88
February	16.86	22.26	13.05
March	16.45	23.96	13.89
April	16.32	24.22	13.50
May	16.82	23.52	14.46

Source: *Colombo Rubber Trader's Association*

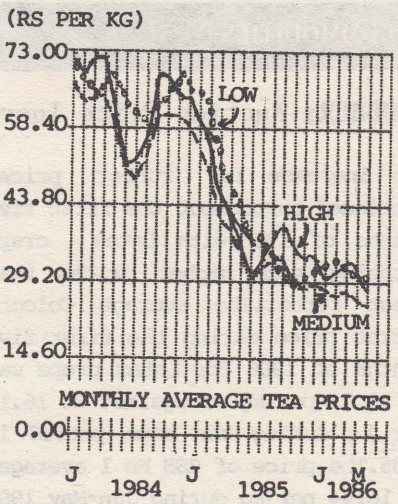
TEA

Crop Declines While Prices Plunge

Sri Lanka's crop figures upto April 1986 show a decline of 7 percent compared to the same period in 1985;production for 1985 period being 79.1 mn kg as against 73.9 mn kg in the first four months of 1986.This decline,however,was considerably lower than total world tea crop figures upto April 1986 which had fallen to 225.3 mn kg in the first four months of this year from 260.5 mn kg in the same period last year.The largest decline was recorded in North India's crop which had dropped by 24.1 mn kg during the 1986 period.In the case of Sri Lanka's crop the fall is attributed to mixed weather conditions experienced in the plantation districts and the delayed monsoon.A significant decline has been noted in the low growns crop. Colombo tea auction prices continued their downward trend upto the end of May this year and there were indications that the decline would continue into June as well. Considering the last three years Colombo auction prices were substantially lower in the first five months of 1986,averaging Rs 29.95 per kg for all grades,compared with Rs 48.59 per kg and Rs 67.56 per kg for the relative periods in 1985 and 1984 respectively.

As seen in the diagram the highest monthly average price for tea in 1986 was Rs 34.00 pr kg for low elevation teas in February;while the lowest average price was Rs 24.00 per kg for medium elevation teas.Table 2 shows that the largest decline in prices over the last three years has been in the category of high grown teas.

Concern for the declining price trends was greater since all major producers were recording lower harvest this year and the quality of Sri Lankan teas remains unchanged.Meanwhile the government



decided to make payments from a Stabilisation Fund to both private and public sector producers at the rate of 25 cents per kilogram of green leaf and Rs 1.15 per kilogram of made tea when the weekly factory average prices are between Rs 22/- and Rs 34/-;while factories will be required to pay smallholders at the rate of an extra 25 cents per kilogram of green leaf.

COCONUT - Lower Unit Prices

Earnings from exports of coconut products had declined to Rs 731 mn in Jan/March this year compared with exports of Rs 751 mn in the first quarter of 1985.The unit valu of kernel products recorded a steep fall with 130.6 metric tons earning Rs 546 mn in the first quarter of 1985 as against 372.6 metric tons earning only Rs 561 mn in the first quarter of 1986. In this kernel products category while export volume increased 185 percent values increased only by 3 percent. The most marked decline was in coconut oil,where the volume exported increased by 550 percent but value increased only by 200 percent.Even local prices recorded a sharp decline with a metric ton selling at Rs 7,664.50 in March 1986 as against Rs 19,696.25 in March 1985. Furthermore, transacted price of desiccated coconut in the local market which was Rs 16.54 per kilogram in March 1985 dropped to 7.85 per kilogram in March 1986. G.J.

Table 1 Monthly Average Prices for Tea in 1983 (Rs per kg)

1986	High	Medium	Low	Total
Jan.	30.11	27.42	32.13	30.12
Feb.	31.08	26.81	34.04	31.38
March	33.32	27.46	32.31	31.54
April	31.24	26.05	30.28	29.58
May	27.62	24.31	29.28	27.45

Source: *Broker's Reports*

Table 2 Average Prices for Tea Over Five Month Period (Rs Per Kg)

Jan-May	High	Medium	Low	Total
1984	69.33	64.44	67.99	67.56
1985	47.17	43.88	53.60	48.59
1986	30.51	26.38	31.60	29.95

Source: *Broker's Reports*

'Chemists for a Better Living'

J.N.Oleap Fernando

Dr. J.N.O.Fernando Professor of Chemistry, Open University of Sri Lanka and President of the Institute of Chemistry, Ceylon,recently delivered his Presidential address on the focal theme "Chemists for a better libving". We publish here extracts from this Presedential address that raised many fundamental issues on teaching science and priorities for Science and Technology in the country

What does the future hold in store for Chemistry? Will organic, inorganic and physical chemistry coalesce into a strong core subject providing a sound foundation for all areas of Science and Technology? Or, will the specialised developing areas of chemistry such as analytical, colloridal and solid state chemistry follow the lead of biochemistry and become separate disciplines? Will polymer chemistry be engulfed in polymer material science and engineering with a consequential loss in chemical origin? There are questions which chemists must attempt to influence the answers in order to retain a greater role for chemistry as the central science.

Chemistry and Chemists in a Central Role in Interdiciplinary Areas

However, one clear message is that if we ignore the role of chemistry in interdisciplinary areas of Science and Technology, chemistry will stagnate as a profession and eventually decay. It is at the interdisciplinary interface between chemistry and the other sciences and between the environment and society that the most important research in the future will be conducted. It would be wrong to think that chemistry as a single discipline exists only by virtue of the service it renders. In its contributions to other fields of human activity it functions as the benevolent and lavish dispenser of concepts and ways of thinking, of structures and properties, of products and processes, to all these in need without discrimination. This is particularly relevant to the teaching of chemistry since an interdisciplinary approach is strongly needed in the study of natural sciences; chemical education should be prepared to lead students to these important areas rather than confining them in basic chemistry. The Eight International Conference on Chemical Education in Tokyo last August had as its theme 'Widening the scope of Chemistry.' with this objective in mind. As the central science, chemistry lends itself to such adaptation much more readily and easily than any other science. It is no easy task to train students of today to be ready to solve problems which have not yet been indentified using scientific knowledge which has not yet been formulated and technology which has not yet been invented.

Three particular problems have been indentified in this respect:

(a) Over emphasis on chemical principles has led to a decline in the presentation of knowledge of real chemical behaviour in our educational programmes.

(b) The false idea generated in the student's mind that chemical behaviour is 'governed by' rather then 'explained by' theory.

(c) What is commonly referred to as 'Learning Overload' representing the sheer success of chemistry over the past many years in terms of both expansion of knowledge and development of techniques.

Trends in chemical education over the past 40 years have shown progress in the proper recognition of the explanatory aspect of science. Learning Chemistry no longer consists of memorising the occurance, preparation, properties and uses of typical substances.

It is our pride that chemists have played no small role in the multifarious activities they have involved themselves in. Throughout the 42 years old history of the SLAAS, Chemists have played a lead role in its activities. It is significant to note that in this multidisciplinary association, it is the Chemists who are continuously called upon to take on many posts of office-bearers. Even today, both General Secretaries, most office bearers and almost half the members of the Council are chemists, Continuously for the past 15 years, at least one General Secretary has always been a Chemist. (12 of all the 20 past General Secretaries have been Chemists). It is a singular tribute to the discipline and profession of Chemistry, (playing such a central role in this multi-disciplinary organisation) that the SLAAS is considering a proposal to set up a separate section for Chemical Sciences; when that happens, hopefully by the end of the year, Chemistry would be the first discipline and profession to have a SLAAS Section for itself.

Chemists have played a pioneering role in research activities in SriLanka; it is again to the credit of chemists that every year the research papers presented by them at the SLAAS Annual Sessions are so numerous and stand out.

In that context, we find it extremely difficult to understand why not a single chemist, young or old, found a place in the Presidential Award List

announced on Independence Day, 1986.

Chemists can however make an invaluable contribution only if the manpower is there. In the use of chemists for a Better Living, the basic issues therefore are, firstly, the production of the Chemists we need and, secondly the retention and use of these chemists.

Production of Special Degree Chemists in Sri Lanka

The lower priority given to the basic sciences in Sri Lanka over the past few decades has resulted in the almost exclusive choice of medicine or engineering by most Advanced Level Science students. It is unfortunate that the choice of a career is determined largely by the finacial return rather than a student's interests and capabilities; the continued reference by the UGC to Medicine and Engineering as prestigious courses, instead of popular courses assists further in syphoning off more students towards such courses in preference to basic science courses. Science is thus losing some of the best brains who might otherwise have chosen it. Are we not wasting our best creative brains for all time by over emphasizing medicine and engineering? This was not the situation a couple of decades ago. The intense competion for university admission has now turned tables completely in respect of the Physical Science Course, which is more versatile, employable and useful than the Biological Science Course. The number qualifying for Physical Sciencethis year is less than half the number of places available. Remedial attention should therefore be taken to make our science courses more attractive to our high school children. Otherwise the same fate that befell Physical Science might fall on Biological Science before long.

Expenditure on education, including higher education, has registered a considerable increase since 1977. A sum of Rs. 5.2 billion or 7.5 percent of the total budget has been allocated to education this year. The expenditure on higher education has also registered an increase, unprecedented in the annals of education in this country and a sum of Rs1 billion has been allocated in the current year. However, the Chairman of the UGC has pointed out that in terms of the GNP, the expenditure on education has decreased from 3 to 2.3 percent, a figure which is well below that of other countries and is comparable only to that of Pakistan and Bangladesh. He has made a plea that the allocation for education should be 5 percent, with at least 1 percent of the GNP being allocated for higher education. The investment on education has a direct bearing on the level of development a country wishes to achieve. Expenditure on education is an investment on human capital and is not a social overhead. If it is the government's policy to provide tertiary education to everyone who qualifies, then a drop in the allocation for education and higher education in terms of the GNP cannot be justified.

The annual admission to conventional universities has increased by 50 percent from 4,150 to 6,000 while the total enrolment has increased by a third from 15,000 to 20,000 over the past decade. Other than the technologically based University of Moratuwa, all other Sri Lanka Universities have science faculties. In accordance with UGC policy, there has been a steady increase of student intake into these facultires. Perhaps only the Peradeniya University has been able to resist such an increase altogether. A committee headed by Prof Cyril Ponnamperuma has also been appointed by the UGC to report on how the Biological Science intake can be almost doubled to 1,000 over the next few years.

Though academic cadres have been increased, universities are however finding it increasingly difficult to recruit and retain qualified staff, particularly with a Ph.D at the ridiculously low salaries we are continuing to pay them. With even a country like Bangladesh paying academics double our salaries, science faculties have been very badly hit in respect of staff numbers. Apart from the University of Sri Jayawardenapura, there has been a drastic reduction in the staff of all other chemistry departments. The Ruhuna University 8 years after its founding as a College has only 2 Ph.D's. Jaffna has only 3 Ph.D's, Batticaloa University College is producing its third batch of graduates and will be conferred university status by October (5 years after it started) with no qualified staff member in chemistry, physics or mathematics. The continued increase of student intake into science faculties and chemisty departments in the context of such acute staff shortage amount to burning the candle not at both ends but right round and if we are not careful, soon nothing may be left. The efficiency and productivity of a University cannot be measured by the student intake.

Matters came to a crisis recently when Deans and Heads of 4 university science departments resigned their so called 'prestigious' posts and reassumed them only after much persuasion. The Professor's maximum is said to be comparable to that of a Ministry Secretary but few seem to realise that even a Dean of a University does not get official travelling even to come to work; nobody points out that a Ministry Secretary and other high Government Officials have official cars with Driver and these can be used for virtually unlimited private travelling for Rs. 150/- per month. Telephones, houses, pensions, railway warrants and similar benefits are not compared. Within the university, science

teachers are paid less than their Engineering and Medical counterparts. All efforts to get this anomaly rectified have been an utter failure. I wish to ask as to why a Science Professor should be discriminated against and be paid a lower salary than a senior lecturer in Engineering? Such gross discrimination for the past 20 years, resulting from the continued non-payment of the 20 percent exodus allowance to science academics, does not help in achieving a solution to the problem of acute science staff shortage in universities. Building a chemistry laboratory is not easy. However, equipping it and staffing it is much more difficult. Unless adequate funds are made available to recruit and retain staff and obtain necessary equipment, chemicals and books, we are creating tremendous problems on an already bursting university system by continuously increasing the student intake.

Specialisation in chemistry has been for a long time and continues to remain the star attraction for many science undergraduates. Reasonable job opportunities available has given chemistry a decided premium in the Sri Lankan context. The conduct of a special chemistry course is however not easy by any yardstick, least of all from the financial point of view.

The results of a statistical survey I have done on the production of special degree chemists from 1944 (one university) to 1985 (five universities) are in your hands. The total output over the four decades is 903 (with 77 first classes and 474 second classes) including 101 produced from the 3 newer universities of Sri Jayawardenapura (over 9 years from 1975/76) Jaffna (7 years from 1978/79) and Kelaniya (5 years from 1980/81).

The increase in the production of special degree chemists, from 1975 onwards has not been commensurate with the increase in number of universities or the phenomenal increase in student intake on the country's need for more chemists for a better living. (The total output in 1986 will in fact decrease to 30 since Peradeniya has no special final batch). The average unit cost of producing special degree chemists at 5 universities and at 100 percent state expense is therefore very high.

The dissipation of the energy and effort of a few members of staff in each of the many universities on ever increasing student intake without adequate provision for the basic requirements of staff, books, journals, chemicals and equipment has been a very serious curtailing factor for the necessary increase of special chemists. A related factor is the paucity of funds for research within the university system since the limited funds available are hardly sufficient to service increasing undergraduate needs although research publications are an essential requirement for staff promotions. The ideals mentioned in the UGC corporate plan to divert resources from undergraduate to post-graduate training and research cannot find practical application in such a situation of ever increasing undergraduate student numbers.

The conduct of special courses in 5 universities raises another question. How equivalent are the standard of the chemists so pro-

SUMMARY OF OUTPUT OF CHEMISTRY SPECIAL GRADUATES

Period	Colombo + Peradeniya		5 Universities		
	Total Output	Average Per Year	Total Output	Average Per Year	Production Details
1944-1955 (12y)	96	8.0	96	8.0	One output from Colombo
1956-1966 (11y)	126	11.5	126	11.5	
1967-1968 (2y)	48	24.0	48	24.0	One output from Peradeniya
1969-1974 (6y)	194	32.5	194	32.5	Col.+Peradeniya
1975/76 to 1977/78 (3y)	100	33.5	109	36.5	Col.+Per.+J'pura
1978/79 to 1979/80 (2y)	69	34.5	93	46.5	Col.+ J'pura + Jaffna+Peradeniya
1980/81 to 1984 (4y)	156	39.0	211	53.0	Col.+J'pura+Per. Jaffna+Kelaniya
1985	13		26		Colombo+Jaffna+ Kelaniya(others not yet released)
	802		903		

duced? The question becomes very relevant to our Institute, on account of our own active involvement in the production of professional graduate chemists through our very popular graduateship courses. Each university is empowered to grant degrees and at least on paper all such degrees are considered to be equivalent although I know that when it comes to employment selection boards, whether in the public or private sectors, are rather more specific and choosy and tend to prefer one or the other university on the basis of their experience of the quality of similar graduates produced by the same institution previously. Also, at present, we accept a special chemistry graduate with a class from any university for direct admission as a graduate member. How confidently can the Institute continue to accept such a class as representing a comparable standard irrespective of the university or the year in which it has been obtained? All of us are aware that a class at the final examination is very crucial and could determine one's entire future. How validly can one compare a class today with one received some years ago? How validly can one compare a class today between the universities? How validly can one compare a class received from a given University from year to year?

The practice of some Universities not having foreign or even local external examiners to even moderate the question paper, leave alone moderate the marking, does not help in this connection. One of our past Presidents has repeatedly suggested that we should conduct a GRE type of examination open to all chemistry graduates to enable a meaningful objective comparision to be made: such an assessment even if it were organisationally feasible, will require the active co-operation of chemistry academics from all Universities but the response to this suggesion from some has not been encouraging.

Examiningthe data I have presented, can we condlude that it is far easier to obtain a class in certain universites and that it is almost impossible not to obtain a class in some of these universities? Is this due to the techniques of examination, better teaching, or is it due to a better quality student intake? Or is it due to evaluation? Or is it due to a lack of uniformity? Should there be a meaningful standardsation of marks from year to year? Does the 55 percent which is accepted as sacrosanet for a class have any logical comparable meaning among the universities.

If one examines the evaluation schemes at these five universities, observe how the all determining single final examination in which three years of study was evaluated once and for all and which existed until the late seventies at Colombo and early eighties at Peradeniya has given way to annual and sometimes terminal examinations at all the universities. The basic structure of the degree which used to be a qualifying year followed by 3 years of special chemistry, has changed in some universities to a 2 + 2 system, or even general degree followed by a single special chemistry year. A careful analysis reveals a wide discrepancy and variation in the evaluation procedure ranging from a heavy input from even first and second year general degree subjects in one university to a complete exclusion of first year performance for the evaluation in another. From university to university, the relative contribution from one year of study to another as well as that between special chemistry and the other general level subjects varies very widely. I made a detailed analysis of this in my Presedential Address to the Sri Lanka Section of the Royal Society of Chemistry 4 years ago and concluded that there is an urgent need for a complete reappraisal of the existing special evaluation criteria in the various universities. I repeat my plea today since there appears to be a discrepancy of standards between universities and even within a university from year to year. Student numbers in the Sri Lankan context are so small for any meaningful standardisation and this makes our task doubly difficult and problematic. However, this is a question which academics must face in order that the certificate we give would for all purposes reflect a reasonable objective evaluation, and, employers may be assisted in their task to compare a degree or more so the class obtained from one or other university. My observations both from a consideration of statistics as well as from personal experience gained as a university teacher for 20 years has driven me to the inescapable conclusion that the entire matter requires early attention.

Sri Lankan universities continue today to produce best quality scientists and chemists who have proved their worth and competence in universities throughout the world from amongst students, most of whom have chosen science as a option to medicine or engineering. The apparent level of attainment at the point of admission to a course of study, particularly in the Sri Lankan context where District quota and under privileged area admissions are given a premium over apparent merit is therefore not necessarily a safe enough index to come to firm conclusions regarding the quality of the eventual product.

Connected to the same issue is the variation in the quality of students admitted to various science faculties. It cannot be denied that despite the commencement of

universities in the various regions there is still a preference to enter some of the more established universities with the result that the average quality of the students entering some of the newer universities are at least on paper poorer than the others. Does this however prevent the newer universities from producing chemists of excellence for better living from such an apparently poorer intake?

Then there is the question of the quality of the staff. The rapid increase in the number of science faculties to no less than 8, has inevitably resulted over the past 20 years in the average seniority and experience of the staff recruited decreasing. Does this mean that the average quality of the academic staff serving particularly in the newer universities is inferior? I do not agree that this necessarily follows and there is abundant evidence of instances in which staff with apparently lower qualifications have, given a reasonable opportunity, proved their worth in teaching, research and other aspects of university life. The absence of a first or second upper, which are the usual primary recruitment criteria for university staff has in many such instances not necessarily proved to be a drawback in the subsequent activity of the relevant university teacher.

The point I wish to make quite emphatically is that while minimum eligibility criteria are obviously required both for student admission and staff recruitment to any institution, one cannot and should not condemn or belittle any group of students or staff or Institution on the ground that only the minimum criteria have been fulfilled. Any Institution should rather be judged on the quality of the work output of the staff and the quality of the students who pass-out.

THE ADB'S ROLE IN DEVELOPMENT IN THE REGION AND THE ISSUES AT THE 19TH ANNUAL SESSIONS

Gamini Abeysekera

Dr. Gamini Abesekera, Additional Director, Economic Affairs Division, Ministry of Finance and Planning, who was a member of the Sri Lanka delegation to the 19th annual meeting of the ADB in Manila, provides an assessment of the major issues at these deliberations and the ADB's role in the region. Sri Lanka's Finance Minister Mr. Ronnie De Mel who functioned as Chairman of the Board of Governors during the 1985/86 period presided over the sessions.

Background

The Asian Development Bank is one of the three Regional Development Banks in the world today. The other two are the Inter American Development Bank and the African Development Bank. While multilateral financial institutions such as the International Monetary Fund and the International Bank for Reconstruction and Development (The World Bank) encompass all the regions in the world, institutions such as the ADB focus on the development needs of a specific region. However, the membership of such Regional Development Banks is not confined to the countries in the region. Accordingly, the ADB is an international partnership of both Regional and Non-Regional countries promoting the economic and social progress of the developing countries in the Asia-Pacific Region. The ABD which was established in December, 1966 at present has 47 mebers consisting of 35 countries from the region and 12 countries from outside the region. The latest additions to the ADB membership were Spain and the Non-Regional country and The People's Republic of China the most populated country in the Region.

The Board of Governors of the ADB - the highest policy making body of the Bank, consists of the Governors (who are usually the Finance Ministers of the respective countries) representing all Regional and Non-Regional member countries. While this Board meets annualy (or under special circumstances) the responsibility of the management of the Bank is vested with the Board of Directors appointed by the Board of Governors. The Board of Directors, at present is composed of 12 Directors (each with an Alternate), of which 8 represent constituencies of the Regional countries and 4 those of the Non-Regional countries. The posts of Director and Alternate Director are rotated among the countries which make up a constituency. Accordingly, Sri Lanka had an Alternate Director during 1983-85 period and now has a Director on the Board of Management of the ADB. The President of the Bank is the chief executtive officer who is elected by the Board of Governers for term of 5 years, after which he may be re-elected; and he is assisted by 3 Vice Presidents who are appointed by the Board of Directors. The Asian Development Bank has 21 departments and offices including two Resident Offices (for South Asia in Dhaka, Bangladesh; and for the South Pacific Region in Port Vuka, Wanuatu). The ADB is contemplating the setting up of a Regional Office in Europe as well to mobilise greater assistance from the Non-Regional donor countries.

Bank Assistance

The assistance of the ADB consists mainly of loan and equity operations technical cooperation, training activities, sectoral reviews, co-finacing

arrangements and special programmes such as Women in Development and Environmental Management. The Financial resources of the Bank mainly comprise Ordinary Capital Resources (OCR) which includes subscribed capital, reserves and funds raised through borrowings while there are two Special Funds set up with the contributions made by member contires for specific purposes. These two Special Funds are the Asian Development Fund (ADF) and the Technical Assistance Special Fund (TASF). The ADF is considered the "soft loan window" of the Bank which facilitates concessional lending to the Bank's poorer member countries while the TASF extends technical assistance to such countries.Table 1 summarieses the operational activities of the ADB.

Loans for Sri Lanka

The Asian Development Fund of the ADB can be considered as performing a similar function as the International Development Association (IDA) under the World Bank's umbrella. In other words the ADF assistance is limited to the poorer developing member countries of the Bank. During 1968-85, ADF was provided about 1/3 of the Bank's assistance to member countries. Accordingly, Sri Lanka has been obtaining a bulk of the loans it received from the ADB through the soft loan window. As of end 1985 the Bank had provided 40 loans amounting to about U.S. Dollar 466 million covering 34 projects in Sri Lanka. Of these loans 34 have been from ADF amounting to U.S. Dollar 452 million or 97 percent of the total loans that Sri Lanka received. A breakdown of the cumulative bank lending to Sri Lanka by sectors is given in Table 2. Furthemore, Sri Lanka has received technical assistance totalling U.S. Dollar 6.3 million which in turn facilitated several projects to obtain bank loans amounting to U.S.Dollar 93 million. A recent evaluation completed by the ADB on project implemetation in Sri Lanka revealed that despite several delays in moving the projects Sri Lanka has progressed satisfactorily compared with other developing member countries. Sri Lanka's disbursement ratio in the 1980s exceeded the average ratio for all recipients of ADF resources. As at end 1985 of the total of 40 loans that the Bank had approved for Sri Lanka, 17 had been completely disbursed and 23 were under administration. Cumulative disbursements of bank loans to Sri Lanka totalled U.S.Dollar 197 million or almost 50 percent of the total amount of loans that were effectively available. The Bank's lending strategy in Sri Lanka has been primarily desingned to enhance the country's capital formation and facilitate structural adjustments needed to re-direct the economy.The growth of ADB's assistance to Sri Lanka can also be seen in Figure I.

Resource Mobilization

The resource mobilisation pattern of the Bank as at end 1985 indicated that authorized capital amounted to U.S.Dollar 16.2 billion while a total of Dollar 6.7 billion had been borrowed from international capital markets for lending purposes. Another Dollar 6.7 billion had been mobilized in ADF contributions for concessional lending while TASF contributions represented Dollar 76 million. Taking the entire period of the ADBs operations as a whole the Bank has committed a total of U.S. Dollar 17.5 billion in loans for 704 projects during the 1967-85 eriod. It has been estimated that each dollar lent by the Bank is matched by an additional investment of Dollar 1.5 provided by borrowing countries and co-financiers of projects. Therefore, the total capital

Table 1

Operational Activities of the ADB (1967-85)

(amounts in U.S.Dollar million)

As at end of 1985

Loan Approvals	
Number of Projects (a)	704
Amount of Loans	17,490.1
Ordinary Loans	
Number of Loans	426
Amount of Loans	11,948.6
Disbursements	5,480.1
Asian Development Fund Loans (b)	
Number of Loans	348
Amount of Loans	5,541.5
Disbursements	1,970.0
Equity Operations	
Number of Projects	7
Amount	7.0
Technical Assistance (Grants) (c)	
Number of Projects	720
Amount of Grants	173.0
Regional Activities (Grants) (c)	
Number of Projects	196
Amount of Grants	30.0
Ordinary Capital Resources	
Authorized Capital	16,222
Subscribed Capital	15,970
Borrowings (gross)	6,748
Special Funds Resources	
Asian Development Fund	6,082.2
Technical Assistance Special Fund	76.0

(a) Projects financed from both ordinary resources and ADF are included.
(b) ADF was established in 1974.
(c) Included projects financed from sources other than the Bank, mainly UNDP and the EEC

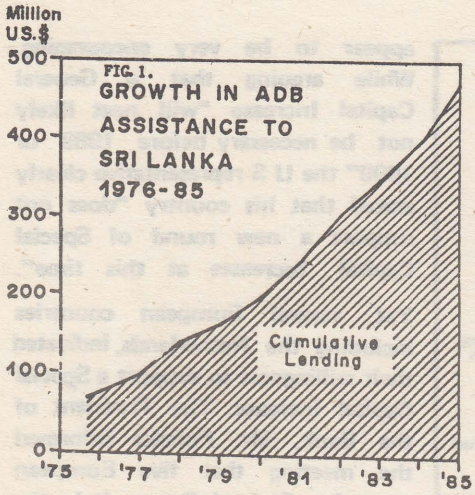


FIG. 1.
GROWTH IN ADB ASSISTANCE TO SRI LANKA 1976-85

formation under the projects finaced by the ADB is estimated to amount to almost Dollar 44 billion.

From the very begining of lending operations of the Bank, an emphasis on the agriculture and agro-industrial sector could be observed. Given the dominance of agricultural activities in the economies of the Asian countries such an emphasis was both inevitable and desirable. For example, of the total loans approved by the ADB (amounting to Dollar 17.5 billion) during the past two decades, more than 30 percent represented assistance to the agriculture and agro-industry sector. Since the emergence of the energy crisis in 1973/74 which aggravated in the 1979/80 period, there has been a special importance attached to financing projects in the energy sector. Of the total loans approved during the 1968-85 period by the ADB about 25 percent consisted of assistance to the energy sector. It appears that being a Regional Development Bank, the ADB has recognized the improtance of promoting Development Banks in the member countries. Accordingly, about 11 percent of the Bank's financial resources have been channelled through Development Finance Institutions (DFIs) in the borrowing countries. Credit lines to DFIs have become the primary mode of the Bank's support to the private sector as well. Another area which attracted the attention of the ADB has been the development of infrastructure to facilitate and stimulate economic activities in poorer member countries. For example, transport and communication projects together obtained more than 13 percent of the ADB's loans. However, this did not result in the neglect of development of social overheads, as almost 8 percent of loan approvals represented water supply and sanitation projects, while another 8 percent or more reflected financial assistance to a range of projects including urban development, housing, education, health and population. The industry and non-fuel mineral sector received approximately 3 percent of the total loans approved by ADB during the 1968-85 period. The allocation of resources by sectors are shown in FigureII.

A pattern similar to what could be observed in regard to lending by the ADB can be seen in respect of its technical assistance as well. In this context, the emphasis on agriculture and agro-industry has been even greater as almost 63 percent of technical assistance has been for this sector. Taking the resources made available to the poorer countries under the Asian Development Fund also it can be observed that almost 50 percent has been for agriculture and agro-industrial projects while about 22 percent has gone to the energy sector.It is noteworthy that assistance under the ADF is provided on very concessional terms, at no interest.

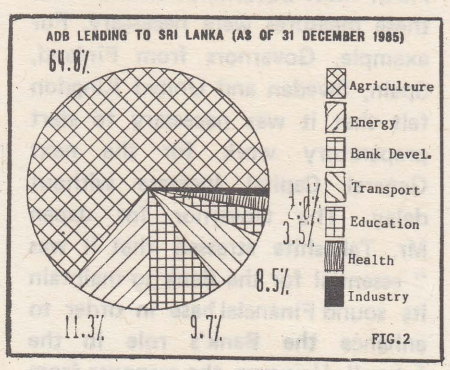


FIG.2

Despite the impressive record of lending by the ADB to developing member countries during the past two decades the Board of Governors at the 19th Annual Meeting noted that there has been a decline in lending in the past year. In his capacity as the Chairman of the Board of Governors, Sri Lanka's Minister of Finance and Planning Mr. Ronnie De Mel expressed his concern about a decline in the Bank's lending by 15 percent in 1985 as compared to the lendings by the Bank in 1984. Three main factors were cited as the reasons for the deceleration in Bank lending: slower world economic growth, domestic reaource constrainsnts, and measures taken by borrowing countries to moderate the external debt burdens. In this context Mr. de Mel reviewed the international economic environment in which the Asian countries had to mange their economies, and stated that " the scope for Adiestment and growth in Asia is conditioned by the policies of the industrial countries". He added that "growing protectionist tendencies and slow expansion in industrial countries have made the outlook difficult for countries with export oriented market economies" "Several speakers from the developing countries endorsed this statement.

Asian Development Fund

The need to stengthen the Asian Development Fund to facilitate further contributions lending to poorer developing member countries was emphasized by Mr. de Mel. While the donor countries indicated their constraints for enhancing contributions to ADF, the developing member countries reiterated the need for the replenishment of ADF. For example, the Governor from Australia stated that the replenishment was not easy "because donor

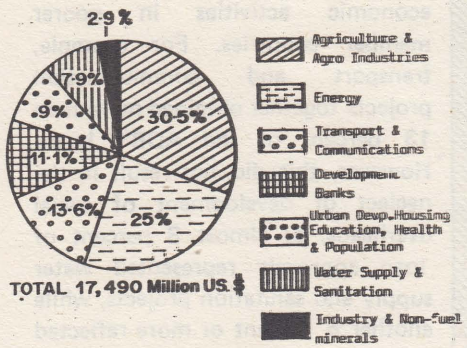
countries showed a greater preoccupation with burden-sharing" and suggested that "one solution might be to have some kind of linking of ADF contributions with ADB capital shares." The Governor from Bangladesh urged that the ADF replenishment must be pursued strongly in view of the growing absorptive capacity of the recipient countries and the likelihood of the need for funding contingencies. In this context it is important to note that ADB introduced an innovative approach to contingency lending by granting special assistance to the newly established government of the Philippines. The President of the Philippines Madam Corazon Aquino in her inaugural address at the Annual Meeting appreciated this step taken by the ADB,stating "The one hundred million dollars loan to our country will not only facilitate the launching of priority development projects; It should also serve us as a singnal to other banking institutions". Mr. de Mel in his chairman's address cited the special assistance loan to the Philippines" as a good expample of how the Bank can operate decisively and flexibly in meeting emergency situations".

The President of the Asian Development Bank, Mr. Fujioka reported at the meeting that the donor countries reached an agreement to replenish the Asian Development Fund with a total of Dollar 3.6 billion just two days before the annual meeting. While appreciating this gesture, developing member countries expressed their dissapointment as the replenishment agreed upon fell short of the traget of Dollar 5 billion proposed by the management. The Governor for India Mr. Visvanath Prathap Singh introduced the ADF as " a vehicle for lending to the Bank's poorer member countries". The Indian Finance Minister also argued that the target proposed by the management for the replenishment was " by no means ambitious and needed to be fully supported". In the context of mobilizing additional flows of resources to support the efforts of developing countries, the Secretary of the Ministry of Finance and Planning, Sri Lanka Dr. W M Tillakaratne who made the country speech in his capacity as Alternate Governor to the Bank, raised an interesting issue when he referred to the declinining oil prices and the estimated transfer of income of some Dollar 60 billion from developing oil exporting countries to the industrial world that would result from the price change, and asked the question, "Can the industrial world....take bold initiatives to facilitate such a transfer of resources to the developing world?."

FIG.3.

ALLOCATION OF ADB LOANS

(To all countries)



Capital Increase

The Governors considered the issues of " Special Capital Increase" of the Bank in the context of futher resources and financial policies of the ADB. Most Governors indicated that these measures were necessary. For example, Governors from Finland, Spain, Sweden and United Kingdon felt that it was necessary to start preparatory work for the next General Capital Increase without delay. The Governor for Japan Mr. Takeshita stressed that it was " essential for the Bank to maintain its sound Financial base in order to enhance the Bank's role in the future". However, the response from the United States Governer did not appear to be very encouraging. While arguing that a General Capital Increase "will most likely not be necessary before 1989 or 1990" the U S representative clearly stated that his country "does not support a new round of Special Capital Increase at this time".

Yet, several European countries including the Netherlands, indicated their willingness to support a Special Capital Increase. The President of the Bank, Mr. Fujioka informed the meeting that five European countries - Finland, France, Italy, the Netherlands and Switzerland were authorized special increases in the capital subscription by the management. In regard to the strengthening of the Technical Assistance Special Fund, (TASF) there appeared to be a wider support from both donor and developing member countries. The view of the United Kingdom(which is the second largest contributor to the TASF) was that it should help to increase the assistance "for improving project preparation and implementation, and the abilities of the recipient countries to cope with unproductive use of resources and lack of administrative coordination".

New Lending Rate System

In regard to the Bank's finacial policies, the Governors noted that several important developments had taken place. During 1985, the Bank management approved the adoption of "a pool based variable lending rate system".President Fujioka elaborated on the new system in his address. He pointed out that "the new system would bring the Bank's financial structure more closely in line with prevailing market conditions" and will allow the Bank much more borrowing and lending flexibility than under the traditional fixed lending rate system. In the Chairman's address Mr. Ronnie de Mel also welcomed the new system stating that, "it could lead to lower the lending rates for developing

member countries" as it provides for the determination of interest rates on a half yearly basis, taking into account the actual cost of the Bank's borrowings.

Assistance to Private Sector

Another important feature of the ADB lending in the past year has been to finance the private sector projects without Government guarantees. This policy was commended by both donor countries and developing member countries who also noted the setting up of a private sector Division in the Bank for this purpose. In the same context, several Governors referred to the policy dialouge initiated by the Bank on privatization. While appreciating the merits in the Bank's approach, several speakers emphasized the need to be cautious and pragmatic in promoting the goal of privatization.

The Governor for India, urged that " Assistance to the privatesector should not be at the expense of the assistance which the Bank normally provides to the public sector for financing essential investments in core sectors." The Governor for Indonesia argued that " it could be more difficult for private sector enterprises within the developing member countries to service higher debt costs of foreign currency loans." The representative from the Sweden emphasized that", "supporting the private sector must never become a goal in itself, but must be seen in relation to its contri bution to long-time development" and suggested that "it is upto each individual in the strategy of economic development". The views of Sri Lanka were reflected in both Mr. Ronnie de Mel's address from the Chair and Dr. Tillakaratna's statement on behalf of the country. Mr. de Mel stated that, " the Bank must remain specially sensitive to the fact that the private sector in most developing member countries, is still at a relatively early stage of development." He added that the constraints to the growth of private sector vary widely across the region and concluded that it is necessary to ensure "a sound balance between economic efficiency and social welfare by giving a due place to both the public sector and the private sector in our countries". In the country speech from Sri Lanka, Dr. W.M.Tillakaratna suggested that " rather than merely emphasizing equity participation by the private sector in state owned ventures, the Bank should encourage a greter degree of private sector participation through the adoption of appropriate macro-economic policies by the countries."

Policy Dialogue

The Board of Governors considered a range of other technical and operational issues as well as a number of matters pertaining to organization and administration of the Bank. An important operational policy issue which stimulated the interest of the speakers was the Bank's effort to conduct "policy dialogue" with the developing member countries.

While the donor countries in general appreciated the need to work out a coherent country programme within a structured policy framework, almost all developing member countries expressed their reservations about the desirability of such an effort. For example, the Governor for Indonesia strongly opposed that "so called policy dialogues should not be used by the ADB- or other donor nations, as a veiled form of conditionality". This view was emphatically endorsed by Dr. Tilakaratna, Alternate Governor for Sri Lanka, stating that " these policy dialogues should not become the basis for cross-conditionality among institutions" such as the World Bank, IMF and ADB. He requested the ADB to continue its role as a good project lender " without getting too involved in macro-economic policy prescriptions for its developing member countries".

Size of the Board

Of the organizational and administrative matters that the Board of Governors had to deal with at the 19th Annual Meeting, the most controversial issue was the size of the Board of Directors. While all of them agreed that the latest member, the People's Republic of China must be accomodated on the Board, there was no concensus whether this should be done by increasing the size of the Board. Several Non-Regional members including the United Kingdon appeared to prefer to keep the Board at its present size of 12, due to cost considerations involved in an increase in the size; but the majority of Regional Members stressed the need for an expansion. It was pointed out that if China is to be given a seat on the Board of Directors without creating an additional seat or seats it would result in the displacement or liquidation of the representation now enjoyed by smaller member countries, some of those who have been founder members of the ADB such as Sri Lanka. The Non-Regional Members indicated their willingness to consider an expansion of the Board only if the number would be increased by two or more seats so that the present balance between borrowers and non-borrowers and between Regional and Non-Regional countries would not be disrupted. However, it was felt that the entry of a large regional member with a vast population certainly would justify an expansion of the Board, but this matter is yet to be solved.

Before the conclusion of the Meeting, the Board of Governors agreed to accept the invitation of the Government of Japan to hold the 20th Annual Meeting in Osaka next year.

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