

THE CONSTRUCTION INDUSTRY AND ECONOMIC DEVELOPMENT:
THE CASE OF SRI LANKA

by

CAROLINE L. CLARKE

B.A. University of Washington, Seattle
(1981)

Submitted to the Department of
Urban Studies and Planning
in Partial Fulfillment of the
Requirement of the Degree of

MASTER OF CITY PLANNING
at the
MASSACHUSETTS INSTITUTE OF TECHNOLOGY
June 1984

© Caroline L. Clarke 1984

The author hereby grants to M.I.T. permission to reproduce to
distribute copies of this thesis document in whole or in part.

Signature of Author:

C
Department of Urban Studies and Planning
May 28, 1984

Certified by:

[Signature]
Professor Ranko Bon, Thesis Supervisor

Accepted by:

[Signature]
Professor Ralph Gakenheimer
Departmental Graduate Committee
MASSACHUSETTS INSTITUTE
OF TECHNOLOGY

AUG 10 1984

LIBRARIES

Rotch

THE CONSTRUCTION INDUSTRY AND ECONOMIC DEVELOPMENT:
THE CASE OF SRI LANKA

by

CAROLINE L. CLARKE

Submitted to the Department of Urban Studies and Planning
on May 28, 1984 in partial fulfillment of the
requirements for the Degree of Master of City Planning.

ABSTRACT

The intent of the thesis is to explore systematically many of the notions of the construction industry's role in national economic development in the context of Sri Lanka. Since 1978, Sri Lanka's national development strategy has emphasized three "lead" projects, two of which are construction-intensive. As a consequence, the construction industry's performance is of vital importance to the attainment of the country's development objectives.

Sri Lanka's construction sector will be scrutinized within Lauchlin Currie's framework of "leading sector" economic growth with the use of general input-output logic. This will allow some comparisons to be made between other sectors in the economy, thereby addressing the oft ignored question of the sector's relative performance vis-a-vis other candidates for "leading" sector.

Thesis Supervisor: Dr. Ranko Bon
Title: Assistant Professor of Architecture

Acknowledgements:

I would like to thank my supervisor, Professor Ranko Bon, for his intellectual encouragement and guidance throughout the writing of thesis. And many thanks to Professor Lisa Peattie for her critical comments on my work.

TABLE OF CONTENTS

| | <u>page</u> |
|--|-------------|
| 1. Introduction..... | 5 |
| 2. Sri Lanka country background..... | 12 |
| 3. National Economic Development: historical Perspective post-independence..... | 19 |
| ----- | |
| 4. Construction Industry as Tool for "Leading Sector" Development Strategy..... | 29 |
| 5. Sri Lanka's Development Strategy Lead Projects..... | 36 |
| Liberalization Policies..... | 43 |
| 6. Macro-economic Effects of Sri Lanka's strategy..... | 46 |
| Construction sector impacts..... | 55 |
| ----- | |
| 7. Method for Evaluation of "Leading Sector" Strategy Preconditions..... | 63 |
| 8. Sri Lanka and Preconditions for "Leading Sector" Strategy's Large sector with high internal multiplier..... | 75 |
| Growth can be stimulated exogenously..... | 82 |
| Low import component..... | 87 |
| Large unskilled labor component..... | 99 |
| Large latent demand..... | 109 |
| ----- | |
| 9. Conclusion..... | 111 |
| ----- | |
| 10. Bibliography..... | 121 |
| 11. Appendix..... | 124 |

INTRODUCTION

Since Duccio Turin popularized the notion in the early 70s, interest in the construction industry's role in national economic development has been steadily growing. Construction's proponents are quick to point out its many attractive characteristics. For starters: The industry produces what countries - especially those at lower levels of development - want most: infrastructure of all sorts, industrial and commercial buildings, and housing. It also provides transitional employment for rural immigrants coming to the cities in the process of industrialization. Moreover, through its substantial multiplier effects the industry stimulates output, income, and employment in other sectors of the economy.

Many of these ideas surrounding the role of the construction industry are now under discussion in Sri Lanka. Since 1977, the government of Sri Lanka has pursued a two-pronged development strategy. On the one hand, the government has introduced the liberalization policies whose intent has been to promote both foreign and domestic investment. On the other, the government has committed over 50% of their budget to three "lead" projects that include a huge dam and irrigation scheme, an ambitious housing program, and an investment promotion zone. The first two of these lead projects are construction-intensive; and consequently, the construction industry's performance is of vital importance to the attainment of the country's development objectives.

As a result of construction's important position for the

strategy and of the ideas about the sector's characteristics mentioned above, construction-led economic growth has become a theme among a certain cadre of Sri Lankan development people.(1) Shortly after the strategy's initiation, they promulgated the idea that the construction industry not only serviced the lead projects, but also was, itself, a tool for economic development. For example, the Country Monograph, prepared for the ESCAP Project Review and Study of the Human Settlements Situation in the ESCAP Region, notes that,

In relation to the recent past, housing has never been so prioritized, and hence, has never dominated the scene as it does now....While the importance of housing was acknowledged [in the past], it was not perceived as an engine of growth, a development resource. (emphasis mine)

Susil Sirivardene (NHDA), p. 7, 1982

This discussion in Sri Lanka has an important precedent in the case of another developing country, Colombia. Lauchlin Currie, in the late 1960s and early 1970s, articulated the "Leading Sector" strategy which gave the urban housing and development sector the leading role in national development. Currie's strategy was operationalized in the 1971-1974 Colombian National Plan (2) and in 1976, Lisa Parsons Fox evaluated the Plan in her Ph.D. thesis in Economics. (3) She uses static input-output analysis to look at the potential of the housing sector in Colombia to meet the requirements placed upon it by the Plan as well as the strategy's overall performance in development.

The intent of the present paper is to utilize Currie's development theory and Fox's general input-output methodology to look at the performance of Sri Lanka's construction sector

as the leading sector in economic growth within the country's present development strategy. In doing so, the construction sector will be scrutinized within an explicit framework of economic growth. This will allow this paper to make some comparisons between other sectors in the economy, thereby addressing the oft ignored question of the sector's relative performance vis-a-vis other candidates for "leading" sector.

The paper will begin with a brief country background, followed by a description of Currie's "leading sector" development strategy. Next, Sri Lanka's national development strategy will be outlined and its macro-economic impacts will be summarized. Input-output analysis is presented as the most appropriate tool for evaluating Currie's "leading" sector theory. And finally, using the basic input-output model as well as material from authors who incorporate input-output logic (both specifically for Sri Lanka and more generally), the country's construction sector is formally reviewed.

LEADING SECTOR DEVELOPMENT STRATEGY:
CURRIE

SRI LANKA DEVELOPMENT STRATEGY:
LIBERALIZATION AND LEAD PROJECTS

SRI LANKA'S EXPERIENCE POST-1977
MACRO IMPACTS AND MICRO IMPACTS

INPUT-OUTPUT ANALYSIS
EVALUATION TOOL

REVIEW OF THE CONSTRUCTION SECTOR

CURRIE
FOX

GANESAN

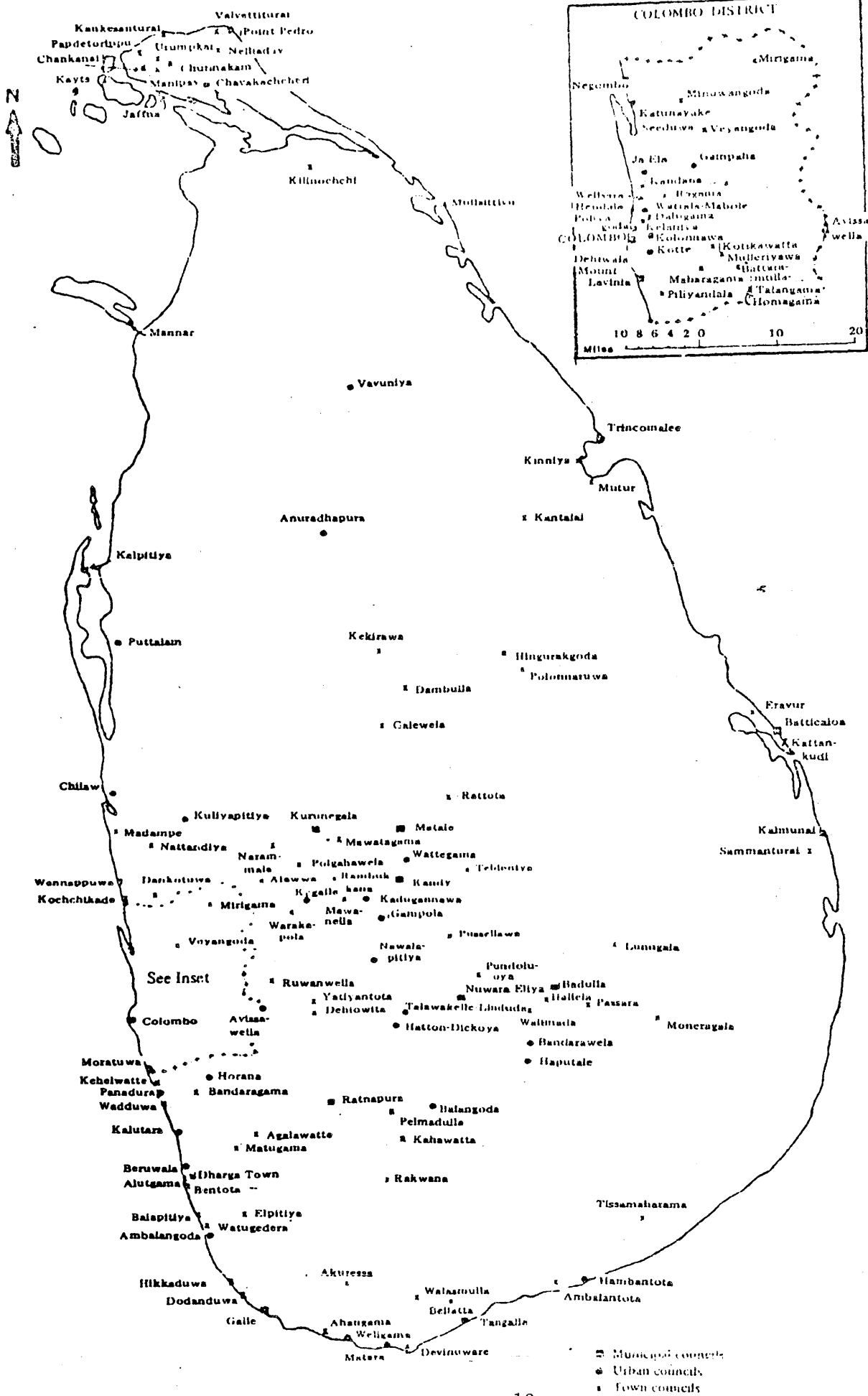
SCHULTZ

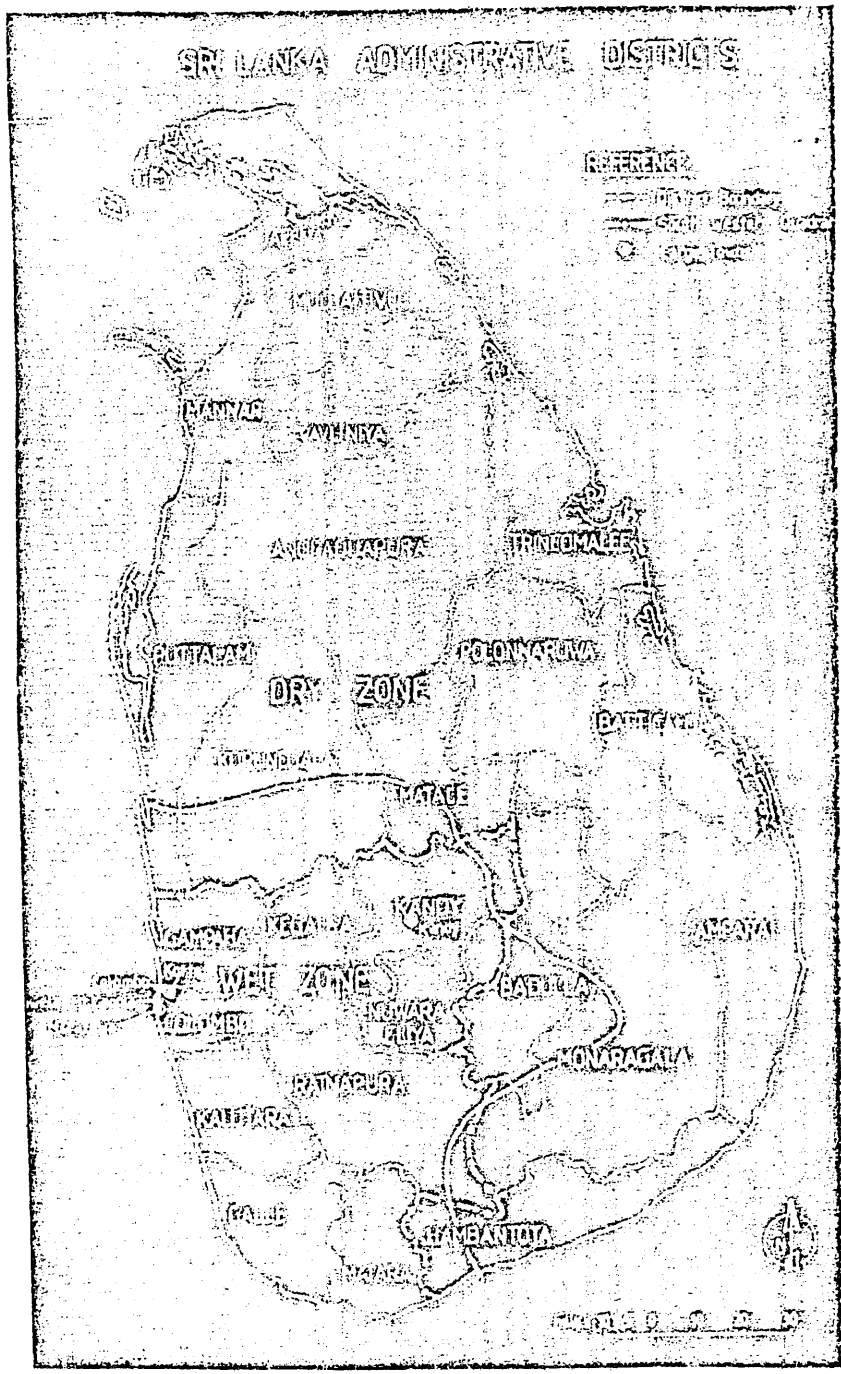
Footnotes: Introduction

(1) The Ministry of Local Government, Housing, and Construction, in particular, adopted and promoted the idea.

(2) Because of the short time during which the 1971-1974 National Plan was actually operating, it is difficult to draw solid conclusions regarding the performance of the "leading sector" strategy in the Colombian case.

(3) Fox, 1976.





Sri Lanka Country Background

Sri Lanka is the island nation off the southern tip of India. It has total area of 25,332 square miles. Colombo is the capital city with close to one million inhabitants.

The country has two geographic regions: a flat plain - making up 4/5ths of the country - encompassing the entire north half continuing around the coastal regions in the southern half. The south-central part of the country is hilly and mountainous.

Population

The total population was estimated to be 14,720,000 in 1980 with an annual rate of growth of 1.7%. The density is greatest in the southwest portion of the island with 22% of the population living in Colombo district. The country is overwhelmingly rural with the urban component estimated to be 27% (with an annual growth rate of 3.7%). Four cities have populations greater than 100,000, four between 50,000-99,000, and nine between 25,000-49,000.

Because welfare, health, education and development expenditures are widely spread throughout the country, the rural to urban migration is considerably less than in other developing countries of similar income level. The urban population is currently 21.5% of the total population with a growth rate of approximately 2.5% per annum which is low by comparison with other countries in the region.

The ethnic majority of the country are the Sinhalese constituting over 70% of the total population. On the basis of geog-

raphy and culture, the Sinhalese can further be classified into two groups - the low country Sinhalese (along the plains of the south and west of the island) and the Kandyan Sinhalese (in the interior highlands). The second most numerous group - the Ceylon Tamils with the Indian Tamils (who are of much more recent origin to the island and are now primarily plantation workers in the Kandyan highland) - suffer from minority status and have never been fully assimilated into the social and cultural mainstream. They populate the Northern Province with their heaviest concentration on the Jaffna Peninsula and along the east coast; a significant population is also found in the City of Colombo.

Table 1

| ETHNIC COMPOSITION (1971) | | |
|---------------------------|-------|------|
| | (000) | (%) |
| Low-Country Sinhalese | 5,446 | 42.8 |
| Kandyan Sinhalese | 3,701 | 29.1 |
| Sri Lankan Tamils | 1,416 | 11.1 |
| Indian Tamils | 1,195 | 9.4 |
| Sri Lanka Moors | 824 | 6.5 |
| Indian Moors | 29 | 0.2 |
| Burghers and Eurasian | 44 | 0.3 |
| Malays | 42 | 0.3 |
| Others | 14 | 0.1 |

*no information available since 1971

These ethnic groups are referred to as "communities" - a term frequently used in South Asia to mean a people sharing in a common self-identity and thinking of themselves as a unique group on the basis of a separate religion, language, social organization or ancestral origin. The Sinhalese are Buddhist and their language - Sinhala - is of Aryan origin; the Tamils, on the other hand, are Hindu and speak Tamil, the oldest and

most prominent Dravidian language of South India.(4)

Despite numerous integrative pressures, the "communities" have remained separate and have been the most important source of division and disruption in Sri Lankan politics. Since independence in 1948, the most serious conflict between the two groups was over the official language question. Much blood was shed over the decision in which Sinhala was proclaimed the official language of the country with the "reasonable use" of Tamil permitted in the northern and eastern provinces.(5) Education and administration is carried out in both languages, with English as the second language in all cases.

Political Parties

Since independence, political power has alternated between the two principal parties, the United National Party (UNP) and the Sri Lanka Freedom Party (SLFP). In 1977, the UNP retook power; they are right-of-center party holding strong constituents in the middle class and non-communal groups. Its economic policies are conservative and its foreign-policy Western-oriented. From 1960 to 1965 and again from 1970 to 1977, Mrs. Bandaranaike was in power. The first time she led only the SLFP - a left-of-center, non-marxist party whose primary appeal is with the lower-middle class, Buddhist groups, and Sinhalese intellectuals and professionals. They support a non-aligned (Afro-Asian-oriented) foreign policy; the nationalization of banks, publishing, heavy industry, import trade, and plantations; and Sinhala and Sinhalese supremacy. The second term, Mrs. Bandaranaike led the United Front (UF) - an alliance

of the SLFP, the Lanka Sama Samaja Party, and the Communist Party. There are six other legal opposition parties - Ceylon Democratic Party, Tamil United Liberation Front, Lanka Sama Smaja Party, the Mahajana Eksath Permuna, Sri Lanka Communist Party, Jatika Vimukthi Peramuna, Sri Lanka Freedom Socialist Party.

The 1972 constitution of Sri Lanka was replaced by a new one in 1978:

The new constitution promulgated in September 1978 embodies three major amendments to the 1972 constitution. Its main feature is the presidential system of government, which brought to an end almost half a century of Westminster style parliamentary government. Until 1978 the president was the constitutional head of state while the real power lay with the cabinet. Under the new system, the president is the head of state, head of the executive, head of government and commander in chief of the armed forces. The powers of the prime minister and his cabinet have been drastically reduced.

Perhaps the most significant feature of the new constitution is the introduction of proportional representation, and the elimination of by-elections (vacancies will be filled by the next man on the party list at the time of the last general election).

Quarterly Economic Review of Sri Lanka, Annual Supplement 1983. pg.3.

Economy

Table 2

Main Origins of Gross Domestic Product, 1982 (% of total)

| | |
|--|---|
| Agriculture, forestry & fisheries | 27.4 |
| Mining & manufacturing | 17.3 |
| Construction, trade, transport & utilities | 36.7 |
| Banking, public administration | 18.6 |
| Total | 100.0 (\$4, 403.8 mn at current prices) |

Source: QEROSL

The economy of Sri Lanka is based in agriculture. Tea(6), rubber, and coconut are the main export crops with paddy (rice)

the major food crop. Of the total cultivated land, the export crops occupy nearly 50% and paddy 40%. The remaining area is planted with cocoa, citronella, cardamon, tobacco, maize, manioc, chillies, peppers, and tropical fruits.

The mining sector produces a fair amount of precious and semi-precious stones. The setting up of a Gem Corporation in the early 1970s captured the previously unofficial foreign exchange earnings from the smuggling activities. Besides the gems, the mining sector is inactive as the country has no coal or oil.

Manufacturing industry has been gaining in importance vis-a-vis agriculture in the economy. In 1982, it contributed nearly 16% to the GDP (current prices) against 27% contributed by the agriculture, forestry, and fishing sector. Primarily concentrated in and around Colombo, industrial activity produces mostly consumer goods although more recently a small steel plant, an oil refinery, and textile and garment production have also entered the scene. Industrial activities depend heavily on the imports of raw materials and components for production. Industry contributes 31% (23% when manufacturing is considered separately) to the GNP, employs 15% of the labor force, and its annual growth rate for the period 1970-77 was 3.2% (1.2% for manufacturing). Reliable employment and wage statistics do not exist. According to the Quarterly Economic Review of Sri Lanka (page 5), however, in 1971 the total labor force totaled 4.5 million people of whom 3.6 million were "gainfully" employed - 50.4% in agriculture, forestry, and

fishing.(7) The unemployment problem was severe throughout the 1970s.

History:

- 1505 - 1656 Portugese occupation of coastal areas
- 1656 - 1796 Dutch occupation of coastal areas
- 1796 - 1802 Dutch possession administered by British East India Company.
- 1802 British Crown Colony established in coastal areas
- 1815 Kandyan convention establishes united Ceylon under British rule.
-
-
- 1948 Ceylon independence.
- 1970 Mrs. Bandaranaike's coalition government: SLFP, LSSP, and Communists
Business Acquisition Act
- 1972 Land Reform Act
- 1977 UNP wins election (President Jayawardene)

Footnotes: Sri Lanka Country Background

(5) Again last summer violence erupted over the language issue/
community issue.

(4) Kearney, 1967.

(6) Not counting China, Sri Lanka ranks second in the world
after India in tea production.

(7) 2.4 million were employees, the rest were self-employed.

National Economic Development: Historical Perspective
(post-independence)

For development economists, Sri Lanka has been an interesting case to study because of its strong emphasis on social welfare while at the same time maintaining a relatively high growth rate. The indicator often quoted in this regard is the so-called physical quality of life index (PQLI); Sri Lanka ranked the highest of any other country in its income range. Income distribution is another indicator of social welfare. Sri Lanka's Gini coefficient has improved dramatically since independence (at least until 1978).(8)

Table 3

| | <u>Size Distribution of Income</u> | | | |
|-------------------|------------------------------------|-------------|-------------|----------------|
| | <u>1953</u> | <u>1963</u> | <u>1973</u> | <u>1978/79</u> |
| Gini coefficient | 0.46 | 0.45 | 0.35 | 0.44 |
| Income shares of: | | | | |
| lowest quintile | 5.07 | 3.87 | 4.97 | 3.76 |
| highest quintile | 56.65 | 55.25 | 45.89 | 54.30 |

Source: Statistics Department, Central Bank of Ceylon. Report on Consumer Finances and Socio-Economic Survey 1978/79: Sri Lanka. Colombo, March 1983.

Source: Stern

Some additional social welfare indicators are included in Table 4, ranging from pre-independence to 1980.

Table 4

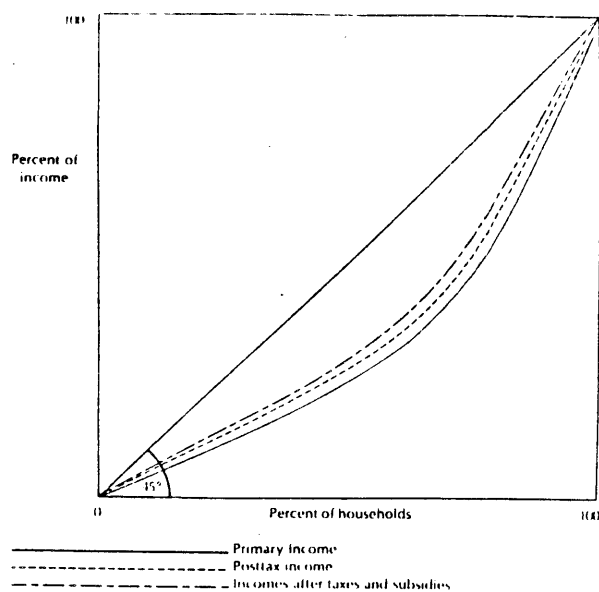
| | | <u>Selected Social Indicators</u> | | | | | | | Source: Stern |
|----|-------------------------------------|-----------------------------------|-------------|-------------|-------------|------------------|------------------|------------------|---------------|
| # | <u>Item</u> | <u>Unit</u> | <u>1946</u> | <u>1953</u> | <u>1963</u> | <u>1970</u> | <u>1977</u> | <u>1980</u> | |
| 1. | Adult literacy | (percent) | 58 | 65 | 72 | 78 ^{a/} | 86 | - | |
| 2. | School enrollment | (percent of ages 5-14) | 41 | 58 | 65 | 99 | 80 ^{b/} | 94 ^{c/} | |
| 3. | Life expectancy | (years) | 43 | 56 | 63 | 66 ^{a/} | 69 | 66 | |
| 4. | Infant mortality | (per '000) | 141 | 71 | 56 | 48 | 42 | 44 | |
| 5. | Crude birth rate | (per '000) | 37.8 | 38.7 | 34.3 | 29.4 | 27.9 | 27.8 | |
| 6. | Crude death rate | (per '000) | 20.2 | 10.9 | 8.6 | 7.5 | 7.4 | 6.1 | |
| 7. | Rate of natural population increase | (percent) | 1.7 | 2.8 | 2.6 | 2.2 | 2.1 | 2.2 | |

Notes: ^{a/} for 1971; ^{b/} for 1976; ^{c/} for 1978.

Source: Central Bank of Ceylon and World Bank, World Development Report, 1982.

In addition, by looking at the Lorenz curve for household income (9) shows the positive effect of government social welfare intervention on the income distribution. See Table 5.(10)

Table 5



Source: de Melo

Source: Alalima (1978: 89)

Since Sri Lanka's independence, political power has alternated between the two major parties. Generally, it can be argued that the two parties together have managed to complement each other's development policies - the SLFP redistributes assets and the UNP concentrated on the agricultural and construction sectors - with the result of the "good" development record mentioned above.

According to D. M. Snodgrass(11), after 1948 the economy shifted from export-led growth toward what he calls "transitional" growth, characterized by an emphasis on protection and industrialization. However, rather than stressing economic growth and diversification, the new administration stressed immediate increases in social welfare spending over public investment. Beginning in the mid-1950s, welfare expenditures ranged between 35% and 45% of governments current expenditures continuing for 20 years.(12) During these early years government resources grew - partly because of higher estate taxes and partly because of increased borrowing -and were spent on food subsidies, education and health care.

However as the 1950s progressed, the terms of trade for Sri Lanka declined vis-a-vis the rest of the world. The government, in an effort to compensate for low private sector activity increased its participation in industrial development and encouraged industries that used domestic resources in order to decrease the balance of payments pressures. In agriculture, the government pushed for the increase in food production - primarily rice - to decrease reliance on food imports. Unfortunately, poor weather conditions in the first part of the

1970s contributed to the stagnation of overall production and decreased paddy harvest.

The administration in power from 1970 to 1977 - Mrs. Bandaranaike's Sri Lanka Freedom Party (SLFP) - was socialist in nature with a functioning parliamentary democracy. In alliance with the Lanka Sama Samaja Party (LSSP) and Communist Parties,(13) the SLFP administration emphasized the redistribution of income and wealth through policies of economic nationalism. Mrs. Bandaranaike's administration also favored import substitution through the use of quotas and licences.

During this period, two major policy pushes - the Business Acquisition Act of 1970 and the Land Reform Act of 1972 - set the momentum for the implementation of the "Mrs. Bandaranaike's" platform. The Business Acquisition Act allowed the government to nationalize existing businesses. In 1972, the Land Reform Act placed a ceiling of 25 acres of paddy land or 50 acres of other land on all holdings. Over the next two years 550,000 acres were taken over and converted to cooperative settlements. The second phase of the Land Reform saw all plantations nationalized. At its completion in 1975, the Land Reform Act had given the government 63% of all tea lands, 32% of all rubber lands and 10% of the coconut producing acres.(14)

During the 1970s, the country's growth rate decreased dramatically; some argue that too much emphasis was placed on equity at the expense of growth. The extent to which welfare expenditures contributed to the decrease in investment, the increase in unemployment and slower growth in overall income has

been a point of great contention.

Also at this time, Sri Lanka was facing a number of serious economic problems -- not the least of which was an increasing international indebtedness made especially acute by the increasing cost of fuel (Sri Lanka has no oil or natural gas reserves). After 1973, there was general world inflation which affected Sri Lanka to the extent they were dependent on imports.

For the housing sector, the legislation during this period centered around the continuation and strengthening of the prior rent control act, although now all houses were to be included.(15) In addition, the Ceiling on Housing Property Law was introduced in 1973 which granted the government power to acquire all housing units not required by the owner for his/her family's use. The intent of the above legislation (coupled with several other acts to prevent the exploitation of low-income tenants) was to promote "as broad-based an ownership of housing property as possible aimed ultimately at a 'more equal' distribution of wealth and the removal of glaring disparition in incomes".(16) The result, however, was a severe restriction of private sector housing development in general, with the small exception of luxury home building which continued because of particular exemptions that were provided under rent restriction. Although tax incentives to encourage private construction had been in place during the 1970s, relatively little housing was built by the private sector because of the lack of long-term finance and the disincentives outlined above.

Instead, the administration sought to increase the housing stock through the expansion of public sector production of housing. At this time the Direct Construction and the Aided Self-help programmes were introduced - the former to provide rental units for lower and middle income urban families, the latter program to provide building materials and some services for low-income rural families. The idea of slum and shanty upgrading was also included in the housing program for the first time. Under the Aided Self-Help Programme, only 1,300 units were completed during 1972 and 1976 and less than 2800 under low-cost direct construction.(17) Loans to private home builders (from the National Housing Fund) however did amount to 20,000 loans.

In 1977, the UNP won the election by a wide margin, promising new policies aimed at stimulating economic growth and creating a large number of jobs. Immediately, the new government introduced a major economic liberalization campaign (in the classical IMF style) aimed at reversing the past administration's policies and creating the conditions that they argued would be necessary for sustained faster economic growth. The rupee was devalued and domestic price and import controls were eliminated in order to stimulate the economy in the short-run. High priority was given to attracting foreign investment. At the same time, increased emphasis was placed on higher food production; in this effort to shift resources from consumption to investment food subsidies were cut drastically.(18) In addition to the liberalization policies, the government's

medium term strategy was to create new jobs - on the order of one million. The Public Investment Program (PIP) designated three "lead projects" - the Accelerated Mahaweli Project, the Investment Promotion Zone, and the Housing, Water, and Urban Development Project - to meet these employment targets as well as to "release the economy from the 'vicious circle' of low investment and growth".(19)

In the realm of distribution of the benefits of growth throughout the population, the UNP's emphasis on social welfare is primarily of the "trickle down" variety rather than asset redistributive as were the prior administration's. The Public Investment Plan for 1983-1987 focuses on increasing employment through the stimulation of the private sector to expand its opportunities and the quality of life for the majority of the country's people who live in rural areas through the development of the agricultural sector. The PIP also emphasizes the improvement of the provision of human settlements and social services such as health and education. And for the urban poor, the intent is to provide basic services and opportunities of increased income and employment. These distribution efforts notwithstanding, Sri Lanka's current development strategy can best be characterized as one of unbalanced growth.

Sri Lanka's economy and planning environment encompasses four levels: the national economy, the different sectors of the economy, a collection of programs, and a series of projects. In the small island economy, the relationships between the four levels are direct and immediate. So that when the Housing, Water, and Urban Development Project was initiated, demands

were immediately put on the construction sector for a wide range of products in both urban and rural areas. In turn, demands were placed on national economic resources. Because of its small size, Sri Lanka's national economic development strategy truly is led by the three projects. And given the highly construction-intensive nature of two out of the three public projects, there have also been a number of people in Sri Lanka characterizing this development strategy as "construction-led" economic growth.(20)

Many developing countries have recognized that the products of the construction sector - infrastructure, commercial and industrial buildings, civil engineering works, and so on - are important for the attainment of national objectives. However, the case is being made that Sri Lanka's development strategy utilizes the construction sector itself as a means for economic development. This argument for the construction sector as the means or "engine for growth" in the national economy has been made by Lauchlin Currie (late 1960s early 1970s) in his "leading sector" strategy for economic development.

Footnotes: National Economic Development: Historical
Perspective (post-independence)

(8) It is not the intent of this paper to explore the problems in the use of Gini Coefficients.

(9) P.J. Alailima (1978) "Fiscal Indices i Sri Lanka," Provisional Draft WEP 2-23/WP69. Geneva: International Labour Organization, as cited by de Melo, p. 146.

(10) Lorenz curve shows the percent of total income accruing to households ranked from poorest to richest along the y-axis. The degree of inequality in the income distribution is illustrated by the ration of the area between the 45o line and the Lorenz Curve to the total area beneath the 45o line.

(11) Snodgrass, 1966.

(12) See Pyatt, Roe, et al., 1978.

(13) LSSP, a Trotskeite party that advocates nationalization of the economy but opposes communalism; SL Communist Party is essentially pro-Moscow; an interesting aside: The communists have always been incorporated into the existing political structure.

(14) According to the critique of the present government, both were poorly executed resulting in decreased efficiency levels on agricultueal estates and decreased capacity utilization in industry.

(15) See USAID, 1981, p. 62, for summary of legislaton 1942 to present.

(16) ibid., p.63. quoting Marga Institution housing study.

(17) ibid., p.64.

(18) Since World War II, food subsidies have been an important feature of the welfare economy. Just before the 1977 election, the subsidy program accounted for 1/5 of the government's current expenditures. Prior to 1977, nearly every Sri Lankan received one pound of rice free and three pounds at a subsidized price; wheat flour, sugar, and infant milk were also subsidized. Post 1977, the rice ration was limited to the poorer half of the population (7 million). The sugar ration was only given to children under 12 years old of families still eligible for rice ration. Other foods continue to be rationed.

(19) PIP, p.14. There was also a fourth lead project - the New Administrative Capital at Kotte. However, this project was scaled back drastically - only one parliamentary building was built - and thus, assumes very little importance in the

development scheme and will not be dealt with in any detail.

(20)Ganesan, Vedagiri, Sirivardana, for example.

Construction Industry as Tool for Development

Currie's theoretical approach to economic development focuses on the interrelationships between the growth rates of specific sectors and the over-all growth rate of the economy. Keynes' focus was more generalized; he looked at the impact of increased demand on the economy as a whole. However, Currie, in the Sayian tradition, looks at real (physical) output of a particular sector and its requirements for additional output of other sectors of the economy. For Currie the development dilemma can be posed in terms of an "interlocked circle" - Liebenstein's "low level equilibrium trap". An increase in overall demand is the result of an increased rate of output in a particular sector. This increased rate of sectoral output is a function of aggregate demand which is, itself, a function of the overall growth rate. To break this interlocked circle, Currie proposes the leading sector whose growth can be stimulated exogenously so that the circle is broken separately from an increase in aggregate demand.

The "leading sector" approach to economic growth represented a substantial break from the supply-side theories and approaches to the interlocked circle dilemma put forward by Currie's contemporaries. For example, to break out of the "interlocked circle," the supply-siders wish to overcome particular constraints on the supply-side. That is, in many sectors, monopoly conditions lead to decreased production further resulting in the underutilization of capital and equipment; market uncertainties exist - especially for export

sectors; labor disputes; political considerations and uncertainties; and in some areas, prices are controlled below costs. For Currie, on the other hand, the constraints on the demand side far outweigh the above supply-side factors in explaining and providing avenues for addressing the need to encourage investment.

...the most effective way to raise the overall rate of growth in both output and employment is...to remove barriers or provide incentives to investment in sectors in which there is actually a large latent demand that can be exploited, so that an increase in investment and subsequent output can find a market without resulting in a depression in prices and incomes in the sector. Such sectors would generate a rise in the overall rate of growth.

Journal of Economic Studies, 1974.

According to Currie, the constraints on demand result from factors which impede mobility of resources and the labor force, create a grossly unequal dualist economy and thereby result in underutilization of labor and capital. Institutional factors such as obstacles to the channeling of savings to urban construction, particular controls that impact production capabilities, and legislation which tends to decrease demand for labor, are a few examples that result in a deficiency of demand. As long as these and other constraints on the demand side exist, any increase in monetary demand - in the Keynesian tradition - will simply increase prices rather than produce higher physical production - the objective in the Sayian tradition.

This emphasis on the demand constraints is not to say that Currie does not anticipate that critical supply constraints will arise. However, he sees supply constraints playing a role

only in the context of particular sectors and usually after the growth is underway rather than as the major constraint on exogenous sector stimulation altogether. Thus, Currie fully expects that bottlenecks may halt expansion of the leading sector, for example, and will have to be broken in order for growth to continue.

This strategy is meant to benefit those countries experiencing a high rate of population growth with a large proportion of the population in agriculture resulting in disguised mass rural unemployment and excessive competition in agriculture. Insufficient labor mobility exists along side of large degree of underutilization of capital equipment in many of the important industrial sectors. These countries must also have a strong entrepreneurial class, basic public services, a "reasonable" industrial base and the potential for agricultural technification; and finally, have sufficient resources that, if efficiently exploited, would permit a good standard of living.(21)

Currie outlines the specific preconditions necessary for a sector to act as the leading sector. 1) The sector must have a high internal multiplier and be large enough to have a substantial impact on other sectors of the domestic economy; 2) its growth must be able to be stimulated exogenously. 3) The sector must have a low import component, 4) a fairly high component of unskilled labor, and 5) represent a large latent demand to be actualized (or a high income or price elasticity of demand).

The reason for these preconditions are fairly straight-

forward. The first two come directly from the above discussion concerning the Sayian approaches to growth which requires sectoral linkages for real output stimulation. In addition to direct purchases of the industry, an increase in final demand for the construction industry will also result in indirect increases in the output of all the industries as additional goods and services are, in turn, required by the construction industry's direct input industries. The third precondition for the low import component is necessary - perhaps crucial - in order for the leading sector to be, in effect, leading something at all. To the extent that leading sector utilizes domestic resources, increased demand in the leading sector will then be "pulling" the rest of the domestic economy rather than the economy of exporting countries. Obviously, the greater the integration of the national economy, the greater the total - direct and indirect - output stimulated by an exogenous growth in the leading sector. Imports represent leakages that, when they cannot be offset, weaken this pull effect on the rest of the economy.

A large latent demand that can be actualized is the key for sustained growth of the leading sector. This change from latent to effective demand is unleashed through the removal of demand barriers.(22) In addition, this latent demand concept relates to income and price elasticities in the following ways:

...the larger the leading sector in relation to the total, the less rapid need be its rate of growth to maintain the high overall rate. On the other hand, the larger the sector, the less the "latent" demand and the more dependent we become on income and/or price elasticity of demand for its products. Finally, the smaller the sector initially, the

more rapid must be its growth to make a significant impact. ...the greater the elasticity of demand for the products of the leading sector, the greater the extent and the longer the period the "latent" market can be exploited. The concepts are supplementary and complementary.

Journal of Economic Studies, 1974, pp. 6,7.

The relatively high component of unskilled labor is not a primary precondition for a leading sector but does, however, play a role. The unskilled nature relieves, to some degree, the mobility problem because little skill or education is required thereby allowing for easier and faster labor absorption of what Currie sees as primarily rural labor into the sector. In addition, the higher unskilled component generally means that productivity can be improved fairly quickly and easily by upgrading the labor force.(23)

When the above preconditions are met, the leading sector development strategy is theoretically quite simple. Currie had in mind the urban housing and development for the leading sector. Thus, with reorganizing the consumer financing process and institutions, latent demand would be actualized. The subsequent housing boom would provide dwelling units, create jobs, generate incomes and savings, as well as encourage spending in other sectors - foodstuffs and clothing (what Currie calls "mass consumer goods"), plus related industries such as household furnishings and plumbing equipment. The effective demand would also allow producers of these basic consumer goods to expand their current operations without large infusions of capital or foreign exchange (because they are primarily domestic industries). Thus, through the mobilization of savings into the urban housing sector the development strategy aimed to

"jolt" the overall economy (through direct and indirect inter-industry linkages) into a higher level of activity and growth.

The next section will describe the Sri Lankan post-1977 Development Strategy. An assessment of the strategy's impact on the general economy (24) and more specifically, on the construction (and housing) sector will follow. The last section will use Fox's and others' input-output methodology to evaluate the performance of Sri Lanka's construction sector relative to Currie's preconditions for the leading sector.

Footnotes: Construction Industry as Tool for Development

(21) Taken from Fox, 1976, page 25.

(22) The importance of the form it takes will be discussed later.

(23) The mobility problem as discussed by Currie refers to labor's ability to move into increasingly better-paying jobs; this subject will be discussed later.

(24) Please note that this must be a preliminary assessment as these are relatively recent policy directions.

Sri Lanka's Development Strategy

Lead Projects

The national economic and social development objectives are formulated in The Public Investment Program (PIP) prepared by the National Planning Division of the Ministry of Finance and Planning.(25) The Program covers a five year period and is designed as a "rolling plan"; that is, it is revised and moved forward each year. The current Program, for example, is the fifth in a series of the present government and covers the years 1983 to 1987; the next Program will cover the years 1984 to 1988. (26)

The total resources available for public investment equals 57% of the total investible resources. In 1978, the government initiated several new projects (the Accelerated Mahaweli Project being one and in 1983 it still represented 34% of total public investment). However, in 1981, because of resource scarcities, the government declared that no new projects would proceed until the ongoing projects reached "a satisfactory stage of completion". Some of these ongoing programs themselves have been rephased or deferred. From 1978 the PIP has been largely dominated by the Mahaweli Development and the Housing, Water, and Urban Development Projects (HWUD), both of which are expected to reach "satisfactory stages of completion" by 1985 and therefore to allow for the inclusion of new projects.(27)

Beginning in 1977, the Plan focused on building up infrastructure it felt to be necessary for "rapid modernization".

The largest infrastructure scheme - the Mahaweli Development Project - aims to use the Mahaweli River for irrigation and power. The portion of the river used by the project is capable of irrigating 360,000 hectares, 270,000 hectares of which would constitute new agricultural land. The power potential of the Project was estimated to be over 500 MW. In addition, the Mahaweli Master Plan also includes a major agricultural settlement scheme to resettle over 140,000 families. Originally, the project was allowed 30 years for its full implementation through phases I, II, and III of the Mahaweli Master Plan. Work began under Phase I in 1970 and included the construction of the Polgolla dam, tunnel, and power plant and the Bowatana dam, tunnel and power plant. Some of the work was still ongoing in 1978. The new government in 1977/78, in effect, attempted to complete this 30 year project (minus the completed work) in 6 years; the Accelerated Mahaweli Project was initiated at this time.

However, the government soon began scaling back the size of the project because of two related circumstances: one, because of escalating costs, and two, because of criticism levied by the IMF, the World Bank, and the aid-dispensing countries concerning the unequal resource investment in the construction-intensive projects, in general.(28) The project was to be financed by foreign grants and low-interest loans. In 1978, the total estimate for the project was Rs.11 billion; in 1980 (February) the cost had increased to Rs.20 billion.(29) Because of these cost escalations and the donors' criticisms, the government decided to limit the project to three instead of

five reservoirs. Total investment allocated was Rs.18 billion from 1980-84 according to the PIP for that period. However, from looking at Table 9.1 for the years 1983-87, the PIP has allocated Rs.29.9 billion to the Project; this figure represents 24% of total public investment for these years. This is roughly the same percentage of total investment that was allocated for the project during 1970 to 1977.(30)

By increasing the output and productivity of the agricultural sector, the Mahaweli Project is also intended to directly improve the export outlook for the country. The government relies heavily upon agricultural products for export earnings. Approximately 55% of Sri Lanka's total land area is under cultivation. Agriculture employs approximately 50% of the labor force, contributes 30% of the GDP and its annual rate of growth between 1970 and 1977 was 2.3%. (31) Tea, rubber, coconut have been the major export crops. The relative position of these three major export crops dropped from 94% of total export earnings in 1971 to less than 50% in 1982;(32) also according to page 23, the value of agriculture is now equivalent to 34% of the foreign exchange earnings. This a result of both an absolute decline in these exports as well as the relative increase in the export of other products.

Agriculture - a traditionally productive sector - was suffering due to the shortage of public investment beginning in Mrs. Bandaranaike's administration; tea, rubber and coconut production continued to decline during 1977-1980.(33) All construc-

Table 9.1

ALLOCATION OF GOVERNMENT CAPITAL EXPENDITURE 1983-1987
(A) Summary - All Sectors

| | 1983 | | 1984 | | 1985 | | 1986 | | 1987 | | 1983-1987 | | | |
|---|-------|------|-------|------|-------|------|-------|------|-------|------|-----------|-------|--------|-------|
| | T | FA | T | FA | T | FA | T | FA | T | FA | F | L | T | FA |
| 1. Total Public Investment | 21917 | — | 22895 | — | 25093 | — | 27363 | — | 27738 | — | — | — | 125006 | — |
| 2. Add adjustment for Capital Transfers | 694 | — | 587 | — | 509 | — | 519 | — | 512 | — | — | — | 2821 | — |
| 3. Total Capital Expenditure | | | | | | | | | | | | | | |
| (Public Sector) of which | 22611 | — | 23432 | — | 25602 | — | 27882 | — | 28250 | — | — | — | 127827 | — |
| (i) Extra Budgetary Resources | 4663 | — | 4800 | — | 4950 | — | 5100 | — | 5250 | — | — | — | 24763 | — |
| (ii) Non Expansionary Resources available to Govt. Budget | 16587 | — | 18782 | — | 20818 | — | 22982 | — | 23249 | — | — | — | 102413 | — |
| (iii) Supplementary financing required for investment programme | 1361 | — | -100 | — | -166 | — | -200 | — | -249 | — | — | — | 646 | — |
| 4. Total Budgetary Provision | 17948 | — | 18682 | — | 20652 | — | 22782 | — | 23000 | — | — | — | 103064 | — |
| 5. Total Budgetary Provision gross of under expenditure | 19914 | — | 20307 | — | 21900 | — | 24200 | — | 24450 | — | — | — | 110771 | — |
| (i) Agriculture | 9234 | 6233 | 10619 | 6412 | 9827 | 5096 | 10100 | 3181 | 10188 | 1688 | 24450 | 25518 | 49968 | 22610 |
| (1) Mahaweli Development | 6773 | 4886 | 7271 | 4779 | 5788 | 3444 | 4753 | 1940 | 5315 | 936 | 17574 | 12326 | 29900 | 15985 |
| (2) Other Irrigation | 618 | 339 | 831 | 505 | 982 | 531 | 1280 | 518 | 1174 | 210 | 1803 | 3082 | 4885 | 2103 |
| (3) Field & Minor Export Crops | 634 | 325 | 955 | 358 | 1206 | 399 | 1678 | 317 | 1502 | 255 | 1850 | 4125 | 5975 | 1654 |
| (4) Forestry & Lands | 237 | 89 | 270 | 107 | 320 | 108 | 381 | 88 | 406 | 97 | 464 | 1150 | 1614 | 487 |
| (5) Plantations | 758 | 493 | 969 | 540 | 1081 | 465 | 1468 | 200 | 1214 | 77 | 1590 | 3900 | 5490 | 1775 |
| (6) Animal Husbandry | 81 | 38 | 147 | 81 | 248 | 130 | 318 | 118 | 330 | 113 | 644 | 480 | 1124 | 480 |
| (7) Fisheries | 133 | 63 | 176 | 42 | 202 | 21 | 222 | — | 247 | — | 625 | 455 | 980 | 126 |
| (ii) Industry | 103 | 59 | 177 | 88 | 505 | 27 | 732 | — | 734 | — | 1141 | 1110 | 2251 | 174 |
| (iii) Housing, Water Supply and Urban Development | 2432 | 884 | 2887 | 796 | 2232 | 347 | 2398 | 78 | 2396 | 32 | 5627 | 6718 | 12345 | 2137 |
| (1) Housing | 648 | 2 | 674 | 3 | 590 | 6 | 628 | 9 | 668 | 11 | 678 | 2530 | 3208 | 31 |
| (2) Other Construction | 366 | 78 | 498 | 90 | 483 | 48 | 479 | — | 472 | — | 646 | 1652 | 2298 | 216 |
| (3) Water Supply | 1380 | 804 | 1282 | 703 | 1159 | 293 | 1291 | 69 | 1256 | 21 | 4003 | 2365 | 6368 | 1890 |
| (4) Urban Development | 38 | — | 433 | — | — | — | — | — | — | — | 300 | 171 | 471 | — |
| (iv) Economic Overheads | 4458 | 2425 | 4369 | 2058 | 5467 | 2126 | 7010 | 2034 | 7218 | 1816 | 18129 | 10393 | 28522 | 10459 |
| (1) Transport | 1162 | 601 | 880 | 260 | 1100 | 17 | 1391 | — | 1509 | — | 4110 | 1932 | 6042 | 878 |
| (2) Power | 789 | 715 | 897 | 605 | 1406 | 900 | 2196 | 862 | 2269 | 704 | 6424 | 1133 | 7557 | 3786 |
| (3) Telecommunications | 560 | 280 | 698 | 305 | 955 | 365 | 1138 | 120 | 1042 | 70 | 3333 | 1060 | 4293 | 1140 |
| (4) Administrative and Others | 1947 | 829 | 1894 | 888 | 2006 | 844 | 2285 | 1052 | 2398 | 1042 | 4262 | 6269 | 10530 | 4655 |
| (v) Social Overheads | 1302 | 765 | 1255 | 194 | 2369 | 243 | 2460 | 171 | 2414 | 59 | 3705 | 6095 | 9860 | 1432 |
| (1) Education | 424 | 24 | 826 | 80 | 1451 | 175 | 1344 | 100 | 1112 | 17 | 1490 | 3667 | 6157 | 396 |
| (2) Health | 830 | 715 | 369 | 89 | 860 | 44 | 1069 | 57 | 1246 | 26 | 2094 | 2280 | 4374 | 931 |
| (3) Others | 48 | 26 | 60 | 25 | 58 | 24 | 47 | 14 | 56 | 16 | 121 | 148 | 269 | 105 |
| (vi) Miscellaneous | 2385 | — | 1000 | — | 1500 | — | 1500 | — | 1500 | — | — | 7885 | 7885 | — |
| 6. (i) 1 as % of G.D.P. | 17.6 | | 15.5 | | 14.6 | | 13.8 | | 12.3 | | | | | |
| (ii) 4 as % of G.D.P. | 14.4 | | 12.7 | | 11.9 | | 11.5 | | 10.2 | | | | | |

T = Total Cost FA = Foreign Aid F = Foreign Cost L = Local Cost

Source: PIP

tion was taking up 60-65% of total public sector investment; the construction-intensive projects (Mahaweli and the Housing, Water, and Urban Development), alone accounted for 40-50% of the public sector investment capacity.(34)

In the overall list of investment priorities, agriculture has always ranked first, commanding the largest share of total capital expenditure. According to PIP 1982-87 an estimated Rs.49.968 billion is allocated for the sector; this represents 40% of total Public Investment for the period. Large expenditure items since 1977 result from the heavy emphasis on the Mahaweli Project which falls under this heading of agriculture. Irrigation alone absorbs 25% of the total public investment for 1983-87; its share in the total resources allocated to the agricultural sector for 1983-87 rises to as much as 60%.(35)

The second "lead project" is the Investment Promotion Zone - the free trade zone north of Colombo - developed in order to encourage foreign investment-oriented industries.(36) The intent was to promote foreign and domestic collaboration thereby "promoting the acquisition of better technology, management skills, greater access to foreign markets, and to create employment and (most importantly) to enhance the country's exchange earnings."(37) The relative share of industrial and other products of total export earnings has increased from 3.4% in 1971 to approximately 50% in 1982. The growth is primarily because of petroleum products, textiles and garments (together accounting for about 80% of additional export earnings between 1977 and 1980). However, because both these items have high import requirements the net effect on the balance of payments

is low.(38)

The Housing, Water and Urban Development Project (HWUD) is the third lead sector and includes a number of different projects: Urban Housing, Urban Redevelopment, Rural Houses, Slum and Shanty Upgrading, Housing Loans, and major water supply and sewerage projects. The support of Prime Minister Premadasa for this ambitious program has elevated the improvement of the housing stock to the level of a national priority. As the other construction-intensive project, the HWUD also captured a large percent of the total capital expenditures - close to 10% according to my calculations from Tables 3a and 3b.

Footnotes: Lead Projects

(25) In addition to the PIP, there is an annual budget both capital and recurrent for the government.

(26) For further explanation of the process of the design and adoption of the PIP see short summary in USAID, 1981, pg. 65.

(27) The HWUD Project was to be kept within 4% of the total investment.

(28) The relationship between heavy investment in the construction-intensive projects and rising costs will be discussed in later chapters of this paper.

(29) By 1981, the cost of the project was estimated at Rs. 40 billion. Although international inflation contributed to the price escalation, a large part of the increase was due to the fact that better estimates were being prepared.

(30) Elsewhere in the Program, the Mahaweli Project is said to capture 35% of the total budget in any one year.

(31) This has declined since 1977.

(32) PIP 1983-87, p.118.

(33) All the major crops declined except rice - because of push for self-sufficiency in basic foods and import substitution effort.

(34) Stern quoted 42%.

(35) This figure also includes other irrigation projects: the Gal-Oya Project and the Uda-Walawe Project.

(36) catered primarily to the factory-type industry - see PIP pages 12-13 for performance summary.

(37) PIP, p.111.

(38) See Ganesan (1982a) for an explanation of the export sector's record.

The Liberalization Policies

As mentioned earlier, the liberalization policies consisted of devaluing the rupee, eliminating domestic price and import controls and cutting the food subsidies program dramatically. The intent, of course, was to attract foreign investment as well as to direct domestic resources away from consumption into investment. Following is a brief description of the import-export policies.

Imports were liberalized in 1977 under the new administration. This came after seven years of tight control under Mrs. Bandaranaike's administration. The new liberalization scheme divided imports into two groups: (1) those requiring a licence - less than 150 goods fall under this heading; and (2) all other goods that are freely importable - under the second heading come the inputs of the construction sector - machinery, raw materials, spares and a large range of manufactured goods. (39) In addition, the import duty structure has been restructured into six "bands": duty free, 5 percent, 12.5 percent, 25 percent, 50 percent, and 100 percent.(40) As one would expect, luxury goods fall at the higher end of the scale, with essential goods at the lower end. The overall result of the new tariff structure is a lower average burden than previously.

On the export side, permits - issued by the controller of exchange - are required for all exports. Some export items are banned, others require special licences. All major export commodities are subject to export duties. Foreign exchange

proceeds - from both visible and invisible exports - must be surrendered.(41)

And finally, with the introduction of the Import Promotion Zone, foreign investment is seen as an essential element of the national development strategy. Tax concessions are offered to the foreign firms to locate in the zone; concessions are also granted outside the zone for export oriented and new technology introducing projects. Approved investors (42) are completely exempt from "exchange controls, transfer of capital and proceeds of liquidation, transfer of shares and payments of dividends (to non-resident shareholders)."(43)

Footnotes: Liberalization Policies

(39) Consignments exceeding Rs 700,000, however, are subject to approval by the Investment Advisory Committee

(40) Duty rates have been increased above 100% for certain luxury goods since 1977.

(41) Invisible exports = some aspects of the tourism trade and remittances from abroad.

(42) Must be approved by the Foreign Investment Advisory Committee - FIAC.

(43) Quarterly Economic Review of Sri Lanka, 1983, p.19.

Macro-economic effects of Sri Lanka's strategy

The Public Investment Program of 1978 channelled investment into projects that had long gestation periods and low productivities. In addition, they turned out to be very capital- and import-intensive. Because of their first two characteristics, the projects had to be financed through an increase in the national deficit.

Table 4

Value of Foreign Trade

(Rs mn)

| | <u>1978</u> | <u>1979</u> | <u>1980</u> | <u>1981</u> | <u>1982</u> |
|---------------------------|---------------|---------------|----------------|----------------|----------------|
| Exports | | | | | |
| incl re-exports, fob | 13,206 | 15,279 | 17,595 | 21,043 | 21,454 |
| Imports, cif | 14,687 | 22,541 | 33,942 | 36,582 | 41,946 |
| Balance (adjusted) | <u>-1,480</u> | <u>-7,262</u> | <u>-16,347</u> | <u>-15,539</u> | <u>-20,492</u> |
| <u>Indices (1978=100)</u> | | | | | |
| Terms of trade | 100 | 72 | 58 | 46 | 38 |
| Volume of exports | 100 | 101 | 99 | 102 | 112 |
| Volume of imports | 100 | 123 | 140 | 145 | 148 |

Sources: Review of the Economy, Central Bank of Ceylon; Customs returns.

Source: QEROSL

Although the pace of economic activity slowed and the development program was limited by 1981, the deficit continued to grow because of poor import performance, continuing recession in developed countries, and adverse terms of trade.

The balance of payments deficit also widened enormously. (See table 5) However, the financing of the deficit has been relatively easy for President Jayawardene.(44) The IMF support has been generous as has other aid and grant increases; in addition, a larger surplus on invisible earnings such as tourism.

Table 5

| <u>Balance of Payments</u> | | | | |
|---|-------------|-------------|-------------|-------------------------|
| (Rs mn) | | | | |
| | <u>1979</u> | <u>1980</u> | <u>1981</u> | <u>1982^a</u> |
| Exports, fob | 15,282 | 17,603 | 20,507 | 21,434 |
| Imports, cif | 22,570 | 33,915 | 36,123 | 41,902 |
| Trade balance | -7,288 | -16,312 | -15,616 | -20,468 |
| Invisible transactions | | | | |
| & private transfer payments | 1,493 | 3,119 | 4,156 | 5,296 |
| Current account balance | -5,795 | -13,193 | -11,460 | -15,172 |
| Capital payments | -1,759 | -5,193 | -13,767 | -14,026 |
| Current account & capital payments (financing requirements ^b) | -7,554 | -18,386 | -25,227 | -29,198 |
| <u>Financed from</u> | | | | |
| Transactions that do not affect debt position: | | | | |
| official grants | 2,239 | 2,281 | 3,118 | 3,379 |
| direct investment | 769 | 753 | 1,003 | 1,080 |
| SDR allocations | 242 | 258 | 252 | - |
| Borrowings & use of resources: | | | | |
| long term loans | 2,903 | 4,143 | 5,350 | 5,663 |
| short term credits | 41 | 4,454 | 10,518 | 9,940 |
| suppliers' credit | 609 | 441 | 1,233 | 1,160 |
| bilateral balances | 413 | - | - | - |
| commercial borrowings (private sector) | - | 732 | 1,546 | 4,916 |

Balance of Payments (continued)

| (Rs mn) | | | | |
|--|-------------|-------------|-------------|-------------------------|
| | <u>1979</u> | <u>1980</u> | <u>1981</u> | <u>1982^a</u> |
| bank borrowings | - | 361 | - | 1,595 |
| IMF drawings | 1,592 | 828 | 4,528 | 1,369 |
| other | 120 | 147 | 142 | 1,071 |
| reserves ^c | -2,175 | 2,886 | -2,456 | -1,734 |
| errors & valuation adjustment ^c | 802 | 1,102 | -7 | 759 |

a Provisional. b External resources gap. c - indicates increase.

Source: Central Bank of Ceylon.

Source: QEROSL

Finally, with the balance of payments deficit since 1978, foreign debts outstanding increased to unprecedented levels. Total debt doubled between 1978 and 1980; by 1982 it had increase again by 55% over the 1980 level.

Table 6

Outstanding Foreign Debts by Major Sources 1978-81

(Rs mn)

| | <u>1979</u> | <u>1980</u> | <u>1981</u> | <u>1982</u> |
|-------------------------------------|----------------|----------------|----------------|-----------------|
| USA | 3,684.8 | 4,966.5 | 6,244.2 | 7,320.0 |
| International agencies ^a | 2,443.3 | 3,292.9 | 4,681.2 | 6,246.0 |
| West Germany | 2,295.2 | 2,328.3 | 2,175.7 | 2,192.5 |
| Japan | 2,143.2 | 3,222.5 | 3,519.5 | 4,621.2 |
| IMF Trust Fund | 1,370.2 | 2,187.0 | 2,719.5 | 2,608.6 |
| Others | <u>4,444.6</u> | <u>6,269.5</u> | <u>9,832.0</u> | <u>11,738.6</u> |
| Total | 16,381.3 | 22,266.7 | 29,172.1 | 34,726.9 |

a IBRD, ADB loans and IDA credits.

Source: Central Bank of Ceylon.

Source: QEROSL

The inflation rate jumped in 1977 with the onset of the liberalization policies. Inflation continued to rise dramatically for the next four years. The inflation was not due to an expansion in the money supply (M³ remains relatively stable) but rather to the overstimulation of the economy in a short period of time. Also, the lead projects were importing large amounts of equipment and materials and, as a result, international inflation. Finally, the lead projects were not productive investments - that is, they could not pay for themselves - which again led to government borrowing and more inflationary pressures.

The nominal interest rate on deposits was increased to 15%

Table 7 Financial Ratios, Inflation and Interest Rates, Savings and Investment Rates

(in Per Cent)

| | $\frac{M_1}{GDP}$ | $\frac{M_2}{GDP}$ | $\frac{M_3}{GDP}$ | Inflation Rate | Interest Rate | | Domestic Savings GDP | Investment | |
|------|-------------------|-------------------|-------------------|-------------------|---------------|-------|----------------------------|---------------|----------------|
| | | | | | Nominal | Real | | Gov't. GDP | Private GDP |
| 1971 | 15.3 | 24.5 | 39.7 | 3.1 | 4.75 | + 1.6 | 13.7 | 7.8 | 9.5 |
| 1972 | 16.3 | 26.1 | 41.5 | 5.3 | 4.75 | - 0.5 | 14.6 | 7.8 | 9.5 |
| 1973 | 15.1 | 22.6 | 37.1 | 13.6 | 4.75 | - 7.7 | 11.5 | 6.2 | 7.5 |
| 1974 | 12.4 | 19.2 | 32.1 | 19.2 | 4.75 | -12.1 | 8.2 | 7.9 | 7.8 |
| 1975 | 11.6 | 18.2 | 31.0 | 6.2 | 7.5 | + 1.2 | 8.1 | 7.5 | 8.1 |
| 1976 | 13.8 | 20.9 | 33.9 | 5.0 | 7.5 | + 2.4 | 13.9 | 8.1 | 8.1 |
| 1977 | 14.7 | 23.9 | 36.1 | 13.3 | 15.0 | + 1.5 | 18.1 | 7.6 | 6.8 |
| 1978 | 13.9 | 25.5 | 38.0 | 11.8 | 15.0 | + 2.9 | 15.3 | 11.0 | 9.0 |
| 1979 | 14.6 | 28.7 | 41.4 | 12.1 | 15.0 | + 2.6 | 13.8 | 17.3 | 8.5 |
| 1980 | 13.8 | 29.1 | 39.6 | 26.0 | 20.0 | - 4.8 | 11.2 | 20.6 | 13.1 |
| 1981 | 11.7 | 28.6 | 38.1 | 18.5 | 22.0 | + 3.0 | 11.7 | 16.6 | 12.5 |
| 1982 | 11.8 | 30.5 | 42.0 | 8.8 | 22.0 | +12.1 | 11.8 | 15.9 | 14.3 |

- Notes: a) M_1 = currency outside banks plus demand deposits.
b) M_2 = M_1 plus savings and time deposits of commercial banks.
c) M_3 = M_2 plus savings and time deposits of the National Savings Bank.
d) All ratios of M_1 , M_2 and M_3 to GDP relate end of year M values to the same year's GDP value.
e) Inflation rate is a simple average of the GDP deflator, the Colombo cost of living and the wholesale price index.
f) Nominal interest rate is the maximum time deposit rate.
g) Real interest rate = $\frac{1 + \text{nominal rate}}{1 + \text{inflation rate}} - 1$.
h) Savings and Investment rates are per cent of GDP.

Source: Central Bank of Ceylon, Review of the Economy, various issues.

Source: Stern

Table 8

Domestic Bank Credit: Lenders and Borrowers

(Rs. millions)

| | <u>Lenders</u> | | | <u>Borrowers</u> | | | |
|------|--|--------------------------------------|--------------|-------------------------|--|---------------------------|--------------------------------------|
| | <u>Central and Commercial Bank</u> | <u>National Savings Bank</u> | <u>Total</u> | <u>Govern- ment</u> | <u>Gov't. Corps. and Coops</u> | <u>Private Sector</u> | <u>Private as % of Total</u> |
| 1971 | 4,480.5 | 834.6 | 5,315.1 | 3,551.8 | 650.5 | 1,112.8 | 20.9 |
| 1972 | 4,936.8 | 951.9 | 5,887.7 | 3,716.3 | 945.3 | 1,226.1 | 20.8 |
| 1973 | 4,814.9 | 1,164.9 | 5,980.8 | 3,824.5 | 792.2 | 1,364.1 | 22.8 |
| 1974 | 5,828.4 | 1,441.1 | 7,269.5 | 3,967.4 | 1,621.7 | 1,680.4 | 23.1 |
| 1975 | 6,232.8 | 1,694.9 | 7,927.7 | 4,504.8 | 1,563.1 | 1,859.8 | 23.5 |
| 1976 | 7,269.1 | 2,019.6 | 9,288.7 | 5,286.8 | 1,718.5 | 2,283.4 | 24.6 |
| 1977 | 8,796.1 | 2,419.9 | 11,216.0 | 5,409.2 | 2,901.3 | 2,905.5 | 25.9 |
| 1978 | 10,575.2 | 2,956.2 | 13,531.4 | 4,819.2 | 4,037.7 | 4,674.5 | 34.5 |
| 1979 | 15,113.8 | 4,014.9 | 19,128.7 | 6,935.3 | 5,254.8 | 6,938.6 | 36.3 |
| 1980 | 25,635.9 | 4,822.2 | 30,458.1 | 13,794.2 | 5,491.0 | 11,172.9 | 36.7 |
| 1981 | 33,824.2 | 5,095.0 | 38,919.2 | 17,884.1 | 5,781.6 | 15,253.5 | 39.2 |
| 1982 | 42,412.0 | 7,425.3 | 49,837.3 | 24,575.5 | 5,865.1 | 19,396.7 | 38.9 |

Notes: a) Several minor banking institutions are omitted from the table, i.e., the State Mortgage and Investment Bank, the National Development Bank.

b) The loans of the National Savings Bank include only its loans to Government. Private sector loans, which amounted to 10% of government loans in 1982, are omitted because of lack of consistent time series.

Source: Stern

over 1976 nominal rate of 7.5%; the real interest rate actually dropped from 2.4% to 1.5% because of the jump in inflation. The rate was increased again in 1980 with the real interest rate fluctuating throughout the period. According to Table 4, raising the interest rate on deposits did have the effect of increasing the absolute number of rupees saved - see M in 1977. The intent of this greater savings mobilization was to stimulate private sector into greater economic activity and thus, to take on a greater share of investment. Overall investment, expressed as a percent of GDP, did in fact increase; however, the private sector's share did not increase as was hoped.

Instead, Government borrowing to finance the lead projects actually "crowded out" the private sector. Table 8 shows the percent of domestic borrowing undertaken by both the public and private sectors. Although the private sector share jumped in 1978, it turned out to be a one time increase only. The government had predicted that private sector investment would increase substantially more than it actually did - see Table 7, final column . (45)

The Mahaweli Development Project had a foreign exchange component (direct and indirect) of 80%; the HWUD's foreign exchange component was 30%. While a good deal of the Mahaweli's foreign exchange was paid for by foreign aid, the government had to completely pay for the HWUD's foreign exchange. Table 9 displays the non-aided portion of the imports required by the two projects as percent of the country's total exports.

Table 9

Total Exports and Non-Aid-Financed Imports
for the Lead Projects

| | <u>Exports^{a/}</u> (Rs. million) | <u>Non-Aided Imports^{b/}</u> | <u>Non-Aided Imports as a Proportion of Exports</u> (Percent) |
|------|--|---|--|
| 1978 | 13,193 | . 174 | 1.3 |
| 1979 | 15,282 | 265 | 1.7 |
| 1980 | 17,595 | 661 | 3.8 |
| 1981 | 21,043 | 1258 | 6.0 |
| 1982 | 21,454 | 1337 | 6.2 |
| 1983 | 24,028 | 1298 | 5.4 |
| 1984 | 26,912 | 826 | 3.1 |

Sources: ^{a/} Exports 1978-1982 from Central Bank of Ceylon, Review of the Economy: 1982; 1983 and 1984 exports are extrapolated assuming a 12 percent rate of growth.

^{b/} Joseph J. Stern, "Macro-Economic Effects of the Lead Projects," op. cit. Based on a "high alternative" and assuming a 10 percent international inflation.

Source: Stern

In sum, the general macro-economic picture after 1977 was characterized by the majority of government investment skewed toward just two capital- and import-intensive projects. The economy was over-stimulated in the short-run with the public sector capturing the majority of the available credit. In addition, government policy was unable to raise the low savings rate (46) and failed to control demand for imports. (See table 2 for summary.)

Table 10

| <u>Domestic Saving and Capital Formation</u> | | | | |
|--|----------------|----------------|----------------|----------------|
| (Annual Averages; Rs. million) | | | | |
| <u>Item</u> | <u>1960-65</u> | <u>1965-70</u> | <u>1970-77</u> | <u>1977-82</u> |
| 1. Gross domestic product at market prices | 7302 | 10170 | 22290 | 63884 |
| 2. Net imports of good and nonfactor services | 121 | 343 | 539 | 9013 |
| 3. Investment | 1074 | 1679 | 3523 | 17315 |
| 4. Domestic savings (3-2) | 954 | 1336 | 2984 | 8303 |
| <u>Analysis</u> | | | | |
| 1. As a percent of GDP | | | | |
| (a) investment | 14.7 | 16.5 | 15.8 | 27.1 |
| (b) savings | 13.1 | 13.1 | 13.4 | 13.0 |
| 2. Marginal propensity to save ($\Delta S/\Delta Y$) | | 13.3 | 13.6 | 12.8 |

Source: Central Bank, Review of the Economy, various issues.

Source: Stern

Footnotes: Macro-economic effects of Sri Lanka's strategy

(44) Unlike the previous administration who was facing chronic foreign exchange shortages.

(45) See table 3: Financing Government Deficits, 1973-1980. Or Stern's Table 8, in the appendix.

(46) If it were not for remittances from abroad, absolute savings would have actually decreased during this period according to Stern.

Construction sector impacts

During the 1960s, Sri Lanka's construction sector had a few large contractors who erected a number of tall buildings. They had equipment and probably easier access to financing. There were also a few major civil engineering contractors who did a good deal of work in the country (with the exception of the major bridges and highways). The remainder of the construction contractors "functioned in an informal atmosphere" where access to capital, qualified personnel, and so on, was practically non-existent.(47) In 1970 in reaction against the then growing power of local contractors, the new government put the majority of the responsibility for construction in the hands of the state sector. They also saw this shift as a means to fulfill their electoral promise to create more employment.

Private construction capacity began to disintegrate during the 1970s as the majority of the work went to state sector construction agencies. Nearly every major building in Colombo during this period was built by the State Engineering Corporation.(48) As a result of this new focus sub-contracting to the private sector was curbed except for that of "labor-only".

As will be discussed next, since 1977 this trend has once again been reversed. Increased construction opportunities in government projects have been channeled through the Sri Lankan Construction Consortium to around 350 registered domestic contractors. These increased opportunities, notwithstanding, the domestic construction sector is still relatively weak.(49) The

majority of construction firms are small - dictated by the technology of the building process, the pattern of resource availability, and the market conditions for this product. (50)

For the years immediately following 1978, the UNP administration's economic policies brought changes that reverberated strongly in the construction sector. (51) Demand for office and residential building shot up in part to meet the demand for expatriate personnel and companies. Foreign grants and loans flowed into the country to support rapid expansion of construction expenditures. According to Ganesan, Construction outgrew GDP 3:1 during 1979. In 1978, the sector experienced 26 percent real growth rates, 21 percent in 1979; it contributed 15 percent to GNP in 1979. According to Table 11, the construction sector averaged 10.4% rate of growth.

Table 11

| Rates of Growth of Gross Domestic Product and its Components (Percent per annum) | | | | |
|--|-----------------------|-----------------------|-----------------------|-----------------------|
| Item | 1960-65 ^{a/} | 1965-70 ^{a/} | 1970-77 ^{b/} | 1977-82 ^{b/} |
| 1. Agriculture, forestry, and fishing | 2.6 | 4.1 | 2.0 | 4.0 |
| 2. Mining and quarrying | 1.0 | 13.9 | 27.3 | 5.4 |
| 3. Manufacturing | 5.2 | 7.3 | 1.0 | 4.6 |
| 4. Construction | -1.1 | 17.6 | -2.7 | 10.4 |
| 5. Services | 4.8 | 4.3 | 3.7 | 7.3 |
| 6. Gross Domestic Product | 3.8 | 5.3 | 2.9 | 6.2 |
| 7. Real National Income | 2.9 | 4.0 | 2.8 | 4.4 |
| 8. Population | 2.5 | 2.3 | 1.6 | 1.7 |
| 9. GDP/capita | 1.3 | 2.9 | 1.3 | 4.4 |
| 10. Real NI/capita | 0.4 | 1.6 | 1.2 | 2.7 |

Notes: ^{a/} At 1959 constant prices.

^{b/} At 1970 constant prices.

Source: Central Bank of Ceylon Annual Report, various issues.

At the same time, domestic industrial output only grew 4 percent.(52) Although there were slightly higher growth rates for the building materials industry, substantial imports were needed to meet construction sector's demand for inputs. The prices of local materials also went up dramatically. The use of imported materials and foreign construction resources increased, bringing the foreign exchange content in most of the major projects to 50-80 percent of total projected costs. (53)

Because of imported inflation and shortage of local building materials production capacity, construction costs began to "skyrocket" at 40-60 percent per year on average - up to 100 percent per year in foreign exchange intensive projects. Although public housing and building contracts were awarded to overseas contractors on a significant scale during 1977-79, the domestic construction sector did create substantial amounts of employment for some of the years. See Table 12 for estimates.

From 1970, the private construction sector - for the most part - had been ignored; as a result, it was almost completely dismantled - "the few who survived...[operating] with their plant and managerial resources run down due to lack of work" (54) - when, in 1977, they were suddenly offered major job prospects in the construction boom.(55) Foreign contractors were brought in and captured a good deal of the state sector organization's work. At the same time, the state sector construction organizations had been strongly encouraged and utilized previously now were only partially utilized.

The result of the construction boom was a serious monetary

Table 12

Direct Plus Indirect Employment
Generated by the Housing and Mahaweli Programme
('000)

| | <u>1978</u> | <u>1979</u> | <u>1980</u> | <u>1981</u> | <u>1982</u> | <u>1983</u> | <u>1984</u> |
|-------------------------------------|---------------|---------------|---------------|---------------|---------------|---------------|--------------|
| A. <u>Low Alternative</u> | | | | | | | |
| 1. Project employment ^{a/} | 9.55 | 14.55 | 21.07 | 31.65 | 39.13 | 31.53 | 14.69 |
| 2. Other employment | <u>98.98</u> | <u>149.50</u> | <u>178.86</u> | <u>281.71</u> | <u>358.37</u> | <u>212.06</u> | <u>29.77</u> |
| 3. Total | <u>108.53</u> | <u>164.05</u> | <u>202.93</u> | <u>313.36</u> | <u>397.50</u> | <u>243.59</u> | <u>44.46</u> |
| 4. Increase in employment | - | 55.52 | 38.88 | 110.53 | 84.24 | -154.01 | -199.13 |
| B. <u>High Alternative</u> | | | | | | | |
| 1. Project employment ^{a/} | 9.55 | 14.55 | 24.07 | 31.65 | 39.13 | 31.53 | 14.69 |
| 2. Other employment | <u>193.33</u> | <u>292.57</u> | <u>353.79</u> | <u>623.38</u> | <u>803.26</u> | <u>480.23</u> | <u>83.69</u> |
| 3. Total | <u>202.88</u> | <u>307.12</u> | <u>377.86</u> | <u>655.03</u> | <u>842.39</u> | <u>511.76</u> | <u>98.38</u> |
| 4. Increase in employment | - | 104.24 | 70.74 | 277.17 | 187.36 | -330.63 | -413.38 |

Note: ^{a/} Assuming 225 person-days of work as equal to one person-year of employment.

Source: Joseph J. Stern, "The Macro-Economic Effects of the 'Lead Projects'," op. cit.

Source: Stern

constraint - both domestic and foreign - beginning in early 1980. A quick summary extracted from Quarterly Economic Review of Sri Lanka for the years 1978-1984 illustrates some of the vicissitudes of the period and the construction industry's response.

1st Quarter 1978:

"... shortage of vital building materials held back the output in the construction sector."

3rd Quarter 1979:

"The boom in the construction trade touched off by the various public works is likely to remain strong both in 1979 and 1980."

3rd Quarter 1980:

"A deceleration in construction and mining is also on the cards. A rapid rise in costs together with material and manpower shortages would constrain growth in this sector to around 10%."

4th Quarter 1981:

"The construction boom is over
The construction boom, which experienced a considerable deceleration during 1980, is expected to remain on a downward curve in 1981 and 1982 as the ambitious development program is further scaled down. House building activity and other private building demand is also likely to remain sluggish, reflecting higher raw material prices and tight credit conditions."

4th Quarter 1982:

"The soaring budget deficit lies at the heart of the financial crisis which is looming on the horizon. The demands which have been made by the ambitious development program have not been matched by corresponding increase in domestic resources. This is the main reason for the budget deficit but the problem has been aggravated by the additional expenditure incurred because of the drought earlier in the year. The widening trade deficit is also partly due to the high level of imports by the development program."

"The construction sector is staging a recovery thanks to the accelerating pace of the Mahaweli. But this year's forecast 10% increase is unlikely to continue unchanged. The expected rephasing of the development program is likely to take it toll."

1st Quarter 1983:

"The construction sector on the other hand is not likely to

consolidate the gains of 1982 as the tough budgetary measures expected in March would in part be aimed at slowing down the investment projects, most of which have a large construction content."

4th Quarter 1983:

"The construction sector is likely to be more buoyant as the rebuilding efforts get under way." [violence-caused damage]

1st Quarter 1984:

"Any slowdown in the construction sector arising from the deferrals in expenditure on the public investment program is likely to be offset by the rebuilding program."

(emphasis mine)

For the housing sector, the liberalization policies meant interest rate reforms to encourage greater savings, a shift from consumer subsidies to producer incentives, removal of excessive administrative controls, and greater reliance on the market mechanism overall. The government believed that the private sector should build the majority of the housing.(56) The formal private sector's growth and production of housing has been small. This is due to a number of factors. First, an organized housing finance system for either mortgage loans or construction finance is practically non-existent. Second, restrictive government policy of the past - ceiling on property acts, rent control, and so on - have not been encouraging for investment. Third, government legislation in the areas of zoning, building permits, standards, and inspection taxes have cut heavily into private builders' expected profit margins. Lastly, as mentioned earlier, the vast majority of the small builders do not have the managerial capacity for increasing their production levels.

The informal sector housing production, however, has increased from 1977-1981 according to recent census data. It has

outbuilt the public sector 7:1 during the period. The informal sector includes building both for low-income groups - through urban slums and shanty settlements - and the middle- and high-income groups - often through construction by small private contractors. And of course, most of the shelter built in the rural areas is included in this category as well.

Since 1980, the government has been facing revenue shortfalls and pressure to scale back the lead projects. In this context, the government has shifted away from the more expensive Direct Construction toward Aided Self-Help projects in urban areas. They are also expanding the Slum and Shanty Upgrading Projects and stressing cost recovery. It must be noted however, that no national housing policy exists within which to deal with standards, affordability, financing, construction and service levels, land supply, and public maintenance. Instead, the building industry must function in an atmosphere of ad hoc regulations and laws that have arisen over time to deal with particular issues. The government, however, is currently reviewing the need for a national shelter policy and some expect this to be forthcoming in the near future.

Footnotes: Construction sector impacts

(47) Ganesan, 1982, p.31.

(48) ibid. p. 32.

(49) ibid.

(50) ibid. p. 183.

(51) The following taken from Ganesan, 1982.

(52) ibid. p.6.

(53) See Appendix 3.

(54) Ganesan, 1981, p. 1.

(55) In addition, most remaining firms were unable "to prove they had done major works so as to be in a position to bid for the larger works under the present boom; [and they suffered] erosion of financial resources and their inability to muster funds to undertake larger contracts." Vedagiri, 1980, section 9.

(56) In the 100,000 Houses Program the public sector was to build 20,000 and the rest was to be built by the private sector. Vedagiri, 1980, p. 22.

It is now clear from the summary of the macro-economic picture and construction sector experience that the lead sector must be a part of an integral, consistent strategy that considers all the major sectors of the economy. And in light of the country's economic situation and priorities, the individual sector's role as leader must be evaluated vis-a-vis others.

This section will briefly summarize the framework for input-output analysis. The following section will use this logic to look at the choice of construction as leading sector in Sri Lanka's economic development strategy. Two papers that have also sought to use the input-output logic will be utilized to look at Currie's preconditions. The first paper is by S. Schultz - "Intersectoral Comparison as an Approach to the Identification of Key Sectors" - in which he evaluates potentially "key" sectors for economic growth.(57) The second is by Ganesan - "Growth of Housing and Construction, Key to Employment Planning" - in which he looks specifically at Sri Lanka's construction sector in conjunction with three possible models for economic growth.(58) The general intent of the two papers will be summarized below.

Method for Evaluation of "Leading Sector" Strategy Preconditions

Currie's framework gives us particular criteria to meet in choosing the "leading" sector but does not provide an explicit methodology to evaluate a sector's performance. In Fox's 1976 Ph.D. thesis she evaluated the Colombian development strategy through the use of a static input-output model. Input-output analysis can be used in a number of ways to evaluate the

relationships between individual sectors and the whole economy.

These can be categorized into three general areas:

1. description of the economy - its structural relationships and industrial production technology (coefficients) - in equilibrium at a particular moment in time and at a particular stage of development.

2. forecasting, sensitivity, and feasibility testing - to answer questions such as: What bottlenecks are likely to be encountered - where and magnitude? Will domestic resources be available to meet the expected level of final demand? Or, what changes in import requirements can be projected?

3. impact-multiplier analysis - to measure the growth impulses initiated or distributed by sector. (59)

Input-output analysis is especially attractive for looking at the leading sector strategy because it can be used not only to predict the impact of policy changes on the macro-economic scale, but also it can indicate the impact on particular micro-economic issues such as the demand for a particular product such as steel or cement.

The Basic Model

A simple input-output (hereafter, I-0) framework is shown in Table 13. (60) In this table, Gross Production is equal to the sum of all intermediate and final demands. In matrix notation,

$$X = AX + F \quad (1)$$

where, A = a square matrix (nxn) of technical coefficients
X = a vector of output (of n dimension equal to number of sectors)
F = a vector of final demand by sectors (of dimension n)

The I-0 table provides a consistent framework for keeping account of deliveries and receipts by each sector. The re-

Table 13

TABLE 2-1
Hypothetical Transactions Table*
Industry Purchasing

| | | <i>Processing Sector</i> | | | | | | <i>Final Demand</i> | | | | | | | |
|---------------------------|------------------------|-----------------------------------|-----|-----|-----|-----|-----|---------------------|----------------------------------|------------------------------|----------------------|---------------------------------|------------|--------------------|----|
| | | Outputs ¹ | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) | (10) | (11) | (12) | |
| | | Inputs ² | A | B | C | D | E | F | Gross inventory accumulation (+) | Exports to foreign countries | Government purchases | Gross private capital formation | Households | Total Gross Output | |
| <i>Industry Producing</i> | <i>Industry Sector</i> | (1) Industry A | 10 | 15 | 1 | 2 | 5 | 6 | 2 | 5 | 1 | 3 | 14 | 64 | |
| | | (2) Industry B | 5 | 4 | 7 | 1 | 3 | 8 | 1 | 6 | 3 | 4 | 17 | 59 | |
| | | (3) Industry C | 7 | 2 | 8 | 1 | 5 | 3 | 2 | 3 | 1 | 3 | 5 | 40 | |
| | | (4) Industry D | 11 | 1 | 2 | 8 | 6 | 4 | 0 | 0 | 1 | 2 | 4 | 39 | |
| | | (5) Industry E | 4 | 0 | 1 | 14 | 3 | 2 | 1 | 2 | 1 | 3 | 9 | 40 | |
| | | (6) Industry F | 2 | 6 | 7 | 6 | 2 | 6 | 2 | 4 | 2 | 1 | 8 | 46 | |
| | | (7) Gross inventory depletion (-) | 1 | 2 | 1 | 0 | 2 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 8 |
| | | (8) Imports | 2 | 1 | 3 | 0 | 3 | 2 | 0 | 0 | 0 | 0 | 0 | 2 | 13 |
| | | (9) Payments to government | 2 | 3 | 2 | 2 | 1 | 2 | 3 | 2 | 1 | 2 | 12 | 32 | |
| | | (10) Depreciation allowances | 1 | 2 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 5 |
| | | (11) Households | 19 | 23 | 7 | 5 | 9 | 12 | 1 | 0 | 8 | 0 | 1 | 85 | |
| | | (12) Total Gross Outlays | 64 | 59 | 40 | 39 | 40 | 46 | 12 | 23 | 18 | 18 | 72 | 431 | |

¹Sales to industries and sectors along the top of the table from the industry listed in each row at the left of the table.
²Purchases from industries and sectors at the left of the table by the industry listed at the top of each column.

Source: Miernyk

ceipts from all outputs will balance total outlays for each industry.

A table of technical coefficients can be derived from the original absolute amounts I-0 table.(61) These technical coefficients tell us "the amount of inputs required from each industry to produce one dollar's worth of the output of a given industry."(62) With this table of technical coefficients one can see the "first round", direct requirements of each industry.

To capture the total - both direct and indirect - additions to output that result from an increase in a sector's final demand sector, Leontief's inverted matrix must be used. In matrix notation,

$$[I - A]^{-1} \quad (2)$$

This matrix is derived from subtracting the input coefficient matrix (A) from the identity matrix (I) and inverting it.

Written in the following form,

$$X = [I-A]^{-1} D \quad (3)$$

the matrix multiplier (as $[I - A]^{-1}$ is often called) relates changes in final demand (D) to changes in gross output (X). Thus, one can measure the direct and indirect requirements if final demand for one sector D_j changes by one unit. The logic of multiplier analysis can also be extended to calculate, for example, the amount of labor (and skill types), of income, or even of indirect taxes generated with an increase in final

This general I-O logic will be supplemented by the works of both Schultz and Ganesan. The intent of these two pieces is summarized below:

Schultz's paper uses input-output techniques to assess the relative importance of individual sectors for economic growth. His analysis of the "key" sector corresponds in large part to Currie's discussion of the "lead" sector. With criteria derived from input-output analysis Schultz ranks the sectors according to their ability to initiate or distribute growth impulses throughout the entire economy. In addition, he also measures the sectors' impacts on macro level indicators - on trade balances, foreign exchange earnings, gross domestic product, and employment - and again makes a ranking of the sectors.

Schultz's discussion is particularly interesting, and useful for our purposes here, precisely because he is not pushing any particular sector as a candidate for the leading sector. In the paper, he uses input-output tables from ten developing Asian countries (Sri Lanka is included here - 1963 and 1965 tables), two non-Asian developing countries (Yugoslavia and Israel), and two "economically more advanced" countries (Japan and W. Germany). A quick summary of some of his results show that other sectors portray the precondition for leading sector as well:

- various industrial sectors of the developing Asian countries emitted "relatively strong intersectoral impulses"; however, this was not the case for the primary and tertiary sectors. "Of the secondary sectors, Processed Foods are predominant, followed closely by Apparel and Construction. (emphasis mine)

Table 14:

Table 7-2. Analysed Input-Output Tables

| Country | Year | Abbre- viation | Number of Sectors in Original Table | Imports | |
|----------------------|---------|-------------------|--|---------|--------|
| | | | | Row | Column |
| India [19] | 1963 | IND 63 | 33 | | x |
| India [26] | 1964-65 | IND 65 | 77 | | x |
| Indonesia [10] | 1969 | IDO 69 | 43 | | x |
| Iran [30] | 1965 | IRN 65 | 29 | x | |
| Korea (South) [15] | 1963 | KOR 63 | 43 | x | |
| Korea (South) [16] | 1966 | KOR 66 | 43 | x | |
| Malaysia (West) [18] | 1965 | MIY 65 | 31 | x | |
| Pakistan [25] | 1960-61 | PAK 61 | 30 | x | |
| Pakistan [36] | 1963-64 | PAK 64 | 54 | x | |
| Philippines [21] | 1961 | PHI 61 | 29 | x | |
| Philippines [22] | 1965 | PHI 65 | 97 | x | |
| Sri Lanka [20] | 1963 | SLA 63 | 38 | x | |
| Sri Lanka [2] | 1965 | SLA 65 | 41 | | x |
| Taiwan [7] | 1964 | TAI 64 | 55 | x | |
| Taiwan [33] | 1966 | TAI 66 | 76 | x | |
| Taiwan [34] | 1969 | TAI 69 | 76 | x | |
| Turkey [4; 29] | 1963 | TUR 63 | 37 | | x |
| Israel [12] | 1965-66 | ISR 66 | 80 | x | |
| Israel [5] | 1968-69 | ISR 69 | 30 | x | |
| Yugoslavia [40] | 1966 | YUG 66 | 29 | x | |
| Germany (West) [31] | 1966 | GER 66 | 56 | x | |
| Japan [13] | 1965 | JAP 65 | 56 | | x |

Source: Schultz

- As regards the dispersion of effects, impulses from Wood & paper products & printing and from Construction are generally powerful and relatively evenly distributed to other sectors.... (p. 150)

- Greatest total Employment effect: Agriculture, then Processed foods. When averaged, Apparel nearly equals Trade.

The various linkage criteria lead to different sector rankings not only between countries, but within a single country as well:

Although some rankings were highly correlated - and thus would justify resorting to the simpler algorithms - none of the criteria under consideration proved to be superior to all others."

page 153.

Although ranking within the three or four top candidates for "key" sectors in Schultz's fourteen-countries analysis, construction is not the most obvious candidate for leading sector. In sum, Schultz's analysis of the "key sector" corresponds in great part to Currie's discussion of the "lead sector". It has the additional advantage of making Currie's theory amenable to investigation.

Ganesan wrote this book in the mid-1970s during Mrs. Bandaranaike's administration. It was originally Ganesan's Ph.D. thesis from University College London where he studied under Duccio Turin and Otto Koenigsberger. This and his other publications deal with subject of Sri Lanka's construction industry and economic development.

Ganesan begins his piece by assuming the importance of the housing sector within the national economy:

the benefits of better housing, greater employment opportunities and increased productive work are all too obvious and we cannot therefore ignore any possibility of rapid

development of the housing sector." (pg. 6)

He does not try to defend his choice of the housing and construction sector as key for economic development vis-a-vis other potentially important sectors. Rather, he focuses his industry analysis on the construction sector alone. He evaluates the construction sector's potential for growth looking at the stimulants and constraints on the building process. He further looks at the benefits from the employment creation within potential scenarios for industry growth, and seeks to determine the optimum technology for Sri Lanka's building process.

To do the above, he constructs what he calls an input-output table for the construction process. (See table 15) However, the matrix is not an input-output table at all. For example, the table is not square which means the coefficients therein cannot be manipulated as one would those in a true input-output matrix. His table, which consists of twenty-two different kinds of construction output, was produced from "data obtained from special surveys of the building materials and construction industries in Sri Lanka during 1974-1975."(63)

Corresponding to this description of the construction process he develops an employment matrix. The limitations found in the initial table, are also in the "employment matrix". Finally, he uses linear programming techniques in the development of a model to optimize the allocation and use of domestic resources to best meet demands for growth of the sector.

In the next section, the implications of both Ganesan's and

Table 15

| Input | Construction Sub-sector | Housing Type 1 | Housing Type 2 | Housing Type 3 | Housing Type 4 | Housing Type 5 | Housing Type 6 | Housing Type 7 | Housing Type 8 | Housing Type 9 | Housing Type 10 | Modern buildings | Conventional buildings | Irrigation (major) | Irrigation (minor) | Roads | Way and Works (railway trackwork) | Bridges | Power | Harbour Work | Water supply and drainage |
|-------|------------------------------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|-----------------|------------------|------------------------|--------------------|--------------------|-------|-----------------------------------|---------|-------|--------------|---------------------------|
| | | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % | % |
| 17 | Electrical items | 0.74 | 0.89 | — | — | — | — | — | — | — | — | 5.62 | 2.89 | — | — | — | — | — | — | 0.59 | 0.26 |
| 18 | Cadjan ² | — | — | — | — | — | — | 3.74 | 3.29 | — | 22.66 | — | 4.40 | — | — | — | — | — | — | — | — |
| 19 | Other materials | 4.06 | 7.62 | 3.01 | 7.72 | 17.95 | — | 2.09 | 3.22 | 1.90 | — | 4.89 | 0.56 | 3.64 | 0.87 | 5.55 | — | 4.17 | 12.76 | 8.75 | 3.08 |
| 20 | Total materials | 67.96 | 65.57 | 64.39 | 70.65 | 70.49 | 66.20 | 60.70 | 61.19 | 67.09 | 77.55 | 52.05 | 61.06 | 21.31 | 14.40 | 26.06 | 59.95 | 39.97 | 35.15 | 51.68 | 31.60 |
| 21 | Transport | 0.18 | 0.11 | 0.03 | 0.18 | 0.03 | — | — | — | — | — | 0.22 | 0.15 | 1.14 | — | 1.36 | 3.02 | — | — | — | — |
| 22 | Total intermediate inputs | 68.14 | 65.68 | 64.42 | 70.83 | 70.52 | 66.20 | 60.70 | 61.19 | 67.09 | 77.55 | 52.27 | 61.21 | 22.45 | 14.49 | 27.42 | 62.97 | 39.97 | 35.15 | 51.68 | 31.60 |
| 23 | Plant and equipment | 0.27 | 0.21 | 0.25 | 0.25 | — | — | — | — | — | — | 6.13 | 2.38 | 23.86 | 7.58 | 7.16 | 7.09 | 9.41 | 18.18 | 7.06 | 1.04 |
| 24 | Labour | 25.58 | 28.62 | 29.98 | 23.20 | 26.48 | 30.80 | 36.31 | 35.81 | 29.91 | 19.45 | 23.18 | 24.70 | 35.70 | 65.73 | 41.79 | 17.44 | 23.55 | 17.57 | 22.37 | 35.97 |
| 25 | Consultancy, overheads and profits | 6.02 | 5.47 | 5.35 | 5.73 | 3.00 | 3.00 | 3.00 | 3.00 | 3.00 | 3.00 | 18.43 | 11.71 | 18.00 | 12.20 | 23.64 | 12.50 | 27.09 | 29.09 | 18.89 | 31.42 |
| 26 | Value added | 31.87 | 34.30 | 35.58 | 29.18 | 29.48 | 33.80 | 39.31 | 38.81 | 32.91 | 22.45 | 47.74 | 38.79 | 77.56 | 85.51 | 72.59 | 37.03 | 60.05 | 64.84 | 48.32 | 68.43 |
| 27 | Output Rs. million | 99.68 | 80.74 | 65.02 | 38.82 | 31.85 | 23.37 | 112.29 | 9.58 | 6.28 | 7.31 | 394.41 | 100.12 | 64.77 | 24.79 | 54.07 | 43.67 | 32.13 | 31.81 | 18.42 | 16.45 |

¹Hard soil consisting primarily of gravel and clay and firm enough to be cut into building blocks

²Roofing material spun from coconut leaves.

Note: Discrepancies due to rounding.

Source: Ganesan (1975), note (3), Chapter 2

Source: Ganesan



Table 15

Continued

TABLE 2.1. Input-output table for the construction industry, Sri Lanka, 1973

| Construction Sub-sector | | Input | | | | | | | | | | | | | | | | | | | | |
|-------------------------|---------------------------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|-----------------|------------------|------------------------|--------------------|--------------------|-------|-----------------------------------|---------|-------|--------------|---------------------------|-------|
| | | Housing Type 1 | Housing Type 2 | Housing Type 3 | Housing Type 4 | Housing Type 5 | Housing Type 6 | Housing Type 7 | Housing Type 8 | Housing Type 9 | Housing Type 10 | Modern buildings | Conventional buildings | Irrigation (major) | Irrigation (minor) | Roads | Way and Works (railway trackwork) | Bridges | Power | Harbour Work | Water supply and drainage | |
| 1 | Cement | % | 12.29 | 10.04 | 18.67 | 21.00 | 14.21 | 2.60 | 0.52 | 3.90 | 0.36 | — | 6.74 | 3.81 | 6.73 | 4.79 | 1.40 | 4.33 | 12.26 | 6.83 | 11.41 | 4.20 |
| 2 | Cement products | % | — | 0.20 | — | — | — | — | — | — | — | — | — | — | 1.14 | 2.73 | 3.76 | — | 9.84 | — | — | — |
| 3 | Steel products | % | 4.86 | 5.27 | 0.29 | 2.95 | — | — | — | — | — | — | 8.10 | 2.44 | 0.70 | 1.56 | 1.68 | 14.51 | 8.24 | 12.22 | 14.23 | 4.12 |
| 4 | Timber and timber products | % | 17.48 | 10.13 | 15.39 | 12.49 | 13.66 | 28.50 | 23.02 | 20.46 | 30.08 | 45.32 | 6.44 | 19.99 | 0.95 | 1.65 | 2.68 | 7.19 | 0.35 | 0.31 | — | 0.81 |
| 5 | Bricks, cabook ¹ | % | 10.08 | 8.20 | — | 0.04 | 7.79 | — | — | — | — | — | 2.50 | 3.39 | 0.15 | 0.29 | — | — | — | — | — | 0.28 |
| 6 | Tiles | % | 6.26 | — | 7.91 | — | — | 11.80 | — | — | 12.44 | — | 0.59 | 2.34 | — | — | — | — | — | — | — | 0.01 |
| 7 | Aggregate, rubble, etc. | % | 1.90 | 1.72 | 5.83 | 3.96 | 2.27 | — | — | — | — | — | 2.35 | 1.03 | 7.40 | 2.23 | 6.92 | 3.69 | 4.45 | 2.42 | 5.17 | 1.21 |
| 8 | Sand | % | 1.79 | 1.29 | 3.19 | 2.61 | 4.16 | 2.00 | 2.80 | 3.00 | 1.76 | — | 1.66 | 1.71 | 0.10 | 0.37 | 0.12 | 0.53 | 0.66 | 0.61 | 0.71 | 0.77 |
| 9 | Earth, clay, etc. | % | 0.19 | 0.10 | 0.48 | 0.41 | 1.03 | 11.20 | 18.66 | 16.60 | 11.78 | 9.57 | 0.21 | 6.62 | — | — | — | 10.15 | — | — | 9.90 | 0.20 |
| 10 | Lime | % | 1.47 | 1.52 | 1.22 | 1.02 | 2.27 | 4.30 | 3.45 | 6.38 | 4.53 | — | 0.91 | 2.30 | — | — | — | — | — | — | — | 0.02 |
| 11 | Asbestos and cement products | % | 0.15 | 10.98 | — | 11.64 | — | — | — | — | — | — | 4.54 | 2.94 | — | — | — | — | — | — | — | 0.30 |
| 12 | Special iron and steel fixtures | % | 0.34 | 0.20 | — | — | — | — | — | — | — | — | 1.21 | 0.02 | 0.5 | — | — | 19.55 | — | — | 0.91 | 16.16 |
| 13 | Paints, varnish etc. | % | 1.12 | 0.59 | 0.87 | 0.81 | 0.16 | 0.20 | 0.42 | 0.34 | 0.24 | — | 0.67 | 0.46 | — | — | 4.0 | — | — | — | — | 0.02 |
| 14 | Hardware | % | 4.59 | 5.38 | 7.53 | 6.00 | 6.79 | 5.60 | 6.00 | 4.00 | 4.00 | — | 1.53 | 3.39 | — | — | — | — | — | — | — | 0.08 |
| 15 | Sanitary ware | % | 0.40 | 0.78 | — | — | — | — | — | — | — | — | 1.71 | 1.19 | — | — | — | — | — | — | — | 0.04 |
| 16 | Sanitary and drainage pipes | % | 0.24 | 0.66 | — | — | — | — | — | — | — | — | 2.38 | 1.58 | — | — | — | — | — | — | — | 0.0 |

Source :Ganesan



Schultz's work will be looked at in specific reference to:

- a) making a useful description and evaluation of the sector and
- b) for operation - measuring the sector's potential for leading sector according to Currie's preconditions.

Footnotes: Tools for evaluation of Currie's preconditions

(57) in Polenske and Skolka, 1976.

(58) Progress in Planning, Vol. 12, 1979.

(59) Tsai, 1974.

(60) taken from Miernyk, 1957, pg. 9.

(61) These are calculated by (1) adjusting gross output by subtracting inventory depletion, and (2) dividing all entries in each industry's column by the adjusted gross output for that industry. demand.

(62) Miernyk, 1957, p.21. Technical coefficients are for the processing sector only.

(63) See Ganesan 1979, page 11 and his appendix 2 for a brief note regarding the survey.

Sri Lanka and Currie's Preconditions for "lead" sector

1. Large sector with high internal multiplier

Countries with high per capita income tend to have a high division of labor and, most importantly, sectoral interdependence. The reverse is also true: countries with low per capita income tend to have a low division of labor and low sectoral interdependence. Thus, expressed by a network of intermediate deliveries in the input-output framework, the degree of the division of labor tells something about a country's level of development.

Within this network of production relations, a sector that is particularly well-linked to others is considered to be "strategic for achieving higher income levels".(64) Schultz proposes the measurement of a sector's degree of interdependence with the greater economy through the quantification of backward and forward linkages. (65) "Linkage ratios" are easy to calculate from the technical coefficient of an input-output table - using the ratio of intermediate ($X_{.j}$) to total transactions (X_j), for example - but only measure the direct effects. Total effects - direct and indirect - of a change in the final demand on sectoral production level - then can easily be obtained through the use of the inverted Leontief matrix.(66) The sectors can finally be ranked according to their "linkage ratios".

In addition to the technical coefficients, Schultz is concerned with the size of a sector's transactions. Thus, he has attached several different kinds of weights - relating to the measurement of size - to the linkage ratios. For example,

- "(1) the sum of intermediate input or output per sector (Ub, Wb), and
 (2) the share of the sectoral gross output in the output of the entire economy (Uc, Wc)"
 (page 140)

By weighting each sector according to its size, Schultz is able to integrate sector size with the requirement for a high internal multiplier.

Because an inverse matrix for Sri Lanka is not available, only the simple estimation of direct backward linkages will be calculated here in order to demonstrate Schultz's techniques to identify "key" sectors.

Pyatt and Round's social accounting matrix (SAM), based on the 1970 input-output table estimated by Mr. Narapalasingham and the national accounts compiled by an earlier UNDP planning project, is utilized here in the calculation of the linkage ratio.(67) The table is highly aggregated - the forty-eight production activities in their original study having been aggregated to ten. As a result, the following calculation should be taken merely as indicative of relative position of sectors and not as precise figures.(68)

The calculation of the U_a ratio is straightforward. In Table 16, the processing sector has been taken from the Pyatt and Round's SAM with the Totals columns for the intermediate transactions added. The calculation for the weighted backward linkage ratio is below each industry column:

$$U_a = X.j/X_j \quad \text{where, } X.j = \text{total intermediate inputs to sector } j$$

$$X_j = \text{total inputs delivered to sector } j$$

From this calculation, the "key" sectors are ranked: First,

Table 16

| | Tea | Rubber | Coconut | Rice | Othr Ag | F & D | Oth Ind | CONST'N | Trd&Tran | Priv Ser | TOTAL | |
|--------------------------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|--------------------|------------------|
| Tea | | | | | | | | | | 2 | 0 | |
| Rubber | | | | | | | 8 | | | | 2 | |
| Coconuts | | | | | | 239 | 8 | | | | 8 | |
| Rice | | | | 1082 | | | 2 | | | 6 | 253 | |
| Othr Ag | 11 | 1 | | 2 | 95 | 63 | 34 | 3 | | 39 | 1099 | |
| F & D | | | | 9 | 11 | 24 | 188 | | | 29 | 248 | |
| Othr Ind | 97 | 24 | 9 | 35 | 69 | 49 | 554 | 417 | 172 | 37 | 261 | |
| CONST'N | | | | | | | 1 | | 7 | 50 | 1463 | |
| Trd&Tran | 50 | 10 | 8 | 44 | 23 | 95 | 249 | 206 | 96 | 42 | 58 | |
| Priv Serv | 11 | 3 | 7 | 15 | 1 | | 4 | 9 | 38 | 55 | 823 | |
| TOTAL (X.j) | 169 | 38 | 24 | 1187 | 199 | 470 | 1048 | 635 | 313 | 275 | 143 | |
| TOTAL (Xj) (from SAM) | 864 | 374 | 577 | 2242 | 1846 | 1276 | 2790 | 1745 | 2845 | 1877 | 4358 | |
| Uc=X.j/X | .0034218 | .0007694 | .0004859 | .0240337 | .0040292 | .0095163 | .0212193 | .0128571 | .0063374 | .0055680 | average = .0088238 | U*=X./X .0882436 |
| Ua=X.j/Xj | .1956019 | .1016043 | .0415945 | .5294380 | .1078007 | .3683386 | .3756272 | .3638968 | .1100176 | .1465104 | average = .2340430 | |
| Ub=(Ua)(X.j) | 33.05671 | 3.860963 | .9982669 | 628.4429 | 21.45233 | 173.1191 | 393.6573 | 231.0745 | 34.43550 | 40.29036 | average = 156.0388 | |

where, Xj = total input of sector j
X.j = total of all intermediated inputs
X = Total output

Rice (.529); second, Other industry (.375); third, Food & Drink (.368) and fourth, Construction (.364). Note that the linkage ratios for Food & Drink and the Construction sector are very close; thus, it may be more accurate to say that they share third place.(69)

The forward linkage ratio (W_a) is not calculated here because it heavily penalizes those sectors - like construction - that produce largely for final demand. This is especially the case for construction that, within the accounting conventions, makes no intermediate deliveries but produces exclusively for final demand. Therefore, in order to capture the forward linkages for the construction industry, dynamic I-0 analysis would have to be utilized. Although empirically more difficult to quantify for the construction industry, these forward linkages are nonetheless purported to exert an important push for other sectors.(70) Related to forward linkages is the concept of "derived demand" - for example, furniture production stimulated by the increase in residential construction's final demand. These impacts will be captured through the use of Leontief's inverted matrix.

Ganesan describes the relationship between the construction industry and its inputs by constructing a table of technical coefficients for the construction process. (71) With these coefficients, he estimates the sector's requirements for products of other sectors. His level of disaggregation for Sri Lanka's "construction process" is informative; he includes materials, transport, plant and equipment, labor, and

consultancy, overheads and profits for ten types of housing and ten types of other construction. However, these represent only direct inputs to the construction sector primarily; his table also captures some of the sector's indirect demand (72) but does not capture the induced demand stimulated throughout the rest of the economy.

If he had also utilized an economy-wide input-output model all the sector's inputs and its relation to the other sectors would have also come to light. (73) The processing sector of Pyatt and Round's SAM shows that direct inputs from Other Agriculture, for example, is overlooked by Ganesan's methodology. A more disaggregated and up-to-date table would illustrate the linkages between the major export crops - tea and rubber - and the construction industry. A look at the sector within an economy-wide framework allows a better picture of how and what the "leading sector" is leading.(74) Because the processing sector in Pyatt and Round's SAM is highly aggregated it is difficult to estimate how much of it is captured in Ganesan's work. However, it appears as though the SAM's "Other Industry" and "Trade and Transport" would be captured by Ganean's categories of materials, Plant and Equipment - and Trade and Transport.

The indirect effects resulting from the increased demand for the construction industry's products are most important for the high-internal multiplier precondition. Clearly, these will extend beyond the direct purchases. Because he does not use a consistent matrix nor the economy-wide matrix, Ganesan provides

no way to estimate these indirect impacts - what Schultz's calls the "power-of-dispersion" using forward and backward linkages. Finally, Ganesan is unable to establish the precise nature of the linkages. By lumping both cement and cement products in his matrix, for example, Ganesan ignores the production relationships themselves.

The advantages of an evaluation method that captures the relative strength of the construction sector vis-a-vis others, all of its impacts economy-wide, and the nature of those relationships are clearly evident here. With one simple calculation of the backward linkages from a highly aggregated table we see Sri Lanka's construction sector does not rank first but third out of ten. Although this kind of analysis is a serious omission (75) in Ganesan's piece, he does, nonetheless, contribute valuable description of the construction sector for the period of the early- and mid-1970s. It is unfortunate that he does not construct an internally consistent input-output table at his level of disaggregation that would allow for systematic investigation of the sector's relationship with the rest of the economy.

Footnotes: Large sector with high internal multiplier

(64) Schultz, p. 139.

(65) U_a, W_a = backward and forward linkages of the Hirschman variety.

(66) $[I - A]^{-1}$

(67) See Pyatt and Round, pg. 342.

(68) In addition, the conventions followed for Pyatt and Round's aggregation of the SAM is not documented in an available form. Thus, the reason the construction sector makes deliveries - albeit small - to Other Industry, Trade & Transport, and Private Services Industries - is unclear, for example.

(69) The other two weighted ratios - U_b and U_c - actually rank construction higher than Food & Drink. One must also remember that this calculation does not include the indirect effects.

(70) See Hagopian and Moavenzadeh, 1983, pp. 80-82, for the citations of studies attempting to measure the forward linkages.

(71) See pp.13-19 of Ganesan, 1979, for elaboration.

(72) It is not clear how much of the indirect demand he is able to capture in his table.

(73) Mr. Narapalasingham's table was available

(74) Schultz also offers another variation of input-output techniques to measure a particular sector's interdependence in the overall economy. The "hypothetical extraction" method removes sectors, one-by-one, from the input-output system in order to evaluate their impact. Using the inverted Leontief matrix, intermediate supplies to and deliveries from the sector would be affected in addition to the "hypothetical" shutdown of the particular sector's production. If the effect on the production of other sectors is greater than the effect on the sector itself, then that sector is designated as "stimulating"; if the reverse is true, the sector is described as "dependent". This situation can also be expressed as a ratio of the "net effects on other sectors and the intermediate deliveries of the isolated sector to others". Those sectors with the largest ratio are obviously the "key" sectors according to this criteria.

look at page 147: "this method tends to result in extremely high values for those sectors that produce heavily for final demand"; therefore, one would need additional information about final demand's share of output.

Footnotes: Continued

(75) By never fully charting the sector's inter-linkages with the rest of the economy relative to other sectors' linkages it is inappropriate to conclude as he does that "This study has shown that there can be no better claim on these funds from the point of view of maximizing urban employment creation and also minimizing the consumption of scarce resources in this effort" (1979, page 74).

2. Growth can be stimulated exogenously

In Currie's strategy, the leading sector's growth rate must be able to be stimulated exogenously and to occur independently of the existing overall growth rate of the economy. The potential exogenous stimulation/investment may come from three main sources, each of which will have a different effect on the level of prices.(76) The first source - preferred by Currie - comes from the reorganization of financial mechanisms such as Savings and Loans institutions. The second comes from direct government budget reallocations to the leading sector; the third source of investment is from foreign aid and loans - either directly targetted at the lead sector or channelled into a project which, itself, will make substantial requirements on the lead sector.

The first case - new investment stimulated through institutional reorganization - may actually represent a number of circumstances.

- (i) New savings is being created - that is, the savings-consumption ratio changes so that people are investing out of their previous consumption; or
- (ii) savings may simply be a transfer of resources from other investment into construction while leaving the consumption-savings ratio in tact; or
- (iii) increased savings may be a result of greater disposable income in which case the consumption-savings ratio may or may not have changed.

Obviously, Currie prefers would prefer either type i or iii. The drawing away of private investment from other sectors defeats the purpose of the leading sector which is to increase production throughout the economy. In theory, however, this effect should be offset when the leading sector takes off and its direct and indirect demand pull is felt.

As mentioned in the previous section, the adjustment of the interest rate for deposits did attract some private sector savings. However, the trend over the six years period between 1977 and 1982 does not show any noticeable overall growth trend for domestic private savings. In the housing sector, in particular, an organized housing finance system hardly exists and certainly is not large enough to unleash the kind of latent demand Currie was talking about.

Table 17

| <u>Investment and Savings Balance</u> | | | | | | |
|---|-------------|-------------|-------------|-------------|-------------|-------------|
| (Percent of GDP at current market prices) | | | | | | |
| | <u>1977</u> | <u>1978</u> | <u>1979</u> | <u>1980</u> | <u>1981</u> | <u>1982</u> |
| 1. <u>Total Investment (a)</u> | <u>14.4</u> | <u>20.1</u> | <u>25.8</u> | <u>33.8</u> | <u>27.8</u> | <u>30.4</u> |
| (= total savings) | | | | | | |
| 2. <u>Gross national savings</u> | <u>14.1</u> | <u>15.6</u> | <u>13.5</u> | <u>13.8</u> | <u>14.3</u> | <u>15.3</u> |
| of which: <u>public</u> | -0.3 | -1.4 | 0.2 | -3.8 | -2.0 | -1.7 |
| <u>private</u> | 14.4 | 17.0 | 13.3 | 17.6 | 16.3 | 17.0 |
| 3. <u>Foreign Savings</u> | <u>0.4</u> | <u>4.5</u> | <u>12.3</u> | <u>20.0</u> | <u>13.5</u> | <u>15.1</u> |
| of which: | | | | | | |
| net concessional aid | - | 9.6 | 8.9 | 7.8 | 8.9 | 8.8 |
| use of reserves | - | -3.4 | -1.4 | 5.5 | 0.7 | - |
| net commercial borrowing | - | -1.4 | 0.2 | 5.7 | 4.9 | - |
| SDRs and direct foreign investment | - | -0.3 | 4.6 | 1.0 | 1.1 | - |

Note: (a) Includes changes in stocks.

Source: Central Bank of Ceylon and Ministry of Finance and Planning data.

Source: Stern

Currie favored the institutional reorganization option because it would allow actualization of demand without large infusions of capital or foreign exchange.(77) This, however, was not the experience in Sri Lanka; instead, heavy government expenditures in the two lead projects were the stimulous for the construction sector. High requirements for foreign exchange also resulted.

Exogenous investment derived from a reallocation of resources through the budget mechanism will require - at least in the short-run - decreases in investment for other sectors proportional to the construction investment increase.(78) Thus, relative prices of the lead sector's products - and those of the sectors linked to the lead through derived demand - will change throughout the economy. Prices will also change when investment is externally financed; in the latter case, however, there need be no decrease in demand for other sectors of the economy. The result for overall price impact will be some weighted average of all changes in demand for final goods and for their intermediate goods.(79)

By allocating 40-50% of its budget to the two leading projects, the government of Sri Lanka did indeed force decreases in other sectors. Relative prices changed dramatically as witnessed by the "skyrocketing" prices for construction materials. The price effect and its impact throughout the economy was especially severe because the government itself resorted to borrowing in order to finance the lead projects. Thus, the "crowding out" phenomenon compounded the limited growth opportunities for the private sector.

Coupled with budget reallocations, foreign savings also grew to fill the gap needed to finance the leading projects. The percent of foreign savings/investment to total savings/ investment jumped dramatically in 1978 (from 2.8% to 22.4%) and finally seemed to level out around 50%. There is no question that the foreign investment is what made the project possible at all. However, any positive relief it gave in terms of not decreasing demand for other sectors was cancelled out by the large amount the government, itself, borrowed.

Footnotes: Growth can be stimulated exogenously

(76) The theoretical discussion of the following section is drawn primarily from Burns and Grebler, 1977, pp. 197-203.

(77) 1974, p. 33

(78) In the short-run budget expenditures are fixed.

(79) Depending on the type of construction produced, the increase in demand will also be expected to change trade flows. Luxury homes are more likely than low-cost houses to generate additional imports of materials, components, and equipment.

3. Low-import component

The leading sector must have a low-import component in order to maximize the growth stimulated by the sector's high multiplier, and in order to avoid aggravating the already serious foreign exchange constraints facing many developing countries.

To the extent that the construction sector utilizes domestic building materials, equipment, and labor, the growth impulses originating in that sector will be passed on throughout the domestic economy. As imports represent leakages of the lead sector's demand pull effects on the economy, the minimization of their use will increase the impact of the growth impulses within the local economy. The country may follow an import substitution policy - either to encourage the production of just the most critical construction inputs or to substitute scarce inputs altogether with indigenous resources and products. Whether the construction sector meets its requirements from the domestic or foreign input markets will have a critical impact on the development of the construction industry as well as of the overall economy.

The construction sector in most developing countries is generally considered to be a low-importer. Materials, components and most equipment for construction is relatively easily developed domestically. However, as building technology around the world has become more sophisticated, complex, and high standard, the decisions facing developing countries have become more difficult. The problem is one of matching types of construction demanded with the supply capabilities of the local

industry. A disaggregation of the construction sector into its parts would take into account the levels of technology, the resource inputs, the spatial distribution of the activities, and the timing implications of the products. One such disaggregation would look like the following:

- (1) Civil Engineering works:
 - infrastructure - dams and irrigation systems, power stations, etc.
 - infrastructure - roads, harbors, bridges, etc.
 - urban infrastructure - water, sanitation, electricity.
- (2) Building:
 - Commercial - high technology
 - Industrial - high technology
 - Other non-residential - medium- and high-technology
 - Residential - medium- and low-technology

Certainly at different stages of development, countries will have different needs for construction types. And often these requirements do not match the country's construction capabilities at the time. For example, it is often a "lesser" developed country that will invest in Civil Engineering construction requiring sophisticated capital equipment, highly skilled engineers and middle management as well as varied assortment of skilled laborers. It is here that design decisions and choices of technology play important roles in matching demand requirements and supply capabilities with the ultimate impact on the import component (80).

Among the many options available, developing countries may choose between bringing in foreign contractors and employing more labor-intensive production techniques which tend to be of lower economic efficiency. The latter production method, however, may be of greater value to the development process than importing foreign expertise and equipment - especially if

labor and foreign exchange were shadow-priced.(81)

Sri Lanka's lead projects also had many technology-type decisions to make. The Mahaweli project, for example, was to be a collection of facilities - dams and irrigation schemes - capable of doubling the available land for cultivation. With promises of World Bank funds, a sophisticated complex was chosen to meet their water and electricity objectives. The result of the financing arrangement and the design decisions was that direct and indirect foreign exchange requirements made up approximately 80% of the project. Domestic construction firms could not meet the requirements made by these large projects - they could not mobilize resources nor could they provide the equipment and technical expertise that was required for such a scheme. It has been argued that by rehabilitating and extending the small-scale irrigation works already in place, the huge amount of resources invested and the heavy import-requirements would have been avoided.(82) But this design decision is presently a mute point; it is commonly believed that the World Bank would not have extended aid in the first place had the latter scheme been put forward.(83)

For the Housing Program, thirty percent of the government's total capital expenditure was spent on the foreign exchange (direct and indirect).(84) This was primarily due to materials and equipment requirements for specialized water, sewerage, and building works.(85) However, the situation may be changing as more recently the housing program is moving away from expensive direct construction toward sites and services

and upgrading schemes that utilize local materials and resources.

In addition to direct construction inputs, many requirements for imports also come from the manufacturers of domestic building materials. During the late 1950s and 1960s import substitution was a key national goal and as a result the range of locally produced materials is fairly extensive. Unfortunately, these efforts themselves were biased toward industries with high components of imported raw materials and techniques. This is another reason why in 1977, the increase in the demand for local materials also resulted in the sharp increase for imports.

During 1976-1979, the major imports were iron and steel products, cement, timber and asbestos sheets, and so on. (For further illustration see tables 18 and 19.) In 1979, cement is being imported in such quantities almost for the first time. The import component of these materials were substantial: for steel, imports represented 70% of the cost of production; for cement, over 35%; for asbestos-cement products, over 50%. The same is true for paint and varnish, structural metal products, electrical materials, and so on. In 1973, the percentage of the value of all local materials (ex-factory) that are in foreign exchange was 25-30%; for 1982, Ganesan (86) (86)1982, p.23. estimates the percentage was around 35-40%.

Schultz measures the effect on trade balances by looking at the difference between the (direct) export ratio in the sector and the total (direct and indirect) import effects caused by

Table 18 Import of construction plant and machinery (1976-79)

| Sri Lanka customs heading no. | Description | Quantity (nos.) | 1976 value (Rs. m. c.i.f.) | Quantity (nos.) | 1977 value (ks. m. c.i.f.) | Quantity (nos.) | 1978 value (Rs. m. c.i.f.) | Quantity (nos.) | 1979 Value (Rs. m. c.i.f.) |
|-------------------------------------|--|--------------------|-------------------------------------|--------------------|-------------------------------------|--------------------|-------------------------------------|--------------------|-------------------------------------|
| 84.09 | Mechanically propelled road rollers | n.a. | 0.5 | n.a. | 0.1 | n.a. | 0.4 | n.a. | 3.4 |
| 84.11A | Air compressors (and pumps) | n.a. | 5.8 ¹ | n.a. | 9.9 ¹ | n.a. | 60.0 | n.a. | 83.2 |
| 84.22A | Pulley tackle and hoists, winches, etc. | - | - | - | - | 651 | 5.6 | 1 272 | 9.7 |
| 84.22B | Cranes, mobile lifting frames, etc. | n.a. | 8.1 ² | n.a. | 14.8 ² | 55 | 18.3 | 262 | 22.7 |
| 84.22D | Lifts and skip hoists | - | - | - | - | 5 546 ⁴ | 6.7 | 7 183 ⁴ | 15.5 |
| 84.23 | Excavating and levelling machinery and attach- ments | n.a. | 23.3 ³ | n.a. | 47.9 ³ | 1 315 | 37.2 | 1 074 | 160.4 |
| 87.01A | Track-laying tractors ³ | 51 | 4.0 | 61 | 2.4 | 5 | 1.2 | 7 | 0.6 |
| 87.01B | Road tractors with trailers | 74 | 0.3 | n.a. | n.a. | 51 | 5.3 | 91 | 10.3 |
| | Total | | <u>42.0</u> | | | | <u>134.7</u> | | <u>305.8</u> |

¹ For 1976 and 1977, includes all items listed under heading 84.11 such as generators, fans, etc.

² Also includes number of other items under heading no. 84.22 such as conveyors, elevators, etc., also parts.

³ Includes parts.

⁴ Possibly includes parts although there is a separate section for parts under heading 84.22.

Notes: 1. It is not clear whether attachments or spare parts are included in the various figures or not.

2. Imports under heading no. 84.23B - bulldozers, angledozers, levellers (self-propelled) are for 1978-82 nos., Rs.24.8 million; for 1979-87 nos., Rs.87.9 million. This may reflect on price increases during 1978-79.

Source: External Trade Statistics, Sri Lanka (1976-79), Sri Lanka Customs.

Table 19: Import of Building Materials (1976, 1978, and 1979)

| Sri Lanka customs heading no. | Description | Quantity (MT) | 1976 value (Rs. million) | Quantity (MT) | 1978 value (Rs. million) | Quantity (MT) | 1979 value (Rs. million) |
|-------------------------------------|--|------------------|-----------------------------|------------------|-----------------------------|------------------|-----------------------------|
| 73.21 | Iron and steel products (structural) | 3 533 | 13.03 | 2 791 | 36.0 | 5 470 | 112.6 |
| 73.10B | Steel bars and rods | 1 636 | 5.0 | 1 100 | 9.4 | 7 851 | 47.8 |
| 73.11 | Angles, shapes and sections of iron and steel | 1 150 | 3.9 | 3 750 | 8.4 | 4 900 | 30.0 |
| 25.23C | Portland cement, etc. ¹ | 400 | 0.51 | 7 195 | 3.8 | 30 552 | 43.8 |
| 25.23A | Waterproof cement, etc. | 7 412 | 0.02 | 32 | 0.3 | 12 880 | 17.9 |
| 44.05B | Timber (wood sawn) | 0 | 0 | 2 153 | 3.1 | 12 926 | 35.0 |
| 68.12C (C1, C2) | A/C sheets, etc. | n.a. | n.a. | 1 000 | 0.4 | 7 300 | 39.5 |
| 70.04 and 70.07 | Glass (rectangular sheets) | 2 300 | 3.0 | 3 400 | 17.3 | 2 000 | 9.4 |
| 69.05 | Roofing tiles (ceramic) | 3 | 0.08 | - | 0.01 | 4 441 | 7.1 |
| 68.12B | A/C pipes (8", 10" and 12") | 287 | 0.005 | - | 0.003 | 843 | 6.4 |
| 69.10 | Sanitary fixtures (ceramic) | 7 | 0.08 | - | 0.3 | 8 043 | 4.1 |
| | Total (including other materials not listed above) | | | | 150 | | 368 |

¹ Mostly Portland cement for construction.

Notes: 1. All prices are c.i.f.

2. Other major items of building materials imported are 1979 import - c.i.f. values in brackets. Refractory constructional goods (Rs.7 million), structural aluminium components (Rs.5.7 million), steel pipes and other sections (Rs.4.7 million).

3. Imports of asbestos (fibre) amounted to Rs.46.4 million (c.i.f.) in 1979.

Source: External Trade Statistics, Sri Lanka (1976, 1978 and 1979), Sri Lanka Customs.

Source: Ganesan

Table 20 Use of imported raw materials by the public sector corporations

| Corporations | Percentage of imported materials to total raw materials by value | | | |
|-----------------|--|-------|-------|-------|
| | 1976 | 1977 | 1978 | 1979 |
| Ceylon Plywoods | 61.3 | 60.9 | 55.1 | 79.8 |
| State Timber | n.a. | n.a. | 70.0 | n.a. |
| Ceylon Ceramics | 16.3 | 23.3 | n.a. | 17.8 |
| Ceylon Cement | 21.9 | n.a. | 52.8 | n.a. |
| Ceylon Steel | 100.0 | 100.0 | 100.0 | 100.0 |
| Ceylon Hardware | 83.6 | n.a. | 100.0 | 100.0 |

Source: Respective corporations and Central Bank, Sri Lanka.

Source: Ganesan

the increased production in the sector. He demonstrates that by balancing import and exports by sector one can determine whether the sector is depleting or adding to the foreign exchange reserves. The performance of each sector can be compared with the others.

Schultz's results across the ten developing Asian countries found that the primary sectors averaged the highest. According to Schultz,

more than anything else, this is attributable to exports of mining products such as ores and crude oil and agricultural products.' (p. 150)

This may also be true for the primary sectors in Sri Lanka. Although there is no ore nor crude oil mining, Sri Lanka's agricultural sector represents the largest contributor to foreign exchange (at least in gross terms). (See Table 21.) The construction sector, on the other hand, does not export at all as by definition, its product is nontradable. Its ranking vis-a-vis other sectors on the scale of net foreign exchange earnings would be solely dependent on how large its drain of foreign earnings would be. Therefore, if an import-export ranking of this sort were done, it is quite likely that Sri Lanka's construction sector would not rank particularly high over all.

In Ganesan's original piece on Sri Lanka's construction sector he used a linear programming model through which he considers what kinds of construction are good for the country's development. His model maximizes employment and output under three development strategies. As he is not looking for the optimal distribution of inputs, he appropriately treats foreign

Table 21

Main Commodities Traded

(Rs mn)

| <u>Exports</u> | <u>1981</u> | <u>1982</u> | <u>Imports</u> | <u>1981</u> | <u>1982</u> |
|--------------------|-------------|-------------|---------------------------------|---------------------|---------------------|
| Industrial exports | 7,456 | 8,445 | Rice | 859 | 488 |
| Tea | 6,444 | 6,342 | Flour & wheat | 1,895 | 1,377 |
| Rubber | 2,889 | 2,322 | Sugar | 2,662 | 887 |
| Coconut | 1,436 | 1,496 | Other food & drinks | 541 | 853 |
| Minor crops | 1,399 | 1,645 | Cotton yarn & textiles | 3,159 | 3,311 |
| Gems | 632 | 684 | Fertilisers | 1,191 | 560 |
| Other exports | 787 | 520 | Pharmaceutical products | 171 | 334 |
| Total exports | 21,043 | 21,454 | Petroleum products ^a | 9,459 | 11,494 |
| | | | Transport equipment | 2,684 | 2,977 |
| | | | Machinery & equipment | 5,106 | 5,605 |
| | | | Total imports, incl others | 35,530 ^b | 36,876 ^b |

a Including crude oil. b Differs from annual totals due to adjustments by the customs.

Sources: Review of the Economy, Central Bank of Ceylon; Customs returns.

Source: QEROSL

exchange as a one of the constraints in the linear programming model. Although consistent with his model and the country situation during the period of heavy import controls, the model does not address the new situation in which import controls for construction equipment and materials are virtually non-existent. Moreover, the import component of the construction sectors is not calculated relative to other sectors nor are the indirect import requirements.

Ganesan's paper, however, deals very well with some of the issues of "appropriate technology" as they relate to the optimization of employment generation and output. Labor absorption into the construction process according to Ganesan comes from a mix of both increased reliance on labor-intensive building and upgraded, more productive capital-intensive methods. Similar to Currie's argument, Ganesan also argues for the expansion of the sector to increase employment opportunities. And interestingly, his linear programming model using foreign exchange as the primary constraint concludes that increased output and increased employment are not contradictory. According to Ganesan, then, the link between greater employment generation and lower import requirements is very evident in Sri Lanka.

One additional thing to keep in mind is the issue of short-run versus long-run implications. Clearly, the years immediately after the initiation of liberalization and the lead projects indicate that the construction sector had a very high import-component. However, this situation is more a result of

the chosen projects and the intensive push in a short-period of time. The manner in which government policies - in project choice, design, and timing - are implemented can make a great difference in the import requirements of the sector. Implementation with a explicit concern for foreign exchange requirements could have resulted in a different experience during 1977-1984 and in the long-run the impacts could be substantial as well.

If one is serious about reducing the dependence on imports, one must begin by determining which of them are appropriate for import substitution. Through input-output analysis, one can ascertain with which items import substitution may actually increase the overall demand for imports. For example, if a particular piece of equipment will now be manufactured domestically, one can look at its requirements for foreign inputs; they may add up to more than the piece of equipment itself.

Footnotes: Low import component

(80) This question has been addressed by Drewer, 1975, for example, as well as the "appropriate technology" literature.

(81) ibid.

(82) Joseph Stern, April 12, 1984.

(83) The sophisticated option was also attractive to the government because they were anxious to encourage a very large increase in employment through both construction and newly settled farmers. And, the political considerations were very important- the government was asking the people to forego much immediate welfare (the decrease in food subsidies, liberalization policies directing consumption toward investment and resources invested in projects) so they wanted to have something to promise the people in the ways of jobs and greater benefits.

(84) Stern, April 12, 1984, lecture.

(85) Look at Vedagiri's observations in 1978 about expensive window and door frames for the "low-cost" houses.

4. Large Unskilled Labor Component

Currie's leading sector should have a large unskilled labor component for essentially two reasons. First, because unskilled labor is more readily available, the leading sector will have a larger employment impact per unit invested. Second, the sector's overall productivity can be improved greatly simply by upgrading the labor force.

Although the unskilled labor component is to be large, Currie in no way intends to say that the sector should be emphasizing labor-intensive techniques at a low pay scale.(87) Rather, the increase in employment Currie envisions is the result of

"increased rate of growth, output and number of better paying jobs, or seek increased employment in greater output."

Journal of Economic Studies, 1974 p. 9

If, despite these increases in growth and output an increase in employment is not accompanying, then one must look to remove structural or insitutional impediments to the mobilization of the workforce before advocating less-efficient production methods.

In addition, for a country in the process of industrialization, this labor absorption capability is crucial as labor shifts and will continue to shift from agricultural production to industrial activities. For rural migrants, the urban construction sector is an employment of easy entrance and provides both the cultural and economic skills necessary for full assimilation into city and industrial life. Moreover, the high

component of unskilled labor the construction industry provides employment primarily to the lower-income groups. In the interest of income distribution, it is argued that more jobs of this nature may well provide relative gains for low-income people.

In a study done by CMT (1980), wages in the construction sector - for 9 out of 10 countries sampled - were shown to be higher than the national mean.(88) This is indicative of the seasonal nature of the work (which often is counter based on seasonal peaks of the agricultural sector) rather than of annual wages relative to other sectors. The same study also noted that the construction wage levels are not increasing commensurate with those of other sectors. Nowhere, however, are construction wage levels below agricultural wages. Furthermore, CMT argues that as witnessed by the more developed countries, as the construction sector itself becomes more sophisticated in the process of development, it will require a more upgraded labor force and, presumably, higher wages will result.(89)

In Sri Lanka, the two lead projects have had major employment effects. In 1975, the (official) unemployment rate was 24% (of the labor force); that figure was reduce by half to 13% by 1981/82. Table 22 shows both direct and indirect employment generated by the Mahaweli and the Housing Programs (both for a high and a low alternative). These figures indicate the construction sector's good record in employment generation during this period.

Table 22

Direct Plus Indirect Employment
Generated by the Housing and Mahaweli Programme
('000)

| | <u>1978</u> | <u>1979</u> | <u>1980</u> | <u>1981</u> | <u>1982</u> | <u>1983</u> | <u>1984</u> |
|-------------------------------------|---------------|---------------|---------------|---------------|---------------|---------------|--------------|
| A. <u>Low Alternative</u> | | | | | | | |
| 1. Project employment ^{a/} | 9.55 | 14.55 | 24.07 | 31.65 | 39.13 | 31.53 | 14.69 |
| 2. Other employment | <u>98.98</u> | <u>149.50</u> | <u>178.86</u> | <u>281.71</u> | <u>358.37</u> | <u>212.06</u> | <u>29.77</u> |
| 3. Total | <u>108.53</u> | <u>164.05</u> | <u>202.93</u> | <u>313.36</u> | <u>397.50</u> | <u>243.59</u> | <u>44.46</u> |
| 4. Increase in employment | - | 55.52 | 38.88 | 110.53 | 84.24 | -154.01 | -199.13 |
| B. <u>High Alternative</u> | | | | | | | |
| 1. Project employment ^{a/} | 9.55 | 14.55 | 24.07 | 31.65 | 39.13 | 31.53 | 14.69 |
| 2. Other employment | <u>193.33</u> | <u>292.57</u> | <u>353.79</u> | <u>623.38</u> | <u>803.26</u> | <u>480.23</u> | <u>83.69</u> |
| 3. Total | <u>202.88</u> | <u>307.12</u> | <u>377.86</u> | <u>655.03</u> | <u>842.39</u> | <u>511.76</u> | <u>98.38</u> |
| 4. Increase in employment | - | 104.24 | 70.74 | 277.17 | 187.36 | -330.63 | -413.38 |

Note: ^{a/} Assuming 225 person-days of work as equal to one person-year of employment.

Source: Joseph J. Stern, "The Macro-Economic Effects of the 'Lead Projects'," op. cit.

Table 23 indicates average wages for skilled and unskilled labor.(90)

In 1982, Ganesan reports that a skilled worker may get up to Rs. 60 per day with a private construction agency or Rs. 45 in a government department including mandatory allowances. An unskilled laborer can receive approximately Rs. 30 per day and Rs 22 from the respective agencies. In addition, because many of the skilled trades - masons, carpenters, mechanics, heavy and light vehicle drivers - migrate to the Middle East, in

Table 23

2: Wages in construction

| | Unskilled labour (Rs. per day) | Skilled labour (Rs. per day) |
|-----------------|-----------------------------------|---------------------------------|
| '71 | 4.84 | 7.49 |
| '72 | 5.00 | 7.63 |
| '73 | 5.70 | 8.30 |
| '74 | 7.32 | 10.73 |
| '75 | 7.68 | 12.57 |
| '76 | 7.76 | 13.26 |
| '77 | 7.76 | 13.26 |
| '78 | 10.97 | 14.12 |
| '79 | 12.17 | 16.92 |
| '80 (Jan.-June) | 16.65 | 23.00 |

Source: Statistical Bulletin, M/LG, H and C.

Table 24

Real Wage Rate Index Numbers^{a/}
(1970 = 100)

| | <u>Workers under Wage Boards</u> | | <u>Central</u> | <u>Government</u> |
|------|----------------------------------|--------------------------------|------------------|-------------------|
| | <u>Agriculture^{b/}</u> | <u>Industry & Commerce</u> | <u>Employees</u> | <u>Teachers</u> |
| 1970 | 100.0 | 100.0 | 100.0 | 100.0 |
| 1971 | 98.3 | 103.3 | 97.4 | 97.5 |
| 1972 | 96.9 | 100.1 | 91.8 | 91.7 |
| 1973 | 100.0 | 100.4 | 87.7 | 85.5 |
| 1974 | 111.3 | 105.6 | 88.1 | 83.9 |
| 1975 | 119.8 | 115.4 | 91.1 | 84.8 |
| 1976 | 121.0 | 117.1 | 95.3 | 88.6 |
| 1977 | 150.3 | 124.5 | 95.4 | 89.0 |
| 1978 | 195.1 | 135.6 | 97.6 | 87.9 |
| 1979 | 227.0 | 142.2 | 104.6 | 91.0 |
| 1980 | 221.6 | 138.1 | 92.4 | 78.5 |
| 1981 | 187.2 | 131.4 | 89.6 | 74.1 |
| 1982 | 190.7 | 133.3 | 106.3 | 84.8 |

Notes: ^{a/} Nominal wage index deflated by the Colombo Consumer Price Index.

^{b/} Includes tea growing and processing, rubber growing and manufacturing, and coconut growing.

^{c/} Includes coconut manufacturing, engineering, printing, match manufacturing, motor transport, tea export, building stock, harbor and port transport, rubber exports, cinema trades.

Source: Central Bank of Ceylon. Review of the Economy: 1982.

Source: Stern

practice specific skilled workers are able to command higher wages. Moreover, foreign contractors often pay substantially more than recorded in Table 23.

According to the UNCHS report (91) , the construction industry as a whole requires a higher percent of skilled labor than does manufacturing in developing countries generally. One may reasonable assume that the case is the same for Sri Lanka. According to Vedagiri, skilled workers are the ones in short supply at all levels of the construction process - including management and supervisory positions.(92) Those with less skill are being forced to take many of these jobs. Primarily because of the migration of skilled workers to the Middle East, the domestic construction sector has experienced a serious constraint on the expansion of many of its activities.

Schultz also identifies "key" sectors by calculating the absolute employment effect (direct and indirect) through the use of employment multipliers. In all the developing Asian countries in his study, he found that comparatively strong employment effects in Agriculture and Trade were produced by a marginal change in those sector's final demands. He also measured the dispersion effect finding that the impulses from Wood & Paper Products & Printing and from Construction to be "generally powerful and relatively evenly distributed to other sectors."(93)

Table 25 (Schultz's Table 7-7) ranks each sector based on total effects and according to country groups. (94) Construction ranks 5th in the A grouping, 9th and 8th in B and C

groupings respectively. Agriculture and Processed Foods rank high relatively consistently - the exception being for medium level countries here exemplified by Israel and Yugoslavia.

Ganesan also estimates employment coefficients in the same manner as his technical coefficients for the production process.

E_{ij} = labor content of industry i utilized by
industry j

However, his employment table also does not adhere to a systematic input-output framework. He is unable, as a result, to perform any type of multiplier analysis but can only hint at the multiplier effect arising from the construction activity. Neither indirect employment effects nor their relationships between sectors can be captured. For example, the increased employment of those producing food for construction labor cannot be estimated by Ganesan.(95)

Ganesan does, however, illuminate the differences in employment generation between the different types of residential and non-residential buildings. He finds that minor irrigation works followed closely by conventional and traditional housing, and road construction generate the highest direct employment. And, as one would expect, the lower the foreign exchange content of the building, the greater the amount of (domestic) employment that is generated. From his partial coefficients he finds that of the whole construction sector, those units manufacturing and distributing materials make up about one third of all the employment. These results lead him to conclude:

Table 25

Table 7-7. Sectoral Employment Effects Compared Internationally

| Sector | | Total Employment Effect Sector Rank | | | Ratio of Indirect/Direct Employment Effect | | |
|-------------|---|--|------|--------|---|------|-------|
| | | Country Groups | | | | | |
| Num- ber | Title | A | B | C | A | B | C |
| 1 | Agriculture, forestry, & fishing | 1 | 6, 7 | 1 | 0.28 | 0.62 | 0.25 |
| 2 | Mining & quarrying | 11 | 11 | 9 | 1.12 | 0.59 | 0.51 |
| 3 | Processed foods | 2 | 10 | 6 | 5.75 | 1.92 | 5.64 |
| 4 | Apparel, incl. textiles & footwear | 4 | 2 | 2 | 1.39 | 0.90 | 1.64 |
| 5 | Leather & leather products | 14 | 19 | 10, 11 | 4.34 | 1.90 | 2.00 |
| 6 | Wood & paper products & printing | 6 | 12 | 4 | 1.80 | 0.68 | 1.78 |
| 7 | Rubber products | 9 | 16 | 7 | 1.10 | 1.18 | 1.51 |
| 8 | Chemicals | 15, 16 | 17 | 17 | 1.81 | 0.99 | 2.86 |
| 9 | Petroleum products | 19 | 20 | 19, 20 | 3.35 | 0.58 | 11.03 |
| 10 | Nonmetallic mineral products | 10 | 18 | 12 | 0.76 | 0.74 | 0.91 |
| 11 | Basic metals & metal products | 17 | 15 | 15, 16 | 1.10 | 1.06 | 2.09 |
| 12 | Nonelectrical machinery | 15, 16 | 8 | 10, 11 | 1.24 | 0.42 | 1.30 |
| 13 | Electrical machinery | 12 | 13 | 5 | 1.03 | 0.35 | 1.27 |
| 14 | Transport equipment | 13 | 6, 7 | 13, 14 | 1.00 | 0.35 | 2.01 |
| 15 | Industry not else- where classified | 7 | 4 | 15, 16 | 0.99 | 0.10 | 4.86 |
| 16 | Electricity, gas, water | 20 | 5 | 19, 20 | 1.13 | 0.56 | 2.40 |
| 17 | Construction | 5 | 9 | 8 | 0.91 | 0.81 | 1.18 |
| 18 | Trade | 3 | 3 | 3 | 0.12 | 0.21 | 0.26 |
| 19 | Transportation, stor- age, & communication | 18 | 14 | 13, 14 | 0.46 | 0.45 | 0.49 |
| 20 | Services | 8 | 1 | 18 | 0.22 | 0.12 | 0.57 |

Note: A = South Korea 1963 and 1966; Philippines 1961 and 1965; Taiwan 1966 and 1969; Turkey 1963

B = Israel 1966 and 1969; Yugoslavia 1966

C = Germany 1966; Japan 1965

Source: Schultz

Table 26

Table 7-3. Country Ranking According to Combined Backward and Forward Linkages

| Combined Backward and Forward Linkages ^a | | | | | | | | | |
|---|------|--------------|------|--------------|------|--------------|------|-------------------|------|
| Less than 0.30 | | 0.30 to 0.34 | | 0.35 to 0.39 | | 0.40 to 0.44 | | Greater than 0.44 | |
| India | 1963 | India | 1965 | Indonesia | 1969 | Germany | 1966 | Japan | 1965 |
| Philippines | 1961 | Iran | 1965 | Pakistan | 1961 | Yugoslavia | 1966 | | |
| Sri Lanka | 1963 | Israel | 1966 | Pakistan | 1964 | | | | |
| Sri Lanka | 1965 | Israel | 1969 | Philippines | 1965 | | | | |
| | | South Korea | 1963 | Taiwan | 1964 | | | | |
| | | South Korea | 1966 | Taiwan | 1966 | | | | |
| | | Malaysia | 1965 | Taiwan | 1969 | | | | |
| | | | | Turkey | 1963 | | | | |

^aCalculated as $(u^* + w^*)/2$.

Source: Schultz

The choice of materials in design of houses and of construction techniques has led to wide differences in employment created and capital resources absorbed through houses built by different income groups.

p.45.

Ganesan's linear programming model optimizes both total employment and output subject to a number of constraints, the most important of which are the total cement and foreign exchange available to the construction sector.(96) Given the input requirements of the different building types the model finds the optimal mix between residential and nonresidential output that will maximize employment.(97) We cannot conclude the relative position of the construction sector's employment creation performance vis-a-vis other sectors with this linear programming model.

Neither Schultz's nor Ganesan's analysis of the employment implications address the very severe labor mobility implications of the expansion of the construction sector. Both authors are dealing with aggregate figures; no calculation was made in reference to the issue of location. Pyatt and Round's SAM is useful again here showing the split between urban, rural, and estate labor (81, 159, and 5 thousand respectively). To make Currie's precondition fully operable, then, one would want to know more than simply the unemployment rate and the number of jobs available - but also where the concentration of construction activity would be.(*)

Footnotes: Large unskilled labor component

(87) In his words, labor-intensive construction is equivalent to "less efficient".

(88) CMT, Inc., 1980 (revised 1982).

(89) As they are in the industrial world; construction sector wages on average tend to be higher than many other sectors, but not the highest.

(90) From Ganesan, 1982, p.20: based on wages of Central Price Fixing Committee of the Government, District Price Fixing Committee, State Engineering Corporation, Labour Gazette (Building Trade), and selected private constructors.

(91) 1981, p. 19.

(92) Vedagiri, 1978.

(93) 1976, p. 150; also see his Table 7-6 on p. 151.

(94) The countries are roughly grouped by level of development; however, note that does not correspond to his table 7-3 that groups countries according to their combined forward and backward linkages.

(95) Those found in "Other Agriculture" from Pyatt and Round's SAM.

(96) We are not dealing with the allocation of foreign exchange between sectors, but a fixed constraint for construction.

(97) Ganesan omits an important next step: he does not measure the sensitivity of the optimal value of employment (Y) to changes in the constraints ($R = C + FE$) where C = total supply of cement, and FE = total foreign exchange available to construction sector: $Y = dE/dR$.

(98) Currie's strategy had an explicit spatial bias because his leading sector in Colombia was urban housing and development. The lead projects in Sri Lanka, on the other hand, are made up of both rural (Mahaweli and Housing) and urban (Housing) construction.

5. A Large Latent Demand to be Actualized

Currie's last precondition is not subject to description using input-output techniques. Neither is it subject to the manipulation of planners. World wide, however, housing and construction are generally understood to represent a large latent demand (99) and their product is considered to be income elastic at low levels of development.(100)

Sri Lanka's construction sector is relatively large (3rd out of 10), in value terms relative to the whole economy.(101) Therefore, according to Currie, latent demand for the sector's product is likely to be less than with a smaller lead sector. In this situation, growth will depend more on a high income elasticity of demand for the lead sector's products. Because of Sri Lanka's relatively low level of development, we can assume that a high income elasticity for housing (at least) exists.

Although the government was unsuccessful in actualizing the sector's latent demand (with the increase in the interest rate), it may be assumed that the sector meets Currie's last precondition because housing and construction are income elastic goods. The construction sector's relative position vis-a-vis other sectors can not be measured easily; and because this precondition is out of the planners' scope to manipulate, the ranking is really of little consequence for the strategy.

Footnotes: A large latent demand to be actualized

(99) UNCHS, 1981.

(100) In the process of development, housing elasticity approaches unity. In the United States, for example, the elasticity is one.

(101) But it is approximately 1/2 the size of the first and second largest as calculated by X_j/X from Pyatt and Round's SAM) in value terms.

CONCLUSION

According to Currie's leading sector preconditions, Sri Lanka's construction sector ranked fairly high relative to other sectors, but never the highest. It is true that the construction sector is well-linked to the rest of the economy; however, from the very simple calculations of backward linkages, at least, it is evident that other sectors have higher internal multipliers than does construction.(102) More recently, the construction sector's poor performance in keeping its import component low seriously weakened its multiplier effect thereby forfeiting much of its potential for altering the structure of the economy.]

As for the second precondition, the construction sector was able to be exogenously stimulated. The government of Sri Lanka, however, was only able to do so through a large commitment of its own resources - through government budget reallocations and foreign loans and grants. Other sectors - such as "Other Industry" - could also have garnered such resources had the government chosen to prioritize that sector instead. The question is not simply whether the sector is capable of being stimulated exogenously but more precisely, whether it can be stimulated in a manner that does not require large infusions of capital or foreign exchange.

Currie proposes the reorganization of the financial institutions for Colombia's housing sector and the complete reliance on this mechanism to stimulate construction for middle- and high-income groups. The "filtering" process is supposed to

satisfy middle-low to low-income households demand. However, in the case of Sri Lanka this would be inappropriate. First of all, the size of middle- and high-income housing demand in Sri Lanka is not large enough to have the wide effects necessary to stimulate growth economy-wide. Second and more importantly, reliance on the filtering process is senseless given the vast shelter needs of the country's poor. Instead, Sri Lanka's housing program has been directly targetted to meet demands for low-income housing. Since this sector rarely participates in such formal financing mechanisms anyway, its reorganization is of little relevance. This discussion notwithstanding, the "crowding out" phenomenon which has occurred through the financial arrangements already made, have exacerbated problems in the distribution of credit for many other kinds of private sector investment projects.

The third precondition - that the sector have a low-import component - represents the most severe short-coming of Sri Lanka's construction sector. As a result of many design and implementation decisions for the Mahaweli Development and Housing Programs, the import component for the two has been extremely high. Against the backdrop of rising balance of payment deficits, the high foreign exchange component of the lead projects has proven to be very costly for the country both in terms of general inflationary effects and the lost opportunity for the development of the domestic construction sector to meet its potential in national economic growth.

The fourth precondition - for a high unskilled labor component - is generally met by Sri Lanka's construction

sector. Evidence is lacking that would compare construction relative to other sectors. However, the constraints placed on the sector in this regard stem from the shortage of skilled workers needed to fill positions at many levels of the construction process of the public projects. This situation points to a problem of a different sort not mentioned by Currie's fourth precondition.

Finally, one can argue that the construction sector does have a large latent demand even though it was only partially actualized through Sri Lanka's construction sector policies. For example, the initiation of the liberalization policies enable firms, on the promise of real future gains, to demand the construction of office and plant buildings. The private sector borrowing did jump - albeit only once - with the increase of the nominal interest rate on bank deposits in 1978. (See table 8.) These responses, although limited in scope, indicate once again that how the government actualizes construction's latent demand is equally as important as the relative size of the demand.

Relative to Currie's preconditions, this paper has not looked at Sri Lanka's construction industry in as much depth technically as one might using input-output analysis. The objective was to utilize the input-output logic in order not to discredit the sector's "leading" characteristics, but to place the construction industry in its relative position within the economy as a whole.

Leading Sectors

To extend the analysis in the direction of finding the most appropriate candidate for leading sector, the next place to look would be at those sectors meeting the leading sector pre-conditions. Embedded in Schultz's analysis are some very interesting data in this regard that warrant further investigation. For his ten Asian countries, the sectors that most qualify as "key" sectors are the Agriculture, Food Processing, Apparel, and Construction sectors. Interestingly, these sectors represent the "basic needs" sectors in the economy; they provide food, clothing, and, in part, shelter.

From Schultz's tables we can see some preliminary correlations between these "basic need" sectors and the levels of development of countries. It seems quite clear that the sectors and shelter, in particular, are less important growth stimulating sectors at higher levels of development. As Sri Lanka is at the lower end of the development levels, these sectors still rank very high for "key" sectors. It might be appropriate, therefore, to think of the leading sector as the combination of these sectors in keeping with Currie's development strategy.

In an input-output framework, they might be aggregated into one sector in order to measure their internal multiplier, import coefficient, and multiplier effects. But before doing so, one would also want to look closely at the linkages between the "basic needs" sectors themselves. Moreover, with the use of a dynamic input-output framework, one might measure the "basic needs" sector's impact on the structure of the economy

over periods of time.

The construction sector still ranks relatively high as a leading sector. Moreover, its contributions to the economy - its products and growth stimulating effects - are important in the long run. The Food Processing sector and agricultural related industry may rank higher according to Currie's pre-conditions (as measured by Schultz's techniques) at a lower level of development in which the country is more dependent on its agricultural base. But it is short-sighted to emphasize those sectors to the neglect of others that will structurally transform the economy over time. The construction industry is critically important over the long-run. Therefore, even if it does not rank highest as a "leading" sector for economic growth, construction can be encouraged to perform better according to Currie's strategy.

Looking at Sri Lanka's construction sector in relation to Currie's preconditions does more than tell us whether or not the sector "qualifies" to lead the economy out of the "vicious circle" of low investment and growth. It also highlights a number of planning objectives that are key for Sri Lanka's implementation of the leading sector strategy. Namely: How might public investment be managed so that bottlenecks (for materials, equipment, capital, and labor) can be minimized and broken, and imports be utilized sparingly and most productively for the development of the sector and economy as a whole? That is, what action can be taken, in the long- and short-runs, to insure the operation of the most important of the pre-

conditions?

Management of public sector investment

The development of the domestic sector capacity to meet the requirements of the government's lead projects can be encouraged through public policy. Because in Sri Lanka's case the government is the most important client of the construction industry, its behavior in the sector is particularly crucial. Discussion concerning public sector's interventions in the sector have been ongoing for some time.(103) The following is a few areas that have emerged throughout the implementation of the construction-intensive development projects.

Perhaps the most important is the manner in which the public projects are released into the industry. By phasing projects the government can insure that, at any one time, the requirements on the sector will not be too much for it to handle and, in this manner, also minimize the incidence of bottlenecks. The implementation of the lead projects actually came all at once. The result was that local construction and building materials firms quickly reached their (short-run) capacity.(104) Currie is well aware that the leading sector may run into bottlenecks that, until broken, will restrict the sector's expansion.(105)

The existence of these supply constraints is not the issue, but rather how one chooses to remove them. In Sri Lanka, the government decided to import the needed materials and equipment. However, by looking at an I-O table, one can estimate the time sequences for required products and begin to respond

to potential bottlenecks. Such a policy requires that the implementing institution(s) be quick and intelligent - in a word, flexible - in its dealings with bottlenecks as they arise.

In addition, by phasing projects the government can, to a greater degree, insure constancy of work for the construction sector; and at the same time, give more forward knowledge about the overall load of work, detailed programs and upcoming projects. This constancy and knowledge are perhaps the most important elements encouraging the industry's development. Public sector projects can also be broken into smaller pieces in order to be within the capabilities of the medium- and small-sized firms that dominate the Sri Lankan construction sector and who otherwise would be unable to compete with foreign firms. Or, in the case where the projects are not especially amenable for disaggregation, joint-ventures between foreign and national firms can be encouraged. This joint-venture should be more than the labor-only contracting that went on during the 1970s, but should include local management as well. This also will help to develop contracting capacity of local firms.

Flexibility in the implementing institutions may also lower the import component of public projects. That is, despite forecasting, shortages of domestic resources will arise unforeseen. And when they do, if the contractor will substitute other locally available components, for example, instead of turning to the import market, the short-run needs might be satisfied without further depleting foreign exchange earnings. Or, if the construction project must import particular equip-

ment in the short-run (as the case of the Mahaweli Project), the government can avoid too many makes and sizes which will pose a problem for operation and maintenance of the equipment later.

In the long-run, these bottlenecks can be permanently overcome. Vedagiri makes a number of suggestions in this regard in his report for the UNDP on the building sector in 1978. For example, some of the imported equipment used by the Mahaweli Project - if needed in future projects - could be progressively manufactured within the country. Private sector should also be given the incentive to produce more of builder's hardware, electrical fittings, and accessories that are currently manufactured or directly imported by public sector agencies. This production may also be done progressively over time.

The development of building materials and components industries also can be directly encouraged. This might be accomplished through the upgrading and extension of domestic capacity in the predominately traditional-type building materials industry. The brick kiln, for one, could be modernized and new kilns of improved design introduced.

Pugging and moulding are good areas for partial mechanization. A few fully mechanized kilns with a carefully selected 'product-mix' are also essential.

Vedagiri, 1978, page 26.

It is especially important for Sri Lanka that the variety of building materials and components to be encouraged are using those processes with low-import requirements for raw materials and components. (106)

These and other long-run policies directed at construction sector development have the additional advantage of helping the sector to meet the "leading sector" preconditions. For example, Ganesan argues convincingly that the development of local industry capabilities will also improve the employment generation ability of construction activities. And obviously, as the building materials industries develop, the construction sector's internal multiplier will increase.

In sum, through the understanding of the production relationships between sectors, the establishment of clear priorities, and the flexible design and sequencing of projects, the government may be better able to overcome the bottlenecks that threaten the construction sector's efficacy as a leading sector and concurrently, further develop the sector's capacity to meet the country's future construction needs.

Footnotes: Conclusion

(102) For 1970 data: Pyatt and Round's SAM.

(103) The UNDP has had an interest in the construction industry in Sri Lanka for the past 15 years; others such as Vedagiri and Ganesan have also written on the subject.

(104) See Ganesan, 1982, or Vedagiri, 1978, regarding the state of the construction industry at the time of the implementation of the lead projects.

(105) In Colombia (1971-1974), the construction sector also quickly ran into bottlenecks for building materials and equipment.

(106) Ganesan, 1979.

BIBLIOGRAPHY

- Burns, L. and L. Grebler (1977) The Housing of Nations: Analysis and Policy in a Comparative Framework. New York: Wiley.
- CMT, Inc. (1980) Role and Contribution of the Construction Industry to Socio-Economic Growth in Developing Countries. Prepared for United Nations Center for Human Settlements, Nairobi. (November). Revised 1982 (April).
- Currie, L. (1971) "The Exchange Constraint and Development -- a Partial Solution to the Problem," Economic Journal 81. pp. 886-904.
- _____ (1974) "The Leading Sector Model of Growth in Developing Countries," Journal of Economic Studies I. pp. 1-14.
- _____ (1975) "The Interrelations of Urban and National Economic Planning," Urban Studies. U.K. (February).
- _____ (1983) "Housing as an Instrument of Macro-economic Policy," Habitat International, Volume 7, No. 5/6. pp. 165-175.
- de Melo, M. (1981) "Modeling the Effects of Alternative Approaches to Basic Human Needs: Case Study of Sri Lanka," in Basic Needs and Development. Leipziger, Danny M. (ed.). Cambridge (Massachusetts): Oelgeschlager, Gunn and Hain, Publishers, Inc.
- Drewer, S.P. (1975) The Construction Industry in Developing Countries: A framework for planning, London: University College Environmental Research Group. (April)
- _____. (1980) "Construction and Development: A New Perspective," Habitat International - Technology and Development, Koenigsberger and Groak, eds. New York: Habitat International/Pergamon Press, Volume 5, No. 3, pp. 395-428.
- Fox, L.P. (1980) Building Construction as an Engine of Economic Growth: An Evaluation of the Colombian National Plan. The University of North Carolina at Chapel Hill, Ph.D. Economics, general.
- Ganesan, S. (1979) "Growth of Housing and Construction Sectors: Key to Employment Creation," Progress in Planning, Volume 12, pp.1-79. Great Britain: Pergamon Press, Ltd.

- (1982) The Construction Industry in Sri Lanka.
World Employment Programme Research, Working Paper. Technology
and Employment Programmes. International Labour Organization.
Geneva. (February).
- (1982) Management of Small Construction Firms: A
Case Study of Sri Lanka, Singapore, Hong Kong, Thailand, The
Philippines, and Japan. A Report prepared under APO Oshikawa
Fellowship 1979-1980. Asian Productivity Organization.
- (1983) "Housing and Construction: Major
Constraints and Development Measures," Habitat
International. Volume 7, No. 5/6. pp.173-194.
- Hagopian, F. and F. Moavenzadeh. (1983) The Construction and
Materials Industries in Developing Countries, a report prepared
for the United Nations Industrial Development Organization,
(August).
- Hillebrandt, P.M. (1974) Economic Theory and the Construction
Industry, London: Macmillan.
- Kearney, R. N. (1967) Communalism and Language in the
Politics of Ceylon, Durham: Duke University Press.
- Marga Institute. (1976) Housing in Sri Lanka. Tisara Press.
- Miernyk, W. (1957) The Elements of Input-Output Analysis.
New York: Random House.
- Ministry of Finance and Planning, Ministry of Planning Division
(1983) Public Investment: 1983-1987. (May).
- Moavenzadeh, F. and J. Koch Rossow (1975) The Construction
Industry in Developing Countries, Technology Adaptation
Program, Massachusetts Institute of Technology. TAP Report
No. 75-4, (Spring).
- Pyatt, Roe, et al. (1978) Social Accounting for Development
Planning with Special Reference to Sri Lanka. Cambridge:
Cambridge University Press.
- Pyatt, G. and Round, J. Social Accounting Matrices for
Development Planning. World Bank reprint series: Number
seventy-four.
- Quarterly Economic Review of Sri Lanka. (1978-1984). The
Economist Intelligence Unit Limited. London.
- Schultz, S. (1976) "Intersectoral Comparison as an Approach to
the Identification of Key Sectors," in Advances in Input-
Output Analysis. Polenske and Skolka (eds.). Cambridge:
Ballinger Publishing Company.

Srivardana, S. (1982) Sri Lanka Country Monograph. A Review of Human Settlements and Shelter in Urban and Rural Areas. (A Study conducted under ESCAP Project Review and Study of the Human Settlements Situation in the ESCAP region.)

Snodgrass, D.M. (1966) Ceylon: an Export Economy in Transition. Homewood: Irwin.

Stern, J. (1984) Lecture entitled: "Liberalization in Sri Lanka: a Preliminary Assessment." Harvard University. (April 12).

Tsai, H. (1974) A Methodology for Evaluating a National Housing Plan: The Case of Taiwan. M.C.P. Thesis, M.I.T.

Polenske, K. and J. Skolka (eds.). (1976) Advances in Input-Output Analysis. Cambridge: Ballinger Publishing Company.

UNCHS (Habitat). (1981) The Construction Industry in Human Settlement Programmes and National Economic and Social Development. (October).

USAID. (1981) Sri Lanka Shelter Sector Assessment. (January).

Vedagiri, T.S. (1978)

(1980) Study of Selected Building Materials: Interim Report. Urban Development Authority (Ministry of Local Government, Housing and Construction) in cooperation with United Nations Development Programme. (July).

(1980) Study of Construction Agencies: Interim Report. (February)

Yaleman, N. (1967) Under the Bo Tree, Studies in Caste, Kinship, and Marriage in the interior of Ceylon. Berkeley and Los Angeles: University of California Press.

APPENDIX

TABLE 2
A SOCIAL ACCOUNTING MATRIX FOR SRI LANKA, 1970
(MILLIONS OF RUPEES)

| | | Expenditures | | | | | | | | | | | Expenditures | | | | | | | | | | | Totals | | | | | |
|--------------------------|--------------------------|-----------------------|---------|---------|--------------|--------|------------------|--------|----------------------|--------------------|----------------------|--------------------|--------------------------|--------------------------|----------|--------|-------------------|----------------|-------------------|----------------|---------------------|------------------|---------------------|-------------------|---------------------|-------------------|--------|-----|------|
| | | 1 | | | 2 | | 3 | | 4 | | 5 | 6 | | | | | | 7 | | | | | | | | | | | |
| | | Factors of Production | | | Institutions | | | | | | | | Producer Activities | | | | | | | | | | | | | | | | |
| | | Labour | | | Other | | Current Accounts | | | | | | Combined Capital Account | Producer Activities | | | | | | | | | | | | | | | |
| Urban | Rural | Estate | Housing | Other | Public | Urban | Rural | Estate | Private Corporations | State Corporations | Government | Tea | | Rubber | Coconuts | Rice | Other Agriculture | Food and Drink | Other Industry | Construction | Trade and Transport | Private Services | Government Services | Rest of the World | | | | | |
| Region | 1 | Labour | | Urban | Rural | Estate | | | | | | | | | 5 | 5 | 9 | 25 | 75 | 46 | 182 | 81 | 414 | 276 | 555 | 1673 | | | |
| | | Other | | Housing | Other | Public | | | | | | | | | 43 | 153 | 67 | 706 | 247 | 68 | 259 | 159 | 487 | 276 | 715 | 3185 | | | |
| | 2 | Housing | | Urban | Rural | Estate | | | | | | | | | 526 | 133 | 11 | | | | | | | | | | | | 711 |
| | | Other | | Housing | Other | Public | | | | | | | | | 13 | 24 | 442 | 282 | 1259 | 184 | 604 | 742 | 1424 | 633 | 123 | 55 | 4984 | | |
| | | Public | | Housing | Other | Public | | | | | | | | | | | | | | | | | | | | | | 174 | |
| | 3 | Private Corporations | | Urban | Rural | Estate | | | | | | | | | | | | | | | | | | | | | | 6 | 3003 |
| | | State Corporations | | Urban | Rural | Estate | | | | | | | | | | | | | | | | | | | | | | 6 | 6901 |
| Government | | Urban | Rural | Estate | | | | | | | | | | | | | | | | | | | | | 6 | 791 | | | |
| Combined Capital Account | | Urban | Rural | Estate | | | | | | | | | | | | | | | | | | | | | | | | | |
| 6 | Private Corporations | | Urban | Rural | Estate | | | | | | | | | | | | | | | | | | | | | | | | |
| | State Corporations | | Urban | Rural | Estate | | | | | | | | | | | | | | | | | | | | | | | | |
| | Government | | Urban | Rural | Estate | | | | | | | | | | | | | | | | | | | | | | | | |
| | Combined Capital Account | | Urban | Rural | Estate | | | | | | | | | | | | | | | | | | | | | | | | |
| | Tea | | Urban | Rural | Estate | | | | | | | | | | | | | | | | | | | | | | | | |
| | Rubber | | Urban | Rural | Estate | | | | | | | | | | | | | | | | | | | | | | | | |
| | Coconuts | | Urban | Rural | Estate | | | | | | | | | | | | | | | | | | | | | | | | |
| 7 | Rice | | Urban | Rural | Estate | | | | | | | | | | | | | | | | | | | | | | | | |
| | Other Agriculture | | Urban | Rural | Estate | | | | | | | | | | | | | | | | | | | | | | | | |
| | Food and Drink | | Urban | Rural | Estate | | | | | | | | | | | | | | | | | | | | | | | | |
| | Other Industry | | Urban | Rural | Estate | | | | | | | | | | | | | | | | | | | | | | | | |
| | Construction | | Urban | Rural | Estate | | | | | | | | | | | | | | | | | | | | | | | | |
| | Trade and Transport | | Urban | Rural | Estate | | | | | | | | | | | | | | | | | | | | | | | | |
| | Private Services | | Urban | Rural | Estate | | | | | | | | | | | | | | | | | | | | | | | | |
| Government Services | | Urban | Rural | Estate | | | | | | | | | | | | | | | | | | | | | | | | | |
| Rest of the World | | Urban | Rural | Estate | | | | | | | | | | | | | | | | | | | | | | | | | |
| Totals | | Urban | Rural | Estate | Housing | Other | Public | Urban | Rural | Estate | Private Corporations | State Corporations | Government | Combined Capital Account | Tea | Rubber | Coconuts | Rice | Other Agriculture | Food and Drink | Other Industry | Construction | Trade and Transport | Private Services | Government Services | Rest of the World | Totals | | |
| | | 1673 | 3185 | 711 | 633 | 4984 | 174 | 3003 | 6901 | 791 | 1443 | 411 | 2234 | 2639 | 864 | 374 | 577 | 2242 | 1846 | 1276 | 2790 | 1745 | 2815 | 1677 | 1649 | 2522 | 2639 | | |

Note: This is a preliminary version of a table to appear in Pyatt and Roe with Lindley, Round and others (forthcoming).

Source: Pyatt and Round

Financing of Government Deficits, 1973 - 1980

Rs. mil., (%)

| | Total Deficit (% of GDP) | | Rupee Loans | Treasury Bills | Central Bank Advances | Foreign Income | Others |
|---------------------|-----------------------------|--------|----------------|-------------------|-----------------------------|-------------------|---------|
| 1973 | 1,425.0 | (7.7) | 563.8 | -78.4 | 33.9 | 178.5 | 727.2 |
| | (100.0) | | (39.6) | (-5.5) | (2.4) | (12.5) | (51.0) |
| 1974 | 1,599.0 | (6.7) | 630.2 | 0.3 | 39.1 | 378.3 | 544.4 |
| | (100.0) | | (39.4) | (-) | (2.4) | (23.7) | (34.0) |
| 1975 | 2,699.0 | (10.2) | 791.3 | 99.0 | 88.1 | 713.5 | 996.9 |
| | (100.0) | | (29.3) | (3.7) | (3.3) | (26.4) | (36.9) |
| 1976 | 3,576.0 | (11.8) | 1,164.0 | 347.1 | 11.5 | 957.5 | 1,084.1 |
| | (100.0) | | (32.6) | (9.7) | (3.2) | (26.8) | (30.3) |
| 1977 | 3,074.0 | (8.4) | 1,077.4 | -225.1 | 17.3 | 1,254.9 | 941.1 |
| | (100.0) | | (35.0) | (-7.3) | (0.6) | (40.8) | (30.6) |
| 1978 | 7,165.0 | (16.8) | 1,260.1 | 123.8 | 333.1 | 3,952.6 | 1,463.6 |
| | (100.0) | | (17.6) | (1.7) | (4.7) | (55.2) | (20.4) |
| 1979 | 8,791.0 | (16.7) | 2,445.2 | 356.8 | 181.0 | 3,737.8 | 2,053.5 |
| | (100.0) | | (27.8) | (4.1) | (2.1) | (42.5) | (23.4) |
| 1980 | 16,274.0 | (23.7) | 2,170.4 | 6,549.0 | 491.2 | 6,135.6 | 904.1 |
| | (100.0) | | (13.3) | (40.2) | (3.0) | (37.7) | (5.6) |
| 1981 | 14,866.0 | (18.7) | 1,548.0 | 3,876.3 | -91.2 | 7,602.0 | 1,930.9 |
| | (100.0) | | (10.4) | (26.1) | (0.6) | (51.1) | (13.0) |
| 1982 provisional | 20,091.0 | (20.0) | 4,110.4 | 3,295.7 | 603.9 | 8,121.0 | 3,960.0 |
| | (100.0) | | (20.5) | (16.4) | (3.0) | (40.4) | (19.7) |

Source: CBC, Review of the Economy, 1980.

Investment in construction by public/private sector (Rs. million)

| | Year | | | | | | | | | | | |
|---|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|
| | 1968 | 1969 | 1970 | 1971 | 1972 | 1973 | 1974 | 1975 | 1976 | 1977 | 1978 | 1979 |
| Public sector - residential and non-residential buildings | 64.4 | 92.9 | 88.7 | 115.0 | 120.1 | 136.9 | 153.0 | 175.5 | 221.6 | 220.5 | 283.5 | 1 219.7 |
| Public sector - other construction | 267.2 | 316.0 | 328.0 | 191.3 | 212.9 | 186.8 | 218.3 | 303.8 | 257.3 | 306.5 | 655.3 | 761.1 |
| Total: public sector | 331.6 | 414.9 | 416.7 | 306.3 | 333.0 | 323.7 | 371.3 | 479.3 | 478.9 | 527.0 | 938.8 | 1 980.9 |
| Private sector - building and other construction | 661.8 | 836.4 | 981.0 | 1 019.4 | 1 156.2 | 1 346.6 | 1 415.4 | 1 367.6 | 1 780.7 | 1 831.3 | 2 400.0 | 3 438.0 |
| (a) Total investment (current prices) | 1 155.5 | 1 438.8 | 1 398.5 | 1 325.7 | 1 489.2 | 1 670.3 | 1 786.7 | 1 846.9 | 2 259.6 | 2 358.3 | 3 338.8 | 5 418.8 |
| (b) Investment per capita (Rs.) | 96.4 | 117.3 | 111.9 | 104.4 | 114.6 | 127.5 | 134.3 | 136.8 | 164.9 | 169.7 | 235.1 | 373.7 |
| (a) Total investment (const. 1963 prices) | 846.5 | 988.4 | 1 086.7 | 1 092.2 | 1 182.2 | 1 159.1 | 1 077.7 | 981.0 | 1 067.6 | 1 077.3 | 977.7 | 1 153.8 |
| (b) Investment per capita (Rs.) | 70.5 | 80.4 | 86.9 | 86.0 | 90.9 | 88.5 | 81.0 | 72.7 | 77.9 | 77.5 | 68.9 | 79.9 |

- eg: 1. Investment is defined as a value of construction work put in place during the year.
 2. After 1977, expenditure by the public corporations (both building and other construction) are covered by "private sector".
 3. 1978-79 figures are likely to be revised.

Source: Department of Census and Statistics for basic data.

Source: Ganesan

Table 1: Allocation of the government capital expenditure for construction at current prices (Rs. million)

Source: Ganesan

| Category | 1980 ¹ | 1981 | 1982 | 1983 | 1984 | 1980-84 | |
|---|-------------------|----------|----------|---------|----------|---------------------|-------------------|
| | | | | | | Foreign per cent | Local per cent |
| Accelerated Mahaweli | 2 015.0 | 3 397.0 | 4 014.0 | 4 471.0 | 4 310.0 | 73.3 | 26.7 |
| Other irrigation | 991.5 | 673.3 | 761.0 | 1 061.7 | 617.6 | 31.0 | 69.0 |
| Housing | 1 158.0 | 1 130.0 | 1 500.0 | 1 420.0 | 1 190.0 | 22.5 | 77.5 |
| - Urban housing | 650.0 | 563.0 | 898.7 | 990.0 | 900.0 | 30.0 | 70.0 |
| - Aided self-help houses | 140.0 | 293.1 | 243.3 | - | 100.0 | 10.0 | 90.0 |
| - Electoral house | 150.0 | 144.0 | 158.0 | 210.0 | - | 10.0 | 90.0 |
| Water supply | 485.0 | 1 044.0 | 1 015.6 | 656.4 | 556.0 | 65.9 | 34.1 |
| Urban development and new projects | 350.0 | 196.0 | - | 400.0 | 514.0 | 23.4 | 76.6 |
| - Kotte parliamentary complex | 350.0 | 196.0 | - | - | - | - | - |
| Transport | 840.0 | 671.0 | 506.0 | 360.0 | 271.0 | 65.4 | 34.6 |
| - Railway on-going works | 635.0 | 428.0 | 260.0 | 109.0 | 92.0 | 88.8 | 11.2 |
| - Highways | 126.0 | 130.0 | 134.0 | 138.0 | 142.0 | 24.6 | 75.4 |
| Power | 583.0 | 471.0 | 679.0 | 1 019.0 | 500.0 | 63.9 | 36.1 |
| - Canyon, bowatenne, etc. (on going) | 238.0 | 221.0 | 25.0 | - | - | 58.7 | 41.3 |
| Port, university buildings | 128.7 | 258.4 | 358.4 | 303.1 | 641.8 | 33.0 | 67.0 |
| Total | 6 551.2 | 7 840.7 | 8 834.0 | 9 591.2 | 8 100.4 | 58.2 | 41.8 |
| 10. Year to year - with 10 per cent inflation | | (+19.7%) | (+12.7%) | (+8.6%) | (-15.5%) | | |
| Change - less inflation | | (+8.8%) | (+2.4%) | (-1.3%) | (-23.2%) | | |

¹ Indicated expenditure on area project = Rs.460.1 million; construction component not known and excluded; Rs.245 million on gas turbine included, only a fraction of this would be in construction. Apart from these, comparatively minor expenditures on buildings, etc. are not included.

Notes: (a) The investments indicated also include expenditure on electro-mechanical equipment. This is appreciable particularly in the Mahaweli, water supply and tall building sectors. For instance, in water supply, civil engineering component is about 35 per cent of gross cost; but varies 50-70 per cent in sewerage, hydro-power, etc.

(b) Total public investment for 1980-84 = Rs.53,551 million. The investment indicated in the above table amounts to 63.5 per cent.

(c) Assumes 10 per cent increase in prices from year to year.

(d) There is a provision for spending up to Rs.3,000 million from debentures on urban development.

(e) Foreign costs probably exclude many indirect costs.

Source: Public Investment (1980-84), Ministry of Finance and Planning, May 1980, table 13.