

ECONOMIC REVIEW

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NATURAL RESOURCES

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CONTENTS

FEATURES

- | | | |
|-------------------------|----|---|
| <i>V. Selvaratnam</i> | 25 | Colonialism, Neo-Colonialism and Underdevelopment in Kenya. |
| <i>Dudley Disnayake</i> | 27 | Ivan Illich on De-Schooling Society |
| <i>Alain Vernay</i> | 31 | Justice by Index ? |

COVER STORY

- 3 Natural Resources Development

COLUMNS

- 2 Diary of Events
16 Banking and Finance
18 Foreign News Review
19 The Economy
20 Commodities
22 Industries
23 Agriculture
24 Management

NEXT ISSUE

- Transportation in Sri Lanka, a comprehensive survey of the transport system, its potential and degree of utilisation.
- The Common Market and Sri Lanka, a detailed coverage of the past, present and future relationships.
- Can the poor in poor countries afford their rich ?

COVER

Our cover is a well known photograph of Sri Lanka taken by the United States Gemini Craft and gives an astronaut's view of the Island. Satellite techniques are now being widely used for natural resource surveys.

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

THE ECONOMIC REVIEW is a community service project of the People's Bank. Its contents, however, are the result of editorial considerations only and do not necessarily reflect Bank policies or the official viewpoint. Signed feature articles also are the personal views of the authors and do not represent the institutions to which they are attached. Similar contributions as well as comments and viewpoints are welcome.

THE ECONOMIC REVIEW is published monthly and is available both on subscription and on direct sale.

DIARY OF EVENTS

- Sept. 1 World Finance Ministers agree in Washington that any of the 127 countries of the IMF could subscribe to a new gold agreement hammered out by a group of ten leading industrial nations. The Finance Ministers, at their annual IMF session agreed to a proposal of the IMF to sell a portion of its gold holdings to aid the developing nations.
- 1 The Ceylon Ceramics Corporation enters the world market in mosaic tiles when it sent out its first shipment of mosaic tiles to Singapore.
- 2 The recommendations for greater stimulation of the American economy to counteract world recession were rejected by U.S. President Ford, in an address to the Annual Assembly of the IMF.
- 2 A US \$4.5 million line of credit has been made available to Sri Lanka by the International Development Authority (IDA) for financing projects in the industrial, agricultural and tourism sectors, stated the Chairman of the Development Finance Corporation of Ceylon at the DFCC's nineteenth annual general meeting. These funds will be channelled through the DFCC.
- 4 Israel and Egypt formally undertook to put an end to hostilities for 3 years when they signed an interim disengagement agreement in Geneva.
- 5 The five-member association of South East Asian Regions (ASEAN) formed a Regional Petroleum Council to develop petroleum resources.
- 12 The U.S. Government will be supplying to India a total quantity of 500,000 tons of foodgrains during the current year (1975-76) on concessional terms. The value of the foodgrains amounting to about \$68 millions (Rs. 55 crores) will be repaid in dollars over 40 years, including a 10 year grace period and will carry a rate of interest of 1.5 per cent, it was announced in New Delhi.
- 16 Amidst strong reservations from the United States on major economic issues of acute concern to the third world, the U.N. General Assembly concluded its Seventh Special Session by adopting a resolution setting out a broad-based programme of measures designed to accelerate the development of poor nations through international co-operation.
- 18 The Manila based Asian Development Bank (ADB) announced that it had approved a US \$30 million concessional loan for Sri Lanka as part of the costs of the massive fertilizer project to be set up in Sri Lanka.
- 22 Egypt is to receive a loan of \$ 300 million from the International Monetary Fund (IMF) to reinforce the position of the Egyptian pound, Egypt's Economy Minister announced in Cairo.
- 23 South Vietnam's Provisional Revolutionary Government (PRG) announced the creation of a new currency to replace the old piaster, in a bid to rebuild her economy.
- 24 The Indian rupee was delinked from the pound sterling.
- 24 A plan of operations for a Dairy Production Improvement project for Sri Lanka was signed in Colombo between the F.A.O. and the Sri Lanka government. Sweden has committed US \$ 2,127,000 to the project.
- 27 The 13-member Organisation of Petroleum Exporting Countries (OPEC) announced a ten per cent increase in crude oil prices from October 1, and to freeze them at that level until June 30, 1976.
- 29 Inflation, high fuel costs and even mismanagement will cause the world's airline industry to fall \$ 1.4 billions short of its goals by the end of 1975, states an official report released in Oslo. In an effort to offset these losses, passengers may be forced to pay upto 16 per cent more in air fares on most routes.
- 30 The Trade and Development Board of UNCTAD was reconvened for a few days in order to finalise the provisional agenda of the Fourth UNCTAD Conference which will be held in Nairobi from 3 to 28 May, 1976.
- 30 Sri Lanka's Prime Minister inaugurates the eighth Asian Regional Conference of the I.L.O. in Colombo attended by over 250 delegates representing 27 governments, 15 inter-government organisations and 11 non-government organisations.

"The forest is a peculiar organism of unlimited kindness and benevolence that makes no demands for its sustenance, and extends generously the products of its life activity; it affords protection to all beings, offering shade even to the axeman who destroys it".

Lord Buddha (6 B.C.)

"In my kingdom are many paddy fields cultivated by means of rain water, but few indeed are those which are cultivated by means of perennial streams and great tanks.

By rocks and by many thick forests, by great marshes in the land covered.

In such a country, let not even a small quantity of water obtained by rain, go to the sea without benefitting man".

Parakrama Bahu I (1153 - 1186 A.D.)

"These wild creatures amidst the wild places they inhabit are not only important as a source of wonder and inspiration, but are an integral part of our national resources and of our future livelihood and well-being".

Julius Nyerere (Arusha, Sept. 1961)

NATURAL

RESOURCES

DEVELOPMENT

Ecosystem and the Flow of Energy

If we examine these words we find that some denote life, or are words that we associate with life, like plants, animals and man. Others, such as water, air and minerals have no life. Plants are the agents that convert solar energy, with carbon-dioxide from the atmosphere, water from the soil, in the presence of chlorophyll present in its leaves, to high-energy compounds such as starch, cellulose, protein and so on. This process is called photosynthesis. Out of this energy assimilated by plants, the plants themselves use a considerable amount for their own use, that is, they add to the growth of the plant; the remaining portion is passed on to animals or man in different plant products like leaves, fruits, seeds, roots etc. A forest fire represents the sudden release of this stored energy. Fortunately, it is usually released more gradually, by two different routes, along what is called the consumer pathway and the decomposer pathway. In the consumer pathway, the living plant material is eaten by some herbivorous animal, like a caterpillar, or a rabbit or a cow; and in turn this animal may be eaten by a flesh-eating or carnivorous animal like a leopard, which may sometimes be eaten by another carnivore (Fig. 1).

In the decomposer pathway, dead plant or animal material is used as

food by bacteria or fungi or soil animals such as earthworms. At each step in either pathway the pattern of energy transfer is broadly similar. Of the food eaten by an animal, the largest part is used to

keep the animal alive, and of the rest, some is passed out as faeces and some go to form new body tissues, either in growth or reproduction. At each stage in such a food chain energy is dissipated by the life processes like

The flow of energy in an ecosystem

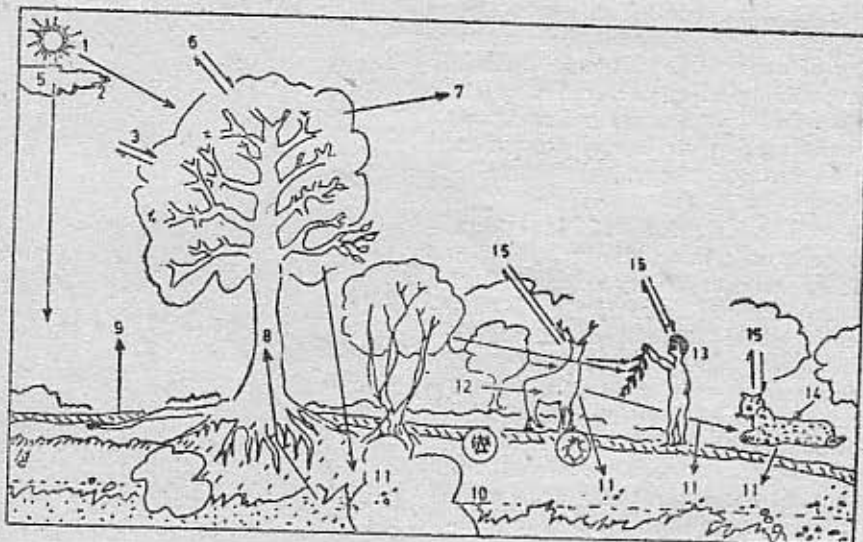


Fig. 1

1. Sun. 2. Clouds. 3. $\begin{matrix} \nearrow CO_2 \\ \searrow O_2 \end{matrix}$ Photosynthesis. 4. Chlorophyll (leaves). 5. Rain.
6. $\begin{matrix} \nearrow O_2 \\ \searrow CO_2 \end{matrix}$ (Plant) respiration. 7. Transpiration—Water Vapour. 8. Water.
9. Water evaporated from earth's surface. 10. Soil. 11. Decomposition of plant/animal material. 12. Herbivorous animal. 13. Man. 14. Carnivorous animal.
15. $\begin{matrix} \nearrow O_2 \\ \searrow CO_2 \end{matrix}$ Animal respiration.

respiration. The difference between the energy intake of an animal in the form of food and the production of new animal matter is known as the conversion loss. These conversion losses are invariably large. If you think of grass equivalent to 100 calories of energy going to form 10 calories worth of herbivore flesh which in turn forms one calorie of carnivore flesh, this is about the right order of magnitude. In the decomposer pathway when plants and animals die, micro organisms like bacteria breakdown these complex substances with which their bodies were formed, into simpler substances that produced them, that is, into carbon-dioxide, water etc. and the energy is released. Carbon-dioxide returns to the atmosphere or is absorbed by water bodies like the ocean; much of the water is again evaporated and comes back as rain, while the energy is let into space. Energy lost in this manner is always replenished by that never ending source—the sun. Most of the others are used again or re-cycled at some stage or other. There is therefore a close inter-relationship between those that have life, like plants and animals, with those that do not, like carbon-dioxide, water, oxygen etc. and that all these form part of a system or process. Such a system is called an Ecosystem or an Ecological System. An important process going on in any ecosystem is the flow of energy.

Another question which occurs in this connection is “what is a natural ecosystem” or perhaps “what is an unnatural ecosystem”? Is the Beira Lake in Colombo or the city of Colombo itself a natural ecosystem, or has it somehow been rendered unnatural, or at least impure? Is the Ruhunu National Park managed for recreational and aesthetic objectives, a natural ecosystem? Does the very act of management render an ecosystem unnatural. Thus, natural resources available to man, are intimately connected with ecological considerations.

Natural Resources

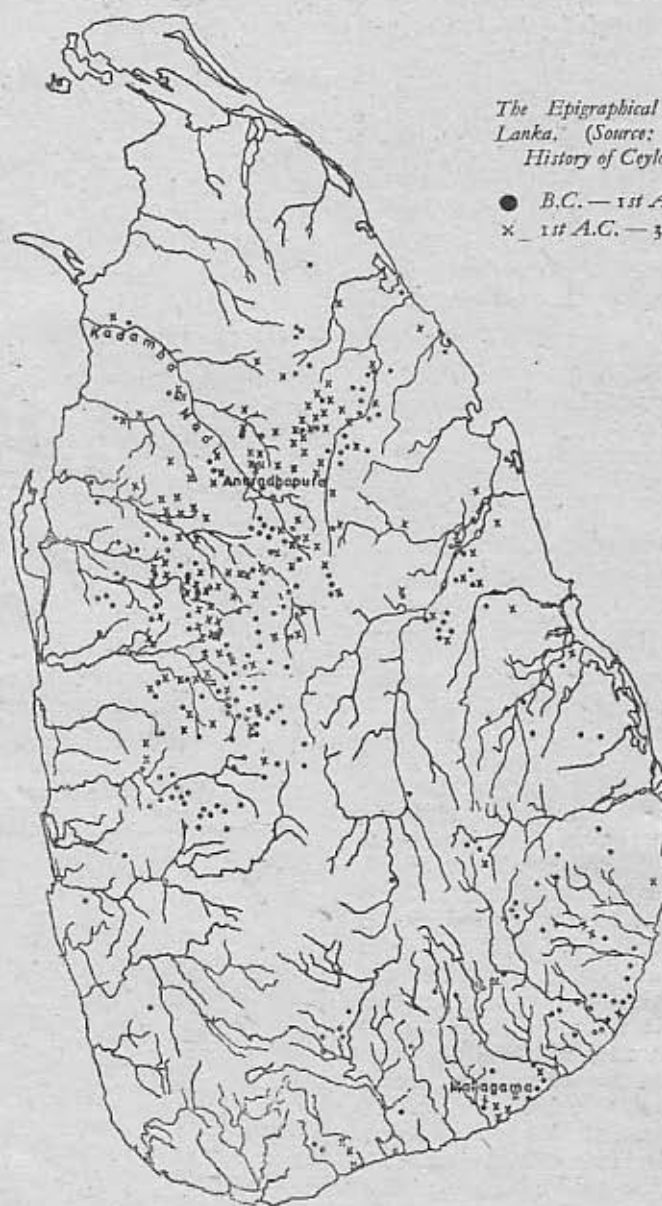
A natural resource ecosystem has been described as an integrated ecological system, one element of which is a product of direct

or indirect use to man. The produce may be biological as in the case of forests, grasslands, agricultural products, fish and wild life; physical, as in the case of water, air and soil or both. In all cases, the distinguishing facet of a natural resource ecosystem, is that man has a direct involvement in the complex set of ecological interactions.

‘Man has a direct involvement’ and that is a point that should be empha-

sised, that no ecosystem, natural or unnatural, can escape from this involvement.

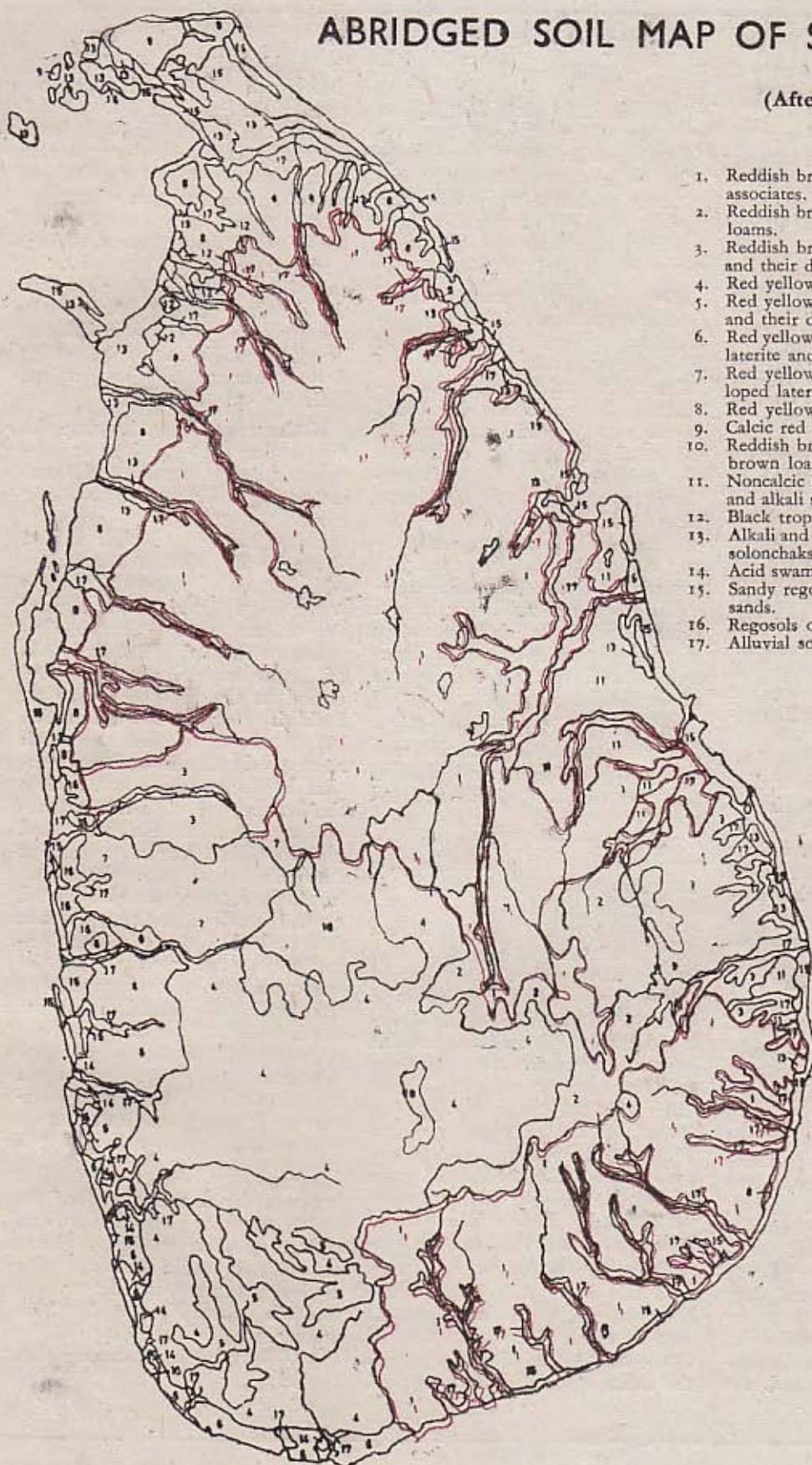
A natural resource might be defined as anything found by man in his natural environment that he may in some way utilize for his own benefit. Natural resources thus include minerals, fossil fuels, and radio-active energy sources, water and soil, as well as the native vegetation and indigenous wild life. It also includes



Map 1

ABRIDGED SOIL MAP OF SRI LANKA

(After C. R. Panabokke)



1. Reddish brown earths and their drainage associates.
2. Reddish brown earths and immature brown loams.
3. Reddish brown earths, noncalcic brown soils and their drainage associates.
4. Red yellow pedzolic soils.
5. Red yellow pedzolic soils with prominent A₁ and their drainage associates.
6. Red yellow pedzolic soils with well developed laterite and their drainage associates.
7. Red yellow pedzolic soils with weakly developed laterite and their drainage associates.
8. Red yellow latosols.
9. Calcic red yellow latosols.
10. Reddish brown latosolic soils and immature brown loams.
11. Noncalcic brown soils, soils on old alluvium and alkali soils.
12. Black tropical clay soils (grumusols).
13. Alkali and saline soil (solodized solonetz & solonchaks).
14. Acid swamp soils (bog and half bog soils).
15. Sandy regosols on recent beach and dune sands.
16. Regosols on old sands.
17. Alluvial soils.

Map 2

Ancient Sinhala Settlements in Relation to Natural Resources

That the availability of natural resources like fertile soil and water suitable for the growing of a variety of crops was a *sine qua non* for the establishment of dense settlements, can be shown by a study of the sites of the early Sinhala settlements. From about the 6th or 5th century B.C. waves of immigrants seem to have landed particularly along the N.W. and S.E. coast of the island. This is about some 300 years before the date to which the earliest epigraphical monuments in Sri Lanka can be assigned. If the site of an inscription is assumed to indicate that it was on or near a settlement of that period, then, the distribution of these inscriptions gives an indication of the settlement pattern at that time. The spatial patterns of arrangement of the sites of the early Brahmi inscriptions, indicates, that by the 3rd or 2nd century B.C. the ancient Sinhala people had explored practically the whole island.

C. R. Panabokke in his studies of the soils of Sri Lanka has shown that the soil type known as the Reddish Brown Earths and their Drainage Associates, found in the Dry Zone are not only the most important soils of this country in relation to the extent they occupy, but also the most fertile, when compared with others of the Dry Zone. The drainage characteristics of this soil, in relation to the topography of the Dry Zone, is probably the most important single factor that determines its ecological adaptability to certain ranges of agricultural crops grown in the well drained, imperfectly drained, and poorly drained sub types of this soil group. Now, this differentiation very closely approximates the local differentiation of soils, as empirically evolved by the traditional Dry Zone farmer viz. *goda bima* corresponding to the well drained soils, *vel-bena*, corresponding to the imperfectly drained soils and the

vel-yaya corresponding to the poorly drained soils. Similarly a study of the soils and their distribution reveals a whole range of meaningful information of a diverse range of soils that occur throughout the country and the way Man had made use of them, and in turn, how the characteristics of the soils themselves had influenced Man.

The Reddish Brown Earth soil type occurs mostly in the Anuradhapura, Polonnaruwa, Vavuniya, Hambantota and parts of the Moneragala and Trincomalee districts. These soils are developed in an area of undulating terrain where the bedrock is composed of impermeable strata of Precambrian age. Such land permitted the development of the classical surface drainage tank system, and the gravity irrigation was essentially confined to the relatively less permeable, low humid clay soils of the shallow valley bottom; the main irrigation channels located on the lower aspects of the landscape.

In the flat landscape of the Mannar district where the infertile Grumusols and saline and alkaline soils named the (Solodized Solonetz) occur, very little irrigation development took place, as this type of soil is unsuitable for the cultivation of food crops. Even the few irrigation projects in this region e.g. the Giant's Tank, showed that the storage tank and the main irrigation channels had to be located and aligned in a different manner from those developed in the region of the Reddish Brown Soils in the Anuradhapura and Polonnaruwa districts. The chief reason, perhaps, was the absence of the hard gneissic rock outcrops on which it found the ends of the bunds, and the absence of rock foundation which was considered indispensable where large bodies of water had to be discharged.

In the areas that contain the Latosols, which are developed on marine sandy loam deposits of Quaternary Age, found between the saline and alkaline soils and

the Reddish Brown Earths, along the North West and Northern areas of the Puttalam, Mannar and Jaffna districts, there had been practically no settlement in the past, because of very obvious reasons. Construction of surface storage reservoirs was not possible in this very porous, freely draining, medium to coarse, textured soils; and also because of the fact that the deeply located ground water resources they contain could not be exploited, by any of the earlier devices known to the Ancient Sinhala civilization.

If the two maps showing the distribution of the Brahmi Inscription and Soils are compared, some interesting and thought provoking correlations emerge. The early Sinhala immigrants who landed along the North West Coast arrived in an area of poor soils, meagre water supply, and sparse natural vegetation. Hence they had to penetrate further inland in search of better natural resources and settled in the area of the richer Reddish Brown Earths, which supported a forest ecosystem much more productive than the vegetation bordering the coast. Thus the first large settlements in Rajarata were established in and around Nuwara Kalaviya with its centre at Anuradhapura. On the other hand, the immigrants who landed on the South East Coast did not face such difficulties in establishing settlements not far from the coast, because of the presence of the productive Reddish Brown Earth Soils in the vicinity. This is exemplified by the sites of the more important early settlements in Ruhuna such as Mahagama, Kajaragama (Kataragama) and Cittalappabata (Sithulpahuwa).

There is a direct connection between the characteristics of the soils, sites of habitations and technological knowledge. A glance at Maps 1 and 2 indicates that settlements were mostly on the Reddish Brown Earth soils which were workable according to the state of technology during that period.

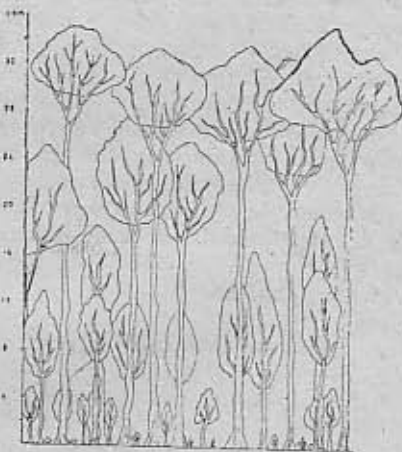


Fig. 2—Profile of tropical lowland rain forest.

the land and landscape, the atmosphere, the ocean and solar energy. They might be classified as non-renewable or fund resources and renewable or flow resources. Renewable resources include water, soil and vegetation and non-renewable as fossil fuels, minerals and radio-active energy sources. Natural resources might also be classified into marketable products, coal, timber, fish etc. or amenities, as harbours, waterfalls or scientific and aesthetic values which are not marketable in the accepted sense.

The resources listed above might be considered "natural" if they are provided by nature in the place where they are or may be used or put into useful form. In these terms we might classify a Dry Zone forest of palu (*Manilkara hexandra*), wira (*Drypetes sepiaria*), burutha (*Chloroxylon swietenia*) and kaluwara (*Diospyros ebenum*) trees as a "natural" ecosystem and a teak plantation on cleared Dry Zone forest as an "unnatural" one. In practice, the distinction becomes academic, it is difficult to identify the point at which this condition of being "natural" ceases to exist, and many would think of a teak plantation as a way of managing what is basically a natural ecosystem.

The concept of what constitutes a natural resource or a natural resource ecosystem varies according to man's capacities, interests and objectives. The concept is a dynamic one that changes with the needs of man, the state of his technology, and

the choices he is prepared to make in order to achieve his aims. Two hundred years ago, coffee plants which grew wild in the Kandyan Hills, were not used for the preparation of a beverage from its beans, but only its tender leaves made into curries, and its delicate jasmine-like flowers for ornamenting temples and shrines. Similarly, the apatite ores found at Eppawala, which are a good source of natural phosphate fertilizer were unknown till about 10 years ago and hence were insignificant natural resources. If there were any Sri Lankians still living in the twenty-fifth century, they will possibly consider

One of the crucial elements in these is natural vegetation. In the paragraphs below we will attempt to show how this resource could be, and is being put, to use in Sri Lanka.

Vegetation can be defined as the mosaic of plant communities in the landscape. Plant communities consist of species that represent one or several of growth forms like trees, shrubs, grasslike plants (graminoids) and others. The spatial distribution pattern of these growth forms of a plant community is called the structure of the plant community. Figs. 2, 3, and 4 illustrate the structure

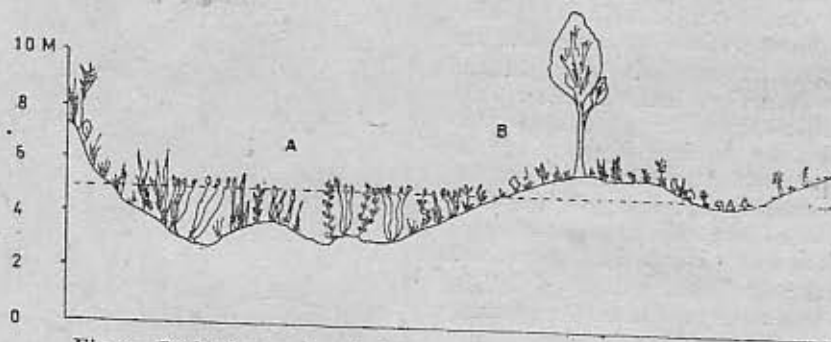


Fig. 3—Profile diagram of tropical lowland seasonally flooded grassland (Villu)

the mud dug from the Beira Lake as a valuable natural fertilizer resource, or the rubble that was once the Colombo Fort a useful natural resource of building material.

Natural Vegetation—Flora—Plant Community

From the foregoing description it is seen that natural resources are composed of a number of elements.

ure of three plant communities of Sri Lanka viz. Tropical Lowland Rain Forest, Upland Savanna (Talawa) and Seasonally flooded grassland (Villu).

Plant Succession and the Climax

Vegetation is natural, when it has not been disturbed appreciably by man. This of course is different from primeval vegetation or that which has not been influenced by man at all.

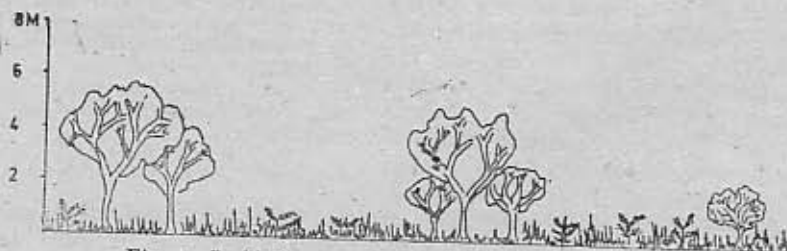


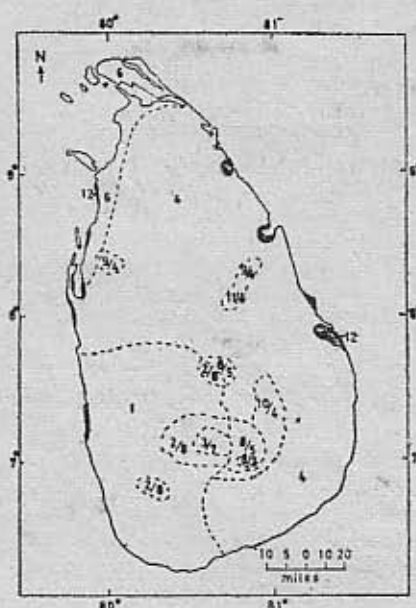
Fig. 4—Profile diagram of Upland Savanna: (Talawa)

Man can destroy the natural vegetation by firing, felling, ploughing etc. but when the land is abandoned the original natural vegetation will return in most instances, by a number of stages. In this way one plant community gradually replaces another till such a condition is reached when no change in its structure would take place. Such a change would occur only with human activity or climatic change or other natural cataclysm such as a landslide. This process of one plant community replacing another is called plant succession and the stage when no change occurs as the climax. Where the climax is in equilibrium with the climate of the area it is called a climatic climax; and good examples of this type of vegetation is the Sinharaja forest in the Wet Zone and the areas of undisturbed forest in the Dry Zone. When, however, the climatic climax stage of vegetation cannot be reached because of the influence of repeated human activity like clearing and firing or the condition of the soil or a number of such factors it is called a biotic climax or edaphic climax respectively. The sub montane grasslands (dry patanas) are a good example of a biotic climax while the Villu or seasonally flooded grasslands in the Tamankaduwa area is an edaphic climax. A good example of plant succession is the sequence of plant communities that takes place in an abandoned chena in the Dry Zone. During such a succession plants like *wara* and *ranawara* give way in a series of successions till the environment is again favourable for the growth of the climax species like *pala*, *weera*, *burutha*, *halmilla*, *kaluwara* etc. The time taken to complete this process will vary according to a number of factors, the most important of which is the condition of the soil and climate. Studies in the regeneration of abandoned chenas in the Dry Zone have shown that it takes nearly fifty years for the climatic climax stage to be reached. Certain terms used by villagers of the North Central Province to denote types of land at various stages of recuperation after a chena had been abandoned, indicates the villagers recognition of the phenomena of plant succession, and its influence on the characteristics of the soil. These words are as follows: *Kanatte* — an abandoned chena, *Lande* — 2 3 to 4 year old

abandoned chena. *Hirilande* — a 5 to 6 year old abandoned chena jungle, *Attanduwa* — a medium jungle superior to ordinary jungle, suitable for chena cultivation, and from 10-20 years old, *Mukalana* — a high jungle. The above description shows that the natural vegetation is actually there to be observed or it exists potentially.

In Sri Lanka to day, most of the natural vegetation except for a few significant types are potential rather than actual. Hence the map of the principal plant communities (Map 3) by N. P. Perera, shows in many areas

Map 3



The distribution of the Principal Plant Communities in Sri Lanka (after N. P. Perera)

1. Tropical lowland rain forest.
2. Tropical sub montane rain forest.
3. Tropical montane rain forest.
4. Tropical lowland seasonal rain forest.
5. Tropical sub montane seasonal rain forest.
6. Tropical thorn forest.
7. Tropical montane grassland (wet patana)
8. Tropical sub montane grassland (dry patana)
9. Tropical lowland seasonally flooded grassland (Villu)
10. Upland Savanna (Talawa)
11. Lowland Savanna (Damana)
12. Mangroves

the potential distribution of plant communities. This map is self-explanatory, except on those occasions when two plant communities occur together, as for example in the case of tropical submontane seasonal

rain forest and submontane grasslands, which at times form a matrix of vegetation, in which each retains its discrete character. Usually in these instances 'islands' of one type are embedded in a matrix of the other variety, in which case the more widespread and abundant community is indicated above the other; thus 8/5 denotes 'islands' of submontane seasonal forest in a matrix of submontane grasslands.

The Value of Natural Vegetation

Natural Vegetation therefore, is the key to the utilization of all land, especially with regard to crop production, range management, forestry, land use planning and much ecological research. There is an intricate relationship between the various plant communities and the physical and chemical environment. This is because vegetation is not simply the result of given climatic and edaphic conditions; but also because Vegetation, in turn, quite directly, affects and modifies these environmental factors; examples of which will be discussed later. Natural vegetation itself, is the best and the most logical foundation on which to base an inquiry into the ecological conditions of the landscape, as it alone expresses the intricate inter-relationship between all factors of the environment.

Trees and the Forest Ecosystem

Forest and woodland are the most extensive, complex and biologically productive of the terrestrial ecosystems. It has been estimated that formerly they covered at least two thirds of the Earth's surface, and although now reduced to almost half their original extent, they still occupy an area, greater than that of the world's agricultural land. They occur over a wider range of ecological conditions than any other type of vegetation. Producing the largest biomass or the volume of organic matter, per acre; their impact on atmosphere and soil is correspondingly great. At the peak of production their annual rate of photosynthesis probably approaches the maximum that can be achieved by plant growth for a particular site; and in this efficiency of the utilization of solar energy it has been said that they are com-

parable to the highest yielding crops. Forests, therefore constitute one of the basic primary resources.

The Forest as a Resource

The forest is one of the most valuable of man's natural resources. The size and complexity of the forest ecosystem is reflected in a variety of products and a diversity of uses unrivalled by any other type of biological community.

The nature and value of forest resources vary, dependent on the type of forest, and relative importance and competition from other resources and not least the stage of economic and technological development of the areas in which they occur. The original and still the major use of the forest is as a direct source of such primary biological products as wood, food and fodder, and a variety of wood extracts among which gums, resin, latex, dyes, tannin and medicinal substances are the most important. Wood which forms the bulk of the forest biomass, however, still retains top priority. Until the dis-

covery of coal and later oil, wood was the only source of fuel. Today, in spite of the production of other natural and synthetic substances, wood retains its importance as a constructional material. Finally its main constituent, cellulose, is the chemical basis for a wide range of products not least of which are alcohol, paper and rayon. In spite of recent changes in the value of wood as a resource, J. D. Ovington in 1965 estimated that of the world's harvested wood, 42% is used for firewood, 37% for construction, 4% for pit-props, 11% for pulp and 6% for other purposes.

The value of forests as a source of primary food is small in relation to their high level of biological productivity. Relatively little of their total biomass is edible by man and what there is, is mainly confined to fruits and seeds. Forests have long been an important source of animal forage supplied either by the herbaceous undergrowth or by the leaves of woody plants. In the Dry Zone of Sri Lanka much of the fodder of domesticated livestock is provided by shrubs and herbaceous plants.

The possibility of using forests more effectively as a direct source of food stuffs—particularly of edible protein—is being given serious consideration. One of the as yet untapped sources is *leaf protein*; as described in an earlier issue of the *Review*. Leaves from an acre of forest can contain half to one and a half tons. Extraction and processing from fresh leaves has been carried out and the product is as nutritionally valuable as animal protein and is superior to seed protein. Potential sources are available in forests presently felled for timber and pulpwood.

The Forests of Sri Lanka

The report of the Land Utilization Committee estimated (Table 1) that in 1967 the area of cultivated land in Sri Lanka was about 40 lakhs of acres or 25% of the total land surface. Of the remaining area 71.5 lakhs or 44% was forest, 24.6 lakhs or 15% Chena lands (used for shifting cultivation) and 10.5 lakhs or 6.4% grassland or shrub land. Much of the uncultivated land is in the Dry Zone.

TABLE I
SRI LANKA
Distribution According to LAND-USE Categories

| | Wet Zone | | Intermediate Zone | | Dry Zone | | Total Sri Lanka | |
|--|-----------|-------|-------------------|-------|-------------|-------|-----------------|-------|
| | Acres | % | Acres | % | Acres | % | Acres | % |
| Developed permanent grasslands ... | 2,370 | 0.1 | 1,110 | — | 2,680 | — | 6,160 | — |
| Damana grasslands ... | — | — | 210 | — | 1,99,970 | 2.0 | 2,00,180 | 1.2 |
| Kekile fernlands ... | 35,390 | 0.9 | 80 | — | — | — | 35,470 | 0.2 |
| Patana grasslands ... | 1,06,360 | 2.8 | 58,120 | 2.5 | 1,310 | — | 1,60,790 | 1.6 |
| Savanna ... | 9,800 | 0.3 | 85,520 | 3.9 | 97,060 | 1.0 | 1,90,440 | 1.2 |
| Scrub land ... | 25,200 | 0.7 | 13,070 | 0.6 | 2,09,950 | 2.0 | 2,49,220 | 1.6 |
| Villu grasslands ... | — | — | 90 | — | 62,440 | 0.6 | 62,530 | 0.4 |
| Other grasslands ... | 6,660 | 0.2 | 860 | — | 1,45,860 | 1.4 | 1,53,380 | 0.9 |
| High yield Wet Zone Forests ... | 28,940 | 0.8 | — | — | — | — | 28,940 | 0.2 |
| Medium yield Wet Zone Forests ... | 1,16,620 | 3.1 | — | — | — | — | 1,16,620 | 0.7 |
| Low yield Wet Zone Forests ... | 2,58,750 | 6.9 | — | — | — | — | 2,58,750 | 1.6 |
| Non productive Wet Zone Forests ... | 1,57,960 | 4.2 | — | — | — | — | 1,57,960 | 1.0 |
| Medium productive Intermediate Forest Zone ... | — | — | 18,700 | 0.9 | — | — | 18,700 | 0.1 |
| Low productive Intermediate Forest Zone ... | — | — | 1,30,690 | 6.1 | — | — | 1,30,690 | 0.8 |
| Non productive Intermediate Forest Zone ... | — | — | 1,71,440 | 7.9 | — | — | 1,71,440 | 1.1 |
| Medium productive Dry Zone Forests ... | — | — | — | — | 3,75,960 | 3.6 | 3,75,960 | 2.3 |
| Low productive Dry Zone Forests ... | — | — | — | — | 31,30,240 | 30.4 | 31,30,240 | 19.5 |
| Non productive Dry Zone Forests ... | — | — | — | — | 26,91,590 | 25.1 | 26,91,590 | 16.6 |
| Mountain Forests ... | 34,000 | 0.9 | — | — | — | — | 34,000 | 0.2 |
| Forest plantations ... | 21,830 | 0.6 | 12,780 | 0.6 | 15,210 | 0.1 | 49,820 | 0.3 |
| Marsh lands ... | 26,250 | 0.7 | 5,260 | 0.2 | 49,510 | 0.5 | 81,020 | 0.5 |
| Unproductive lands ... | 7,450 | 0.2 | 5,570 | 0.3 | 93,620 | 0.9 | 1,06,620 | 0.7 |
| Salterns ... | — | — | — | — | 6,100 | 0.1 | 6,100 | — |
| Water surfaces ... | 40,270 | 1.0 | 33,550 | 1.6 | 4,25,990 | 4.1 | 4,99,810 | 3.2 |
| Total | 37,67,070 | 100.0 | 21,52,690 | 100.0 | 1,03,08,470 | 100.0 | 1,62,28,250 | 100.0 |

Source: Report of the Land Utilization Committee Sessional Paper XI of 1968.

A study of this table shows that in the Wet Zone there is very little forested land that can be cleared for cultivation. This is also the region of rapid population growth and the advance of urbanization. In this process, more and more of the existing cultivated land will be used for building homes, factories and service centres. The transformation of the coconut estates that were bordering Galle Road between Ratmalana and Moratuwa about 20 years ago and the village homestead gardens in and around Nawala, Kotte, Nugegoda and Maharagama can be cited as good examples of this process of land utilization with urbanization. It is the Dry Zone forest, about 60%, that still remains to be exploited. But

of this, even the medium productive forest is only 3% and this is found in the area of reddish brown soils—the only soils except in some of the alluvial areas, which are suitable for future cultivation. In fact, much of the remaining area of forest in the region of these soils will be cleared, in the next few years, when the Mahaweli waters reach the North Central Province, and later the Northern Province especially in the Vavuniya district. It is seen, that within the pace of a few years, the Dry Zone forest will be greatly reduced.

SOIL EROSION and CONSERVATION

Land completely covered with vegetation, whether grass shrubs or trees

is an ideal condition for resistance to erosion and absorption of rainfall. When man first came to Sri Lanka most of the country was covered in varying density by either forests savanna or grassland. During the Kandyan period (1509-1815), in almost every province, there were the *Tahansikele* or *Rajasanthaka Kele* in which no chena could be cleared and was preserved solely for defence purposes. But in 1882 D' Vincent in his report on the forests of Ceylon, stated that this protective forest could not be traced and very little remained in regions below 5,000 feet. With the growth of the plantation industry much of the forests in the Hill Country were soon cleared. Ernst Haeckel in his book 'A Visit

Influence of Forests on Climatic and Water Supplies

In 1929 the government set out the main objectives of forest policy in Sri Lanka as

1. To provide those beneficial influences on climate, soil and water which results from the presence of forests.
2. To ensure a sustained yield of timber, fuel and other forest products to meet the needs of the nation.

The indirect influences of forests are themselves adequate reasons for the maintenance and creation of forests and other forms of wild vegetation. Many of these benefits are real, but intangible, and easily overlooked in a balance sheet. Perhaps, the first question that arises in most minds when considering the influence of forests on climate, is what influence forests have on rainfall. One school of thought considers that forests increase both the abundance and frequency of local precipitation over the areas they occupy; while others mainly meteorologists, harbour doubts on this matter. However, D. Mueller-Dombois of the Smithsonian Institute Ecology Project in Sri Lanka, has demonstrated, by an analysis of the daily rainfall in the Horton Plains, that there was

more water under trees during March and April than that collected in rain gauges in the open patana land adjoining the forest, during these months. In May, the amount was about equal, and during June and July more rain-water was received in the rain gauges in the open, than inside the forest. This shows that the clouds moving across the 7000 foot level of the Horton Plains does not always issue rains during March-April. Nevertheless, the trees comb out the super-saturated air and droplets precipitate on tree branches and leaves, that then recharge the soil beneath. March-April is the time before the onset of the South West Monsoon and during this relatively dry period between 120,000 to 100,000 gallons per acre are deposited on the forest floor than are delivered on adjoining patana grassland or crop land. In contrast during the South West Monsoon period June - July, when there is plenty of water, the forest floor seems to receive less. This appears to be due to alternating broadcast shower activity and sunshine, the latter resulting in greater evaporation from tree crowns of the intercepted rainfall. This gives an impression of the importance of the Montane forest at Horton Plains in the regularization of the stream flow particularly of the Mahaweli ganga and Walawe ganga which have their head-

streams in this region. Actually, these two rivers provide a high proportion of the irrigation water of this country. Changes in the water budget in this manner, are clearly much more important, than any effect on precipitation, and these also include increased run off followed by accidental soil erosion and decreased ground water, thus leading to a hydrological rather than a meteorological drought.

Because of the stronger winds in cleared areas, deforestation has frequently been followed by soil erosion. The deliberate planting of trees to provide a well disguised wind break, brings not only protection from damaging winds, but as a consequence of these, higher humidities, and reduced evapo-transpiration rates are experienced. Experiments carried out by the Forest Department in the Uva Basin in the planting of Eucalyptus for shelter and timber show that during the May - August period of strong dry winds in this region, the average wind velocity was reduced to a quarter of the open velocity at distances upto 10 times the height of the trees. The influence of these belts on wind velocity has contributed considerably to the conversion of the sub mountain grasslands (dry patanas) into prosperous areas of vegetable cultivation, particularly around Palugama (Kepppetipola).

to Ceylon' published in 1883 describes how the forests were annihilated by felling and burning so that after the fire had completed its work, the land was covered with black logs, lumps of charred timber, masses, and often great fragments of stones, broken by the heat that had swept over them. This is further substantiated by Ferguson in his book 'Ceylon in 1903' when he wrote

"Money was sent out to Ceylon, to fell its forests and plant them with coffee, and it was returned in the shape of copious harvests to the home capitalists, leaving in some cases only the bare hillsides from whence their rich harvests were drawn".

Much of the land that was cleared and not replanted and where no soil conservation measures were taken, reverted not to forest but to patana grasslands. This happened mainly because, since the top soil was washed away the indigenous tree species found it extremely difficult to germinate and grow in competition with the patana grass *mana*—*Cymbopogon confertiflorus*. It can be shown that many areas of the sub montane grasslands (dry patanas) were actually formed during the early British times and that this process is taking place even today. Although it is not possible to restore the original conditions of vegetation and at the same time maintain the nation's agricultural economy, measures taken to conserve soil and water must be patterned, as far as possible, after nature's own methods of soil conservation. This means the maintenance of a protective cover of vegetation, or a protective mulch over much of the land as possible. Erosion during the early British period was probably so extensive, that laws were passed during this period that at least, all the land over 5000 feet that were not cleared, should be left intact, and that vegetation bordering streams passing through estates should not be cleared.

The landslips that occurred in the Kotmale Valley and land subsidence that occurred in certain parts of the Central High lands focussed attention on the need for effective soil conservation measures and a soil conservation division was established in the Department of

Agriculture. The Soil Conservation Act was passed in 1951 and the provisions of this Act are applied in the upper catchments of the Mahaweli Ganga and Kelani Ganga. The lands above 5000 feet actually form only a very small percentage of the area of Sri Lanka, but even much of this area has been cleared in the region of the Horton Plains, Moon Plains and Elk Plains. There are several reasons why close-growing vegetation and vegetative debris, such as crop residues are highly effective in checking soil and water losses. In the first place, such cover serves to reduce or eliminate the direct impact of the rain on the soil surface. When even a drop of rain strikes bare soil, particles are agitated and loosened by the splash effect and the finer ones are thrown into suspension to be floated away in the runoff water. By sheltering the ground surface with vegetation or vegetative debris, this step in soil wastage is controlled. The speed of water flowing over the surface is checked by the numerous stems and leaves of a dense stand of vegetation or by the vegetal litter left or placed on the surface of the ground. This reduction in the speed of run off greatly decreases its power to pick up and carry off soil particles, while allowing more time for the water to penetrate the Earth. As a number of the rivers of Sri Lanka which supply water to the large irrigation schemes have their source in these areas, it is essential that the headwaters of these rivers should be protected from excessive soil erosion.

The Value of the Conservation of Natural Fauna and Flora

Another reason is, that this wild landscape has a peculiar fauna and flora which must be preserved, not only for the beauty of these areas for recreation, but also as a gene reserve pool to be utilized in fighting the pests and diseases that ravage cultivated crops. The wild vegetation, especially the different types of Tropical Rain Forest, is a reservoir of great genetic diversity, which in the past had influenced the pattern of plant and animal evolution throughout the world. Hence, there are very strong reasons to conserve at least a degree of this diversity. Firstly, it is important to preserve the wild relatives of domesticated plants, as rela-

tives of those domesticated, retain resistance characteristics, lost in the increasingly specialized domesticated ones, and hence, more susceptible, to pests and diseases.

Secondly the tropical forests have many plant species, which are at present unused by Man, which may have value in the future. These include food and fibre plants as well as animal fodders. Also new phytochemical compounds are being found which have value as medicines. The minimum extent of forest cover required to serve as adequate protection for the soil and water resources will depend inter alia on the intensity and amount of rainfall, the form of the land and the liability of the soil to erosion.

In Sri Lanka the protective role of the forest must assume greater importance in the Wet Zone where the rainfall is high and the terrain generally steeper than in the Dry Zone. Fortunately the main plantation crops that replaced the forest in the Wet Zone were rubber and tea, much of which were well managed and maintained.

Natural Vegetation and Wild Life Conservation

Soil conservation and wild life conservation both depend fundamentally on the re-establishment and maintenance of protective stands of vegetation. Each, therefore, may make important contributions to the other. The term wild life used here is restricted to undomesticated animals—mainly mammals, reptiles, birds and fish. The basic essentials of existence of such animals are cover, food and water. Without exceptions, all wild life must have cover of some sort, cover into which it may dart when attacked by an enemy, cover in which to sleep, or in which it may find protection from the elements. This cover must also be in such proximity to their food supplies that they will not be unduly exposed when feeding. Without exception, all wild life must have adequate food at all seasons to survive, be they be herbivorous, carnivorous or omnivorous. In the balance of nature, one cannot exist without the other, for if carnivorous animals are greatly reduced, the herbivorous animals will multiply at a rapid rate without their natural

enemies. The increased numbers of the herbivorous animals will in turn, have an effect on the vegetation, and change its composition. The effect animals have had on the vegetation of the Ruhunu National Park in relatively recent times has been recorded by C. W. Nicholas in his Administration Report of the Wild Life Department in 1953. It is well to quote this observation here.

"To those acquainted with the Yala Strict Natural Reserve and the National Park over the past 25 - 30 years, an impressive development during this period has been the gradual extension of the forest into the plains. The writer (Nicholas) recalls the Mahapelessa and Vepandeniya plains with scarcely a tree on them: today Mahapelessa is heavily overgrown with trees and Vepandeniya is nearly covered with bushes. Similar invasions of parklands by forests have occurred at Potana, Pillinawa, Agra Eliya, Buttawa and Silawa. Under natural conditions, such as have prevailed in the Yala area for the past 500 years or more, there is an intimate relation between the grasses and the herbivorous animals. The latter maintain the boundaries of the grasslands by nibbling and trampling the seedlings and young plants which have grown up from seeds which have fallen, or deposited outside the forest verge and are competing for space with the grasses.

In this competition the grasses will hold their own against the invading tree or shrub seedlings provided there are sufficient animals to destroy the latter. But if the animal population decreases appreciably by human interference, migration, disease or other cause the forest will invade the plains".

The two largest National Parks in Sri Lanka, are the Wilpattu, in the area between Puttalam and Mannar and the Ruhunu National Park in the South East. Today, in Sri Lanka there is a growing battle between those that maintain that these Reserves should be extended and those who say that they be brought under the plough. From the point of view of agriculture both these areas are only for marginal use as the soils they contain are not highly productive for agriculture, especially in the Wilpattu area.

The areas of the richest soils in the Dry Zone i.e. the Reddish Brown Earths, are the areas that are cultivated today or earmarked for future development. It is such areas that also contain the forests of high and medium yield. It is estimated that for the Mahaweli Project alone, about a million acres of what is possibly natural forest will be cleared. Foresters consider that for the gathering of forest produce, about 25% of the land should be allowed to remain as forest. In such areas, careful and prudent management practices have

to be adopted to get maximum benefit. Management can be done in several ways, one example of which is by enrichment planting of Wet Zone forest with Mahogany (*Swietenia macrophylla*) or opening of the forest canopy or the upper storey of the existing forest, which induces *hora* (*Dipterocarpus zeylanicus*) to establish natural regeneration and grow to the height of the canopy strata; so that, more than 90% of the *hora* pole size crop, replaces the original mixed crop of trees. The above examples show, how, the existing Tropical lowland rain forest can be managed, without totally destroying its nature. But, in most other areas, like in the Montane Zone, and the Dry Zone; management mostly entails the establishment of forest plantations. Re-planting with the native species or enrichment is not economical in the Dry Zone Forests, because of the paucity of regeneration of the useful species, like *Palu* and *Satin*. *Palu*, takes something like 200 years to reach a growth of six feet girth. It is the same with *Satin*. Nearly 25% of the abundant tree species in the Dry Zone forest is *Wira* (*Drypetes sepiaris*) but this is not of much use economically, because of its poor form.

Table II indicates that the capacity of the natural forests to provide the requirements of industrial wood is severely restricted and hence the country will have to depend more and more on forest plantations to produce future needs.

TABLE II
FOREST RESOURCES OF SRI LANKA

| Type | Wet Zone | | Intermediate Zone | | Dry Zone | |
|--------------------|----------------------|------------------------|----------------------|------------------------|----------------------|------------------------|
| | Area | Volume | Area | Volume | Area | Volume |
| | Acres (thousands) | Cu. ft. (thousands) | Acres (thousands) | Cu. ft. (thousands) | Acres (thousands) | Cu. ft. (thousands) |
| High yield ... | 29 | 105,920 | 19 | 21,748 | 376 | 412,428 |
| Medium yield ... | 117 | 275,340 | 131 | 104,160 | 3,130 | 2,194,298 |
| Low yield ... | 259 | 378,551 | 171 | 88,634 | 2,691 | 831,701 |
| Non-productive ... | 158 | 97,305 | — | — | — | — |
| Montane ... | 34 | 23,460 | — | — | — | — |
| Plantation ... | 22 | — | 13 | — | 45 | — |
| All types ... | 619 | 880,574 | 334 | 214,542 | 6,212 | 3,438,427 |
| Percent ... | 8.6 | 19.4 | 4.7 | 4.8 | 86.7 | 75.8 |

Source: Forest Inventory of Ceylon — 1964.

SAVANNAS— So-called Royal Physician Gardens

The natural vegetation termed savanna, especially that type called the Upland Savanna or Talawa; is found in the Passara, Bibile, Nilgala, Ekiriyanakumbura and Koslande areas. It comprises a mixture of tall shoulder high, coarse tussock grasses, chief of which are *Illuk* (*Imperata cylindrica*) and *Mana* (*Cymbopogon confertiflorus*); and low, contorted but profusely branched trees, of average height 12-25 feet, characterized by fairly thick corky barks. The tree and shrub species in such areas carry about 50-75 plants per acre. As the most frequent tree species present are widely used in Ayurvedic medicine, like *Nelli* (*Embilica officinalis*) *Bulu* (*Terminalia bellerica*), *Aralu* (*Terminalia chebula*) and *Gamalu* (*Pterocarpus marsupium*), the myth of Royal Physician Gardens has been conjured to explain their presence. Another common tree species is *Kadumberiya* (*Diospyros melanoxylon*) the dried leaflets of which are used as the wrappers for *beedies*. A characteristic feature of a good many of the savanna tree and grass species is that they are resistant to fire, and this cultural practice of firing has been shown to be beneficial for the perpetuation of this type of vegetation. A case in point is that it is after a fire that reflush of leaflets occurs in *Kadumberiya* trees.

Another characteristic feature is that they are plants, though now growing wild, which have been introduced probably during historic times; the type of plant, described by botanists, as naturalized alien species. A possible reasoning to establish the above statement could be as follows. In the region of Eastern Uva, where the Upland Savanna is found to its greatest extent, the threefold pattern of land use; irrigated paddy fields or *yaya*, garden land or *gewattu*, shifting cultivation plot or *hena*, with adjacent forest land or *valpiti*; which forms the basis of the agricultural economy of ancient

Sri Lanka, could not be pursued to its fullest extent. This is because, for some reason or other, no large irrigation schemes were constructed in this area. Even minor irrigation works are not so numerous, as in other areas. The soil map (Map 2) indicates that the type of soil found in this area is the Reddish Brown Earths and Immature Brown Loams. In this region of undulating and rolling relief, the agriculturally rich Reddish Brown Earths are usually found on the crests and upper and middle slopes of the undulating terrain. This is the area occupied by the lowland seasonal rain forest (Map 3). Mixed with these, especially on the middle slopes, are the immature brown soils, where the savanna vegetation is found; while the humic soils that occur on the lower slopes and valley bottoms, are poorly drained, and used for paddy cultivation. The main requirements of the immature brown soil for cultivation is a satisfactory supply of irrigation water, on account of the poor water retaining capacity of these soils.

Now the presence of such a soil type, in the region of the reddish brown earths, especially in the middle and lower slopes has to be explained. A possible explanation is as follows: Because of the paucity of irrigation schemes, in this area, in ancient times, the people living in this region, must have had to resort more to shifting cultivation to obtain their food, than if irrigation water had been available for paddy cultivation. This is the position even today. Inscriptional and other archaeological evidence in this region, though not so numerous as in areas of a large number of irrigation schemes, and hence large populations, nevertheless indicates that there was a considerable settlement. Further, if subsistence was mainly dependent on chena cultivation, the ratio of land to man would have been more, than where this type of cultivation does not play a dominant role; as in the area of predominantly reddish brown loams. Consequently,

instead of the normal, forest-chena-forest cycle being allowed to take place, a chena plot which had not fully recovered from the effect of such cultivation with the usual plant succession and soil enrichment taking place, would have to be used, with the resultant soil erosion and degradation. A. W. R. Joachim and P. Kandiah have shown that in Sri Lanka, chena lands suffer little change in soil structure unless the period of fallow has been drastically reduced and the cultivators forced to prolong the period of cultivation beyond the usual one or two year period. These immature brown soils were thus formed by a degradation of the reddish brown earth, especially in areas where there was a presence of a certain amount of ferro-magnesium minerals, in the parent material. In most cases, the top or the A horizon of the soil is very shallow being 6-8 in. deep in the best area. The middle horizon or B, is usually less than 2 feet in thickness, with a layer of quartz gravel; while the lower or C horizon, consists of decomposing acid gneisses. Once this deterioration of the soil has taken place, new fire resistant and sun loving species like the savanna tree and grass species would colonize such land, and eliminate the forest species. Once the forest was replaced by savanna in this manner, it is not profitable to use it again for chena cultivation. As described earlier, the common savanna tree species are used in medicine and as such, would be widely grown in home gardens, with the spread of settlements to these areas. But once the soils of former chenas became impoverished, these species colonized such derelict land, and displaced the forest species; thus converting an original forest vegetation to savanna. Even today, such lands containing the savanna vegetation are hardly cleared for chena, because of the infertile nature of the soil, which contains a matrix of quartz grains with little water retentive power. In these areas chenas are cut where land is available in the *Mukalana* or high forest growing on the more fertile reddish brown earths.

INDUSTRIES BASED ON VEGETATION RESOURCES

Natural Vegetation provides a base for an increasing number of industries.

In Sri Lanka there is an increasing use of paper for purposes other than the traditional.

Paper

The annual requirement of paper in Sri Lanka is estimated at 87,000 tons of which only 25% was manufactured locally.

Per Capita Paper Consumption in Some Developed and Developing Countries in 1973

| | |
|---------------|----------|
| U.S.A. ... | 640 lbs. |
| Canada ... | 451 " |
| Japan ... | 320 " |
| U.K. ... | 300 " |
| Australia ... | 290 " |
| Malaysia ... | 42 " |
| Kenya ... | 12.8 " |
| Sri Lanka ... | 5.5 " |
| India ... | 4.5 " |
| Pakistan ... | 3.5 " |
| Nigeria ... | 1.8 " |
| Ethiopia ... | 1.0 " |

The paper factory at Valaichchenai commenced functioning in 1956 with a capacity of 3,750 tons of writing and printing paper per annum. The raw material was illuk grass and rice straw. The fibres of these are short. Illuk grass grows wild in the Savannas in the tree and grass mixed community in the Manampitiya, Passara and Bibile areas. However, it is cultivated at a farm at Punani close to the factory, to save transport costs. Again, in spite of the factory being situated close to the large rice growing areas of the Batticaloa and Polonnaruwa districts, the collection and cost of transport of the straw is a problem.

The available local raw materials like grass and straw have short fibres and supply 70% of the raw material. As a result, a certain percentage of long fibre and pulp has to be mixed with it, in order to get good strength for the paper. Till 1973 this 30% was imported from Canada, U.S.S.R. and the Scandinavian countries. But today these long fibres are obtained locally from plants like *Cypresses* and *Eucalyptus*, grown in forest plantations in the hill country. Experiments have shown that Kenaf, (*Hibiscus cannabinus*) Bamboo (*Dendro-*

calamus strictus) Kathurumurunga (*Sesbania grandiflora*) and Val bel (*Hibiscus tiliaceus*) can also be used. The advantages these have over cypresses and eucalyptus is that they are quick growing and mature within 5-7 years while the cypresses and eucalyptus take about 30-40 years to attain pulpable wood size.

In 1967 a second paper machine was established in the mill at Valaichchenai to manufacture paper board and this commenced commercial production in 1972. The demand for paper products in the various forms of writing paper, hardboard, wrapping paper etc. are rising. The current production capacity is about 22,500 tons per annum against the demand of 90,000 tons. To meet at least part of this demand, the second paper factory at Embilipitiya is under construction and scheduled to go into operation by mid 1976, to manufacture fine paper (writing and printing). When this mill goes into production, the total produced in the country will be 37,500 tons per annum, and by 1980 the demand would rise to 120,000 tons. The Paper Corporation is therefore considering the setting up of a third factory in the North Central Province taking into consideration the Mahaweli Development scheme and the availability of water, electric power and fibrous raw material through this development. This would specialise in the manufacture of Kraft paper for making of bags, newsprint and board for boxes.

POLLUTION OF THE ENVIRONMENT

The use of natural resources has been accompanied by their abuse, which is increasingly exhibited in the various forms of pollution. Pollution or the destruction of the purity of the environment is one of the most important problems of the modern age. Pollution is caused by the addition of a substance or form of energy to the environment, in larger quantities than the local habitat can well accommodate. How has man done this? As an example, in 1965 the United States of America spent 3 million dollars to collect and dispose off one hundred and twenty five million tons of the waste products of urban areas, including 48 billion cans, 26 billion bottles and jars, and 65 billion metal and plastic caps.

These figures do not include human and farm animal excreta, pesticides and herbicides, automobile exhausts and industrial sewage which are released into the environment.

The Ecological Significance of Pollutants

The ecological significance of insecticides is related, first, to the fact that some of these substances are chemically very stable, breaking down or decomposing, very slowly. Once discharged into the physical habitat they can therefore, persist for a long time in their original or even more toxic form. This for instance, is a characteristic of the more popular organo-chlorine, insecticides like D.D.T. than of the organo-phosphorous insecticides like parathion, which in comparison, are very unstable. While the latter are highly poisonous to birds and mammals, including man, they break down so rapidly that they lose their toxicity only a few hours after application.

The second is that these substances which may be present in very small quantities in the soil, air or water can become highly concentrated once they enter the biological cycle. They are absorbed directly by the tissues of invertebrate animals or in the case of some of the particularly poisonous insecticides, those of higher animals including man. If not broken down in the process of respiration or not excreted, these substances can become progressively concentrated in tissues as they are passed from one facet or food chain of the ecosystem to another. The degree of concentration is dependent on the particular animal tissues in which these materials are "stored" and the length of the food chain or number of trophic levels through which it passes (See Fig. 5).

At present the effect of insecticides is more widespread and apparent. Research on D.D.T.—the most widely used and easily detected of these substances, is beginning to reveal the full effect of insecticides on animal population. Concentration in the tissues of higher animals who feed on plants treated with these preparations or who prey on such herbivorous animals, may build up to levels which can cause sterility or death.

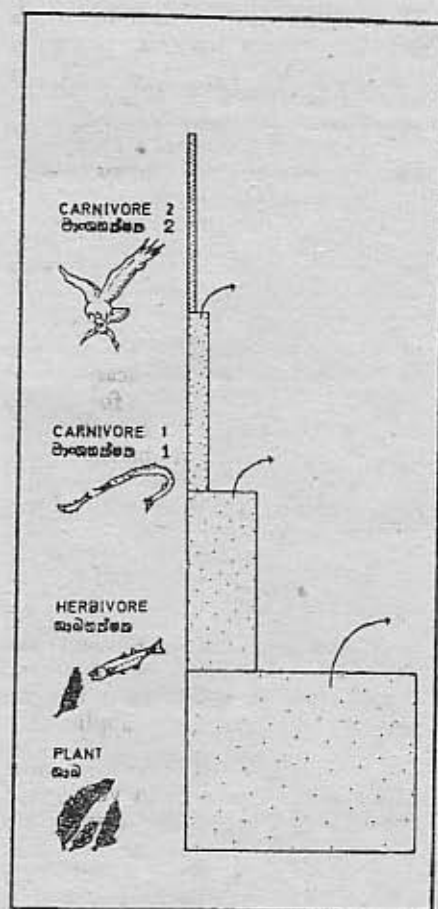


Fig 5

- BIOMASS
ජෛව ස්කන්ධය
- ↪ LOSSES THROUGH RESPIRATION
AND EXCRETION
බසිලාවය හා ස්වච්ඡායෙන් නැතිවීම
- ... DDT
... ඩී.ඩී.ටී

Diagram illustrating concentration of D.D.T. residues in their passage along a simple food chain. (Source: G.M. Woodwell, *Toxic substances and Ecological cycles*, Scientific American Vol. 216, 1967)

Man himself is accumulating these compounds in his body fat, but as yet we are not quite certain of any good or bad effects they have on us.

POLLUTION AND DEVELOPMENT

Today, the largest sources of pollution are the factories in highly developed areas of the world. These are

the areas where the largest economic and technological resources that are a necessary condition to act on environmental problems are also concentrated. Action, however, might worsen the situation rather than improve it—as was true in the case of smog clearance in Los Angeles, U.S.A. In this process, efforts to reduce carbon monoxide in the exhaust of motor vehicles led to measures increasing the equally harmful products by high powered engines of nitrogen oxides and the highly poisoning nitrogen dioxide. In the same way, the abolition of the use of D.D.T. and other persistent organochlorine insecticides, could drastically increase malaria, and reduce agricultural production in tropical areas.

The problem is indeed very complex and complicated. For example, some experts believe that 20,000 million people can live in the U.S.A. at present high standards, simply on the products of atomic energy, water and minerals in common rock. Others however, postulate irretrievable damage in terms of exhausted resources, thermal pollution, and environment disruption, if even half that number secure the current living standards.

Land Exploitation

There is no doubt about the need for the maximum exploitation of the country's available land area. The more important issue that emerges in the foregoing analysis, however, is that each tract of land should be put to a use to which it is best suited, paying due regard to national urgency and the demand for particular produce. But there are inherent dangers to guard against; particularly, the misuse and over-exploitation of our natural resources with a view to quick and large returns to the detriment of long term conservation. References in the earlier pages drew attention to the lessons in history which warn against such dangers.

Despite the ruling by the early Britishers that no land over 5000 feet should be alienated this principle was violated to suit colonial interests. During the period of intensive commercial planting in the 19th century mass land clearings were ushered in. In the process the upper slopes of the hill country were deprived of essential forest cover. River banks

were denuded right up to the water's edge and steep land was left unprotected. To these destructive activities were added inefficient drainage, which caused unprecedented silting and floods. A gross ignorance of tropical conditions, initially, led to a devastation of acre upon acre of stream reserve which continued unabated despite warnings of the dangers in such a course. Retribution for such truculent misdeeds did not take long to come. Faulty land use, it was argued, was a contributory cause to the ruin of the coffee plantations in the 1880's.

Again the rubber and coconut plantations, subsequently opened up on the lower hills and coastal plains, themselves contributed to the deterioration and erosion of vast quantities of soil. Cultivation practices, such as growing of cover crops, on rubber lands which ensured the stability of the soil and minimised its washaway took long years of trial and error to come.

The object should be to strive to restore equilibrium and an overall consistency in man's interventions on the natural environment, in order to satisfy the population's requirements as far as possible by reconstituting the biological potentiality of the country's soil, flora and fauna, both natural and selected species.

Some ecologists however, view any agricultural intensification in tropical land as futile and dangerous. For instance Tropical forests are often improvidently cleared for farming or grazing when, in fact, the land would provide greater returns through forestry. Forests can provide wood products, fuel, employment and protein in the form of wild game for nearby residents—not to mention their role as ecological stabilizers.

A fear is constantly being expressed on whether the regions being opened up for agriculture will survive the coming onslaught of development without an ecological collapse, or at least a permanent cutback of productive capacity. The most intractable challenge may be the maintenance of soil fertility over time within the financial and technical constraints that bind the average tropical farmer.

Funding the External Resources Gap

Trade Deficit Reaches

Rs. 1,372 Million

Sri Lanka's foreign trade gap had, according to Customs data, reached Rs. 1,372 million by the end of August this year (See Table I). The country's adverse balance in 1974 of Rs. 1,107 million, which was an all-time record, has already been exceeded by as much as Rs. 265 million. Indications are that, with due adjustments in Customs data for the Food Commissioner's and Petroleum Corporation exports the foreign trade gap could reach almost Rs. 2,000 million by the end of 1975.* The additional burden on the country's petroleum import bill, with the recent price increases could possibly take this figure even further. This widening foreign trade gap is causing serious concern in many quarters, especially when its impact on the country's external resources situation is considered. The big question looming just now is—how can the widening foreign resource gap be bridged? Upto now the excess in the value of imports over export earnings has been financed almost entirely through foreign aid in the absence of private capital inflows.

Some assurances of relief have come our way in the form of the IMF's oil facility and other offers of assistance by the international community to the 'most affected nations' among which Sri Lanka is placed.

Imports

The sharp increase in the country's import bill has resulted largely from the higher expenditure on the imports of essential commodities such as rice, flour, sugar, petroleum and fertilizers. Import values of base metals, machinery and mechanical appliances and vehicles and other transport equip-

TABLE I
SRI LANKA'S FOREIGN TRADE

| | | Jan. to Aug. 1975 (in Rs. Million) | |
|---------|-----|---------------------------------------|-------|
| | | 1974 | 1975 |
| Imports | ... | 4,554 | 3,867 |
| Exports | ... | 3,447 | 2,495 |
| Deficit | ... | 1,107 | 1,372 |

ment have also recorded steep increases. World-wide inflationary pressures are taking their toll on Sri Lanka's balance of trade (See Table II).

TABLE II
SRI LANKA'S IMPORTS - MAJOR ITEMS
(Jan. to Aug. in Rs. Mil.)

| | | 1974 | 1975 |
|----------------------------------|-----|-------|-------|
| Cereals | ... | 612.5 | 924 |
| Flour | ... | 714.4 | 873 |
| Sugar | ... | 141 | 209 |
| Petroleum | ... | 482 | 590 |
| Fertilizers | ... | 94 | 139 |
| Base metals and articles thereof | ... | 122 | 171 |
| Machinery & Mechanical equipment | ... | 122 | 206 |
| | | 2,530 | 3,103 |

Exports

While the country's import bill has kept soaring our export earnings have not moved up at equal pace. The exceptions are tea and coconut oil and copra exports which in the first eight months of this year have shown an increase of Rs. 500 million in earnings over the same period last year.

TABLE III
EXPORTS OF TEA, COPRA AND COCONUT OIL

| | | Jan. to Aug. (in Rs. Mil.) | |
|-----------------------|-----|----------------------------|-------|
| | | 1974 | 1975 |
| Tea | ... | 843 | 1,295 |
| Coconut oil and copra | ... | 82 | 136 |
| | | 925 | 1,431 |

All other major items of exports showed a drop in earnings. The following seven major items, together with tea, copra and coconut oil, make up over 95% of our export earnings. All these items have earned less over the first eight months of the year as seen in the table below.

TABLE IV
EXPORT EARNINGS OF OTHER MAJOR ITEMS
(Jan. to Aug. in Rs. Mil.)

| | | 1974 | 1975 |
|---|-----|-------|-------|
| Animal products | ... | 21 | 15 |
| Coconut products (other than coconut oil and copra) | ... | 541 | 525 |
| Rubber | ... | 570 | 390 |
| Gems and jewellery | ... | 70 | 49 |
| Wooden articles and wood-charcoal | ... | 23 | 15 |
| Ready-made garments and textiles | ... | 66 | 57 |
| Petroleum products | ... | 67 | 31 |
| | | 1,358 | 1,080 |

The injustice of the existing economic order is clearly evident in the above figures where in most of Sri Lanka's commodity and industrial exports earnings have fallen over 1975. Meanwhile, as pointed out earlier, we had to pay over Rs. 500 million more for our basic imports. The value of imports continue to exceed export earnings, the deficit being financed almost entirely through foreign aid. It is becoming more apparent that the external capital being received through official aid is being completely swallowed up by the overseas price increases of Sri Lanka's imports.

Foreign Borrowings Increase

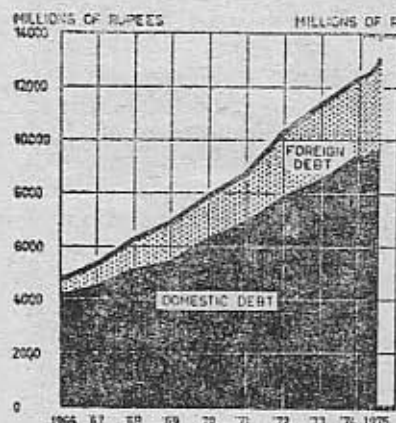
Data on Government's loan operations is available for the first half of this year (January - June). This data shows a marked increase in the

*The Central Bank has shown that after adjustment of Customs data with those provided by the Food Commissioner, the Ceylon Petroleum Corporation and the State Gem Corporation a further Rs. 273 million had to be added to the trade deficit by the end of June this year. The adverse balance of trade according to Customs data was Rs. 974 million as against an adjusted figure of Rs. 1,247 million.

utilization of foreign loans relative to the corresponding period last year. The total amount of foreign loans utilized during January-June 1975 amounted to Rs. 340 million as against Rs. 138 million during the same period last year—an increase of Rs. 202 million or 150%. Of this total Rs. 163 million consisted of project loans obtained mainly from the International Development Association (Rs. 100 million), West Germany (Rs. 332 million), Asian Development Bank (Rs. 13 million) and International Bank for Reconstruction and Development (Rs. 11 million). The balance Rs. 177 million of non-project or commodity loans was received mainly from Japan (Rs. 74 million), U.S.A. (Rs. 58 million), India (Rs. 16 million), France (Rs. 16 million), and Canada (Rs. 10 million). Indications are that the utilization of foreign loans by Government during 1975 will be substantially higher than in 1974. The amount of foreign loans utilized during 1974 reached a peak of Rs. 388 million.

Sri Lanka's total outstanding foreign debt amounted to Rs. 3,364 million by the end of June 1975. Of these outstandings Rs. 764 million or 23% of the total represent debts to the United States of America; Rs. 509 million or 15% to West Germany, Rs. 412m. or 12% to China, and Rs. 369 or 11% to Japan.

PUBLIC DEBT (GROSS)



Public Debt Outstanding

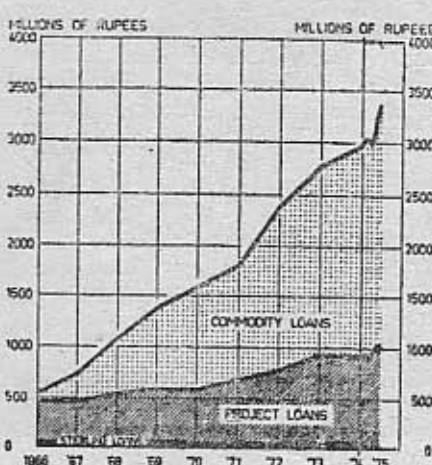
By the end of June 1975 the gross public debt outstanding had reached Rs. 13,162 million of which Rs. 9,798 million was on the domestic debt and Rs. 3,364 million on the foreign debt. The Domestic Debt outstandings comprise 30% from the banking sector and 70% from the non-banking sector.

The charts below highlight the trends on the accumulation of the public debt during the last ten years and the composition of the foreign debt during this period.

More Government Revenue

The provisional figures of revenue for the first six months of this year reveal increases in nearly all major items when compared with the same period last year. Major increases are recorded in receipt from FECS—Rs. 130 million more than in the same period last year; import tax increased by Rs. 62 million; import duties by Rs. 50 million; turnover tax by Rs. 43 million and tobacco tax by Rs. 33 million when compared with the corresponding period in 1974. Indications are that if the same amount of revenue is earned from these sources over the next six months they would all exceed what was originally expected of them. This is evident in the adjoining table showing provisional figures for the first half of 1975 and the estimated figure for the whole of 1975.

COMPOSITION OF FOREIGN DEBT



Source: Central Bank of Ceylon.

ASIAN MONETARY UNIT Effective November 1

The monetary authorities of six Asian countries, including Sri Lanka, have concluded agreements among each other over the last two months to operate an "Asian Clearing Union". Under these agreements Sri Lanka will be able to make its payments to these countries, from November 1, through the special clearing facility maintained by the "Union".

The measure is a sequel to the mutual declaration signed in Iran in July by Sri Lanka, India, Iran, Pakistan, Bangladesh and Nepal to link the trading accounts of these nations. This "Clearing Union" is essentially a banking facility which makes for quicker and easier accounting to promote trade in the currencies of each of these six countries and with the least reserves of foreign exchange.

The accounts of the clearing facility, in respect of the trade among these countries, will be kept in a common unit. Under these agreements the instruments of payment eligible for settlement through the clearing facility will be expressed exclusively in the currency of Sri Lanka or one of the countries involved. Sri Lanka's Central Bank would notify the Commercial Banks during each month of the buying and selling rates for the Asian Monetary Unit and of the Clearing Union's clearing currencies and also of the payments not eligible for settlement through the clearing facility.

TABLE V
MAJOR ITEMS OF GOVERNMENT
REVENUE

| | (in Rs. Million) | |
|---------------|-----------------------|------------------------|
| | Jan.- June 1975 | Esti- mated 1975 |
| Income Tax | 358 | 595 |
| Turnover Tax | 318 | 634 |
| Import Duties | 166 | 252 |
| FECS Receipts | 545 | 948 |

The adverse trends for two of the country's major export commodities have also affected Government's revenue position. Export duties show as much as Rs. 100 million less when receipts between January and June of 1974 and 1975 are considered. In the first half of 1975 export duties fetched Rs. 229 million compared with Rs. 329 million in the same period in 1974. This was mainly due to the heavy fall in earnings from rubber and coconut products. Export duties are expected to bring in as much as Rs. 742m. for the whole of 1975.

The Conference Front

Focussing on the Seventh Special Sessions of the UN General Assembly, which discussed the Plan of Action for the Establishment of a New International Economic Order in the early part of September, three important international meetings of direct relevance to Sri Lanka escaped attention. The conference of eight Asian nations which met in Bangkok till July 31 and reached agreement on tariff reductions; the 5th Ministerial Conference of non-aligned countries in Lima, Peru from August 25 to 30th; and the meeting of Commonwealth Finance Ministers from August 26-28th.

Asian 'Common Market'

At the end of a meeting of representatives of the Governments of Bangladesh, India, South Korea, Laos, Pakistan, the Philippines, Sri Lanka and Thailand, held in Bangkok with the assistance of experts from the U.N. Conference on Trade and Development (UNCTAD), agreement was reached on a series of broad multilateral tariff concessions among the eight countries as a stepping-stone towards an eventual Asian free-trade zone or 'Common Market'.

These tariff reductions, ranging from 10 to 80 per cent and averaging about 33 per cent, related to more than 160 items, including agricultural commodities, manufactured goods, chemicals and minerals—the total estimated value of this trade being \$50,000,000 a year.

The agreement was to be ratified by all the governments involved by Jan. 31, 1976. It was also expected that other Asian governments would be invited to join in the tariff concessions, and at a second meeting in November 1975 agreement would be sought on the elimination of certain non-tariff trade barriers, such as quotas, packaging restrictions and health regulations.

The Commonwealth—

Meeting of Finance Ministers

The 1975 meeting of Commonwealth Finance Ministers, held in Georgetown (Guyana) on August 26-28, considered inter alia an interim report on the economic relationship between developed and developing countries prepared by an

expert group appointed in May to work within terms of reference laid down at the recent Commonwealth heads of government meeting.

The report endorsed the plan for an integrated commodities programme drafted within the framework of the U.N. Conference on Trade and Development (UNCTAD) following the U.N. Special Session on Raw Materials and Development of April-May 1974 and the subsequent Dakar conference of non-aligned countries in February 1975, under which it was proposed to create an international fund to finance buffer stocks of certain key commodities with a view to stabilizing raw material prices and compensating exporting countries for fluctuations in income. The Commonwealth experts accepted UNCTAD's suggestion that contributions to such a fund should come from both the importing and exporting countries, adding that "petroleum-exporting countries might (also) wish to contribute, in view of the fund's investment possibilities as well as its contributions to international economic co-operation".

While certain aspects of the interim report—which was described by the Guyanese Prime Minister, Mr. Forbes Burnham, as embodying a plan of action which "an international community (wishing to) match deeds to rhetoric and to avoid chaos ought to embark on speedily"—were fully accepted by the Finance Ministers' meeting, the communique issued after the meeting gave only a qualified "general endorsement" to it, reflecting the reservations of certain industrialized members of the Commonwealth on some of its recommendations.

In particular, the British Government, whose approach to problems of trade in raw materials had been outlined by the Prime Minister, Mr. Wilson, in a speech to Commons wealth heads of government, was said to have objected to the report's endorsement of the UNCTAD stockpile financing plan preferring a more pragmatic approach which would encourage consumers and exporters of particular raw materials to examine their common problems on a case-by-case basis; to have argued that the

indexation of commodity prices to the general level of inflation in the industrialized countries would merely create new inflationary pressures from which many of the poorest developing countries would be the worst sufferers; and to have dismissed as unrealistic the report's call for the immediate implementation by the developed countries of United Nations aid disbursement targets.

Funds Mooted at Non-Aligned Session

Under a resolution fully approved by the non-aligned ministerial conference in Lima, it was decided to create a solidarity fund for the economic and social development of non-aligned countries.

This fund was to be established by means of contributions of the equivalent of 500,000 special drawing rights (SDRs) to be paid by each of the fund's members in four annual payments in freely convertible currency. These contributions were expected to produce a basic capital of some SDR 40,000,000 which could be augmented by voluntary contributions from the wealthier member states. The fund was to be located in Kuwait, which was reported to have offered an initial contribution of 300,000,000 Kuwaiti dinars (rather over U.S. \$1,000 million).

In other resolutions the conference agreed in principle to the creation of five other funds, as follows:

- A "special fund for financing buffer stocks of raw materials and primary products by developing countries", with its modalities to be settled by a conference to be held in Geneva on June 30, 1976;
- a fund for the development of food production in Third World countries (as proposed by Peru);
- another fund for agricultural development (also on a Peruvian proposal);
- a special fund for land-locked countries, such as Afghanistan, Nepal and Upper Volta; and
- a fund for the post-war reconstruction "of Cambodia, Laos and Vietnam and of the other peoples affected by imperialist aggression".

THE ECONOMY

Recovery of Plantations Output in 1975

THERE has been much concern expressed about the decline in the output of the major plantation industries (tea, rubber and coconut) after 1970. This decline has often been attributed to the sharp curtailment of development expenditure (manuring, re-planting and maintenance) in the climate of uncertainty that prevailed with the impending land reform legislation and the possibilities of dislocation in management caused by the land reform. Some observers go a step further to state that the plantation output would continue to decline even further in the next few years owing to the operation of these factors.

conditions that prevailed during most of the period 1971-74.

The plantation crops are highly sensitive to weather conditions and even under the best of management, a fall in output cannot be avoided if weather conditions turn adverse.

Contrary to the pessimistic forecasts about the plantations output in future years all indications are that in 1975 the output should show a marked improvement. According to the provisional estimates, the tea output should attain a level of around 485 million lbs., which is the highest level recorded since 1971. It is equivalent to the average annual level of 1966-70 and is higher than the 1974 level by over 8%. Rubber production is expected to reach around 325 million lbs., which

The economy of Sri Lanka is a victim of not only unfavourable world market forces (such as sharp fluctuations in commodity prices) but also of unfavourable weather conditions internally. A drought can cause severe adverse effects on the balance of payments. It can, on the one hand, lead to a lower level of plantation output and hence a drop in potential export earnings. On the other hand, a drought which causes a failure in the paddy harvest will lead to higher food imports. In this way, adverse weather conditions can seriously undermine the balance of payments, just like unfavourable world market forces.

Growth prospects dampened by adverse weather

Moreover, the agricultural sector (plantations and the domestic agriculture) is the largest single source of national income in the country, accounting for over one-third of the Gross National Product. In such a context, a fall in the output of the plantations or the domestic agriculture can lead to a dampening effect on the overall economic growth. During 1973-74 in particular, the domestic agriculture (which centres around the production of paddy and other subsidiary food crops) has shown significant increases in production. But, this failed to bring about a corresponding increase in the overall agricultural output owing to the decline in the plantations output. In other words, the rise in the output of domestic agriculture has been merely instrumental in offsetting the decline in plantation output. In 1975, the same story has been repeated in a different form. While the plantations output is expected to show a marked improvement, paddy production has suffered heavily as a result of bad weather conditions. It is well known that the last Maha crop was a failure. Even the Yala crop has not come up to the expected levels. All indications are that the total paddy crop this year would be well below 60 million bushels, a drop of over 20% from the last year's level and lower than any of the years since 1968. Thus the increase in the plantations output will be more or less offset by the drop in the paddy output. Adverse weather conditions have once again dampened economic growth prospects of the country.

PLANTATION CROPS AND PADDY

Output Over Ten Years

| | Tea (million lbs.) | Rubber (million lbs.) | Coconut (million nuts) | Paddy (million bushels) |
|-------------|--------------------------|-----------------------------|------------------------------|-------------------------------|
| 1966-70 ... | 484.9 | 323.2 | 2486 | 61.7 |
| 1971 ... | 480.1 | 311.2 | 2617 | 66.9 |
| 1972 ... | 470.6 | 309.4 | 2963 | 62.9 |
| 1973 ... | 465.8 | 341.0 | 1935 | 62.9 |
| 1974 ... | 449.8 | 301.0 | 2031 | 76.8 |
| 1975 ... | 485.0* | 325.0* | 2600* | Below 60.0* |

* Provisional estimates

As seen in the table above, it is certainly a fact that the plantations output has recorded a substantial drop in recent years. The output of tea which averaged 485 million lbs., per year during 1966-70, recorded a continuous decline in the subsequent years, and by 1974 it had fallen to 450 million lbs., the lowest level recorded in the last fifteen years. The rubber output during 1971, 1972 and 1974 has also been considerably below the average annual output of the period 1966-70. The coconut production, having reached a peak of 2963 million nuts in 1972, recorded a drastic fall in the subsequent years, 1973 and 1974. While the reduction in development expenditure, the effects of land reform etc., have certainly played a role in this output decline, one factor that has been often ignored in the discussions on this subject is the adverse weather

is somewhat higher than the 1966-70 average and is an improvement of about 8% in relation to 1974. Coconut production is estimated to reach around 2600 million nuts, which is higher than the annual average of 1966-70 and represents a recovery of nearly 30% on the 1974 crop. This improvement in the production performance of the plantation sector in 1975 is not a result of any sudden increase in the use of fertilizer and other development expenditure or removal of the uncertainty about ownership (in fact, the land reform will now be extended to company-owned estates as well). It is rather a result of favourable weather conditions. The experience of 1975 clearly shows that even under conditions of reduced development, expenditure and so forth, the plantations output can respond markedly to improved weather conditions.

COMMODITIES

TEA

UP. — Production 54 Mn. lbs.
Earnings Rs. 453 Mn.

Both production and earnings from tea continued their upward trend into August 1975. Compared to the same period (8 months) of 1974 tea production has shown an increase of approximately 54 million lbs. and tea earnings an increase of Rs. 453 million.

Tea production between Jan.-Aug. 1975 was 332,243,744 as compared to 302,423,098 lbs. during the same period in 1974. The major part of this increase was achieved from Jan.-March 1975. The increase in production was also reflected in the increased quantity of tea exported from Sri Lanka during this period. Exports in Jan.-Aug. 1975 recorded 309,105,203 lbs. compared to 255,212,335 lbs. during the same period in 1974. Export earnings from tea during Jan.-Aug. 1975 was Rs. 1,295,385,950 compared to Rs. 843,394,023 and this is ascribed to the better prices for all grades of tea. The FOB value of tea in 1975 was Rs. 4.19 per lb. compared to Rs. 3.30 per lb. in 1974.

The prices for all grades of tea at the Colombo Auctions showed substantial increases in 1975 when compared to 1974. The increase in unit prices are shown below:

COLOMBO AUCTION PRICES (Rs. per Kilo)

| Elevation | 1974 Rs./ctr. | 1975 Rs./ctr. | Increase Rs./ctr. |
|----------------|------------------|------------------|----------------------|
| High grown | 3 04 | 7 15 | 4 09 |
| Mid grown | 2 62 | 6 57 | 3 95 |
| Low grown | 2 76 | 7 35 | 4 59 |
| All elevations | 2 81 | 7 01 | 4 20 |

London Auction prices also provided higher prices in 1975 as against those of the same period in 1974; as shown below:—

LONDON AUCTIONS (New Pence per Kilo)

| Source | 1974 | 1975 |
|-------------------|-------|-------|
| N. India | 56.79 | 61.92 |
| S. India | 52.46 | 59.17 |
| Sri Lanka | 60.94 | 63.73 |
| African countries | 59.40 | 61.63 |
| Others | 51.21 | 56.17 |
| All | 58.43 | 61.91 |

The Oldest Tea in Recent History

The approximately 15,000 cases of tea held up in the Suez Canal for over 7 years and ultimately discharged at Trieste were sold with all faults. The fact that these aged teas attracted support is perhaps an indication of the limited availability of low priced teas.

RUBBER EXPORTS

| | 1974 | | 1975 | |
|--------------|-------------------------------|------------------------|-------------------------------|------------------------|
| | January Quantity (lbs.) | August Value Rs. | January Quantity (lbs.) | August Value Rs. |
| Sole Crepe | 5,501,433 | 25.9 | 6,853,297 | 18.2 |
| Latex Crepe | 58,196,859 | 182.0 | 64,910,551 | 120.2 |
| Scrap Crepe | 20,980,234 | 48.1 | 19,946,874 | 31.3 |
| Sheet Rubber | 117,880,804 | 310.2 | 146,512,709 | 224.8 |
| Block Rubber | 394,688 | 1.2 | 1,212,270 | 3.0 |
| Latex | 112 | .0001 | 94,204 | 0.1 |
| Grand Total | 202,954,130 | 567.4 | 239,529,905 | 397.5 |

COFFEE

Frost Pushes Down Stocks to Record Lows

Calamities never come at convenient times, but the recent frost in Brazil has come, not merely at an inconvenient time but at a rather difficult time for the coffee world. For Brazil this frost comes on the heels of indications that her hard work and long efforts in combating the coffee rust were succeeding. This had given the Brazilians reason to formulate long-term marketing plans which were based on projected earnings from these coffee crops—crops that would now be drastically reduced while at the same time causing inflated earnings from the current crop. For consumers in importing countries, the frost will translate into higher prices. But substantially higher prices will probably mean an acceleration of the drop in consumption.

The first estimates from the Brazilian Coffee Institute (IBC) showed the grim picture of the extent of the frost damage: 100% of the 915 million trees in Paana (Brazil's largest coffee producing State) were affected; in San Paulo 66% of the 800 million trees; in Mato Grosso 80% of 54.8 million trees; and in southern Minas Gerais 10% of its 292 million trees were hit by the frost.

RUBBER

Export Earnings 30 per cent drop

A higher volume of rubber was exported during the first eight months of this year when compared with the same period in 1974. Earnings, however, were lower by Rs. 170 mln. RSS 1 prices continued to maintain a steady level. The increase in quantity of rubber exports during the period under review were the result of an increase in Latex crepe and Sheet rubber.

The "Black frost" as it is called, was unusually severe, killing many trees outright and badly mauling many more in what was by far the worst frost and freeze of the century. In Paana, as in other coffee growing States in Brazil frosts of a much less intensity called "White Frosts" are more or less expected. These usually affect only the higher leaves of the tree, allowing the plant to recover in a short time. This, however, was not the case of this July frost which froze the trunk of the coffee trees, turning the sap black and causing all the leaves to turn brown and eventually fall off.

The damage comes at a particularly bad time, as world stocks of coffee in consuming countries are at near record lows. Also IBC carry-over stocks from previous years—used in recent years to offset production shortfalls—are at an all-time low of 15 million bags. In addition coffee crops in other Latin American countries are behind schedule due mainly to unfavourable weather.

These factors have all had an impact on international coffee prices and encouraged local coffee exports too. Between January and August this year a total of 799,291 lbs. have been exported at a value of Rs. 2,219,345; of this as much as 452,991 lbs. were exported in August earning Rs. 1,366,392.

COCONUT

Copra/Coconut Oil Production Rising

World production of Coconut Oil in 1976 is forecast to reach 2.57 mln. tonnes which is about 4.0 percent higher than the output in 1975. World production of Copra this year is estimated at 3.88 mln. tonnes compared with a 1974 output of 3.2 mln. tonnes. The 1975 copra output is equivalent to 2.48 mln. tonnes of coconut oil and would be higher than the 2.10 mln. tonnes equivalent of copra produced last year. The increased production is expected primarily from a larger output of copra in the Philippines and Indonesia.

Actual Exports

Export earnings from all coconut products in August 1975 at Rs. 45.0 mln. showed an increase of Rs. 9.2 mln. in comparison with the previous month. Earnings during the first eight months of this year were Rs. 18.8 mln. ahead of earnings during the same period in 1974 (See table below).

EXPORT OF COCONUT PRODUCTS

| | 1974 Jan.-August | | 1975 Jan.-August | |
|-----------------------|------------------|-------------|------------------|-------------|
| | Volume (kgm.) | Value (Rs.) | Volume (kgm.) | Value (Rs.) |
| Coconut oil ... | 12,443,400 | 80,978,220 | 33,910,478 | 133,032,705 |
| D.C. ... | 26,018,078 | 147,178,525 | 32,100,794 | 125,419,727 |
| Copra ... | 6,096,344 | 291,656 | 659,925 | 3,329,365 |
| Poonac ... | 2,941,181 | 977,713 | 101,605 | 39,831 |
| Fresh nuts (nos.) ... | 575,257 | 850,120 | 1,947,531 | 2,948,233 |
| Fibre products ... | 73,826,065 | 65,222,228 | 45,692,695 | 56,094,800 |
| Shell products ... | 18,131,390 | 16,382,160 | 11,700,395 | 9,802,112 |
| Total value ... | | 311,880,622 | | 330,666,773 |

Earnings from the export of coconut oil in August 1975 at Rs. 23.6 mln. showed an increase of Rs. 11.8 mln. or 100%, when compared with the previous month. This was due to the increase of the F.O.B. price per unit as well as the quantity exported, during the month.

Earnings from the export of desiccated coconut in August 1975 at Rs. 13.2 mln. showed a decrease of Rs. 3.3 mln. when compared with the previous month. This was due to the decrease in the quantity exported during the month.

SPICES

Drop in Earnings

Export earnings from spices during January-August at Rs. 44.2 mln. had fallen by Rs. 9.7 mln. when compared with the same period in 1974. Export earnings from Cinnamon, the major spice, continued to be at a lower level. Further details below.

SPICE EXPORTS

| | 1974 Jan.-Aug. | | 1975 Jan.-Aug. | |
|--------------|----------------|----------------|----------------|----------------|
| | Quantity Cwts. | Value Rs. mln. | Quantity Cwts. | Value Rs. mln. |
| Cinnamon ... | 94,878 | 37.2 | 53,728 | 28.7 |
| Cardamom ... | 1,521 | 3.1 | 4,771 | 8.3 |
| Cloves ... | 9,190 | 9.7 | 2,905 | 5.2 |
| Pepper ... | 5,457 | 2.7 | 1,888 | 1.2 |
| Nutmeg ... | 2,072 | 1.3 | 1,374 | 0.8 |

ESSENTIAL OIL EXPORTS

| | 1974 Jan.-Aug. | | 1975 Jan.-Aug. | |
|-----------------------|----------------|----------------|----------------|----------------|
| | Quantity Cwts. | Value Rs. mln. | Quantity Cwts. | Value Rs. mln. |
| Cinnamon leaf oil ... | 1,508 | 4.2 | 663 | 1.1 |
| Cinnamon Bark oil ... | 13 | 0.5 | 4 | 0.2 |
| Citronella oil ... | 2,192 | 4.7 | 1,379 | 1.5 |
| Ginger oil ... | 8 | 0.1 | 2 | 0.05 |
| Cardamom oil ... | 16 | 0.5 | 3 | 0.03 |
| Clove oil ... | 12 | 0.03 | — | — |
| Nutmeg oil ... | 27 | 0.1 | 44 | 0.2 |

Essential Oils

Export earnings from essential oils during the eight months upto August were substantially lower when compared with the corresponding period in 1974. There was a decrease in the quantity of Cinnamon leaf oil and Citronella oil shipped the two major essential oils exported from Sri Lanka. Details of exports are given below:

PAPAIN

Slight Revival in Market

The papain market which crashed earlier this year due to limited purchases by Japan has shown a slight revival. The quantities exported are higher this year (over Jan.-August) compared to the same period in 1974; but average prices at the Colombo Auctions were almost 50% down compared to the same period in 1974. London average prices remained constant for Ceylon Brown Sun-dried Papain. White Ceylon over-dried papain was unquoted.

PAPAIN EXPORTS

| Exports | 1974 Jan.-Aug. | | 1975 Jan.-Aug. | |
|-------------------------|----------------|-------------|----------------|-------------|
| | Quantity | Value (Rs.) | Quantity | Value (Rs.) |
| Papain white (cwt.) ... | 474 | 1,927,257 | 710 | 1,885,113 |
| Papain brown (cwt.) ... | 102 | 310,421 | 70 | 112,852 |
| Total ... | 576 | 2,237,678 | 780 | 1,997,965 |

Colombo Average Prices: (Monthly) Rs./lbs.

| | | | |
|--------------------------|-------|-------------------------|-------|
| Papain white — Aug. 1974 | 41.10 | Papain brown — 1974 ... | 19.00 |
| Papain white — Aug. 1975 | 23.04 | Papain brown — 1975 ... | 10.90 |
| Jan. - Aug. 1974 | 41.57 | | 29.08 |
| Jan. - Aug. 1975 | 22.72 | | 11.09 |

London Average Prices: (Monthly) £/lbs.

| | | | | |
|------------------------------------|------------------|------|------------------|------|
| Ceylon brown sun-dried (spot) ... | Jan. - Aug. 1974 | 1.35 | Jan. - Aug. 1975 | 1.35 |
| Ceylon white over-dried (spot) ... | UNQ | ... | UNQ | ... |

Sri Lanka's household electric bulb

A survey conducted a few years ago had shown that, the locally manufactured household electric bulb based on c.i.f. price of local manufacture only was one of the cheapest in the world. The table below shows com-

packaging) constitute only approximately 15% of the finished product, the balance being imported.

The glass cover or "shell" covers 35-40% of the foreign exchange

| Wattage | Sri Lanka | Foreign Countries | | | | |
|----------|-----------|-------------------|------|------------|---------|-----------|
| | | Britain A | B | W. Germany | Holland | Singapore |
| 40 W ... | 2/16 | 2.02 | 2.35 | 2.20 | 2.87 | 1.56 |
| 60 W ... | 2/17 | 1.78 | 2.35 | 2.32 | 2.87 | 1.56 |

parative rupee (c.i.f.) prices for five countries including Sri Lanka.

However, in recent years prices have been increasing rapidly, locally. Broadly the retail cost of a local bulb is today made up as follows:—

| | | | |
|--------------------------------|------|------|------|
| e.g. 60 watt bulb— | | | |
| Retail price ... | ... | ... | 3.95 |
| Retailer's margin ... | ... | ... | .45 |
| | | | 3.50 |
| B.T.T. ... | ... | ... | .50 |
| | | | 3.00 |
| Raw materials of which | -/90 | | |
| cts. is duty, Fees etc. ... | | 1.80 | |
| Balance for wages, over-heads, | | | |
| discounts, profits etc. ... | | 1.20 | |

The price lists of local products displayed in local newspapers some time ago are rarely seen now, including those from the manufacturers of reputed products.

Local manufacturers of bulbs have taken refuge in that favourite resort 'the world market' to increase prices. The major components of the local bulb are imported and the import prices of these raw materials are dependent on world markets. The local raw materials (inclusive of

component and would constitute a highly profitable local industry if it could be locally blown. This constitutes a fine type of blowing for which local technological know-how is yet not geared. However this would be the logical and inevitable future step for the improvement of the industry and would need between approximately 8-10 million rupees foreign exchange investment for local production of the shell. The laboratory tests on local silica sands have shown that they are suitable for the purpose. If, to set up an economically viable bulb "shell" unit, part of the production has to be exported. We should be able to find suitable foreign markets.

The base or what is referred to as the 'cap' which is usually brass need not necessarily be so indestructible since the life of a household electric bulb is comparatively short. In this respect, local producers have commenced the use of an aluminium cap thereby reducing costs.

There are two local bulb producers who among them supply an annual local requirement of approximately 4 to 5 million units. The first local bulb factory commenced production in 1961 with Japanese capital, and has two production lines. They produce approximately 2½ to 3 million units per year of 15-150 watt bulbs.

The second bulb factory was established in 1969 and had an excess capacity due to which they had to cut back on production. Its annual production on a single line is about 2 million units or approximately 40% of local requirements of 25-100 watt bulbs. It had a collaboration agreement with a Hungarian firm. These companies are both privately owned. However, the Government in keeping with the practices at that time, had approximately 15-18% participation in the former company and a government Director sat on the Board of that Company. Both companies were run at a loss for the first few years due to various factors—high rejection rate, poor quality of gas being available, etc. However, both industries are today viable and are making profits—the latter having yet to cover up losses incurred earlier while the former has declared dividends of 6-8% after the initial tax holiday. The capacity of both factories together is over and above the country's total requirements; but it was envisaged earlier that with the process of electrification of the country, they together would be able to meet future requirements. It was also thought at the time that a monopoly in this sphere would be economically unhealthy.

A Vicious Circle

Thinking on the local market is based on the theory that the expansion of this industry depends generally on the prosperity of the country and a vicious circle starts operating here. Until consumption increases no expansion can take place. For consumption to increase—costs are too high of (a) initial costs of electrifying houses—e.g. cables, switches, holders, meters (b) initial electricity connection deposits and tariffs and (c) bulbs. Approximately only 12% of the country's homes are electrified.

The local industry has also done little to explore the possibilities of an export market. Some negligible exports have been done e.g. to the Maldives and ships calling at the Port of Colombo have been given their requirements of 110-volt bulbs. However very much more remains to be done if we are to make a mark in international markets. The present low capacity utilization demands that this avenue be explored.

PASSION FRUIT

The need for introducing new or non-traditional crops that would not only satisfy the nation's demand for food and industrial raw materials and for increasing employment, but also aimed at diversifying a vulnerable export sector heavily dependent on a few products is no doubt compelling and urgent. Some of the programmes undertaken to expand the cultivation of such crops have on the whole achieved good progress especially in minor export crops. In certain others, however, inadequate planning both in respect of short and long-term requirements has led to discouraging results. The story of passion fruit is a case in point.

Since 1970 considerable effort was made to induce commercial cultivation of passion fruit. Foreign markets were held to be favourable and assured. A Swiss firm, according to authoritative sources, contracted with Marketing Department for 320 tons of passion fruit juice in 1972 going up to 2,000 tons in 1976. It was estimated at that stage that an extent of about 6,500 acres were required in 1976 to meet the contract demand. Market prospects were claimed to be promising indeed.

The cultivation of the crop on a commercial scale, however, was new to the farmers and it required continued effort by several government departments to popularise the new cultivation. The Department of Agriculture offered generous technical advice to cultivators while the Marketing Department gave a guarantee of purchase at a good price (35 cents a pound). Further, the estate owners were given an outright grant of Rs. 1,000/- per acre to convert un-economic tea and rubber lands to passion fruit plantations. Even the rubber replanting subsidy scheme was modified to permit cultivation of passion fruit as an intercrop. These incentive schemes and the promotion drive were based on the assumption that "a World Market has been established for our passion fruit". Efforts are now bearing fruit. The 2,000 acre youth scheme under the

Land Commissioner's Department located at Yattapatha specialises in this crop. Several Co-operative Farms (e.g. Lassanagama at Deraniyagala) also grow passion on a large scale. An estimated 5,000 acres of passion are grown today in various parts of the country in addition to the large number of small farmers growing it as an intercrop. During the peak season the daily purchase of the Marketing Department is in the region of 100,000 fruits.

Success leads to awkward situation

This phenomenal success, has however, put the Marketing Department into a very awkward situation today. Anticipated foreign demand and even the firm contracts with foreign buyers, for reasons precisely not known seem no longer to work in our favour. Today apparently only a third of the passion fruit produced in the country could be disposed of in foreign and local markets. The Marketing Department, however, continues to buy at the guaranteed price all passion fruit offered for sale. Though the factory at Narahenpita has the capacity to process the entire quantity received, it actually processes only the amount that could be marketed locally and externally and part of the purchase is diverted to the private sector. A sugar subsidy is used as an incentive for the private sector to process the fruit and market the product themselves. Being uncertain of the future market situation, the Department is not prepared to process all what is bought up and keep in storage (the juice could be kept only for a year or so in canned form).

It is unrealistic to expect the Marketing Department to indefinitely continue buying the passion fruit which it cannot market. Nor could it continue with subsidising (through sugar) the private processing plants indefinitely. In the immediate future such practices may be necessary to protect the producer who has already invested in the crop and especially to see that he does not lose faith in future promotional campaigns. It is noted that even in the face of continuing market uncertainties, there

apparently is no official policy yet to discourage further expansion of cultivation of passion fruit.

Several strategies are available to at least partially solve the problem. One would be the launching of an intensive campaign to market the products locally through attractive prices to the consumer (Marketing Department has already reduced the price of passion fruit cordials). Authorities could if necessary stop the local sale of other jams and cordials which already have better marketing outlets in other countries. An alternative which obviously is crucial from a long-term perspective would be to undertake an immediate and intensive drive for foreign markets, especially through effective bilateral agreements. The possibilities of direct contacts with independent foreign buyers may perhaps be an area worth exploring than relying essentially on large firms. Our products ear-marked for foreign markets should no doubt be constantly of a high quality.

That market research at the early stages of nationally promoted new ventures is a pre-condition for success needs no elaboration here. Such research should be of a continuing nature in order to assess periodically the changing facets of the International market situation especially when the new programme relies heavily on foreign markets. While research should supply the Planning Authorities with accurate data and projections on which to base programmes, the planning itself needs to be realistic in respect of possible changes in demand, particularly in order to build up safeguards for the new programme. To take an example, if the organisers of the youth scheme at Yattapatha took such built in safeguards in planning, they would have based their farm plans on two or more crops capable of spreading the risk rather than relying solely on a new crop. The need for realistic and accurate assessment of market conditions is thus a pre-condition before launching new programmes, the absence of which may lead not only to considerable loss to farmers (e.g. those who took up to cultivation of crops like manioc, sorghum, cowpea, etc.) but more seriously to a loss of confidence to undertake any such future programmes.

Taking the Shock out of Retirement

THE transition in the personal lives of all employees that has often the characteristics of a shock and trauma is retirement. One week an employee is working eight hours a day or more, in the next week he is left aimless and almost considered without value.

In the traditional social and economic order of countries like Sri Lanka there was no sharp division between the working life and the retired life, just like there was no sharp division between the working day and the leisure, both merged one into another. The sharp divisions arose with the introduction of new techniques within the last century or so.

In the Western countries where the movement towards sharp divisions and regimentation of lives first arose, there exists now a reverse tendency. In the field of working day, there is a move towards flex-time which in its treatment of the working day has similarities to the time in the traditional *kaiya*.

Many Western countries have now begun to introduce the same philosophy into sharp division in working life and retirement. They are now advocating a phased approach to retirement. "Someone who has worked for 40 years has almost got to learn to relax to get out of the work routine" states the Personnel Manager at the U.K. Pharmaceuticals Firm Glaxo Laboratories Ltd. Glaxo is one of several firms that have introduced "phased retirement" programmes which give employees a preliminary experience of life without a full time job. As Glaxo employees near the retirement age, they are gradually given increased leisure time over a long period, which may extend from months to even years.

The U.K. has a Pre-Retirement Association and its Chairman, Dr. H. Beric-Wright states "two factors have recently promoted interest in phasing retirement. First is the growing involvement of the more far sighted Pensions Departments in the general welfare of pensioners.....the other is the realisation that retirement at

any age poses problems for the Company and for the individual. Both have to make re-adjustments and replacements in activities. Phased retirement makes all this very much easier".

Enterprise Progress—the Organisation of French Employers has calculated that the cost of instituting a Phased Retirement Programme will be quite small. They have suggested a programme that begins when an employee is reduced by 10% while his salary drops by 5%. In similar steps, the working time progressively declines to 50% at the age of 64 whilst the salary drops by 25%. However, phased retirement has also come under criticism. Mary Welch, the Personnel Manager of the U.K. car accessory firm, Joseph Lukas Ltd. feels that Phased Retirement is not fair to the person who is retiring, as well as his successor. She feels that people relax in their last years in any case and "moreover, if the retiree comes in only one or two times a week, people don't take him seriously. They regard him as retired already. Phased Retirement is a?" However many firms that have tried it have recorded a success. The French Heavy Engineering Societe Turbomeca introduced a voluntary Phased Retirement Scheme for its employees in 1970. The decision to enter the phased scheme or the abrupt retirement system is left to the employee.

Another French company to introduce the new scheme, is Gillette France Sa. Here the employees over the age of 60 receive additional weeks as

holidays, starting with two extra weeks in their 61st year and rising to 20 extra weeks in their 65th year.

Organisations who have experimented with this field of retirement, which is phased, has advantages because it allows a smooth succession into the retiree's job. This allows for an organisation to be sure that the new executive was capable of taking over before the old executive retired. In this process conflicts over authority or sharing out the work has not generally occurred, for, by the final stages, the retiree is hardly in the organisation enough of the time to keep a tab on things.

When the phased programme implies employees taking off time during the working day, some conflicts with efficiency could arise. At Turbomeca for instance, the employees choose when they take their time off. One might opt for two hours a day, another for a month at a time. The randomness in this procedure inevitably creates conflicts with production line efficiency.

Of the schemes which have been voluntary, phased retirement generally seems to be popular with retirees.

In the case of developing countries like Sri Lanka, which have many systems of time in their work places depending on whether the work days belong to the relatively modern sector (offices, factories etc.) or the traditional (paddy cultivation etc.) we have been adopting too sharply different time scheduling systems. With the most advanced Western techniques now shifting the time scheduling systems nearer the traditional methods, it would be advantageous for us to examine these new techniques favourably, for they seem to be nearer to our existing patterns.

'Going Back is Modern Management'

The phased approach to retirement and the blurring of working life and non-working life has many similarities to patterns of work before the growth of industrial organisations in the 19th century. This is reflected also in many other modern tendencies, for example

"Latest"

*Phased Retirement
Flex time*

Job enlargement

Organisation Structure loose not tight. Organic.

"Pre Industrial"

*(Exists still in some parts
of Sri Lanka)*

*No rigid division between
work and leisure.*

Job not fractionated, taken as a whole.

Non bureaucratic, small organisations

Colonialism, Neo-Colonialism and Underdevelopment in Kenya

V. SELVARATNAM

Colin Leys, *Underdevelopment in Kenya: The Political Economy of Neo-colonialism*, London, Heineman, 1975, 284 pp. A Review.

The relative underdevelopment of countries like Sri Lanka more than two decades after their independence is the subject of several new analyses. Consequently the ideas of the 1950's and 1960's on what constituted the causes of underdevelopment are being rapidly eroded and new ones being put forward. One such important analysis is the book by Colin Leys "Colonialism, Neo-Colonialism and Underdevelopment in Kenya", published this year, which is reviewed here by V. Selvaratnam. V. Selvaratnam teaches social sciences, with special emphasis on development problems, at the Faculty of Economics and Administration, University of Malaysia.

A continuing and deepening situation of poverty and a highly unequal distribution of income is the most terrifying reality facing many Third World countries today. Many 'developmental' social scientists of the 1950's and 1960's attributed this phenomena primarily to such chronic internal factors as lack of capital; poor planning; economic co-ordination; technology and know-how; rapid population growth; and investment climate. They stated that the problem of Third World poverty could be contained and possibly eradicated by successfully attracting foreign capital and orienting and incorporating the economy of these Third World countries within the framework of the world (largely western) market and its economy. The major role in achieving the targets in this developmental process, according to this thesis, must be played by the Western-educated or Western oriented middle class who they say have the 'universalistic' characteristic of being 'rational' in their economic outlook.

Many of the Third World countries under the guidance of aid-giving countries and 'developmentalist' institutions have toed this 'conventional development theory' for at least two

decades. However, nothing like the Rostowian "Stages of Growth" have emerged. If anything, there has been a widening gap in wealth between rich and poor countries and within both the rich and poor countries themselves. What is also significant within the Third World countries is that there is mass pauperization alongside parasitic forms of consumption by the bourgeoisie. This phenomenon was pointed out by social theorists like Paul Baran, Andre Gunder Frank, Charles Bettelheim, Osvaldo Sunkel, and Samir Amin, in terms of the mechanisms of 'economic dependence' and 'underdevelopment theory' and their relationship to the world capitalist system.

Colin Leys' study follows the footsteps of these new social theorists. Based on the framework of the 'underdevelopment' and 'dependency' theories the study explodes the myth of the 'conventional developmentalists' prescriptions for development in Kenya since its formal independence in 1963. There has been in Kenya a continuous reproduction of poverty and inequality; and above all the country is politically and economically subordinated to the interests of international monopolies. The

general theme of Colin Leys is that the underdevelopment of the Kenyan economy began with colonial domination of Kenya when its economy was moulded as a dependent economy to the metropolitan economy. This was carried over into the post-colonial era. This process of underdevelopment has culminated in "the early 1970's to a period of uncertainty, monetary crisis and the risk of recession" (p. 275). The direct result of this underdevelopment is widespread and increasing income inequality, insecurity and the generating of a feeling of inferiority among the masses.

What are the main forces which have contributed to the underdevelopment of Kenya? Under colonial rule, European capitalists became the dominant group and they moulded the Kenyan economy. The foreign capitalist relations with Kenya were initially in commerce and trade and "the essence of it was conducted on very unequal terms, namely that it was backed by superior force on the side of the capitalist traders". With the introduction of direct colonial administration, the administrators encouraged the implementation of 'rational' capitalist forms of commodity production on the undeveloped traditional and pre-capitalist modes of production in the form of European-owned, managed and protected coffee, tea and sisal plantations and small settler farms. This was followed by European-owned and operated banking, commercial and manufacturing enterprises which further reinforced European economic power. An Asian, largely Indian, comprador bourgeoisie too developed. They were the more important functionaries and they were completely linked to the metropolitan bour-

geoisie. At the bottom of the strata were the African peasant producers and wage-workers who were compelled to work for their European masters "partly by force and partly by taxation, and partly by preventing them from having access to enough land or profitable crops to enable them to pay without working for wages" (p. 30). Thus by the middle of the 1920's, more than half of the Kikuyu and Luo able-bodied men who were independent peasants had been converted into a wage earning proletariat.

The first significant factor is that colonialism and the introduction of metropolitan capitalism, not only developed and perpetuated an unequal exchange between the Kenyan economy and the colonial metropolitan centres, but made Kenya play the classic role of a country at the periphery of a capitalist system. This capitalist development, in other words, integrated and locked Kenya and its economy to a world-wide network of commercial, financial and other subordinate relationships such that it was difficult to extricate it from the world capitalist system. Thus this system was carried over almost intact into the era of post-independence.

What is interesting is that colonial domination and exploitation of the Kenya economy brought about significant features within the colonial structure of Kenya. There developed a class formation which also reflected a colour line. The Europeans formed the bourgeoisie while the brown Asians were the comprador class. They between them also gave rise to the petit bourgeoisie. At the bottom of the social ladder were the bulk of the black African peasant and wage-labourer.

In the colonial period, Leys points out, European plantations and the less capitalized white settler farms, in order to be viable, needed not only cheap labour but a more elaborate system of state support. This was done through a highly elaborate system of propagandization of an economic ideology which fostered the myth of the importance of European agriculture to the economy. This enabled discrimination against the African peasants. In spite of this, the African peasants were made to pay the bulk of the taxation while the

Europeans were given the entire benefits of the government's public expenditure programmes — like the railways, roads, schools, hospitals, extension service and so on. In addition Leys points out that the Europeans were subsidized through customs tariffs and were also given privileged access to profitable external and internal markets which were organized and regulated under some degree of monopoly.

The economy of Kenya and in particular European capital and settler population thrived and continued to prosper on the basis of exploitation of the population as taxpayers and wage-workers so far as world commodity prices remained high. Thus the prosperity of the non agriculture sector also depended on commodity exports. However, when prices collapsed during the 1920-33 depression European enterprise suffered and the economy stagnated.

The transition of the colonial economy to a neo-colonial economy started with the outbreak of the Second World War. The war not only granted a reprieve to the stagnant economy but, after the war it enjoyed considerable economic expansion, especially due partly to investments by international corporations. This created a sustained demand for Kenyan commodity exports which continued into the 1950's and 1960's. Leys points out that this economic prosperity enabled the European capitalist interests to make adaptive modifications to the economy without the necessity of radical reconstruction when the Mau Mau political crisis and the African mass-supported nationalist and anti-foreign movements began to demonstrate. Therefore foreign investments became insecure in the light of the African desire to ownership and control of capital within Kenya. The European capitalist responded by forming the 'multiracial' New Kenya Group in 1959 under the leadership of Michael (later Sir Michael) Blundell. Not surprisingly they were prepared to accommodate and seek an alliance with African leaders who eventually become the ruling class, even at the expense of the white farm settlers. However, this economic acceptance of the African partner was permitted as long as they were prepared to accept the private-enterprise system

of the European and to allow them to stay in business. But this alliance was always in favour of the European capitalist and therefore they continue to maintain a substantial share of the Kenyan economy.

Thus Independence and 'Africanisation' was a sham and a device to keep the colonial economic structure intact, and in reality Kenya became a neo-colonial country. The African small businessmen were given special assistance and later protection against local Asian businessmen and not at the expense of foreign-based investors.

The effect of this was that it created "a new stratum of African petit-bourgeoisie, ensconced within the general system of protection and monopoly, in such a way as to serve and complement foreign capital and not to replace it" (p. 149). The system therefore perpetuated foreign import houses and foreign-owned local manufacturers. What is interesting is that African small traders through state support,

".....learned to make their profits through monopoly, in some cases adding no value whatever to the goods they handled, or even reducing their value. In the most successful—that is to say, the most thoroughly protected—cases, they could best be regarded as being an extension of the parasitical system, receiving a commission on turnover instead of a salary. A new and politically powerful section of the 'auxiliary bourgeoisie' to be provided with a share of the national surplus". (p. 156).

More importantly, the system also created a handful of new African capitalists who had considerable political power. Foreign capital, finding these African bourgeoisie indispensable to their own interests, struck alliances with them in a number of forms. Thus these Africans were made agents, partners, etc., by foreign enterprises to provide political patronage and protection in return for a share in the profits.

The African peasant mode of production became more and more dependent on the foreign-dominated capitalist mode of production. The capitalist sector provided markets for

peasant products and gave opportunities for peasants to engage in wage labour to supplement their limited income from their farms. Leys points out that the continued survival of these relatively low income generating peasant modes of production helped to subsidize the capitalist mode of production in two main ways:

"One was that they provided a direct subsidy to wages in the capitalist mode of production: 'competition (for work) permits the capitalist to deduct from the price of labour power that which the family earns from its own little garden or field.' The other was that they supplied agricultural commodities at very low prices relative to the prices of the manufactured products sold to the peasants and wage workers (p. 171).

Leys' thought provoking and topical study argues that independent Kenya under the purview of foreign dominated economic institutions and planners has not solved its economic and social problems. Instead, economic and social contradictions are on the increase as a result of the growth of capitalism and the gradual disappearance of traditional society. These have led to further social tensions along class lines which in the past have been explained extensively in terms of tribalism and racism. What seems to be the outcome is that there are signs of an overall radicalization of the working masses.

Colin Leys' study is a brilliant and lucid historical, sociological and economic analysis of the mechanisms of colonialism and neo-colonialism and their exploitative process in the Kenyan economy. This classic study is not confined to Kenya alone, in its implications. Other 'underdeveloped' countries in the Third World can draw from the Kenyan experience. The dependent 'underdeveloped' countries have only one means of discarding the continuous process of 'underdevelopment' and that is to make changes in their social structures.

IVAN ILLICH ON DE-SCHOOLING SOCIETY

Dudley Dissanayake

"Development has quite often met the search for a way to imitate those social, economic and cultural structures that grew up in the West during the last century or two. 'Development' was often an act of mimicry without much creative activity from Third World countries. The last ten years has seen the beginning of a strong scientific critical comment on the Western structures passed on to us in the name of 'development'. One of the most innovative commentators who has been calling for a creative approach to development is Ivan Illich. His views on de-institutionalisation have been the subject of much heated comment. Dudley Dissanayake who writes this Summary of Illich's views is the Principal of the Ministry of Social Services School of Social Work in Colombo.

Illich, hailed as a deeply stimulating thinker, has made a considerable impact on Third World thinking during the last decade. He has given innovative perspectives and analyses of prominent social institutions, whose roles were long taken for granted.

Born in Vienna in 1926, he holds a doctorate in history from the University of Salzburg. Having come to the U.S.A. in 1951, he has served as an Assistant Pastor in an Irish-Puerto Rican Parish in New York City. He was Vice-Rector in the Catholic University of Puerto Rico where he organized an intensive training Center for American priests who were to do evangelical work in Latin America, on its culture. He was the Co-founder of the famous CIDOC—Center for Inter Cultural Documentation in Cuernavaca, Mexico. The seminars he has conducted have achieved widespread recognition.

His research seminars on 'Institutional Alternatives to technological Society' had special focus on Latin America. It is with his extensive concern and analysis of life, requirements and efforts of Latin America, that his ideas became widely relevant

to most of the Third World countries. His incisive observation on what is considered good for developing countries, both by themselves as well as the developed countries, necessitates fundamental re-thinking about many familiar institutions and efforts.

The two most famous books authored by him "De-Schooling Society" (Harrow) and "Celebration of Awareness" (Penguin) published in 1969 and 1970 contain what is referred to as "A call for institutional revolution". His favourite institutional example that needs to be radically innovated appears to be the Schools. "His assault on the Schools..... demands to be considered seriously".

In his foreword to "Celebration of Awareness" Illich states "each chapter in this volume records an effort of mine to question the nature of some Certainty. Each therefore deals with some deception—a deception embodied in one of our institutions. Institutions create Certainties, and taken seriously, certainties deaden the heart and shackle the imagination".

In view of the fact that schools have become Universal institutions, practically following the same form

"All over the world, schools are organized enterprises designed to reproduce the established order"... The establishment of more schools in "Malaysia or Brazil teaches people the accountant's view of the value of time, the bureaucrat's view of the value of promotion, the salesman's view of the value of increased consumption, the union leader's view of the purposes of work... People learn that they acquire more value in the market if they spend more hours in class."

and trends, the interest in educational over-hauling or drastic reforms draw global interest. In all countries education is considered a critical investment for development. It is considered a panacea for development too. Many countries have pursued policies of expanding schools and teachers with great determination, along with their population explosions. But as we in Sri Lanka are well aware, the quantitative expansion has created more socio-economic problems, quite contrary to the expectations of development, through a mechanistic imitative educational process.

Illich raises profound questions about schools. He argues that schools all over the world have an anti-educational and polarizing effect on society. According to him "schools confuse process with substance, teaching with learning, grade advancement with education, diploma with competence, fluency with ability to say something new. Teachers because they sell a packaged curriculum become merchandise distributors. Pupils learn not because of the teachers but because they are motivated by the stick or the carrot of a career". Hence he urges that the schools should be disestablished and the society "deschooled".

He does not use the word "school" in its commonplace meaning. "By 'School' of course I do not mean all organized formal education. I use the term 'schools' and 'schooling' here to designate a form of Child-care and a *rites de passage* which we take for granted. We forget that this institution and the corresponding appeared on the scene only with the growth of the industrial state"..... "Schooling implies custodial care for persons who are declared undesirable elsewhere by the simple fact that a school has been built to serve them.

The School is supposed to take the excess population from the street, the family or the labour force....."

"Schooling also involves a process of accepted ritual Certification for all members of a 'schooled' society. Schools select those that are bound to succeed and send them on their way with a badge marking them fit. Once universal education is accepted as a hall-mark for the in-members of a society fitness is measured by the amount of time and money spent on formal education in youth, rather than ability acquired independently from an "accredited" curriculum".

"Once education is regarded as the product of schools, unschooled education gives the impression of something spurious, illegitimate and certainly unaccredited."

He questions the value of extending obligatory universal schooling to all people in poor nations. "U.S.A. is rich enough to afford schools but most other countries are not but behave as if they are....."

".....Before poor nations could reach this point of Universal schooling, however, their ability to educate would be exhausted. Even ten or twelve years of schooling are beyond 85% of all men of our century if they happen to live outside the tiny islands where capital accumulates. Nowhere in Latin America do 27% of any age group get beyond the 6th grade, nor do more than 1% graduate from a University. Yet no Government spends less than 18% of its budget on schools and many spend more than 30% Universal schooling, as this concept has been defined in industrial societies, is obviously beyond their means".

Even within an affluent society like the USA, where massive public funding is provided for schools, under policies of equal educational opportunity for all classes a poor child rarely can catch up with a rich one, because the former in any case lacks educational opportunities such as travel, books, conversation etc. which are 'casually available' to the latter; both outside and inside school. "So the poorer student will fall behind so long as he depends on school for advancement or learning. The

poor need funds to enable them to learn not to get certified for the treatment of their alleged disproportionate deficiencies".

Obligatory schooling not only creates distinctions within a society but also "grades nations according to an international caste system" by making a country's educational dignity based on the average years of schooling, "a rating which is closely related to per capita GNP and much more painful".

"Schooling", he argues, does not promote justice or learning because, schools try to combine both learning and assignment of social roles, which should be two distinct functions. This happens due to the certification which inevitably follows a programmed curriculum and is insisted upon for most social or professional roles. Competence should be detached from curriculum. Further all learning is not the result of teaching as "most people acquire most of their knowledge outside the school".

"Certification constitutes a form of market manipulation and is plausible only to a school mind. Most teachers are less skillful, less inventive and less communicative than the best craftsmen or tradesmen. Experiments.....suggest that many young teen-agers, if given proper incentives, programs and access to tools are better than most school teachers at introducing their peers to the scientific exploration of plants, stars and matter.....".

In his essay, on 'Ritualization of Progress' (in *Deschooling Society*) he elucidates the social effects that the school system creates. "Certified College graduates fit only into a world which puts a price tag on their heads, thereby giving them the power to define the level of expectations of their society. In each country the amount of consumption by the College graduates sets the standard for all others". Graduates become models for consumer standards, and the modern paraphernalia such as cars and tape-recorders, turn out to be their visible indicators. This is a new function Universities have developed. Further a University graduate usually feels more comfortable with his North American and

European colleagues than with his non schooled brethren and all students are academically processed to be happy only in the company of fellow-consumers of the products of the academic machine.

"The curricular instruction gives students a programmed or fragmented view of reality. It also alienates young people, preparatory to life 'by depriving education of reality and work of creativity'. Although most learning is not the result of school teaching, "once a man or a woman has accepted the need for school, he or she is easy prey for other institutions....."

Illich does not stop with his provocative analysis of the school system. He takes much interest in suggesting alternatives, which are specific and also fundamental. He agrees with some contemporary analysts about the need to diverting the state appropriated funds directly to the learners. Ultimately there should be no obstacle for anyone at any time of his life to be able to choose instruction among hundreds of definable skills at public expenditure. He suggests issuing an 'Edu-Credit Card' or educational passport to each citizen at birth, so that they may acquire the needed learning at their convenience with less undesirable side effects than a school. In order to favour the poor who may not use their cards early in life, interest should be added to them. This will ensure more just distribution of educational funds among all citizens.

Prior to setting forth his detailed innovative proposals for learning, in his essay on the 'Institutional Spectrum' (De-Schooling Society) Illich states 'we need a set of criteria which will permit us to recognise those Institutions which support personal growth rather than addiction, as well as the will to invest our technological resources preferentially in such institutions of growth'.

The choice he has identified as between two contrasting types—(A) Manipulative Institutions which are dominant in contemporary society. These specialize in manipulating their clients. (B) Convivial institutions which are distinguished by spontaneous use and which do not require

hard pressure on clients for their use. Examples are public markets, telephone link-ups etc. These two models occupy extremes of an institutional spectrum which he describes as right to left respectively. "Schools fall into the right end of the spectrum. Of all 'false utilities' School is the most insidious. A highway system produces only a demand for cars. A schools system creates a demand for the entire set of modern institutions which crowd at the right end of the spectrum. A man who questioned the need for highways would be written off as a romantic, the man who questions the need for school is immediately attacked as either heartless or imperialist....." "The established teachers Unions, the technological wizards and the educational liberation movement reinforce the Commitment of the entire society to the fundamental axioms of a schooled world, somewhat in the manner that many peace and protest movements reinforce the commitment of their members—be they black, female, young or poor—to seek justice through the growth of the gross national income".

He observes that our educational institutions are at the service of the teachers' goals. However the structures that have to be developed are those that will enable each man to define himself by learning and by contributing to the learning of others. His proposals are intended to create a new kind of educational relationship between man and his environment.

"I intend to show that the inverse of the school is possible that we can depend on self-motivated learning instead of employing teachers to bribe or compel the students to find the time and the will to learn; that we can provide the learner with new links to the world instead of continuing to funnel all educational programs through a teacher."

There are three purposes of a good educational system which he enumerates as follows:

- A. It should provide all who want to learn with access to available resources at any time in their lives.
- B. It should improve all who want to share what they know to find

those who want to learn it from them.

- C. It should furnish all who want to present an issue to the public with the opportunity to make their challenge known.

For this he proposes four channels which will contain all the resources needed for real learning. Things, models, peers and elders are the resources that will be utilized in varied ways. He uses the term 'learning webs or networks' for his methods. The new educational institutions should start with the question "what kind of things and people might learners want to be in contact with in order to learn?" The four networks he suggests, as new educational institutions are:

- A. Reference services to educational objects. These objects may be in laboratories, museums, or in factories, farms etc.
- B. Skill exchanges—which permit persons with skills to share them with others, by providing information about themselves.
- C. Peer-matching—a communications network which enables persons to announce the learning activity they wish to engage, in the hope of finding a partner for the inquiry.
- D. Reference services to educators at large—a sort of a directory source.

The educational administration needed for these will consist of three areas of Competence:

- i. to create and operate the kinds of educational exchanges or networks outlined.
- ii. to guide students and parents in the use of these networks.
- iii. a primus inter pares to undertake difficult intellectual exploratory journeys.

He also foresees the disappearance of the school-master and the rise of a vocation of an independent educator. His proposals are a distinct shift from the existing "Manipulative type" of educational institutions to the 'Convivial type' he suggests for the future. Thus de-schooling of society not only means disestablishment of the school, but freeing people from the shackles of categories created to view reality.

Schools are not only the 'reproductive organ of a consumer society'. It has become 'the planned process which tools man for a planned world, the principal tool to trap man in man's trap'. It is supposed to shape each man to an adequate level for playing a part in this world game. Inexorably we cultivate, treat, produce and school the world out of existence." The critique and proposals, though mainly revolving round the current school system, goes well beyond those confines and points to deeper and wider concerns about the contemporary world. The dilemma of institutionalization is not confined to the schools.

"Institutional goals continuously contradict institutional products. The poverty program produces more poor; the war in Asia, more Vietcong; technical assistance more under-development. Birth control clinics increase survival rates and boost the population; schools produce more drop outs and the cut in one kind of pollution usually increases another."

"Surreptitiously, reliance on institutional process has replaced dependence on personal good will. The world has lost its humane dimension and acquired the factual necessity and fatefulness which were characteristics of the primitive times..... Man has become the plaything of scientists, engineers and planners."

Treatment meted out to clients by professionals through their institutions, show steadily declining results. Illich observes that doctors, teachers, social workers all realize their common factor—"they create further demands for the institutional services they provide, faster than they can provide service institutions".

Illich illustrates how people have become prisoners due to the very institutions they have created, as they condition our world view. Factories, schools, hospitals etc. produce goods and services packaged to contain our view of the world. Progress is treated as the increase of these institutions. Although industrialized rich countries can provide their citizens with packages of consumptive services, Illich argues, it does not mean that those societies are "sane or economical or that they promote life." In most of

the Third World development has got identified with the progressive availability of material goods commonplace in industrialized societies.

In his essay on "Planned Poverty" he says the end result of Technical Assistance is that (1) for each car Brazil puts on the road, fifty people are denied good transportation by bus (2) every dollar spent in Latin America on doctors and hospitals cost a hundred lives. Had each dollar been spent on providing safe water hundreds of lives could have been saved. Similarly the examples of such situations can be increased.

His perspectives are of distinct value to the Third World. Often, we seek solutions to our problems by imitating the institutional solutions developed in the Western industrial



Ivan Illich

saving mankind from distorted industrial development

societies. Invariably these have led to more misery because they lack the appropriateness needed for the local realities. Though some of his solutions may tend to be described as visionary, the overall impact of new directions for thought in Third World societies appears to be his foremost contribution.

Fundamental inquiry around rethinking on matters taken for granted for a long time does indeed provide much enlightenment about the irrelevant paths we take. The following extract illustrates a common mistake in many developing countries. "Most of South America need; paramedical workers who can function for indefinite

period without the supervision of a qualified doctor. Instead of establishing a process to train midwives and visiting teachers who know how to use a limited arsenal of medicines while working independently Latin American Universities every year establish a new school of specialized nursing or nursing administration who can function only in a hospital"

"Under-development, can be seen not only in material aspects such as less-food, less-clothing etc. Visible signs of being short of consumer goods is reinforced by the social institutions."

According to Illich "under-development is also a state of mind or as a form of consciousness is the critical problem. Under-development as a state of mind occurs when mass needs are converted to the demand for new branches which are for ever beyond the reach of the majority. Under-development in this sense is rising even in countries which are for ever beyond the reach of the majority".

Better Means Less

By pointing out the mistakes of the 'advanced' countries, Illich hopes to enable others to avoid them. "Above all", he says at the beginning of this book *Tools of Conviviality*, "I want to show that two-thirds of mankind can still avoid passing through the industrial age".

Illich hopes that the Third World can take a different path from the presently industrialized countries. But he is not too hopeful. He fears it is being pressured, partly by its own professional elites, to follow a path which will destroy its existing conviviality and replace it with the tensions, additions, and sense of failure which characterise industrial societies. He recognizes also that benefits for the poor demand a reduction of the resources being used for the rich (while benefits for the rich make huge demands on the poor). "Yet the rich pretend that by exploiting the poor nations they will become rich enough to create a hyper-industrial balance for all. The elites of the poor countries share this fantasy".

JUSTICE BY INDEX?

by Alain Vernay

"Indexation" a process by which the prices of commodities from the Third World are tied to the prices of manufactured goods from the industrialized countries and where prices would range within an agreed world trade-price index: has been recently considered one solution to the instability and decline of Third World commodity prices. A well publicised attempt is that where oil prices should be tied to manufactured goods, as advocated by Iran. Indexation it is felt holds promise for countries like Sri Lanka whose economies are dependent on the export of commodities to the West. In this article Alain Vernay raises some critical questions regarding the hopes placed on indexation. Vernay, a specialist in economic affairs, is Deputy Editor-in-Chief of the French "Le Figaro".

At the preparatory meeting for the future "International Conference proposed by the President of the French Republic", discussion between the developing countries and the industrialized countries broke down over the insistence of the former on explicit reference in the agenda to the need for indexation of raw material prices and their refusal to accept the industrialized countries' counter demand to re-examine the current level of oil prices.

A disagreement due to similar reasons occurred a month before at Teheran during a meeting of Iranian and European economists to examine global development problems. Even though the participants started out with many common premises, conclusions nevertheless differed over the opportuneness and effects of a price indexation of raw materials as well as of oil. Referring to this disagreement, Professor Luigi Spiventa of Rome's Institute of Political Economy quoted a remark by Professor Joan Robinson, "It is difficult to find a black cat in a dark room, but it is even more difficult if the cat is no longer there".

Conferences end, but the problems remain. In view of their importance for the future, it might be worthwhile going over the differences which arose at Teheran, even among supporters of raw material price indexation.

Indirect Indexation

As for indirect indexation, which tends to stabilize the purchasing power of developing countries by providing for compensatory pay-

ments while retaining a certain price flexibility based on the market, it was criticized on the grounds that it does nothing to correct the "plundering of natural resources" and is unrealistic: in order to control the price fluctuations of the 18 principal raw materials, would it not be necessary to start out with at least \$13 billion to build up stocks?

Direct Indexation

A direct price indexation of exported raw materials based on the price of a basket of imported goods stirred up differences concerning the selection and content of the import price index. Several variations were proposed, but none received majority support. These variations were: a general index of all manufactured goods imported by the developing countries; a general index including as well as manufactured goods, the food products and fuel brought by the developing countries; and other indices based on one of the preceding formulas but only applying to a particular developing country commodity.

Should we go any further into this maze if there is no way out? Wouldn't it be better to ask the fundamental question which now arises in so many instances: is indexation the main road to development?

I should like to make it clear that it seems unrealistic to me to attach prime importance to the beneficial effects of indexation for all the developing countries. True, they are closely linked by years of common experience and political dependence, and now by economic dependence, but their needs differ

widely according to their wealth or poverty in petroleum and mineral resources.

Three Possible Solutions

In the light of this simple idea and from the viewpoint of economic effectiveness, three groups of possible solutions should be examined.

- ✦ The first solution is an indexation of only oil prices which OPEC may well be in a position to impose. It is the only exporters' cartel or club, if you wish, which is sufficiently strong and united enough to do so.
- ✦ The second solution would be an indexation of all raw materials as demanded by the "Group of 77", led by Algeria, which considers such a solution as a basic requirement for a new economic order. The consequences of this solution should be closely examined even if they seem unrealistic in the present context.
- ✦ The third solution would be within the framework of a strategy for international co-operation. It would mean the adoption of a series of measures designed to stabilize raw materials and would vary according to circumstances and beneficiaries.

The First Solution

An oil price indexation would seem to be inevitable after the stabilization of prices from January to September which corresponds to a 20 to 25 per cent decrease in real terms following the more rapid rise in the price of industrial products in 1974 and 1975.

Added to this are the effects of the decrease in the exchange rate of the dollar—the medium of payment for oil purchases, even though OPEC countries also import goods from Europe and Japan.

The second of these phenomena is already being corrected thanks to the fixing of the parities of the OPEC currencies (starting with the sales price of crude oil) in terms of special drawing rights (SDRs). This automatically compensates for the depreciation of the U.S. currency. It will also be necessary, and this is relatively easy, at least bilaterally, to find ways of indexing the petrol-dollars lent

to the West so that OPEC will not become the victim of negative interest rates.

With regard to the first problem, it is necessary though difficult to determine the relationship between oil and industrial prices. The essential thing is to agree on a starting level. It will probably be necessary first to take into account the cost of other conventional energy sources. On this basis, the price of crude oil, which is bound to rise progressively, would be lower than it is at present. This would respond to the anxiety to maximize OPEC's earnings in the middle and long term by not encouraging over-investment in petroleum substitutes.

The Second Solution

The indexation of all raw materials, in order to avoid the excessive fall in prices which occurred in the 1950's and 1960's, nevertheless seems to me to be based on a false relationship and mistaken assumption.

The false relationship is that of the developing countries to the raw material producers. Few Third World countries have a predominant position in the production or even the export of minerals and metals. A price increase, according to the most recent U.N. studies, would first be detrimental to most of the developing countries, but would be to the advantage of Canada, Australia, South Africa, the United States and the U.S.S.R. Moreover, the world's grain stocks are in the Western countries. The stabilization, indeed the reduction, of agricultural prices takes on a far greater importance for the developing countries than the automatic indexation of raw materials, if one realizes that the demand for insoluble grains will, by 1985, have to increase to feed 750 million people instead of the present 400 million.

In my opinion, the mistaken assumption (which explains the "Group of 77's" misplaced confidence in the possibility of a continued rise in raw material prices) is the belief that raw materials are unrenovable and, therefore, rare, according to the all-too-hasty thesis of the Club of Rome. The Club has in fact, had to revise its first report because the supply of new resources depends on the amount of capital invested in discovering them.

At this point what can we conclude? Clearly, it is neither in the interest of

the developing countries to push the prices of the commodities they control to such levels that they encourage the development of substitute products, nor is it in the interest of the industrialized countries to let the price of raw materials fall too low, because that would lead to waste and discourage recycling raw materials. This is more important in the long run than recycling petrodollars. Any excessive fall leads later to an excessive rise. It's not because of altruism that, after a dizzying fall of copper prices, the world's largest mining and industrial company, Rio Tinto Zinc, is trying to help the group of copper exporting companies (CIPEC) to keep the price of copper up by negotiating the purchase of Japanese surpluses.

The world is economically interdependent, as we have seen by the general collapse into stagnation after the quadrupling of oil prices. International structures, already weakened by monetary disorders, were unable to hold up under the late but rapid rise of crude oil prices.

There are grounds, for believing, therefore, than an indexation of Third World products based on Western inflation would have unfortunate consequences for the Third World as well. With the indexation of raw material prices, there would be little chance of reverting to a strict monetary policy and fixed (but adjustable) parities, the abandonment of which has rightly been exposed as one of the causes of the developing countries' present difficulties.

It seems, on the contrary, necessary to undertake simultaneously the reform of the international monetary system, which has been hanging fire for some time, and the reform of the system of terms of trade between industrialized and developing countries. Terms of trade cannot be governed simply by the law of the market-place.

The Third Solution

An international co-operation strategy will involve, first, granting disadvantaged countries preferential and non-reciprocal—access to markets for the largest number of their industrial as well as their agricultural products; secondly, maintaining the price of the few commodities produced only by

the developing countries; and finally, giving more to the poorest countries, in line with the present tendency in Europe to increase the low salaries of workers faster than the high salaries, and to abandon the unjust system of equality in the granting of social and family allowances, adjusting the benefits according to the degree of poverty.

The Road to Follow

The road to follow has been indicated by the Lome Agreement. According to this Agreement the European Community guarantees given prices for given quantities of the agricultural products of 44 countries, and, in the case of the Sugar Agreement, guarantees prices equal to those obtained by EEC farmers.

This form of co-operation will call for action by the industrialized countries to encourage competition on their domestic markets. For this, the Western governments must obtain the support of farmers, workers, industries where man-power is threatened, trade unions—in short, of public opinion in general. It will be impossible for them to obtain this support unless the developing countries, at the same time, forego their most extreme demands.

This moderation seems all the more necessary because association agreements would also have to be concluded between State-owned and private firms in the industrialized and the developing countries. However, hope of achieving the golden triangle—that is, the conclusion of agreements for development of the poor countries of the Third World with funds from the OPEC countries and with Western countries supplying their know-how—should not be abandoned.

The game will have been won when selective indexation, carried out in stages, can be seen merely as a complementary measure, a barrier against excessive market fluctuations, and not as the main pawn in a wider game which includes the opening of frontiers, technical assistance and joint ventures. That round has not yet begun. Only when it begins and is successful will it be possible to achieve the sort of international division of labour which, heretofore, would have been considered by everyone to be a threat to economic independence.

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