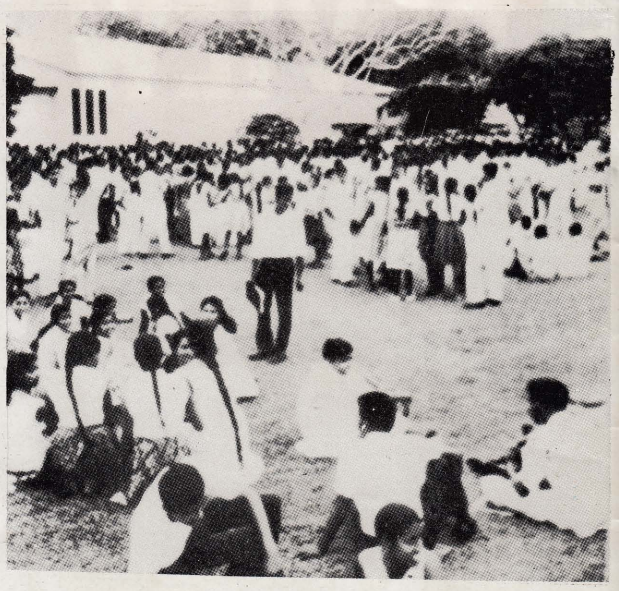
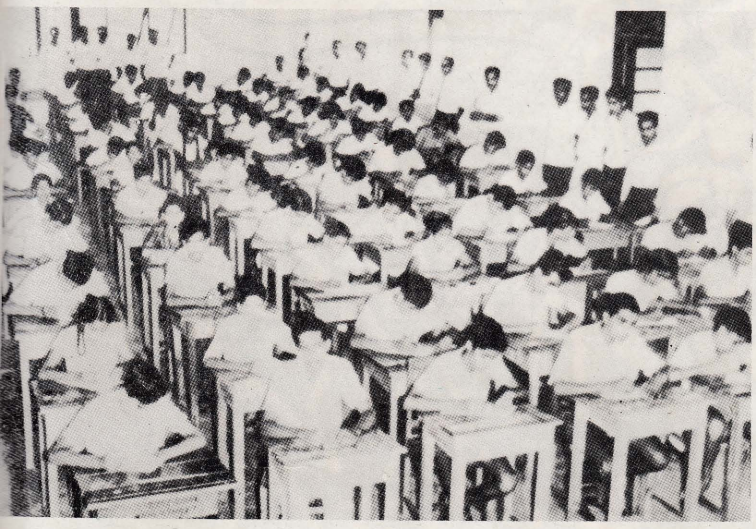
ECONOMIC REVIEW

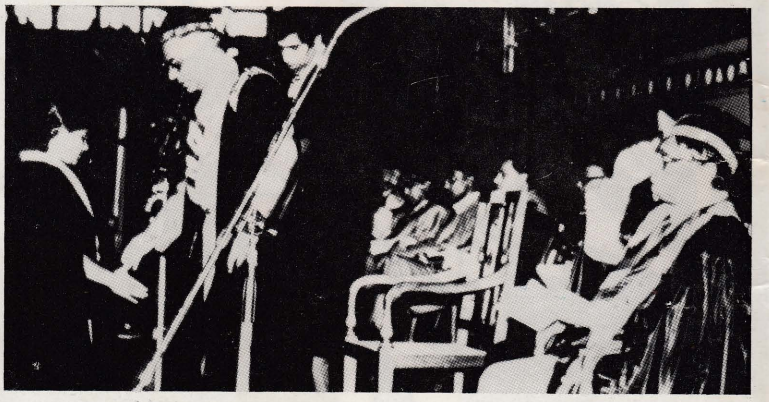
APRIL
1983

UNIVERSITY – ENTRY, EXPECTATIONS AND FACING THE FUTURE

After 12 years or more of schooling comes the major hurdle, for those aspiring to a higher education, in the form of the 'A' Level exam. At no stage is the competition greater, and the select few finally enter full of hopes and enthusiasm. But many among them, particularly those following courses where employment prospects are doubtful, soon develop fears of an uncertain future and are often irked when their demands and requirements as students are not met. These frustrations together with idealist motives towards a better society are released in various forms including protests and demonstrations. Most of them ultimately experience that final moment of the formal convocation and then return to face the realities of a world where they must survive.







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

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.

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Some recent trends in the nutritional status of Sri Lankan pre-schoolers

Rice and wheat flour consumption and the flour milling industry in Sri Lanka

* Methods of computing paddy production statistics
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COVER ARTIST

G. P. Athulathmudali, whose speciality is art education, has wide experience in illustrating for publications.

DIARY OF EVENTS

March

1 The guaranteed price of paddy was raised from Rs57.50 to Rs 62.50 per bushel.

The National Milk Board increased the producer prices payable on a litre of milk, with a fat content of 2.5 percent, from Rs 1.75 to Rs 2.75. Prices were increased progressively upto a maximum of Rs 6.95 per litre, with a fat content of 8.5 percent. The Board simultaneously increased the retail price of milk (e.g. 568 ml. bottle) of pasturised milk from Rs 2.30 to Rs 3.20 and the price of a bottle of sterilized milk from Rs 2.55 to Rs 3.45.

The National Savings Bank was granted approval to diversify its investment portfolio by way of lending 10 percent of the net savings it mobilises each year for specific development activities. This scheme is also expected to help the NDB to reduce its dependence on the interest subsidy it receives from the Government.

2 The Ceylon Petroleum Corporation increased the selling price of petroleum, kerosene and diesel with a view to eleminating the operating losses of the Corporation. The price revision includes (per litre) petrol Rs 10 to Rs 12; kerosene Rs 3.88 to Rs 5.20; super diesel Rs 6.60 to Rs 7.90 and auto diesel Rs 5.97 to Rs 6.75.

4 An increase in the price of Liquified Petroleum Gas (LPG) was announced. The price revision is on a 13 kilo cylinder from Rs 90 to Rs 120 and 40 kilo cylinder (industrial) from Rs 501 to Rs 603.

8 The Budget for the fiscal year 1983 was presented to Parliament by the Minister of Finance and Planning Mr. Ronnie de Mel.

9 Letters were exchanged between the Governments of Japan and Sri Lanka for a grant of Japanese Yen 45 million (Rs 4.4 million approx.) to be used for restoration and preservation of ancient monuments in the area demarcated the Cultural Triangle of Sri Lanka.

The proceeds of this grant will be used for purchase of civil engineering and construction equipment necessary for excavation and conservation of monuments.

10 The Ministry of Transport announced a revision of bus and train fares following the upward revision of prices of diesel. The average increase in bus fares, resulting from the new fare structure is estimated at 25 percent; while the increase in railway fares was estimated at 40 to 48 percent.

14 OPEC oil ministers, meeting in London, agreed to reduce the bench-mark price for Saudi light Arabian crude to $ 29 a barrel and to lower production ceilings.

16 The Central Bank introduced a supplementary refinance facility in respect of non-traditional exports, in order to further promote non-traditional exports and encourage banks to provide pre-shipment finance to small scale exporters. The new scheme enables the grant of refinance to exporters through commercial banks for a period of 120 days by way of discounting or rediscounting promissory notes executed by exporters and tendered to commercial banks.

24 Sri Lanka's first merchant bank with foreign participation was inaugurated in Colombo at a formal ceremony by the Minister of Finance and Planning. It is a joint venture of the People's Bank with Guinness Mahon & Company Ltd. London. Named the People's Merchant Bank Ltd., its functions will include the financing of development projects in both private and public sectors; corporate financing; managing share issues and loan syndications (See also page 20)

The Central Bank reduced the bank rate from 14 percent to 13 percent; and the rate of interest on Central Bank refinance to commercial banks on pre-shipment export credit from 12 percent to 11 percent. In addition, the interest rates applicable on loans granted under the Medium and Long Term Credit Fund (MLCF) were reduced by 1 percent per annum

Letters were exchanged between the Government of Denmark and Sri Lanka providing a grant of Danish Kroner 69.12 million (Rs 184 million approx.) for financing rural water supply and sanitation in Matale and Polonnaruwa districts.

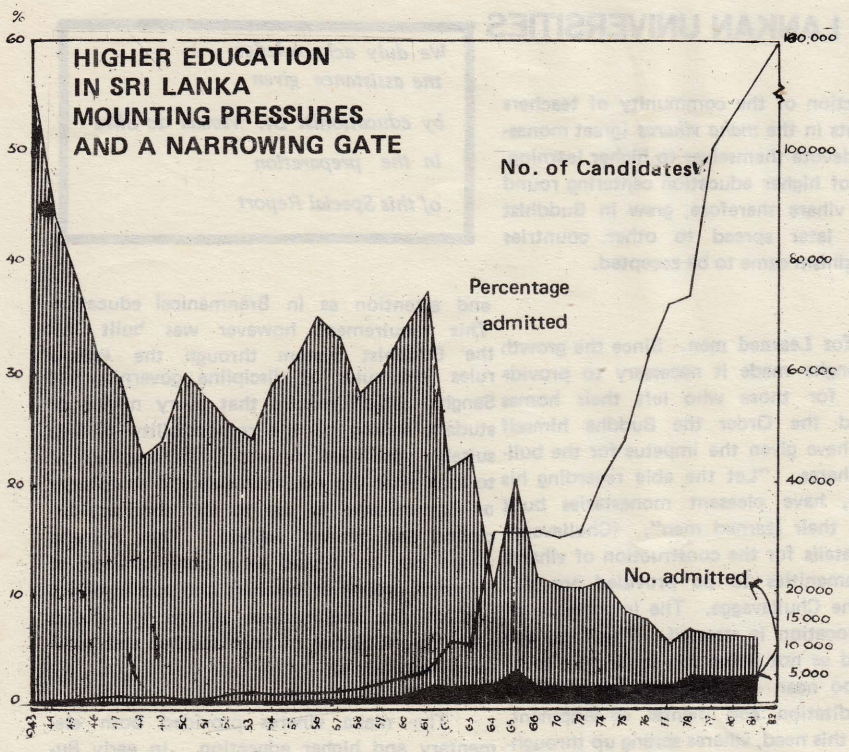
27 India's foreign collaboration approvals in 1982 totalled 593, the highest for any year so far and the total foreign equity investment was of the order of Rs 62.8 crores also a record as compared to Rs 58.8 crores for nine years 1973 to 1981 taken together, stated a report from New Delhi. The US and West Germany led with 110 new collaborations each followed by the United Kingdom with 107 Japan, Italy, France, Switzerland, Sweden, Austria, Canada and the Netherlands.

28 The International Monetary Fund approved a loan totalling more than $ 375 million to help Zimbabwe cover its serious balance of payments deficit and the effects of the world recession. The package deal was announced simultaneously by the IMF and the Zimbabwean Minister of Finance Dr. Bernard Chidzero.

30 Following the Central Bank's reduction in the bank rate on March 24; the penal rate structure (21–30 percent) on Central Bank accommodation to commercial banks in excess of allocated limits was replaced with a flat rate of 20 percent.

Letters were exchanged between the Japanese and Sri Lanka Governments providing for a grant of Japanese Yen 677 million (Rs 65.3 million approx.) to finance Phase I of the Kirinda Fishery Harbour project. This grant will finance costs of construction equipment, building materials and the consultancy fees of Phase I of the project.

31 An agreement was signed in Colombo providing an additional US $ 17.3 million (Rs 397.9 million approx.) for three on-going projects financed by the United States Agency for International Development (USAID). The projects are Mahaweli Basin Development II (Rs.368 million); Development Services and Training project (Rs 18.4 million) and Private Voluntary Organisations Co-financing project (Rs 11.5 million).



The unstable situation continued well into the 1970's. Steps to centralise universities, and from around 1978 to decentralise, were among the changes attempted in reorganisation of the higher educational set-up in the country. Most significant of the recent changes was that a single University system was converted into a system covering six formally autonomous universities, functioning formally under a University Grants Commission, which is expected to oversee the disbursement of university funds and the maintenance of academic standards. Government expenditure on higher education (see table 1) which averaged Rs. 13 million a year at the end of the 1950's and increased to about Rs. 28 million a year at the end of the 1970's is estimated to reach an average sum of Rs. 450 million annually for the three years 1984–1986, a significant increase, and an indication of the growing importance that Higher Education is due to receive.

HIGHER EDUCATION

This Special Report examines some of the major issues associated with university education in Sri Lanka.

During the last 30 years the University has been a subject of growing concern to teachers, students, parents, politicians, administrators and all others associated with the country's development. Over the 1960's and 70's the problems created by the ever increasing demand for higher education reached serious proportions. A growing population, faster expanding primary education facilities and rising expectations of a broader specturm of society all emerging together over the 1960's brought increasing pressure on the social, economic and political institutions of the day. The economy, for a variety of reasons, was never able to accomodate these pressures and ad hoc solutions resulted. The developments in the sphere of higher education during these last three decades have moved closely with the social, economic and political changes occuring during each phase of change.

Table 1 GOVERNMENT EXPENDITURE ON HIGHER EDUCATION

Year	Rs. Million		3 Year Annual Average Rs. Million (approx.)
1958 – 59 (1)	11.0		
1959 – 60 (1)	12.1		
1960 – 61 (1)	15.5		13.0
1979 (2)	33.3		
1980 (2)	22.1		28.0
1981 (2)	28.5		
1982 (Est) (2)	47.2		
1983 (Est)	125.6 (2)	223(3)	—
1984 (Est) (3)		377	
1985 (Est) (3)		538	450.0
1986 (Est) (3)	—	430	

(1) Report of the Universities Commission, 1962.
(2) Annual Government Estimates of Revenues and Expenditure.
(3) Public Investment 1983–1987, Ministry of Finance & Planning.

THE UNIVERSITY CONCEPT AND SRI LANKAN UNIVERSITIES

We duly acknowledge the assistance given by educationist Dr. Wimala de Silva in the preparation of this Special Report

What is a University ? What are its unique characteristics ? To understand some of the basic concepts and assumptions underlying the idea of a University let us examine briefly two traditions of University education, the Buddhist and the West European, both of which have influenced the Universities of Sri Lanka.

BUDDHIST TRADITIONS

General

India has a very ancient tradition of higher education long preceding Buddhism. But the development of institutions of advanced study, with an organisation, a structure and a corporate body of teachers and scholars, took place only about the 3rd century B.C. with the rise of Buddhism.

The Maha viharas, the focal points of higher education. The Brahmanical tradition favourec individual not collective forms of worship or study. The establishment of a close personal relationship with the teacher was a vital element in the educational process, whether religious or secular. Therefore brahmanical education was imparted in the home of the teacher in small domestic units. On the other hand Buddhist education was practically identified with the education of the *Sangha* (the Buddhist order of monks). It was therefore, only logical that Buddhist education centering around the *viharas* (monasteries) should be institutionalised. It was also logical that Buddhism which considers the mind as the most vital element in all active processes should develop the organisation and structure enabling a section of the community of teachers and students in the *maha viharas* (great monasteries) to devote themselves to higher learning. A system of higher education centering round the maha vihara therefore, grew in Buddhist India and later spread to other countries where Buddhism came to be accepted.

Buildings for Learned men. Since the growth of the Sangha made it necessary to provide residences for those who left their homes and joined the Order the Buddha himself is said to have given the impetus for the building of viharas. "Let the able regarding his own weal, have pleasant monasteries built and lodge their learned men". (Chullavagga VI 1.5) Details for the construction of viharas and the amenities to be provided are also given in the Chullavagga. The importance of the right location is stressed. The ideal site is described as not being too far from a town and not too near — well suited for a life of study, meditation and mental development. Because of this need, viharas sprang up throughout Buddhist India — Some were built by kings, merchant princes, and wealthy citizens — vast edifices in spacious parks. Others were built by the community.

The maha viharas were supported by the community and maintained by the produce of villages and lands gifted for their maintenance. Education in the viharas was, as a result, free. It was also residential. Both teacher and pupil were provided with the basic requirements of food, lodging, clothes and medicine.

Organization of learning. On admission a student was given the same individual care and attention as in Brahmanical education. This requirement however was built into the Buddhist system through the *Vinaya* rules 'the rules of discipline governing the Sangha) which require that every novice or student should be the responsibility of two suitably qualified superiors, an *upadhayaya* to look after the academic side and an *acharya* or *karmacharya* to see to the conduct, discipline and general welfare. Thus a maha vihara can be viewed as a confederation of different groups of teachers and pupils, where like in the Brahmanical system the duties and responsibilities of both teacher and pupil were well defined.

The maha viharas provided both elementary and higher education. In early Buddhism education was confined to the study of the Pali canon and its philosophy as accepted by the Theravada school. But with the rise of the Mahayana school, about the beginning of the Christian era, studies became more liberalised. Elementary education in the viharas, particularly in those of the Mahayana school came more within the broad framework of general education imparted in India. A study of the Dhamma was basic. But as in the brahmanical system — viyakarana (grammar) Silpasathanavidya (arts and crafts) hetuvidya (logic) and adhyatmavidya (inner science) were also included. It was further necessary that the bhikkus should be trained for the maintenance of the organisation. Thus there are frequent references in the Chullavagga to bhikkus who were trained in building construction to build and maintain the viharas, in weaving to make and repair their robes, in medicine to look after and nurse the sick and in business studies to attend to stores and manage the vihara. A student who proceeded to advanced studies had therefore, a basic knowledge, not only of Buddhism but also of the 5 sciences and of the skills needed to run a large establishment with efficiency.

It was from goals such as the preservation and the spread of Buddhism which were directed towards social objectives, that there developed two of the main activities connected with the maha viharas — teaching and research. The need to preserve the Dhamma in its pure form gave rise to the following research activities —

Mano pubbam gama dhamma
Mano settha·manomaya

Dhammapada

All that we are is the result of our thoughts; it is founded on our thoughts; it is made up of our thoughts.

Translation – Max Muller

A cultivated intellect, because it is good in itself, brings with it a power and a grace to every work and occupation which it undertakes.

Newman – Idea of a University

The university's distinctive responsibility . . . . . is to be a place where the criticism and evaluation of ideas is continually being carried forward, where nonsense can be exposed for what it is and where intellectual virtues rooted in sincerity of mind are being fostered and transmitted.

Walter Moberley – The Crisis in the University

No one ought to meddle with the universities, who does not know them well and love them well.

Thomas Arnold

(i) captioning, classifying and grouping the Buddha's teachings into the standard division, namely the Tripitaka.

(ii) production of a great volume of exegetical literature — annotations, explanations and commentaries (atha katha) directed towards the clarification of different points in the Dhamma. This required outstanding scholarship and critical analysis of a high order.

It is thus clear that higher education in Buddhist India was directed towards achieving the purposes of the Sangha. Though with the rise of Mahayana Buddhism more secular studies came to be included, nevertheless, speaking generally, it can be said that for professional and secular education the laity had to turn, as described in the Jatakas, to studies which existed outside the vihara. But in spite of these limits there was a rapid expansion of higher education as provided in the maha viharas. According to Fa-Hien, there were in the 5th century A.D. no fewer than 500 viharas of the Theravada school alone. Some of these would have provided higher education. There were in addition viharas belonging to the Mahayana school and to smaller sects. Learning advanced not only quantitatively but also qualitatively. Several of the maha viharas had the highest reputation for scholarship because of the learning of their teachers and attracted students from all parts of the Buddhist world. One of the best known of these was Nalanda. (See Box)

UNIVERSITY TRADITIONS OF WESTERN EUROPE

General

The establishment of "universities" as a continuing organisation developed in Europe in the 12th century A.D. But the traditions they embodied went back several centuries to the *studium generale* or collection of schools of higher learning. As in India each school comprised of an eminent scholar and the students who gathered round him to imbibe his learning and skills.

It is generally accepted that the traditions of higher learning associatd with the studium started in Ireland about the 5th century A.D. and were sustained and nourished there. It is a matter of record that even in the early years Ireland had two studium to which students flocked — each having as many as 7,000. One of the cities thus famous for its learning was Armagh to which "by virtue of its schools became the metropolis of civilization". The *Brehon* laws of Ireland, contain specific safeguards of this sytem. They ensured the autonomy of the schools, the rights of students to study where they wished and freedom of movement from school to school and teacher to teacher. These laws also defined the rights and obligations of the teacher-pupil relationship and provided for the maintenance of poor students.

NALANDA

Nalanda existed from pre Buddhist times as a centre of Brahamanical studies. But it gained eminence as a seat of higher learning only with the rise of Mahayana Buddhism. By the 7th Century A.D. it was for all intents and purposes a large university with its official seal — the seal of the *Sri Nalanda Mahavihara Arya Bhikku Sangamaya* (Venerable community of Monks in the Great Vihara of Sri Nalanda).

According to Hiuen Tsang the grounds of Nalanda were gifted to the Buddha by 500 merchants. From time to time there were royal endowments taking the form of buildings of great magnificence and villages for its maintenance. In I—Tsing's time there are said to have been over 200 villages for the daily supply of food and other requirements to Nalanda.

During this period Nalanda had developed the highest standards of scholarship and become the acknowledged centre for Mahayana studies. It has been described by Mookerjee in *Ancient Indian Education* as "practically a Research Institute for advanced students and the highest court of judges of intellectual worth. The highest academic distinction of the times was a fellowship of Nalanda. The value placed on the seal of scholarship from Nalanda was such that according to Hiuen Tsang there were those who 'stole' the name of Nalanda brothers. (Forging certificates is apparently not a modern practice).

Students flocked to Nalanda largely because of the renown of its teachers. But they also came to study and copy the vast store of manuscripts in its library as well as to establish their own credentials for scholarship. Its fame was not confined to India. Distinguished scholars like Hiuen Tsang came from countries to which Buddhism had spread. The demand for admission was such that though there were as many as 8,500 students at the time of Hiuen Tsang yet they formed only about 20 percent of those who sought admission. The students had to prove their capacity to profit by higher study at Nalanda and to attain a very high standard in elementary education. Selection was not on strictly denominational lines. Persons of other faiths such as Tirthakas and Brahmins were also admitted both as pupils and teachers. The question asked of a pupil was "Have you the right disposition ?" not "Have you the true belief ?"

In spite of its size, the organization was on the same lines as other viharas. All the students and teachers were in residence. Though there were such large numbers the tradition of providing an upadhaya and acharya for each student continued. Education was free and the basic requisites of teachers and pupils were also provided free. In spite of the size of Nalanda, matters ranging from the annual assignment of rooms to discipline were in the hands of students themselves. Nevertheless, according to I—Tsing, the rules and discipline in Nalanda were stricter than anywhere else and indicated the success of self government.

The main field of study was the Buddhist Canon. But there were also studies in other philosophies prevalent in India at the time. For instance, though Hiuen Tsang came to Nalanda primarily to study Mahayana Buddhism, he also studied Yoga under the Kulapati (Vice Chancellor) who was the highest authority on the subject at the time and also followed Brahamanical studies which included fields of learning such as philology, law and astronomy. Nalanda thus had both religious secular studies and as many as 100 lectures are said to have been given each day. It has been said "verily, Nalanda has the merit of collecting at one centre the available authorities on every subject of learning". (Mookerji, *Ancient Indian Education).*

During the peak of its academic excellence there was a movement of scholar monks between Nalanda and China, Japan, Korea, Tibet, Nepal, Mongolia, Java and Sumatra.

Nalanda was also a training ground in oral communication. Organised debate which was part of the intellectual life of India assumed fresh proportions as the "schools of discussion". These were probably schools of special studies, which drew scholars from all over the Buddhist world, to debate in I—Tsing's words "on all possible and impossible doctrines" and thus establish the credentials for scholarship and for their capacity as preachers.

Study at Nalanda was also a qualification for state service. After completing their education it was not uncommon for scholars to present themselves at court for service under the king.

From about the 9th century A.D. gradual decline set in. Buddhism itself was losing its hold in India. Some of the great centres of learning like Nalanda were destroyed. Others changed their character and became centres of Tantric and other philosophies. But the traditions of higher education in the maha viharas were preserved in the countries to which Buddhism spread.

Such centres of higher learning spread throughout the length and breadth of Europe. The most renowned scholars attracted students from many lands. Thus "universality" as a basic characteristic of the studium was there from its very beginning. It was facilitated and became rooted in the system by the fact that Latin was the language of scholarship throughout medieval Europe.

Another feature, present from earliest times was that these schools were both lay and religious and provided instruction not only in the purely academic fields of study such as philosophy and theology, but in professional studies as well. Paris, for instance, was reputed for philosophy and theology, Bologna for law and Palerno for medicine. These centres of higher learning were not confined to imparting instruction. There is evidence that the advancement of knowledge was also considered to be one of their basic functions.

The first university to be established as a corporate body in the modern sense, was that of Bologna. The university of Bologna was formed not with the purpose of establishing a seat of higher education, for that was already there, but as a guild of students to safeguard their freedoms, rights and privileges. During this period the studium had become internationally famous for its law studies. It had about 10,000 students, and drew students from 16 different countries. The citizens of Bologna recognizing the studium as a major asset to the city attempted through its commune to prevent the free movement or *migratio* of the teachers and restrain their activities to the confines of the city, thus encroaching on the freedom of movement of the students as well. The establishment of the universities was the protest action taken by the student body against civic curbs on their traditional right to free movement. Similar confrontations between civic authorities and studium had occured in other parts of Europe. But the steps taken by the students of Bologna precipitated action by the universal authority of the time — the Pope. He confirmed by Lex Credendi (i.e. confirmation of acceptable beliefs widely held at the time) the traditional privileges of the studium. He also gave official recognition to the university degree by the phrase *jus ubique docendi* — the right to teach everywhere. Papal jurisdiction thus confirmed and legitimized the basic traditions of the studium — that it was a "universal" centre of learning, and its location unimportant, that freedom of movement for teachers and students was vital, that scholars should have a measure of immunity and that internal control should be guaranteed, without curbs from civic authorities.

MAHAVIHARA

Though the word Mahavihara is a generic term, in Sri Lanka, it came to refer to the first ecclesiastical organization at Anuradhapura, Its main task was to teach the Dhamma to the novices and the laity. But since it was built for the great theras, who formed the first mission from India, it was from its inception a centre for advanced study as well, as is seen from the activities undertaken by the scholar monks.

One of the first tasks of the Mahavihara was to translate into Sinhala the Pali Canon and the Commentaries brought by Mahinda, in keeping with the instructions of the Buddha that each should study the Dhamma in his own language. Sinhala was the language of study at every level though a knowledge of Pali was indispensable for the understanding of the original texts.

Besides translations a great volume of original work in the fields of exegetical literature was also produced. The Mahavihara became the centre for the growth of textual scholarship in the atthakatha in the Theravada tradition. The Maha-or-Mula-attakatha of the Mahavihara is considered the commentary par excellence and established the Mahavihara as a centre of high scholarship throughout the Buddhist world.

Another outstanding achievement of the Mahavihara was to perform the stupendous task of committing to writing the Pali canon which was brought into the Island and preserved through the oral tradition. By the first century A.D. the bhikkus of the Mahavihara considered it vital, that to ensure its preservation in its original form, it should be recorded in writing. This was done by 500 bhikkus at Alyvihara. The commentaries were also written down at the same time. This was the first occasion when the whole of the Tripitaka and the available commentaries were recorded in writing.

Another area of scholarship, far-reaching in its consequences, and affecting attititudes values and behaviour even of the present day was the collection and systematizing of historical material relating to the island. It was customary for each Mahavihara to have its history compiled in Sinhala. But the Thera Mahanama in the 8th century A.D. used not only the chronicles of the Mahavihara but also other source material, to produce in elegant Pali verses, the Mahavamsa — a systematic record of the history of the Island from the perspective of Theravada Buddhism.

The Mahavihara owed its very existence to the missionary activities of the Sangha in India. And so it was accepted that one of the major purposes of the Sangha was to spread the Dhamma. Missions were sent to South India, the Malay peninsular and the Indonesian islands. The study of the languages of these countries therefore became an important field of study. One reason for the translation of Sinhala commentaries into Pali may have been the need for Buddhist literature to be in a common language to facilitate its spread. One language which was not studied was Sanskrit because it was the language of Brahmanism.

The profundity of learning at the Mahavihara and how jealously admission to it was guarded, can be gathered from the recorded fact that when the Thera Buddhaghosa came from India to translate into Pali the Sinhala Atthakatha he was asked by the bhikkhus of the Mahavihara to prove his ability to translate the commentaries by writing an original commentary. This he did. The Visuddhimagga, which he produced to prove his scholarship, has become a standard compendium of Theravada Buddhism. It is said that he with two associates — Buddhadatta and Dhammapala both of whom came from India — translated into Pali and recorded in writing all the Sinhala exegetical literature available at the time. He was also the author of a number of original commentaries. The influence of Buddhagosha was however far more profound than the writing of texts, however scholarly. His achievements and the debt he owed to the Bhikkus and Mahavihara have been expressed in the following terms. "The achievement of Buddhaghosa was to develop Theravada from a mere body of doctrines into a school of philisophy. The Theravada standpoints in doctrines became those established by Buddhaghosa in his works, so completely indeed that Theravada is practically identified with his system of thought and scriptural interpretation. But the system was not his own or even largely original, it followed closely the line of tradition current in the monkish circles of Anuradhapura, and, as he himself admitted, must have been moulded and shaped by and enlarged for him by the ancient Sinhalese Atthakathas." (S. Dutt *Buddhist Monks and Monastries of India.)*

Oxford and Cambridge

It is to this tradition that the two oldest universities of Britain belong. Oxford was established in the 12th century, contemprane-ous with the first universities of medieval Europe, and Cambridge in the 13th century. They were originally founded as "places of religious and useful learning". Thus they were conceived as social institutions, serving a specific social need. The religious nature of their foundation became strongly marked in their various activities. They were open only to Christians (after the Reformation to members of The Church of England). The religious test was removed only in the mid 19th century. Until the beginning of the 19th century these were the only universities in England. Though each has developed its own traditions, yet because of the strength of their common heritage, they are linked together in the minds of people.

In the early days, like other centres of higher learning in Europe, neither university owned buildings. The students maintained themselves. The custom therefore developed of groups of students renting a house for themselves. One was elected (Principal) to act and represent the rest. Gradually these hostels or Halls came under the control of the university. At the same time wealthy benefactors endowed hostels to support poor scholars. These later developed as colleges — corporate bodies governed by their own fellows and own regulations. Such were the beginnings of Balliol College, Oxford, and Peterhouse College, Cambridge.

Oxford and Cambridge received rich endownments and came to enjoy the patronage of both the popes and kings, since they provided the educated men with the trained intellect needed for the administration of church and state. Thus the tradition of Oxbridge providing the statesmen and civil servants for the government goes back to the early beginnings and is embodied in the bidding prayer of Oxford University sermons, "that there never be wanting a succession of persons duly qualified for the service of God in Church and State".

The aloofness of the geographical setting of Oxford and Cambridge, the architectural dignity of their buildings, the spacious grounds, their extensive amenities, their renown in certain fields of study, their rich traditions, the elitist nature of their clientele and the corporate life most students are still able to enjoy in the Halls; have given them certain characteristics of universities in the British Empire.

It should be recalled that until the early 19th century Oxford and Cambridge were the only universities in England. They were therefore the pre-eminent examples of higher education, not only in Britain, but also in the far flung posts of the British Empire. The aim of many a parent, whom the British educational system influenced even in the distant colonies, was to send his son to Oxford or Cambridge. And many Universities established in the colonies were strongly influenced by their traditions.

ABHAYAGIRI VIHARA AND PIRIVENAS OF THE 15TH CENTURY

Abhayagiri Vihara

The Mahavihara was, however, not the only seat of higher learning. Another equally important centre developed in the 1st century AD. Abhayagiri Vihara founded by King Vattagamini became the centre for the dissentiant monks of the Mahavihara who accepted Mahayanist beliefs. Abhayagiri was liberal in outlook. It established contact with other sects and new movements in India. It studied the Mahayana texts in Sanskrit and introduced in the Mahayana tradition, the study of the 5 basic sciences and other fields of secular knowledge.

In spite of various political upheavals, the pirivena system of education continued throughout the centuries. It had its ups and downs. Nevertheless, pirivenas continued to be the centres where Buddhism was preserved and traditions of scholarship maintained. (The 15th century was a period in which the pirivenas flourished).

Pirivenas in the 15th century

Insight into the establishment and working of a higher pirivena can be obtained from the Pepiliyana inscription. In this inscription the release of 25,000 pieces of gold was ordered by royal command for the construction of a library, hostel and other buildings required for a pirivena. The importance of establishing high academic standards is indicated by the endowments to provide for the academic and other staff and to obtain the services of writers of books. The importance of attracting persons of high scholarship is indicated by the order that if there were any persons who were authorities on the Tripitaka or any of the five sciences — the traditional fields of study in a pirivena — they should be taken in straightaway to teach on a fixed honorarium.

The Sandesa poems give a vivid insight into the pirivenas during this period, and the intellectual and cultural activity they provided. It would appear that fields of study introduced by the Abhayagiri Vihara had taken root. The pirivenas had become institutes not only for religious studies but also for secular studies and training for the professions, such as law and medicine. The religious studies included, besides the study of the Tripitaka and the commentaries, study of the Vedic and other Indian philosophies as well.

Language and literature, including poetry and drama, were important fields of study. Sinhala, Tamil, Sanskrit and Magadha (Pali) and Prakrit are specifically mentioned. It is probable that other languages were also taught, considering the fact that there were scholars like Toragamuve Sri Rahula, head of the Vijayabahu Pirivena of Totagamuwa who enjoyed the title *Shad Bhasha Parameshvara* (Master of Six Languages). Other secular studies such as economics, astronomy, mathematics, art and architecture were also included in the curriculum. During this period there was great literary activity. Every work of literary value or scholarly worth was written by a scholar who had his education at a pirivena, even the highest in the land (kings and princes) had their education at a pirivena.

With the conquest of the island by the western powers, the pirivenas started to decline — the Portuguese burnt and destroyed some of the pirivenas. With British rule, they declined still further, for other reasons. The British brought into the island other values, new requirements which were met by the system of education they introduced. A knowledge of English was made a requirement for government service. The introduction of services such as the railway, and telecommunication required persons who were trained in modern science and technology. These the pirivenas could not impart. Buddhism itself was relegated to a lowly position. And so the pirivenas too were devalued. They continued to preserve and impart instruction in the Dhamma and in the traditional fields of knowledge. They did not receive government patronage, except perhaps in a very meagre way. Their teachings had little relevance to the new needs and so they lost the prestigious position they earlier held as seats of higher education and centres of great intellectual activity. The national resurgence in the 19th century brought new life to the pirivena system. Two new pirivenas were established — Vidyodaya and Vidyalankara — which achieved distinction as centres of Buddhist studies.

SOME BASIC CONCEPTS OF A UNIVERSITY

The above account of two important university traditions bring out some basic concepts of a university.

1. The nucleus of a university is the corporate body of teachers and students, not a fixed location or buildings.

2. A university is a social institution providing for the highest intellectual needs of a community as regards both academic knowledge and professional training.

3. The main goal of a university is to preserve transmit and expand knowledge. This is achieved through teaching, research and extension work. Its other activities stem from these. They supplement and enrich these activities and are not substitutes for them.

4. The output of a university provides the input into the job market at the highest level. The highest appointments in the administration and in the professions are open to them. Such employment requires not only a trained intellect but also superior personality qualities.

5. As a social institution a university has to respond to the social aspirations for higher education and be responsive to social change. These determine the specific objectives of a university, the criteria for selection of students, the fields of study, the content of courses, the qualifications of teachers, the main academic activities and the amenities provided.

6. Since knowledge is universal, a university belongs to an international community of scholars. It therefore has to reconcile the needs of the society within which it functions and the international requirements of scholarship.

7. As the nerve centre of intellectual activity a university is greatly valued by society. It receives the best the state and the community can afford, by way of land, buildings and other amenities. The students are looked after in respect of physical and academic needs, and great prestige is attached to those who have graduated at a university.

8. A university is granted many freedoms to achieve its goals — academic freedom, freedom to exercise its own controls and to evolve its own professional standards. It is free to manage its own affairs with the minimum of outside interference, unless it fails to fulfil its functions as a social institution.

9. Whatever assets a university may have by way of buildings, funds, books and other amenities, the greatest asset it has is its teachers. They form the king-pin on which the effectiveness of a university rests. The soundness of their scholarship, their concern for the student and their application to the main functions of a university, teaching, research, and extension work, determine the quality of a university.

UNIVERSITY EDUCATION IN SRI LANKA

To what extent are these basic concepts applicable to the universities of Sri Lanka ? How extensive is university education ? How far do the universities as social instiutions fulfil the needs of the community in respect of higher education ? To what extent are they centres of vigorous intellectual activity ? How effective is the teaching ? How extensive and meaningful is the research ? Quantitative data regarding the present situation in respect of university education is given in Tables 5–7. The case of the University of Ceylon is analysed here, as a social institution. To understand the complexity of the interweaving forces which affected it, it is studied in historical perspective.

The beginnings of modern university education

Though, as shown in the Boxes there was an extensive system of higher education in the country based on the Buddhist tradition yet the modern universities did not develop from this indigenous system. The first University was created by the British on the British model. The same basic structure has been preserved in subsequent universities as well.

Prior to 1920

With the conquest of the Island by the British, a system of secondary education was introduced based on the British system and directed towards serving the needs and interests of colonial rule. These schools were sited in urban areas. Education was imparted in English and was available to those who could pay for it. They provided for upward social mobility and produced the limited numbers needed for the middle and lower rungs of government service. Functioning at a very much lower and inferior level were the 'vernacular' schools meant for the masses. They were free and education was imparted in Sinhala and Tamil. Most of the features which characterised university education in the beginning, have their origins in the secondary school system. The major problems which universities have had to face have their roots in this dual system of education which created a new elite and brought about a social cleavage.

Colleges. University education as such was provided only with the establishment of the University College in 1920. But the need for higher education was met by the secondary schools, several of which had established undergraduate departments. These "Colleges" trained students for the external degrees of the University of London and of the Universities of India. All these colleges were run by Christian missionary societies except Queen's College (later Royal College), which was a government institution. The need for a medical college to train medical assistants in western medical science was realized early by the government. And so in 1870 a Medical College was established. It soon developed as an institution capable of producing full fledged medical practitioners and gained recognition by the General Medical Council of the United Kingdom. The beginnings of modern university education go back to the "Colleges" and to the Medical College, and is in line with the ancient practice of the centres of higher education providing both a general education and professional training.

The University Movement. The most promising students from the Colleges were sent on scholarship to study at British Universities. Those whose parents could afford it did likewise. Thus there emerged a new elite who had their education in British Universities. They were also the persons who provided the leadership for a national resurgence, one facet of which was the university movement which agitated that the government should establish a university. It pointed out that the system of working for external degrees of foreign universities neither served local needs nor provided a true education since they were concerned only with passing examinations. Those who initiated the movement had broad concepts of what a university should be. They conceived it not as a factory for churning out degrees, but as a social institution which would be

SOME LANDMARKS IN THE HISTORY OF UNIVERSITY EDUCATION IN SRI LANKA

1870 – Medical College established.

1881 – Exam for the External Degrees of the University of London held for the first time.

1889 – The Medical College recognised by the General Medical College of the United Kingdom as an institution authorised to confer diplomas in medicine and surgery.

1920 – The University College was established in Colombo affiliated to the University of London.

1942 – The University of Ceylon was created by the Ceylon University Ordinance No.20 of 1942, amalgamating the Medical College and The University College, and having the faculties of Arts, Oriental Languages, Science and Medicine.

1947 – Department of Agriculture and Veterinary Science was established.

1949 – First transfer to the University Park Peradeniya – Departments of Law and Agriculture and Third and Final years of Veterinary Science department. The Faculty of Engineering was established:

1952 – Transfer of students from the Faculties of Arts and Oriental Studies to Peradeniya.

1957 – First batch of students to study through the Medium of Sinhala and Tamil.

1959 – The Vidyodaya and Vidyalankara Universities were established.

1961 – A second science faculty was established in Peradeniya.

1961 – First intake of non-residential "external" students to Peradeniya University – the residential principle was abandoned.

1962 – A second Medical School was established in Peradeniya.

1963 – A second faculty of Arts and Oriental studies was established in Colombo.

1964 – Transfer of the faculty of Engineering from Colombo to Peradeniya.

1966 – Higher Education Act. No.20 of 1966 superceded Ordinance No.20 of 1942 and Act. No.45 of 1958 – Establishment of a National Council of Higher Education which provided officially for control for Universities by the state, Vidyodaya and Vidyalankara coming under this Act were converted into modern secular Universities.

1967 – University of Colombo was established.

1967 – The College of Advanced Technology was established at Katubedde, Moratuwa.

1972 – University of Ceylon Act. No.1 of 1972; whereby a monolithnic University structure was introduced.

1974 – Post-graduate Institute of Medicine established.

1974 – Jaffna University Campus established.

1975 – The following were established: – Postgraduate Institute of Agriculture; Post Graduate Institute of Pali and Buddhist Studies; Institute of Aesthetic Studies; Institute of Workers Education.

1977 – Institute of Indigenous Medicine established.

1978 – Universities Act, No.16 of 1978 whereby a University Grants Commission (U.G.C.) was established, and the six campuses in the monolithnic structure were converted to separate Universities.

1978 – Creation of a Ministry of Higher Education, the Secretary of which was also the chairman of the U.G.C.

1979 – Ruhuna University College established.

1979 – A Campus of Peradeniya established at Dumbara.

1980 – The Open University established.

1981 – Batticaloa University College established.

the centre of a national and cultural renaissance and a focal point in the development of the country. It was expected that it would be established in the best humanistic traditions of Oxford and Cambridge and at the same time provide for the rising demand for science and technology in line with the newer British Universities.

The University College

Establishment. But it was hardly to be expected that the government would hasten to establish an institution, one of the declared purposes of which would go counter to its interests. Thus from the time the idea was first mooted the objectives of the university were at cross purposes with those of the government. And so for one reason or another the establishment of a university was postponed until in 1920, the University College was established in Colombo in an emasculated form, the main consideration being finance – "a poor makeshift and only to be tolerated as a beginning". (Sir Ponnambalam Arunachalam). It was a government institution affiliated to the University of London and followed the courses of study and syllabuses decreed by it for external degrees.

In keeping witht the British system, education at the University College had to be paid for. It was therefore confined almost exclusively to persons of comparatively affluent circumstances. Residential facilities were limited and the system did not provide for close supervision of the student, and care for him by a suitably qualified teacher as in the tradition of the Buddhist Maha Viharas and of Oxbridge. Nor did it provide for the enriching impact of corporate living. Thus, because of its structure, the main activities were directed towards obtaining a foreign degree – a situation which the initiators of the University movement had specifically hoped to avoid.

Courses of Study. There were three departments – Arts, Oriental Studies and Science. Studies in commerce and agriculture, which would have served national development and were originally thought of as important fields of study, were not provided for in the University College. The only step taken to achieve the objective of making the University College a centre of national and cultural renaissance, was the setting up of the department of Oriental Studies. But this was a watered down course, the contents of which too were determined by the University of London and could not compare in depth to the learning in these fields at the higher pirivenas. The medium of education was English. Even the study of Sinhala and Tamil, was in English. Thus far from meeting the social needs, as defined by those who initiated the university movement, the University College became an instrument for furthering

westernisation, entrenching it deeper, and establishing a new elite uprooted from its indigenous traditions of learning, and but weakly implanted in the new. Its main service was to provide the persons needed for government administration and teaching service.

Post-graduate Studies. The University College did not provide for post-graduate studies. Those who qualified for advanced study had to proceed to London. The effect of limiting the university concept to teaching was two-fold. Firstly, it effectively stunted the growth of the University College as a place of learning. It was only a place where students learned, not a place of vigorous intellectual activity. For instance the initiative for establishing the Ceylon Association for the Advancement of Science was taken, not by the University teachers, but by the head of a government department, Dr. D. N. Wadia. Secondly, the scholars who were trained abroad, received their training in areas of specialisation which were seldom related to local needs and in conditions which could not be reproduced in an underdeveloped colony. This was both frustrating to the individual and wasteful from the point of view of the country.

Move to establish a residential university.

While as was seen, the University College which was to be the nucleus of the future University was a small educational institution, limited in the scope of its studies both in breadth and depth, geared to the examinations and requirements of a foreign university and established in a site with the main consideration being finance, there was a powerful group which advocated that the future university should move out of Colombo, be residential and sited and housed in grounds and buildings worthy of the centre of a cultural renaissance. This view was accepted by the Board of Ministers at the time. The persons who spear headed the move to establish a residential university outside Colombo were undoubetdly influenced by the setting and life at Oxbridge. Nevertheless, it was in keeping with the Buddhist traditions of higher education as well. But in the political context of the day, university education was not an area of high priority. And so for various reasons the establishment of a university was delayed. It was only in 1942, that for practical reasons arising from the exigencies of World War II — delay in sending question papers and answer scripts to and from London, and fear of their being destroyed through enemy action — that the University College and the Medical College were combined to form the University of Ceylon. This was done by the Ceylon University Ordinance No.20 of 1942.

THE UNIVERSITY OF CEYLON

General

The impact of the Ceylon University Ordinance
It is important to consider the provisions of the Act, since it provides the legal base to determine the university structure, what it can do and cannot do, and how it should be done. Though laws alone are not the determinants of the way a university functions, yet there is a relationship between the two. And so, the way the University of Ceylon acted when confronted with certain major issues can be understood when viewed within the framework of the University Act.

The act decreed that the University of Ceylon was to be, as recommended by the Riddell Commission of 1929 "unitary, residential and autonomous". What are the implications of that ? In terms of this Act, the university could not have a number of campuses in different parts of the Island. Its expansion was therefore limited both by it being unitary and by the requirement that it be residential. The world "autonomous" guaranteed its independence — a deep-rooted value in university traditions and what the students of Bologna fought for in the 12th century. The legal base of the university thus provided for its development, in two major respects, not in the style of the University of London to which one of the original constituents had been affiliated, but on the model of Oxbridge, which were in the eyes of the people, the ideal of a university. The Act however, failed to provide an inbuilt mechanism whereby the University was required, as a social institution, to be responsive to social needs.

Buildings. When the Act was passed, outline plans for the University Park at Paradeniya had already been prepared. But because of delays created by World War II the first phase of the building programmes was completed only in 1952. Nevertheless, the final result was such that could hold its own with any university campus-beautiful landscaping and elegant buildings incorporating traditional styles of architecture, conforming, though unwittingly to the requirements for the residences of "learned men" as laid down by ancient Buddhist tradition. The whole University, however, could not move to Peradeniya. The medical and science faculties remained in Colombo.

To what degree did the university, as a social institution, established with great expense to the tax payer, respond to changing social needs ?

The University of Ceylon as a social institution

Westernization. Academically, the university until about the early 1960s had built up high standards, "which gave the University a most enviable reputation among the Commonwealth Universities." (Malalasekera). But it was seen that the university college far from achieving one of the main purposes for which it was established, namely, to meet local needs in higher education and be a centre for cultural development had in fact become a major force in creating a westernised elite. The University of Ceylon was heir to this tradition and when the University moved to Peradeniya, the style of life of the Halls of Residence modelled on Oxbridge, strengthened the westernization. The University came to be viewed in the popular mind not as a vigorous centre of national life, in tune with the needs and aspirations of the people, but as a body insensitive to the country's needs oriented from if not actually hostile to what was indigenous. That there were grounds for this view has shown up clearly in the way the University reacted to two vital issues—expansion of university education and teaching through the national languages.

Background to demand for expansion of University education and teaching through the national languages

From the beginning of the 20th century with the growth of the nationalist movement and spread of modern views on social justice, the dual system of education in the country with its gross inequalities, became more and more the target of criticism until in 1945 legislation was introduced to bring all schools under one system. The introduction of universal adult suffrage and the possibilities opened to the broad masses of the people to state their views in periodic elections also played an important role in the spread of modern views on social justice. The growing pressures from the electorate ultimately led to the system of education being free and in the medium of the mother tongue from the Kindergarten right through university. This legislation, the practical steps taken to improve the quality of education in the rural areas as well as the unprecedented growth in population (Table 2) brought about a steady increase in the number of schools (Table 3) and school participation or employment (Table 4). It was clear that it was only a matter of time before there would be a similar demand for university education.

The benefits of 'universal' free education in Sri Lanka can not be disputed, though the operational aspects of the scheme have received strong criticism from various quarters. One such comment was from the cartoonist Collette in the 1980s (reproduced here) where views were particularly harsh on the scheme. The effects on University Education were also 'explosive' as this comment from a paper by Professor Swarna Jayaweera reveals "The impact of free education had been limited by the use of the English Language as the

medium of instruction in the secondary school. This barrier was removed by the change in the medium of instruction to the national languages, grade by grade from 1953 to 1959. The greatest impact was on the University Entrance classes (Grade 11 and 12) which had hitherto been confined to English medium secondary schools. Schools were upgraded to meet the demand from the increasing numbers who qualified at the G.C.E. (Ordinary Level) and who now had the opportunity of continuing their education as a result of the change in the medium of instruction in Grades 11 and 12 in 1958 and 1959. Enrolment in these grades more than doubled from 1957 to 1959 and increased sixfold by 1964 as senior secondary education was extended in different parts of the island. In 1942, 30 schools had presented candidates for the University Entrance Examination; 319 schools did so by 1960. Candidates appearing for the University Entrance Examination increased from 2,289 in 1957 to 11,870 in 1962 and 31,350 appeared for the GCE (Advanced Level) Examination held in 1964 when the post 1946 population explosion began to reach the top of the secondary schools.

This accelerated demand for university education posed problems for the university which was buffeted also by the winds of social change. The politico-social environment of the post 1956 era gave added momentum to cultural and social imperatives for the elimination of privileges and inequalities. The issue of educational opportunity was compounded by the fact that the university provided access to prestigious and remunerative employment. The university succumbed to government and social pressure . . . . . The result was in the nature of an explosion in university enrolment from 1958 to 1966".

Reaction to the social demand for expansion

Even at the time when the University was established, the demand for admission was rising. The original building plans for the student population of 1,000 had to be changed so as to accommodate 4,000. But even this was inadequate. In spite of the fact that the right to education was emerging throughout the world as a social need, independent of the laws of supply and demand, the then Vice-Chancellor. Sri Ivor Jennings. resisted the expansion of the university on the grounds that the opportunities for employment were limited. There was also the genuine feat that academic standards would be lowered with increased numObers. When the University could not substantially increase its intake there was the demand that it should at least hold external examinations. This too was resisted. And so the view gained ground that the Vice-Chancellor was deliberately limiting higher education. But it must be said to the credit of Sri Ivor, that he foresaw the problem and suggested that when the numbers at the University reached 3,500 another unit should be opened in Colombo. But meeting the rising social aspirations for higher education was not seen as a problem of the University. And so, no plans were submitted for a second unit and Sir Ivor's suggestions were not implemented in a planned way. When Sir Nicholas Attygalle succeeded Sir Ivor Jennings as Vice-Chancellor he too followed the same restrictive policy. There was justification for this stance for though the government required the expansion of university education, it did not provide adequate funds for for purpose. As Sir Nicholas pointed out to the Jayasuriya Commission on Education (2nd June, 1961) the government had to make a decision whether to limit university education to the facilities presently available, or admit all those who qualified. If the latter course was decided upon, then it logically followed that other universities would have to be opened in Co-

Table 2 Population Segments Exposed to Education 1946–1981 (census years)

Year	5–14 years		15–19 years		2–24 years		Total population	
	No. '000	%	No. '000	%	No. '000	%	No. '000	%
1946	1,617	24.3	681	10.2	642	9.6	6,657	100.0
1953	2,006	24.8	704	8.7	767	9.5	8,098	100.0
1963	2,778	26.2	1,032	9.7	896	8.5	10,582	100.0
1971	3,280	25.8	1,360	10.7	1,271	10.0	12,689	100.
1981	3,380	22.8	1,608	10.8	1,510	10.2	14,850	100.0

A significant drop is noted in the proportion of the youngest age group (5–14 years) from 1963 onwards

Table 3 Number of Schools – Government and Aided 1945–1981 (selected years)

Year	Government	Aided	Total
1945	2,399	2,144	4,543
1950	3,188	2,139	5,327
1955	3,675	2,213	5,888
1960	4,394	2,592	6,986
1965	8,361	1,086	9,550
1972	8,551	1,146*	9,697
1975	8,622	1,053*	9,675
1980	9,117	282*	9,399

Source: *Years 1945–1965: Education in Ceylon, A Centenary Volume, Vol.111 p.1256*
Years 1972–1980: Economic and Social Statistics of Sri Lanka, Central Bank of Ceylon, June 1981. Vol. 1V No.1 p.83

* *Others (not categorised)*

Table 4 School Enrolment Grades 9–12 (1952–1980)

Year	Enrolment Grades 9–10	Enrolment Grades 11–12	No.of Candidates GCE (O.L.)	No.of candidates UE/GCE (A.L.)
1952	69,233	5,342	52,992	2,026
1957	151,265	6,946	101,337	2,289
1961	232,700	23,000	154,813	6,547
1965	294,253	46,353	222,522	31,199 (A.L.)
1979	447,275	163,020		101,015 (A.L.)
1980	414,547	199,643		

Source: *National Science Council of Sri Lanka Seminar Report, University Education and Administration Report Director General of Education, 1981.*

* GCE (A.L.) April 1979 and August 1979.

lombo, Galle and Jaffna. Where the University of Ceylon failed was in not planning for such expansion and pushing it through vigorously: and so as pressure for admission mounted every concession had to be practically extorted from the University. As a result instead of planned development, ad hoc measures were introduced affecting the whole morale of the University. The first major concession was in 1961 with the intake of a large number of non-residential "external" students on a second class basis, without making available to them all the facilities of the University. It was not surprising that the students started being restive. The demand for University admissions still continued to mount. This was specially for the Arts Oriented Studies faculties as the subjects provided in the rural schools were largely arts oriented. A second teaching Unit of these two faculties was established at Thurstan Road, Colombo in 1963 to admit those who had qualified. This was extended in 1965 to the Race Course Pavilion and came to be derisively known as the *Asva Vidyalata.* The result of these ad hoc measures was to make these two faculties in Colombo "a parody of university teaching". (Thistlewaite)

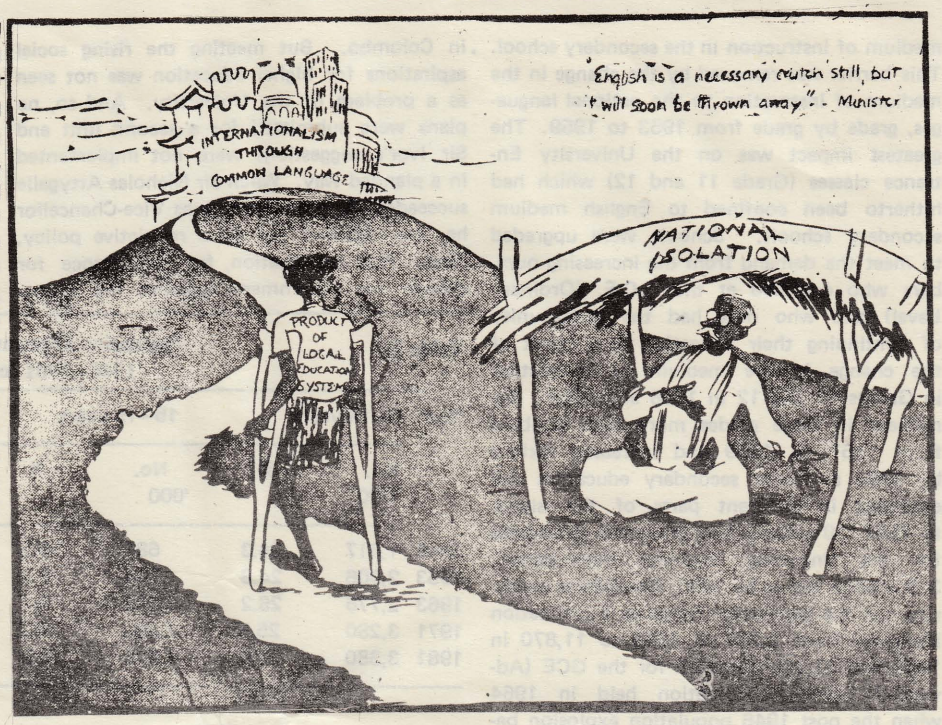


Table 5 **Numerical and Percentage Distribution of Full Time Students in University/ies**

Year	Total Students	% of students in arts based courses	% of students in science based courses
1942	904	43.8	56.2
1947	1,554	41.6	58.4
1952	2,232	40.6	59.4
1957	2,718	40.3	59.7
1962	7,816	62.9	37.1
1966	14,287	75.8	24.2
1972	12,074	65.2	34.8
1977	14,146	60.6	39.4
1981/82	17,636	59.2	40.8

Source: *Education in Ceylon, A Centenary Volume – Vol. 111 p. 886*

Table 6 **Student Admissions as a Percentage of Applicants**

Year	Number of Applicants	Number Admitted	% Applicants Admitted	Total Student Enrolment
1943	350	197	56.3	904
1947	1,384	412	29.7	1,554
1952	2,026	520	25.6	2,232
1957	2,289	766	33.4	2,718
1962	11,870	2,551	21.4	7,816
1966	31,432	3,656	11.6	14,287
1972	31,411	3,338	10.8	12,074
1977	72,474	3,721	5.9	14,146

Source: *Prof. Swarna Jayaweera, National Science Council of Sri Lanka. Seminar Report, University Education, 1980 pp.19–22*

The numbers in Colombo had increased by 1966 to almost the same as in Paradeniya and so a new university was created in 1968; the University of Colombo – taking in the old established faculties of medicine and science, which had not moved to Peradeniya, and the new arts faculty which was of a completely different origin and complexion.

The demand for higher education continued to rise in the seventies; and the Universities were not able to meet this demand even though Sri Lanka had a low university entrance rate compared to other countries of the region. This feature stands out in strong contrast against Sri Lanka's high participation rates in secondary education. The result was the growing competition at the level of university admission. This situation has become so acute that the Advanced Level examination (from which students are chosen for the University) has become one of the country's most competitive examinations. While this means a total distortion of the meaning of education for the student, forcing him to cram up for the purpose of satisfying the examination requirements under heavy pressure, it also has given rise to a lucrative business of private tutories that have mushroomed in many places, though mainly in and around Colombo.

The main response of the state to this acute crisis at the University Entrance Level had been to reform the method of admission and experiment with various formulae. This began in the early 1970's under the pretext of setting right an alleged discrimination against Sinhala medium students. But since

that time the formula for admission has kept on changing and there have been many grievances about the system. In introducing the formulae it is argued that they have been introduced to correct a disadvantage that some pupils face at the level of secondary education due to socio-economic factors. But if this was the aim behind these measures a better method may have been to introduce the formulae on the basis of the socio-economic background of the students rather than on the basis of so called under privileged areas as is now done. Secondly, if one looks for the reason for the introduction of these measures at this particular time, that is, at the beginning of the seventies, it is easy to observe the connection with the growing competition to enter the university, especially to the science faculty. This also gave rise to another diversion in the grievences of the ethnic minority who claimed that such conditions discriminate against them.

Response to teaching in the National Languages Another major issue was the language of instruction. The attitude of the University was equally unsympathetic to the use of the national languages. In 1954, notice of a motion to be moved in the University Court was ruled out by the Vice-Chancellor, Sir Ivor Jennings, since it was framed in a language which he did not understand.. (Hansard H.R. 1952 Vol.12). In the House of Representatives Pieter Keuneman criticised the Minister of Education for not adopting a firm line with the University "A bold choice is needed. Be a man Mr. Minister, do not be a mouse." (Hansard H.R. 1955 Vol.20). Thus though the legislation for teaching in the national languages was passed in 1945, yet when the first batch of students educated in the mother tongue came in fourteen years later, the University was caught unprepared, teachers untrained, books not available, even the terminology had not been created.

Table 7 **Number qualifying for admission and the number admitted (Admission years 1970 to 1981)**

Examination Year	Admission Year	Number * Eligible	Number ** Admitted	Percentage Admitted
1970	1970	10,262	3,457	33.69
1971	1972	Not available	3,338	—
1972	1973	10,747	3,420	31.82
1973	1974	12,961	3,532	27.25
1974	1975	15,446	3,789	24.53
1975	1976	15,023	3,942	26.23
1976	1977	19,045	4,150	21.79
1977	1978	27,582 (Note-1)	4,996	18.11
1978	1979	26,918	4,959	18.42
1979	1980	29,698	4,857	16.35
1980	1981	40,236 (Note-2)	5,004	12.43

* Number attaining the minimum requirement for admission.
** Number offered admission by the UGC

Notes: (1) This sharp increase in the number eligible for admission resulted from the amalgamation of the Lower and the Upper Kindergarten Classes to constitute Grade 1 in 1965.

(2) The Advanced Level Examination was held twice in each of the years 1979 and 1980 and several students had sat and attained the minimum requirements for admission at both examinations held each year Thus, the eligible numbers shown against the admission year 1980 and 1981 include some double-counting. While this factor was partly responsible for the increase in the eligible number from the admission year 1979 to 1980 and from 1980 to 1981, the sharp increase from the admission year 1980 to 1981 was very largely caused by two new batches of students having sat, for the first time, the Advanced Level Examinations held in 1980. These two batches consisted of —

(a) Students who had followed the G.C.E. (Advanced Level) interim syllabus as from 1978, and

(b) Private students who had succeeded at the old G.C.E. (Ordinary Level) Examination held in 1977 and who commenced following the G.C.E. (Advanced Level) old syllabus as from the following year.

Source: *University Grants Commission Annual Report, 1981.*

The resistance to change is, however, not unique to the University of Ceylon. The general position throughout the world, is succinctly put in the following words "It seems to be a common situation that while it is felt that socio-economic needs should be met and the university should change and develop accordingly, tradition and resistance encountered from both staff and students have delayed reforms. However, national needs cannot wait indefinitely and the universities, if they are unable to find a solution to internal resistance, must be prepared to lose some of their autonomy in order to be better linked with progressive social and economic developments in their countries." *(Planning the Development of Universities 11)* This was exactly what happened in Sri Lanka.

Curb on autonomy, the answer of the state

Because of certain structural features of the University, the autonomy it was empowered with, the traditions on which it was founded and the direction given by the first Vice-Chancellorin its formative years, the University found it difficult to change in response to the needs of society and the new values which were incompatible with those on which it was founded. The government was therefore placed in a dilemma. As representatives of society they had to satisfy the legitimate aspirations of the people for higher education. But as legislators who had framed the University Act they had to protect the autonomy of the University which both sides of Parliament accepted as their nalienable right. But there was little doubt as to which of the pressures would prevail. It was inevitable that there would be inroads into university autonomy, first informally and then through legislation. The Higher Education Act No.20 of 1966 superceded Ordinance No.20 of 1942 and provided for control of universities by the Minister of Education through the establishment of a National Council of Higher Education appointed by the Governor-General. This affected not only the University of Ceylon but also Vidyodaya and Vidyalankara Universities, which had been created in 1959, and future Universities as well. Though with each subsequent change of government there had been a fresh Universisites Act, yet the Universisities have never regained their original status. The

Universities Act No.16 of 1978 created a University Grants Commission, one of its functions being to ensure "that Universities accept the obligation of conforming to nationally formulated policies in such matters as University admissions and the language of instructions in Universities." (Universities of Sri Lanka Handbook 1979). If the University Act of 1942 had a similar provision, perhaps the history of University Education might have been somewhat different and less traumatic.

The loss of the autonomy of the universities must also be seen in the context of the changes that were taking place within the university and their impact on society at large. The mid-sixties, when legislation was brought to limit the autonomy of the universities, was also the time during which the pressures to enter the university were so high that the government had to take the unprecedented step of admitting all those who qualified to enter the Arts stream and open a new unit attached to the Colombo University (the Ashva Vidyalaya as it then came to be known). This changed the compostion of the university significantly,both quantitatively as well as qualitatively. At the same time it was during this period that the phenomenon of unemployed graduates, especially in the humanities reached significant proportions. Allied social problems had their impact within the university and resulted in an acute politicization of the university atmosphere. It is not that this political element was absent from the university at any time, but during this period it became a powerful force as student problems reached acute proportions. As a result student activism in the universities was extremely high and included the formation of a single student body uniting students of various faculties to campaign on major student issues. The move to curb the autonomy of the universities followed in 1966 and it continues in some form upto the present day. This trend has left its impact in many fields of university activity, including such primary university centered activities like research.

The limits imposed on university autonomy is the main feature which the University teachers, opposed in the newer acts. To see the problem removed from bias, it is helpful to place it in the global context. The International Institute for Educational Planning (I.I.E.P.) instituted a research project in 1969 on "Planning the Development of Universities" (PDU) This study covered 80 universities from 50 countries, including the U.S.A and U.S.S.R. The degree of autonomy enjoyed by universities was one of the aspects studied. The final report has this to say on the subject. "The problem of university autonomy attracts much attention and has an important place in any discussion about university planning and management.

In our opinion, today autonomy is only one of the instruments ensuring the fulfilment of university's educational and socio-economic functions. The meaning of university autonomy has changed drastically even since the last century. It can now be considered as a measure of the division of functions and responsibilities between the university management and society, as represented by Central and Local Governments." (PDU—11 P.45)

The data collected revealed that all the universities in the sample enjoyed a rather high degree of autonomy. It varied in different areas of university organisation, the lowest being in finance. Contrary to what one would expect, the developing countries, have a higher degree of autonomy, in all areas of activity, than the universities in industrialised countries. In its conclusions on the subject of autonomy the report states —

"Thus it appears that the most important differences in the degree of autonomy are due to the socio-economic system of the country. University autonomy is generally considered important for university development; this may be so, but in the present situation practically all universities enjoy a high degree of autonomy and, therefore their most important problem is how to use it in the most effective way in accordance with the progressive social and economic trends of their respective countries. This being so, universities in order to make a greater contribution to progressive national development, might sometimes have to sacrifice some of their autonomy." (PDU—11 P.54).

Politicization

The Universities Act of 1965 which brought all three universities under one set of laws and regulations gave wide powers to the Minister of Education. The way these powers were handled, making political affiliation, or at least political sympathies with the ruling party an important factor in appointments and promotions, brought in party politics into the universities in a big way, creating dissensions and breaking down morale. During election times staff and students were out in the field, canvassing for different political parties. As governments rose and fell tension rose between supporters of opposing parties. The universities seemed like seething cauldrons ever ready to boil over.

This situation was however, not peculiar to this country. What had been said by a former Dean of the State University of New York at Buffalo (SUNYAB) in describing the decade 1962—1972 could well have been written about the universities of Sri Lanka. "We at SUNYAB have been and are in a state of flux. It startled me to reflect that in the past six years I have known three presidents (at SUNYAB) . . . . . During this period I have seen morale go to heights and depths. I have seen a high level of productivity shattered and essentially stopped for a period of months. Within SUNY I have seen . . . . . the Legislature begin to exert itself in different directions. I have seen the power of the Trustees and the Chancellor diminish, so that now both are weaker, at least with reference to effectiveness.

I have seen students change rapidly too. We have had anything but constancy . . . . People have said, "We have got to have some levelling off. We got to have something we can count on." (PDU — IV)

This also tells us that however much we might develop concepts of university autonomy idealistically the universities are not immune to changes going on within society. As mentioned earlier the politicization process in the Sri Lankan universities can be linked to the changes that took place both within the university as well as outside. The social composition of the student population in our universities had undergone significant changes with the expansion of higher education. This had brought in different demands on university structure and content. Similarly there had been pressure from society demanding that universities serve the goals of development set out by various governments. For example, this resulted in the introduction of job oriented courses at the university, very often resented by those looking at the university more as "a community of pure thought". The politicization of university life seems to have been an almost inevitable outcome of the type of socio-economic development that the country was witnessing. But the question that arises is how we could maintain the quality of university education and some of the cherished ideals of a university within this contradictory process.

Universities and Politics

If we examine the meaning of the word politics in its broadest sense it is difficult to visualise any part of society functioning without political content; since it impinges on every aspect of living. It means even in the functioning of those institutions which do not have a "party" political colouring, there is politics in the sense that it exists in an evolving social process and the institution

plays a role in it, takes a side in the process, and so on. From this viewpoint it is difficult to visualise any process of teaching, learning and development of knowledge, without seeing the underlying political content of it. What this means concretely is that even in those periods when we felt that was no 'politics' in the universities, the politics of that period required the members of the university to play that seemingly apolitical role. They were expected to gain 'neutral knowledge' and then fulfill the role of administrators, to keep society running as it was. This of course had implicit political assumptions of the nature of society etc. But this is not to be perceived in the sense of direct party politics or political interference.

In the September 1979 issue of the Economic Review on State Sector Management, we touched on these politicization aspects both implicit and explicit. From the late 1950's there is a gradual intrusion of political factors into the bureaucracy and administration. The remarks we made there also have bearing on the universities. The actual difference between the early implicit politicization and the more explicit, over the last decade or so, is that the politics of the students are more apparent and usually are in direct link with established parties. This brought direct politics into student activities including the process of election to the students councils. It is quite possible that in some instances this type of political activity at times brought more harm than good to the student communities' activities of learning, or of discipline. Yet, on the other hand, political activity was a vital process of social education.

In no part of the world has politics not got mixed up with education, though in some countries and circumstances it has been more strongly so. In Sri Lanka's case, however, there have been clear instances where disgruntled political groups have used the grievances of young students to further schemes for their own advancement. One occasion when attention was focussed on this factor was following the violent Peradeniya University student's strike of December 1965. A Commission of Inquiry that probed the circumstances leading to this student strike drew attention to the party political influences behind the action. The Commissioner summed up the situation as follows, though this situation, once again, would have been possible only because other circumstances such as over-crowding and an insecure future had been leading a large part of the student body into action, however, desperate and damaging it may have been to all concerned: "It must not be forgotten, however, that education is the main function of a University. National problems must engage the attention of University students but this must not be allowed to take precedence over education. I, therefore, recommend that the University staff and students should not be allowed to take part in active politics. There should never be a U.N.P. Don or a L.S.S.P. Don or a Don under any other political label. If any officer of the University or any student considers that politics is more important than education, he should resign from his academic post or be sent out of the University. I do not by this wish to debar students from expressing themselves freely on political issues. They should have the liberty to do so with proper guidance by the teaching staff and this guidance cannot be given by a staff that is engaged in active politics. Politics should even be a subject and students should be trained to acquire independent political views on reaching full maturity".

Problems of Students

And what of the student ? What does he perceive as the main obstruction to the learning process ? The Report of the Committee of Inquiry, University of Ceylon, Colombo — Student Grievances. Dilemma of Higher Education (Oct. 1971) describes them in detail. The problems of students fall into three main categories:

(1) Those arising from socio-economic factors in the society such as the high aspirations for university education, infiltration of politics into universities and a weak economy unable to absorb the graduates.

(2) Those arising from weakness in the organisation such as poor planning, inadequate amenities, and failure to maximise utilization of resources already available.

(3) Those arising from human factors such as apathy, and lack of security regarding the future.

At the present moment the problems which seem to overshadow all others are socio-economic. Two of them are very specific — the need for residential facilities and increased bank loans. The third is a general fear of unemployment.

Accommodation. It seems much too obvious to mention that certain basics have to be met for a student to make maximum use of the opportunities for learning. This has been recognized from ancient times. According to Hiuen Tsang, the fact that the students of Nalanda in the 7th century A.D. were provided with the four requisites, food, lodging, clothing and medicine, was "the source of the perfection of their studies to which they have arrived". In the Middle Ages at Oxford and Cambridge living quarters were built and provision made to meet the requirements of needy students. In the 1940s, when the question of whether the University of Ceylon should be residential or not was being debated, Jennings justified his support for a residential university by pointing out that with the expansion of university education, able students from deprived homes will come in, and a hall of residence will help them to overcome the limitations of their background. The residential requirement was, however, never fully implemented and with the unplanned expansion of university education had to be dispensed with altogether. And so the students from poor rural homes had to make do with crowded lodgings, without either the physical amenities or the cultural environment to support their studies.

Grievances arising from the shortcomings in the halls of residence have been a reason for student unrest. One could even point out an overemphasis on such matters by the Student Committee which are sometimes trivial, though there are reasons for such forms of agitition. But bigger problems regarding resident facilities arose when the authorities realised that halls of residence are centres of political activity, sometimes of a violent nature.

University Student Loans. Tied up with the need for residential facilities is the need for financial assistance for students to maintain themselves. In Sri Lanka, up to the mid 60's a bursary scheme provided for those in need of financial assistance. But with the expansion of higher education, bringing into the universities a large influx of students from low economic groups and from rural areas, it was apparent that another system of assistance would have to be introduced.

The state therefore initiated a loans scheme. The first step was taken in 1964, whereby a maximum of Rs.600/— per annum was granted to needy students. The loan was to be rapaid with interest once they graduated and found employment. With the rising cost of living the size of the loan was increased. But it has remained at a maximum of Rs.2,700/— per annum since 1972. The problem of loans has to be viewed from the point of view of the student as well as from that of the bank. As far as the student is concerned, living costs have escalated so much that board and lodging costs alone come to

about Rs.350/— to Rs.400/— per month. There has been a similar rise in transport costs. Therefore the cost of maintaining themselves far exceeds the amount available to students as a loan. A study of the university loan scheme conducted by the People's Bank Research Department in 1978 has revealed that 86.33% of the students who obtained bank loans were from the Faculty of Humanities and Arts. A research study conducted by Chandra Gunawardena (PHD Thesis 1980) on the Arts Graduates who passed out in 1976 further reveals that over 70% of these graduates, when classified according to father's occupational prestige were children of farmers, traders, drivers, policemen or persons of lower status. When classified incomewise 74% were from families having an income of less than Rs.600/— per month. These studies bring out clearly that a large number of university students are not able to get adequate family support to maintain themselves. And so there is a crying need for loans linked with the cost of living.

From the point of view of the banks, (the Bank of Ceylon has also come into the scheme) the loan scheme is a loss. In 1980, the total outstanding balance of university student loans due to the People's Bank was Rs.50.7 million, this being 86% of the student loans granted. (University Students Loan Scheme — People's Bank Study Papers 1981). Therefore the banks, saddled with a bad debt and an ineffective recovery system, are reluctant to increase the loans.

It is clear that this problem too needs to be viewed in a new light. Just as an apprenticeship trainee is given a stipend of Rs.350/— per month since his skill is essential for the economic development of the country, similarly the training of a graduate should be viewed as meeting a national need — training the intellect, developing the powers of conceptualizing and servicing the need for human development which is a necessary accompaniment of economic development. That there is this fresh outlook on the part of the policy makers is seen from the Mahapola Scholarship scheme whereby a monthly scholarship of Rs.400/— will be given to 1,001 university students in 1982/83 on the basis of merit and need. It is envisaged to extend this scheme each succeeding year until it covers all students who need such help. This is but a logical extension of the free education scheme, and follows the ancient tradition, both in the Buddhist world and in Western Europe, whereby the community supported its needy scholars.

Unemployment of Arts Graduates: It is reasonable for any person who spends three to four years in advanced study to expect to find employment in his area of specialisation and at the level at which graduates have been traditionally employed.. But with the spread of university education, there has been in the country unemployment of graduates and under utilization of them in occupations such as clerical posts requiring a lower level of education and intellectual ability.

This applies at the present day, mainly to arts graduates. With the rise of science and technology, the relevance of such courses to modern employment need is clearly visible. But particularly in poorer countries where development is viewed almost exclusively in economic terms, the relevance of humanistic studies to the urgently felt need for modernization and development is barely seen. Money spent on courses of study where there is no visible relationship to economic development, has come to be considered as a waste of the tax payer's money. The situation has been reversed from the times when humanistic studies had high prestige as leading to the cultivation of the whole person, and it was expected that persons aspiring to high positions in political and public life would have pursued such a course of study. It was seen that with rapid expansion of the arts courses in the 1960s without a corresponding expansion of amenities and strengthening of the infrastructure their standards were so reduced as to be considered a parody of university education. Further the average arts student coming from a traditional low-income home and with a most inadequate knowledge of English does not get the help from the university to overcome the limitations of his home background. And so the products of the arts faculties find it difficult to obtain employment except in the state sector. When this is saturated, there is wide unemployment of the arts graduates. Most private sector employers will not touch them. The product does not meet the requirements of modern employment and has little value in the in the open job market. The need to take action to remedy the situation is seen by the government and voluntary organizations as well. For instance, the Ministry of Youth Affairs and Employment established a unit for Graduate Employment. In the non-governmental sector the Sri Lanka Federation of University Women (SLFUW) engaged in a project which besides training a limited number of women arts graduates, attempted to develop a replicable strategy directed towards making them more employable. Nevertheless they do not appear to have had a major impact on the problem. More long term planning, a stronger thrust, sustained action and a multi-dimensional approach seem to be required, to remove the root causes.

It is not surprising that in such an employment situation anxiety for the future should manifest itself in various ways inimical to the learning process. For instance, strikes and other activities disruputive to learning are seldom heard of in the Medical, Engineering and Science faculties. Jobs are available for these students not only in Sri Lanka, but also in other parts of the world and their training is valued by society. But there have been strikes and frequent outbursts of violence among arts students who face a different future.

THE TEACHER

General

The effectiveness with which any teaching institution fulfils its functions depends utlimately on the teacher — his scholarship and the effectiveness with which he can stimulate and guide the student in the learning process. It was the fame of its teachers, which attracted students to the studium generals. Similarly the fame of Nalanda and Wijayaba Pirivena depended largely on the high scholarship of their teachers. It is the same today, for a teacher of high calibre is able to draw out the potential of a student, and give life and vigour to the teaching, overcoming many obstacles and shortcomings in the organization. Therefore the recruitment policies as regards teaching staff are even more crucial than the admission policies as regards students. It is equally vital that the universities should be able to retain a good teacher.

Functions The work of a university teacher covers a wide range of interrelated functions — lecturing, tutoring, planning and developing the curriculum, marking examination scripts, assessing students' work, serving on various boards within the universities and in the wider community, keeping abreast of new knowledge, engaging in research and taking part in the administrative work in the department. It is not expected that every member of the teaching staff would be equally able in every one of these functions. Moreover, the needs of a university may vary at different stages of its history. For instance, in a newly established university a good teacher may be more important than a brilliant research worker. And so the universities have to determine their policies as regards recruitment of teaching staff in terms of their long term objectives and felt needs. They have also to provide the working conditions to retain them, and play their roles effectively within the organisation.

Attitudes While recognizing that there are many university teachers who are intellectually

many university teachers who are intellectually active, play leadership roles in professional and scientific organizations both national and international, and influence policy, nevertheless there is strong indictment against the average university teacher — his apathy, lack of social concern and readiness to do the minimum. This criticism is made more of the Arts and Humanities Faculties, than of the science based Faculties. The frustration prevalent in the Arts departments was expressed by a senior don who stated that he would never advise a young graduate to join the university staff, and he himself would prefer to join the tourist industry even as a chauffeur if he were not bonded to the university. This is clearly an extreme view, and there are dedicated teachers even in the arts faculties, who have maintained the vigour of their department. Nevertheless, that there is a general lethargy is clear, gauged by the fact that there are hardly any activities in most departments other than lectures.

Problems of Teachers

Salaries

From the point of view of the teacher the salary scales, though they have improved consistently, yet cannot compare with those in the private sector and in the advanced and petro-dollar countries. The universities allow consultancy work, yet unlike in the engineering and medical faculties for such work in the arts faculties is very limited. And so the middle grade lecturers in particular find it difficult, if not impossible, to pay the incredibly high rents demanded and run a car even for family use, without additional sources of income.

Working Conditions: Further, the teachers complain of a high work load, and lack of opportunities for career development. For instance, though university teachers are granted sabbatical leave, they find it difficult to make use of this privilege because of the low value of the Sri Lankan rupee in relation to most other currencies. They have therefore, to depend on scholarships and fellowships, which are difficult to obtain in the face of the economic recession in most developed countries.

With the rapid expansion of the arts faculties the teachers have had to put up with the barest of physical amenities, and sometimes lack even a table and chair of their own.

It is alleged that with the politicization of the universities rifts have been created among the staff — that an atmosphere of fear, suspicion and mistrust had developed and with each change of government witch hunting takes place, sometimes openly, sometimes in hidden ways.

Attitudes of Society: The attitudes of society also affect morale. Today the studies which are highly rated and for which competetion is high are science based. They have high value not only in the job market, but also in society as is indicated in the demand for doctors and engineers in the matrimonial columns of Sunday papers. On the other hand the average arts graduate is rejected in the open employment market. This is bound to reduce the morale of the Arts Faculty.

Devaluation of teaching: Certain weaknesses in university objectives, structure and organization are also contributory to the apathy of university teachers. The universities of Sri Lanka are in a contradictory situation for though teaching is their main function yet when promotions are considered little value is placed on the qualitative aspects of a person's teaching, on his activities such as the production of texts and other teaching aids directed towards improving the teaching-learning process, and on the contribution to the academic activities of the students. On the other hand, an important criteria for promotion is the output of research which is not a major activity in the universities of Sri Lanka. And so the policies of the universities instead of encouraging the qualitative aspects of teaching in fact go against them.

Training: Though it is generally recognized that training is necessary to upgrade university teaching, nevertheless, except in the Faculty of Medicine, Peradeniya, there is no provision to train faculty members. The University of Sri Lanka attempted to introduce a training programme in the mid 1970s. But there was resistance on the part of teaching staff to the idea and the plan was dropped. Since teaching methods vary according to the subjects, training may be considered a departmental function. Nevertheless, central planning and co-ordination is necessary to determining questions common to all universities and all departments e.g. priorities in research, the funds that can be allocated for training, whether attendance should be compulsory or voluntary and if voluntary the incentive that should be given to encourage participation. This is an area in which inter university co-operation will be most profitable. Such training can also be conducted for different subjects at regional level, with assistance from international sources, as is the case with the Medical Teaching Unit, Peradeniya.

Research

Expansion of knowledge is traditionally one of the most important functions of a university. In the Buddhist centres of higher learning this was an important activity and was directed, in view of the goals of the organization, towards editing the Buddhist Canon and writing commentaries on the texts. It was seen how these activities drew scholars of the calibre of Buddhaghosa to the Mahavihara.

Provisions for research

Lack of a research tradition: Though there was this tradition of research in the higher pirivenas, yet the modern system of university education was constituted without this vital component This was not considered a function of university education. Whatever research was considered necessary for the country was provided for by the colonial government, within the ministries and specialized departments. This university education was crippled from birth, without the research component.

Research experience for university teachers was however recognized as being important, as it indicated by the requirement that for promotion to the senior grades, a higher degree is essential and published research important. But this experience had to be obtained and still continues to be obtained at centres of advanced study in England and other parts of the advanced world. While this has the undoubted advantage of bringing Sri Lankan scholars into the wider international community of scholarship, it has its disadvantages as well. For instance, the sophisticated methodologies they learn can seldom be used in local conditions. The other side of the coin is that the creativity and intellectual vigour which should go to develop local research is utilized by foreign institutions. From the point of view of the individual it is frustrating to return from abroad to the university and find that he does not have the conditions under which to continue the research activities in which he had been engaged for 3 to 4 years and that the work he had done in those centres has little relevance and value in the social context of a developing country.

Research output and obstacles to research

In spite of the handicap with which the university started as regards research, there are several outstanding names whose contributions to their fields of study are internationally recognised.

Taking a more general view it is seen that most of the papers contributed to the annual sessions of the Sri Lanka Association for the Advancement of Science are from university teachers. Nevertheless it is generally believed that the output of research from universities is far from being adequate.

Post-graduate studies. Research in most universisites is carried out in post-graduate departments. But in Sri Lanka post-graduate studies (except for the Diploma in Education) were comparatively recently started and cover only a few disciplines. There are at the moment only three schools of post-graduate studies — in Medicine, and Agriculture and Buddhist Studies. For the research output to be greater, the expansion of post-graduate studies is necessary

A real difficulty in building up research in the universities is the situation as regards employment. The jobs which call for research experience on recruitment are very few. Therefore though many enrol for post-graduate courses or start on research programmes while waiting for employment, nevertheless the moment a job is available they give up their course of studies or research and take up the job. This applies particularly to the arts graduates. Similarly with staff members, when opportunities come their way to further themselves the research which is undertaken is dropped. Hence it is not easy to build up post-graduate departments where most of the research in universities is carried out.

Other research institutions. Over the years Sri Lanka had seen the establishment of research institutions outside the universities. Some of them had been established within the government institutions, while others are private.

The oldest of these were established by the planters during the British rule to meet the needs of the plantation economy. The Tea Research Institute, the Rubber Research Institute and the Coconut Research Institute were the first to be established. The Medical Research Institute which had its beginnings in the Medical Department was established later. In recent times a number of research institutes have been established. The Ceylon Institute for Scientific and Industrial Research was founded, to meet the needs of industries. The Banks — the Central Bank, the Bank of Ceylon and the People's Bank — have their research departments. Various ministries have set up research institutions to meet their specific needs in Agriculture — The Central Agricultural Research Institute at Gannowuwa, the Rice Processing Development Centre at Anuradhapura, the Agrarian Research and Training Institute in Colombo. There are also research units in most ministries. The private sector firms particularly those linked with the multinational organizations have their research units. All these prefer to take in the young graduate and train him according to the specific needs of the organization. It is therefore important for universities to co-ordinate with research organizations and also define broadly their areas of research. This already exists at the personal level. But such links have to be established and strengthened at the institutional level.

Funds: The question is often raised regarding the inadequacy of funds to develop research. It is clear that universities cannot depend on government grants alone for vigorous research programmes. In other countries funding for research comes from various sources such as other ministries and government departments industry, business, private benefactors, international organizations and the like. In Sri Lanka, since the traditions of research in universities are weak, these links, are few. At present there is a demand for research as is seen in the number of consultancy and research organizations which have mushroomed during the last decade. They appear to be flourishing and serving a social need even though they lack the expertise available to the universities. The universities are now more involved in community based research, than they were earlier, both state sponsored programmes (e.g. the University of Jaffna, conducted a survey of resources of the Jaffna Peninsular as a base for the development programmes), and those sponsored by the agencies of UN and other international organizations (e.g. nutritional studies of the Faculty of Medicine). This is generally the result of the initiative of individual teachers. But speaking broadly there does not appear to be the vigorous thrust to maximise opportunities that are available for research. For instance, even the funds granted by the UGC are not used fully and are sometimes severely underutilized. The situation is the same as regards the funds allocated for research by the National Science Authority.

Work load of teachers. The research output of individual teachers, with the exception of highly motivated scholars, is considered for the most part inadequate. One reason given for this is their workload which gives little time for research, particularly in departments where the numbers are large. It should however be pointed out that the research output was very little even when living conditions and conditions of work were far more favourable for research activities. In fact there seems to be a greater output of research now than before. As far as the work load of teachers is concerned, little data is available on the subject. It is alleged that though the work load is high in theory, it is not so in acutal practice. However, that teachers have other duties as well is not unique to the Sri Lankan situation. All teachers are expected to take on responsibilities in addition to teaching. It is valuable to learn how other universities cope with the problem.

Strengthening Research

Since it is accepted that teaching and research are complementary activities and that teaching is enriched by being carried out in an atmosphere of research, it seems vital that the research component in the universities of Sri Lanka be strengthened and developed. It is usual to think of research as a high powered intellectual activity, producing world shaking results. But in fact activities which have the characteristics of research can be carried out at all levels from primary schools upwards, and integrated into the teaching and evaluation processes, so that learning becomes an exciting and stimulating experience. It is therefore possible for research to be carried out in the universities not only at the post-graduate levels, but at undergraduate levels as well. This is already being done in some departments of the universities. Academic levels would rise if research becomes a necessary component of all studies.

Need for a fresh orientation as regards policy, organisation and administration

If research is to be an integral part of university activities a fresh orientation is necessary on the part of those who make policy decisions. While the importance of research for the individual is recognised its value for the organization does not appear to be equally appreciated. Much of the research credited to the Sri Lankan Universities is carried out by individual academics, a large proportion being the studies, submitted for a PHD. But today except perhaps in the humanities, research involves teamwork, and is mainly of a multi-disciplinary nature. This requires overall planning in matters such as balance between teaching and research, priorities in allocation of funds and building up and sharing resources. It also requires co-ordination between various disciplines. One of the major problems which faces the planners of research is to ensure freedom for the different departments and individual research workers within the framework of overall planning. Further, unlike teaching, research activities are expected to be carried out throughout the year. Nevertheless, the university management and administration does not consider research, as coming within its purview, except where funding is concerned. But if research is to be a pervasive and major activity in establishing and maintaining academic standards, then there should be purposeful planning to provide the necessary physical conditions and environment for research.

This raises again the fundamental problem of objectives. Should the research in a poor country be determined by the conditions and requirements in the advanced countries where the sciences, (natural, physical, social and behaviour), have reached a high level of sophistication, or by national needs. It is necessary that our research workers be trained in, and be familiar with, the methodologies developed in advanced countries. But the crying need is for research into areas which are socially relevant, though pure research cannot be completely shut out. This can only be developed in the local situation.

Labour exports as major foreign exchange earner

The dramatic increase in manpower exports to the Middle East and African countries continued into 1982. A decline was expected towards the end of last year, with indications of a drop in oil prices and a possible slackening of construction activities in the Gulf States. On the contrary, the upward trend in demand for skilled labour and housemaids in specific Middle East states, particularly Saudi Arabia, has continued over the first few months of 1983, according to figures of vacancies advertised in the local press.

Receipts from private transfers, mainly remittances, made by Sri Lankans employed abroad showed a significant increase in 1982, these were almost 50 percent more than receipts of the previous year, reaching nearly Rs.6 billion and very close to earnings from tea which maintained its position as the main foreign exchange earner for the country. (See table below).

It is apparent from the trends of annual foreign exchange earnings that private transfers will soon move into position as Sri Lanka's leading exchange earner. An examination of the composition of Sri Lanka's foreign exchange earnings show that in 1977 private transfers contributed only 2 percent of total earnings, but by 1982 private transfers accounted for as much as 17 percent of the total (see diagram). By 1987 (over the next 5 years) private transfers are officially projected to contribute almost as much as the combined earnings from tea and rubber. The Finance Ministry's projected figure for 1987 of net earnings from private transfers is US $ 505 million. while tea is US $ 391 million and rubber US $ 122 million. Another notable factor is that the surplus from private transfers, which has been rising steadily since 1977, has played a significant role in offsetting to some extent the comparatively poor receipts from merchandise exports.

The direct beneficiaries from these remittances have been thousands of households of the migrant workers, where income has today generally moved above that of the national average household income. (National average monthly income of households covering almost 8 million people was estimated at below Rs.500, according to a 1981 Survey for the

Table 1. Composition of earnings from the two main export commodities and receipts from private transfers

Year	Tea	Rubber	Private Transfers Amount Rs.Mn.	% Increase
1978	6,401	2,021	342	–
1979	5,772	2,491	754	118
1980	6,170	2,590	2,260	184
1981	6,444	2,889	3,918	64
1982	6,342	2,323	5,771	47

Based on Central Bank of Ceylon data

Table 2. Recorded overseas employment through Department of Labour and Private Employment Agencies

		No. migrated	%
1.	Administrative and Managerial	31	0.2
2.	Professional and related workers	505	3.5
3.	Clerical and related workers	678	4.7
4.	Sales Staff	38	0.3
5.	Supervisors and Foremen	264	1.8
6.	Skilled and Semi-skilled workers	6,045	41.5
7.	Un-skilled workers	6,994	48.0
		14,555	100.0

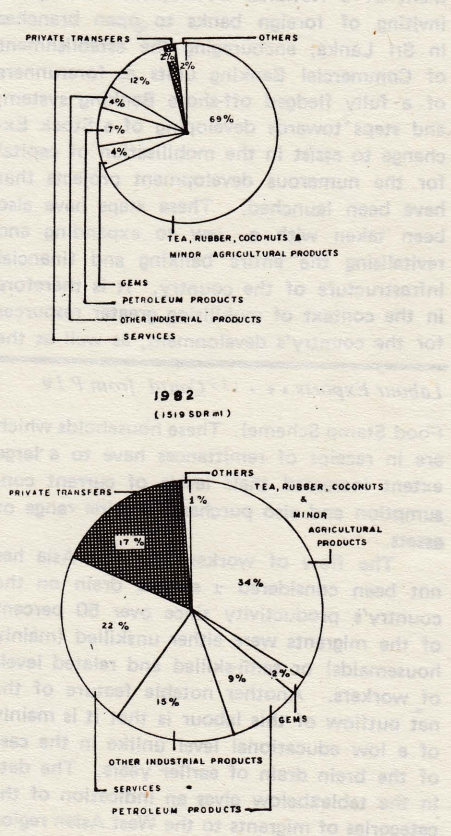
Source: Department of Labour

Table 3. Country-wise Record of Migration to the Middle East 1982

		No.	%
1.	Saudi Arabia	10,591	73.5
2.	U.A.E.	844	5.9
3.	Iraq	755	5.4
4.	Oman	534	3.7
5.	Kuwait	484	3.4
6.	Baharain	282	1.9
7.	Lebanon	251	1.7
8.	Quatar	241	1.7
9.	Jordan	134	0.9

Source: Department of Labour

CHANGING COMPOSITION OF SRI LANKA'S FOREIGN EXCHANGE EARNINGS



Banking — Finance

Merchant Banking with International Participation

Sri Lanka's first Merchant Bank, with foreign participation was inaugurated in Colombo on March 24th this year. The new Merchant Bank is a joint venture of the People's Bank and Guinness Mahon & Co., Ltd. a leading firm of merchant bankers in the United Kingdom. Established under the name People's Merchant Bank Ltd. it is expected to help in meeting the pressing need to expand the activities and services of banking and other financial institutions of the country. Such expansion becomes urgent today with the increasing demands for both domestic and foreign finance.

The increased demand for funds in Sri Lanka has arisen as a result of the massive development programme undertaken by both public and private sectors over the last few years. Earlier measures undertaken, over the last five years, in this direction have included an increased scope of operations and coverage of the State Commercial Banks; the establishment of a National Development Bank; the inviting of foreign banks to open branches in Sri Lanka; encouraging the establishment of Commercial Banking units as forerunners of a fully fledged off-shore Banking system; and steps towards developing of a Stock Exchange to assist in the mobilisation of capital for the numerous development projects that have been launched. These steps have also been taken with a view to expanding and revitalising the entire banking and financial infrastructure of the country. It is therefore in the context of mobilising greater resources for the country's development, as well as the promotion of Colombo as a international financial centre, that this new Merchant Bank was established. This venture is also intended to help in extending Sri Lanka's banking services to new fields of finance such as overall financial packaging, syndication of loans, placement of funds, assistance to companies for mergers and acquisitions, and in the management of complex industrial ventures.

Two other areas to which the new Merchant Bank is expected to direct its activity are contractor's support finance; which includes advice on materials and equipment procurement, arranging and managing export credits and syndicated loans and issuing guarantees and performance bonds; and Corporate Finance which covers business management advice, mergers and acquisitions and consultancy serivces. A British export guarantee line of credit is also being made available through the People's Bank to Sri Lanka's importers as a result the Guiness Mahon partnership.

The experience of recent years has shown that without the massive flows of foreign resources that have taken place very little of the development activities undertaken by the government would have been possible. A relatively small and poor country like Sri Lanka could not mobilise domestically more than a small part of the resources it needs for the development projects it has undertaken. Many of the oil importing developing countries have been compelled to resort to private capital markets to raise some of the finances for their development needs. Sri Lanka has not escaped this trend. The government (for its balance of payments needs) and state corporations (for their capital development needs) have in recent years raised syndicated commercial loans in the international capital market through the Western merchant banks. This new merchant bank, with its international connections, should now give Sri Lanka the opportunity of securing foreign commercial laons on more favourable terms when the need arises

For instance, the international bond market is noted for its volatile interest rates. In attempting a foreign syndication a local merchant bank with its foreign collaboration will be in the best position to do so, since it will also be in constant touch with the international money market.

In the five year period ahead (1983—1987) it is anticipated that Sri Lanka would need to continue raising funds in the private international markets; possibly over US$ 150 million a year during this period. Government would need to borrow US $ 79 million (net) per annum on the average on commercial terms; these include items such as US Aid Housing Guarantee loan and bridging finance for Kotmale. The net medium and long term borrowings by the private sector and corporations are expected to be about US $ 78 million per annum, according to estimates of the Government's Public Investment Programme 1983—1987. Furthermore, direct foreign investments which are estimated to reach a level of US $ 50 million in 1982 are expected to increase over the period; therefore at least a further US $ 50 million will also have to come in annually on foreign investments, according to these estimates.

Until recently Sri Lanka's banking and financial system was structured in such a way as to meet mainly the short term credit needs of the country. But today the problems of finance are far more complex and banking has both become an instrument of socio-economic change, and evolved into a technology for delivering a wide range of financial services No country can afford to be cut off from developments on the international monetary scene with the growing inter-dependence in international trade and finance. This applies particularly to small countries like Sri Lanka which have been traditionally import-export based economies and have in recent years moved strongly towards a liberalised trade and exchange system. In this context the exposure of such a country to international competition, in the financial sphere, is significant.

The open economy policy of recent years has produced an enormous expansion in investment, commerce and trade; and particularly promoting export activities, in banking and in a general business environment in which there are now attractive prospects for financial investments. Furthermore, there is also the promise of political stability which can induce strong investor confidence. The importance of the establishment of a Merchant Banking sector in Sri Lanka may be seen more clearly in this context.

Labour Exports . . . *Contd from P 19*

Food Stamp Scheme). These households which are in receipt of remittances have to a large extent increased their levels of current consumption and also purchased a wide range of assets.

The flow of workers to West Asia has not been considered a serious drain on the country's productivity since over 50 percent of the migrants were either unskilled (mainly housemaids) or semi-skilled and related levels of workers. Another notable feature of the net outflow of this labour is that it is mainly of a low educational level unlike in the case of the brain drain of earlier years. The data in the table2below gives an indication of the categories of migrants to the West Asian region during 1982.

Indications are that today almost 75 percent of the Middle East migrants are recruited, for employment in Saudi Arabia. The other major destinations, according to recorded figures, are the UAE, Iraq, Oman and Kuwait. (See table 3).

The pattern of employment appears to have changed in recent years. Earlier the proportion of recruitment for employment in the UAE was very much higher. The 1982 pattern, with Saudi Arabia taking the lead, has continued strongly into 1983 according to a survey of press advertisements of vacancies over a period in 1983.

This survey also indicated that not only have the number of vacancies being advertised not fallen but pay scales advertised (in terms of Rupees) have also been higher than a year earlier. Private transfers which reached Rs 5.8 billion in 1982 are estimated to exceed Rs 8 billion in 1983 due to factors such as this.

READY MADE GARMENTS AND FOREIGN INVESTMENT

Sri Lanka's ready-made garments and textiles have emerged as the second most important item of exports by 1982. With modest beginnings in the mid–1960's; export earnings went up to Rs.5 million by 1970. But by 1982 the value of garment exports had reached Rs 3.1 billion and accounted for over 15 percent of the total value of exports from Sri Lanka. Three significant factors responsible for the dramatic change in this sector of exports over the last decade were: firstly, the rising cost of labour in the industralised countries and relatively large and cheap labour force available in Sri Lanka; secondly, the inability of maior Asian exporters such as Hong Kong, South Korea and Singapore to further expand exports from their countries and the need for these exporters to shift the scene of their operations elsewhere; thirdly, the introduction of a liberalised trade policy at the end of 1977 which permitted a completely free flow of raw materials and other inputs: that have enabled this industry to flourish locally.

There are at present over 100 firms directly engaged in the export of garments and a considerable number offering feeder services to the major garment exporters on a sub-contract basis. It is estimated that this sector has a capital investment of over Rs 1,000 million and provides direct employment to about 61,500 persons. The rate of growth of exports in this sector averaged almost 75 percent in the five years upto 1980, but slowed down thereafter. Fears have been expressed that recession in the industrialised world was taking its toll on what appeared to be Sri Lanka's most promising export industry and pessimism has been expressed about its future.

Sri Lanka's garment exports faced further quota restrictions from its leading markets in the USA and the EEC countries. Effective lobbying by Sri Lanka has helped to relieve the situation slightly in the EEC but the USA has tightened quotas for 1984. While the EEC has imposed limits only on six categories of items USA has extended the limitations to fifteen categories under new quotas, though under the earlier agreement only five categories were under quota limits.

There are signs, however, that the recession is receding. Exporters in the Katunayake Industrial Processing Zone who enjoy a substantial slice of the country's export quota to USA are of the view that the situation can now change for the better; and the Chairman of the KIPZ Exporters Association Stephen Tong states here the future is by no means bleak. He predicts that the investment climate in Sri Lanka should now improve and investors could go ahead and finance their venture with no fears.

Stephen Tong, Chairman of the Katunayake Industrial Promotion Zone Manufacturer's Association in a discussion with T. B. Karunaratne of the People's Bank, Research Division.

When we last met you nine months ago to discuss the international market situation relating to apparel products you mentioned at that time that markets were very tight and competitive and that under the existing quota arrangements market prospects were not bright. What would you say is the position today ?

There has been an improvement in recent times. Over the past few months things have been picking up; especially for the ready-made garment trade. I think things would get even better. The American markets are recovering. Whether you like it or not you have to depend on American market, it is a prime mover; even Japan has to depend on the American market to a great extent.

How would you consider the European Community as a market for garments; is this market also improving ?

The economic recession in the EEC appears to be coming to an end; the situation continues to improve. The question is how fast they can improve and how long the improvement will last. With interest rates and oil prices coming down things should pick up here. People are buying again. They are getting confident again and improvement should grow stronger, if not now, in six months time.

Aren't we trying to face competition from other countries that have established Free Trade Zones and the growing number of suppliersof apparel products ?

Almost every country is going into the Zone business. Even America is effectively considering establishing Free Trade Zones in the cities. They have already made a start in some of their industrial areas. The competition will always be there.

Do you think that under this situation Sri Lanka will be able to compete in the American market.

At this moment of time, Yes, As long as we can give them the kind of quality and price they want, there is no doubt we can sell.

How competitive are we price-wise ? Are we able to compete with other Asian suppliers ?

At the moment, Yes.

Do we have problems of contact (eg. transport) due to distance of the markets?

Yes, especially with regard to shipping charges. The costs are high. There has been an improvement, but when considered in terms of mileage with other suppliers we are still paying more. For instance, more than Hong Kong for South Korea.

Are you not resorting to air freight for export of your apparel products ? Do you have problems of air freighting your goods ?

Yes, but it is not exactly a big issue. The problem is handling at air ports. I don't think Air Lanka's air cargo service is doing a good job. May-be, because their volume of business or the volume of cargoes they handle is increasing. But for some reason, although they have bought new equipment etc. the services are not adequate. Similarly space is also a problem; because shortage of space results in mishandling.

How satisfactory is the handling of cargo at the Colombo Port ?

It has improved a lot. The increased use of containers have helped a lot.

Have any new manufacturers of garments come into the Export Processing Zone ?

No, I don't think. There is not much scope for newcomers to manufacture garments because the quotas are utilised I think. The attention is now on attracting new lines of investment other than garments. For instance, electronics, electrical goods etc.

Do you think the possibilities of producing garments has reached a maximum limit now ?

No. If anyone comes in and manufactures a new item where there is no quota there is scope.

At our last discussion you mentioned that there is risk in producing new items that are not under quota. You said there was a risk of marketing. Has the position regarding such items changed ?

The position now is that I am producing one non-quota item, but I don't know when quotas will be introduced It may be any moment. For example, when we started earlier quotas came. then we were asked to diversify. But this time America imposed quotas on four more items.

Are there any factories that were in production in the Zone but have now closed down ? If so what are the reasons ?

I don't think that garment factories are faced with such a situation, but there are some factories producing rubber and related productshaving problems.They were faced with marketing problems and nothing more.

Have quotas not caused marketing problems for garment exporters. For instance, quotas are given by importing countries to the Government authorities; in obtaining your share of the quota did you face any problem ?

These quotas have been in existence for the last three years and are distributed according to past performances. New firms which have been established after quotas came are getting allocations from the quotas. These factories should also record substantial production.

Have quotas affected the expansion programme of the established factories ?

Of course yes. Infact, we are producing at 80 to 90 percent of our capacity. We cannot expand since quotas have limited us. We have been operating for four years and employees have increased their skills. Their levels of efficiency are much higher now. Two years ago we did not have this problem; they were not so skilled then. But now we are unable to make maximum use of their skills.

Do you still import raw materials for the manufacture of garments ? There are several textile factories in production within the country; why are youstill reluctant to use their products for the manufacture of garments ?

The materials most garment factories require in the Zone are not available here. Local factories produce materials like sarees, and for the local market. I think they are still not geared to produce for international markets and at a competitive price. I think quality can be achieved; but the design is the problem. The local manufacturers are not aware of recent trends in designs. If they could produce the materials we require it is good for us as well, because there will not be such costs as transport involved. They therefore can have a margin which can give them a competitive position. ion. But the essential thing is to have the right product.

What is the position regarding costs of manufacture in the Zone.

Our present concern is only with the electricity charges; the fuel adjustment charges of the Electricity Board.

What about the cost of labour ?

It has been increasing here every year, as in the case of other producer countries. But in countries like Singapore and South Korea labour costs are very high. Labour cost by itself, is much less here; but, there are lots of unproductive pay days, where nothing is produced.

When we last met you were of the view that the business climate and investment climate here were not very good. What would you say is the position now ?

One year ago or even half a year ago we did not know when this recession would end. Now we know and we have better signs that the end of recession is in sight, so the investment climate should be better. Now investors can finance their ventures without any fear.

INVESTMENT PROGRAMME'S PERSPECTIVE OF GARMENTS EXPORT SECTOR

The Government's Public Investment Programme 1983—1987 has recorded as a disturbing feature, the inability of Sri Lanka's garment exporters to meet their entire quota requirements. Another feature commented on, in this document, is the heavy dependence of the garments industry on imported inputs. The hope is expressed that indigenous textile and handloom industries will gear their production to the requirements of the garments export sector. The Programme states:

"Garments and textiles have emerged as the second most important item of exports from Sri Lanka. With a modest beginning in mid—1960s, the exports in 1982 amounted to SDRs 146 million, with the 16 percent share in total exports.

Sri Lanka's export of garments, however, depends heavily on a narrow base of 4 or 5 items of clothing — namely, shirts, blouses, trousers and jackets, all of which have evoked restrictions from the importing countries in the form of quotas which permit only marginal expansion per annum. Any higher earnings from quota items could only be generated through production of higher value items. Recently, a disturbing feature in the export of garments has been the inability of the exporters to fulfill the entire quota requirements, mainly due to the rigid conditions imposed by the new Multi-Fibre Agreements. It is however, encouraging that the process of diversification has already started and, as a result, the share of the above items in the total export of garments has come down from 85 percent in 1978 to 61 percent in 1981.

Another major factor which is adversely affecting efforts for reducing costs and improving competitive efficiency of the garments industry is its heavy dependence on the imported inputs which account for nearly 70 percent of the total value of exports. The local exporters have no control over such large import components for their exports. The rapid expansion of industry during a relatively short period has also exerted tremendous pressure on the availability of skilled and experienced workers. However, in view of the steps being taken to ensure full utilization of capacity and additional exports of about 18 million pieces of non-quota items from 1983 onwards from the GCEC, the garment sector is expected to maintain its momentum. It would be in the interest of both the indigenous textile and handlooms industries if they are geared to produce the variety of cloth required by the garments industry".

ECONOMICS OF AGRO–CHEMICAL USE IN PADDY PRODUCTION: EXPERIENCE AT GAL OYA

By A. S. Widanapathirana and
C. M. Wijayaratne

The use of various intensive cropping practices and the adoption of fertilizer responsive high yielding crop varieties have aggravated the pest and disease problem in agriculture in recent years, as we showed in our January 1983 special issue on Pesticides. There is no doubt that agro-chemicals have today to play a very significant role in agriculture, and in a country like Sri Lanka which imports most of its agro-chemical requirements the costs of these chemicals have now become an important factor in deciding whether the local farmer can operate profitably or not. Another debatable issue, in the present context, is the extent to which farmers could derive economic benefits from the use of agro-chemicals.

In this study A. S. Widanapathirana and C. M. Wijayaratne of the Agricultural Research and Training Institute (ARTI) have concentrated their survey on selected conolization units of the Gal Oya Scheme in attempting to measure the impact of chemical use in paddy production. They conclude that chemicals constitute an important component in paddy production costs and that the use of weedicides and insecticides is widespread. In the Gal Oya colonies the intensity of herbicide use does not appear to be directly related to the yield of paddy; and so too in the case of insecticides. This study questions the economic justification for present or increased levels of agro-chemical use at Gal Oya and maintains that because of the considerable health and environmental dangers posed by the use of chemicals further study into these subjects is urgently required.

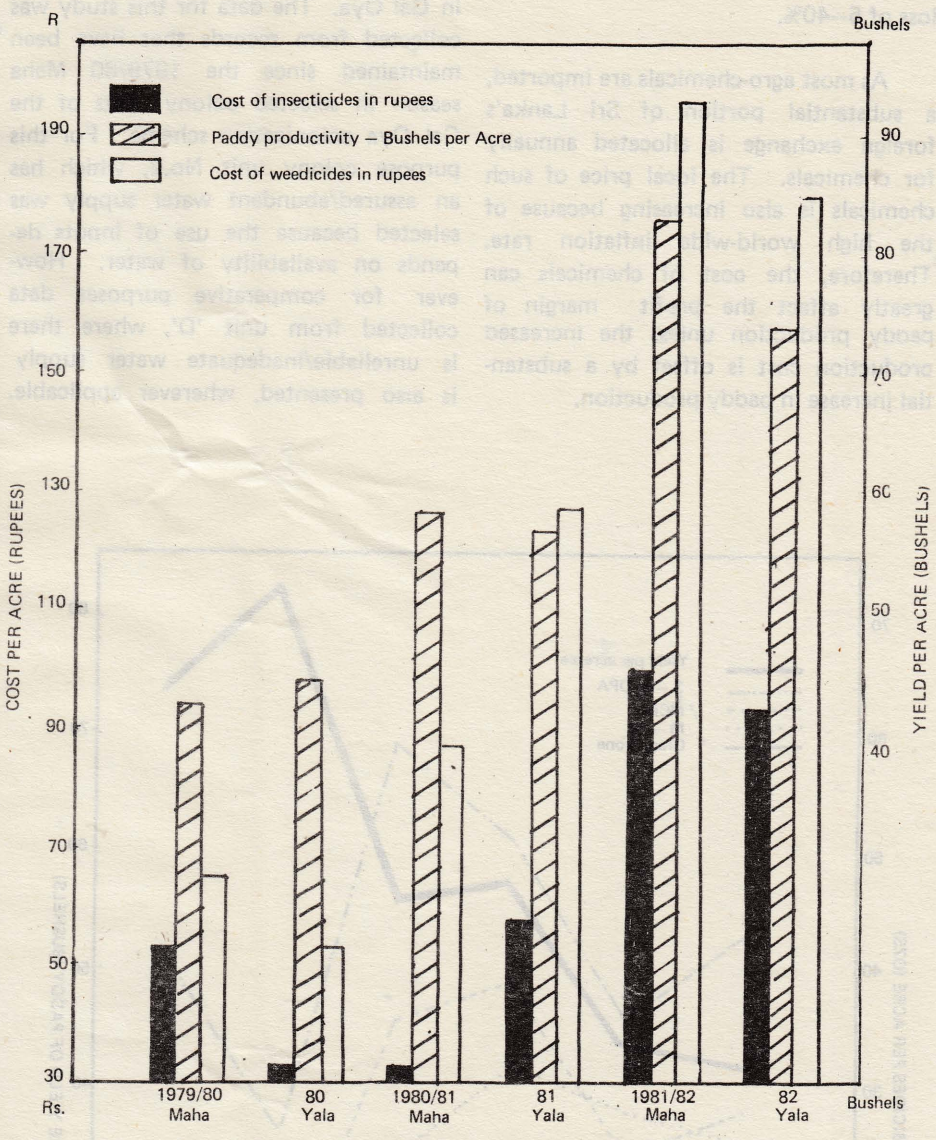


FIG. 1 Cost of chemicals in relation to paddy productivity

Chemicals that are widely being used in agriculture include:
(1) Fertilizer – to improve nutrition of crop plants; (2) Growth regulators – to induce better crop growth, in order to achieve desired timing and to up grade the quality of crop yield; (3) Pesticides – to combat insect pests and other pathogenes which infest crop plants; and (4) Herbicides – to control weeds that compete with crops. All of the above are known collectively as agro-chemicals.* The use of these chemicals in agriculture is considered important in that each boosts crop output, particularly in intensive and multiple cropping systems necessitated by dwindling farmland in the country.

The adoption of fertilizer responsive high yielding crop varieties, improved planting and after-care operations, staggered planting techniques, the use of irrigation and other intensive cropping paractices have aggravated pest and disease problems greatly. The use of

* Although agro-chemicals refer to herbicides, insecticides, fungicides and chemical fertilizers, the word chemical is used to denote the former three types of chemicals only, throughout this paper.

agro-chemicals therefore, has played a far more significant role in modern agriculture mainly because of the higher incidence of pest and disease outbreaks which account for a crop loss of 5–40%.

As most agro-chemicals are imported, a substantial portion of Sri Lanka's foreign exchange is allocated annually for chemicals. The local price of such chemicals is also increasing because of the high world-wide inflation rate. Therefore, the cost of chemicals can greatly affect the profit margin of paddy production unless the increased production cost is offset by a substantial increase in paddy production.

The objectives of this paper are to determine whether or not there are any real economic benefits from the use of agro-chemicals and to present an overview of chemical use in paddy production in Gal Oya. The data for this study was collected from records that have been maintained since the 1979/80 Maha season in selected colony units of the Gal Oya colonization scheme. For this purpose colony unit No.2, which has an assured/abundant water supply was selected because the use of inputs depends on availability of water. However for comparative purposes data collected from unit 'D', where there is unreliable/inadequate water supply is also presented, wherever applicable.

Table 1 Use of Agro-chemicals by Variable factors

Season N	1979/80	80	1980/81	81	1981/82	82
% farmers using:						
a.weedicides	78	86	90	100	100	97
b.insecticides	69	61	80	70	93	62
Number of different chemical formulations applied:						
a.weedicides	4	6	3	5	5	5
b. ticides	11	8	10	5	14	10

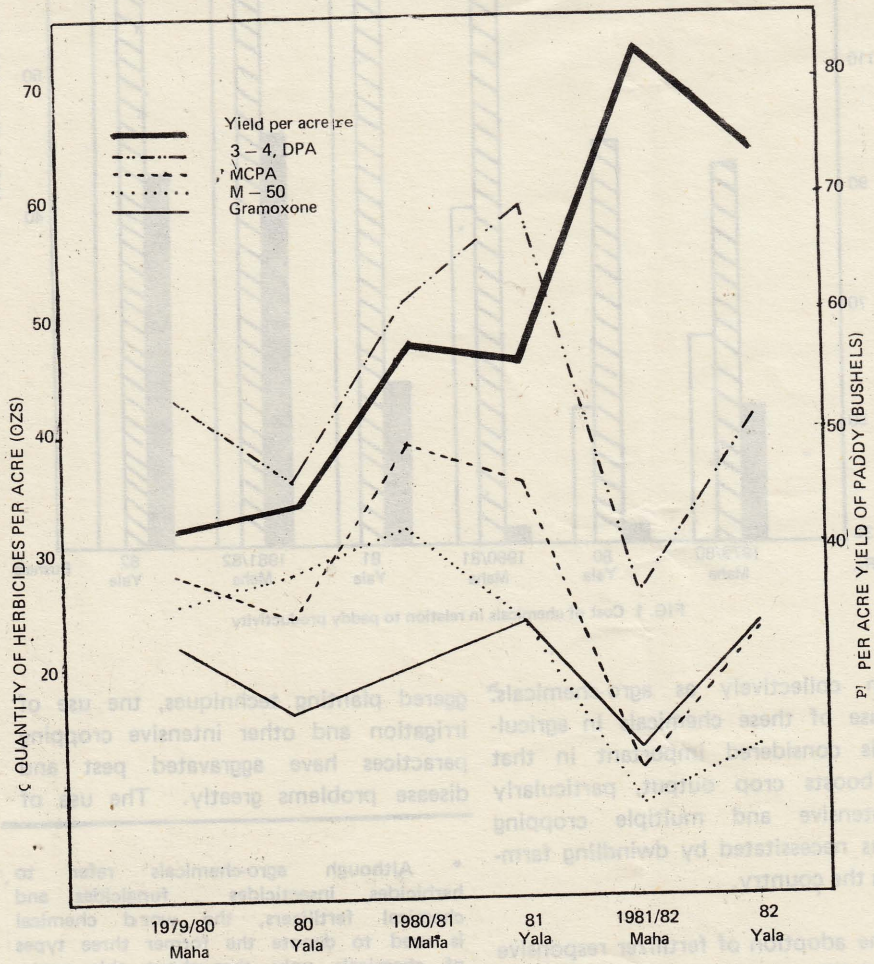


FIG. 2: Yield of paddy in relation to herbicide inputs. :ide inputs.

The investigation shows that the paddy farmers at the Gal Oya scheme use three distinct types of chemicals for the control of weeds, insect pests and diseases. The use of weedicides is most prevalent, followed by the use of insecticides. The use of other chemicals (fungicides) for the control of diseases is very low. However, the study has highlighted many differences in the types, application techniques and other aspects of chemical use across seasons, between the two colony units and even within the same colony unit.

Sections 1 and 2 discuss the position regarding weedicides and insecticides respectively, while section 3 attempts to analyse the cost of chemicals in general. The final section presents the findings of the investigation.

Weedicides

More and more farmers are using weedicides; and almost all farmers have been using chemicals to control weed infestations during the last few seasons (Table 1).

As table 1 shows the number of different weedicides had increased to 6 in 1980. Costs have increased as the use of herbicides has spread. According to Figure

1, the per acre cost of weedicides has shown an almost three-fold increase in 1982 from its value in 1979/80. The increase in per acre cost of weedicides may be due to one of the following three reasons;

(a) increase in price of chemicals with fixed quantity,
(b) increase in the actual quantity of chemicals with fixed price and,
(c) increase in price as well as quantity of chemicals.

Figure 2 indicates that the quantities used of most of the herbicides have come down in 1980 compared to 1979/80 Maha season. This is reflected in the decline in the per acre cost of weedicides shown in figure 1 during the same period. During the 1980/81 and 1981 seasons, both costs and intensity of use went up. From 1981 Yala to 1981/82 Maha the cost of weedicides has registered a steep rise. However, the actual quantities of all 4 herbicides have dropped to the lowest level. Therefore, the increase in cost of herbicides necessarily is due to an increase in price as the real quantities of herbicides used have come down. Further, a comparison of changes in per acre paddy yields with changes in herbicides quantities (Figure 2) reveals that yield has increased irrespective of herbicide inputs. For example the yield rose from 43 bushels per acre in 1979/80 Maha to 44 bushels per acre in 1980 Yala, while the quantities of weedicides registered a decline. Yields reached an all time high value in 1981 Yala, while the absolute levels of all 4 herbicides were reduced to the lowest level of the 6 seasons investigated.

An increase in herbicide prices increased cost without a corresponding increase in yield, since yields are apparently not directly related to herbicide use levels. In effect, profitability decreases with the use of herbicides.

The question now is why yields have increased even with a reduction in the use of herbicide inputs, considering the importance of weed control in the cultivation of modern rice varieties. An indepth study may be required in order to answer this question. This could perhaps be explained in two ways. First, an increase in the price of weedicides may discourage the farmer from using this expensive input and force him to resort to other measures of weed control. Second, it may also be possible that the present intensity of its use might be higher than the dosage required to achieve effective control of weeds. Hence, higher intensities of herbicide use may not be related to paddy yields. The lowering in application rate in 1981/82 (Figure 2) may be due to the sudden increase in price of herbicides in the same season. However, the subsequent upward trend in application rates show the farmers have now adjusted to the prevailing high prices of herbicides. Figure 2, also indicates that the rate of application of some chemicals, for example, 3–4 DPA[2] are much higher than others such as M–50[3] and MCPA[4]. The difference in rate of application of these chemicals is partly due to the use of small quantities of M–50, MCPA etc. mixed with larger quantities of 3–4–DPA by farmers in the hope that better weed control can be achieved. The situation in unit 'D' is similar to that in unit 2 although farmers in the unit 'D' have not planted at all in some seasons because of lack of water.

Table 2 Unit cost of chemicals classified by season (Rupees per acre)

Input	Yala*	Maha*	Mean cost 1979/80 to 1982
Weedicides	120.70 (76.42)	135.40 (63.82)	129.36 (69.48)
N	87	89	176
Insecticides	62.17 (114.66)	77.53 (90.64)	71.13 (99.88)
N	59	81	140

Co-efficient of variability (C.V.) values in the parenthesis.
* Mean value for 3 seasons.

Seasonal Variation

Table 2 describes variations among farmers in cost of herbicides, where mean costs in Maha seasons are greater than in Yala seasons. However, the

Table 3 Cost of chemicals in relation to holding size (mean cost in rupees per acre)

Season size (in acres)	Yala*			Maha*		
	1	1–2	Over 2	1	1–2	Over 2
Weedicides	59.26 (97.75	142.64 (59.32)	151.99 (69.46)	92.52 (75.47)	151.60 (64.10)	144.85 (52.50)
Insecticides	57.71 (76)	55.74 (98.76)	83.75 (150.01)	70.17 (85.23)	68.31 (83.48)	52.08 (70.58)

Co-efficient of variability values are in the parenthesis
*Mean value of 3 seasons

data is not sufficient to explain this disparity. Although mean costs are lower in Yala, the variation among farmers in per acre cost is greater in Yala seasons. This is shown by the higher co-efficient of variability (C.V.) values. Such high values show that many different approaches are adopted by paddy farmers to control weeds.

Effect of size of holding

Table 3 presents the mean per acre cost of herbicides according to holding size. It is apparent that as holding size increases the mean cost also increases in Yala seasons. The same relationship is not clear for the Maha. However, Table 3 shown that the lowest mean cost of weedicides and the greatest variability exist with smallest holdings. The high mean cost of weedicides shown in Table 2 is apparently due to the presence of owners of larger holdings while the high variability of cost in same table might be due to the presence of owners of smaller holdings. Owners of large holdings have greater resources so that they can afford higher investments in chemical weed control. On the other hand, farmers on smaller holdings have poorer resources and are not in a position to invest much in expsnsive inputs such as weedicides. However, a detailed study would be required in order to evaluate the returns to the investment in weedicides.

Insecticides

It can be noted from Table 1 that the majority of farmers apply insecticides for the control of insect pests. The number of insecticide formulations has also increased rapidly from 5 formulations in 1981 Yala to 14 in 1981/82 Maha season. Of the 14 different formulations, only 4 have been used in all 6 seasons under review. In otherwords, farmers have been spraying different insecticides in different seasons. Table 1 also shows that more insecticide formulations have been used in the Maha seasons than in corresponding Yala seasons. In unit 'D' which is subject to an irregular water supply, fewer insecticide formulations are used than in unit 2. In unit 'D' also, the number has been greater in Maha than in Yala. The data suggests that the application of different types of insecticides are related to the degree of water availability. Farmers in seasons/areas of abundant water use many different types of insecticides, but use fewer in seasons/areas with less water. However, the available data does not suggest the reasons for this realtionship.

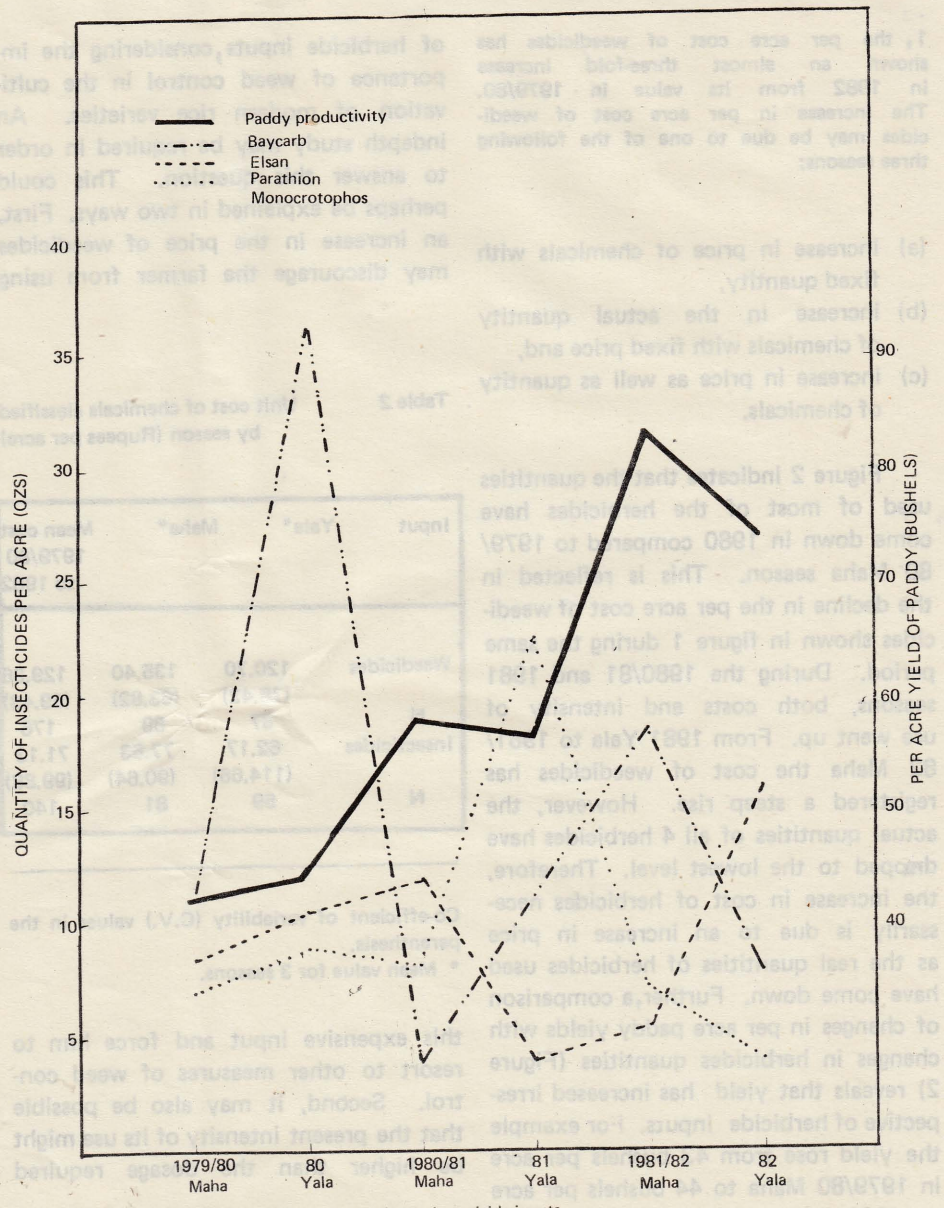


FIG. 3 Yield of paddy in relation to insecticide inputs

Cost of insecticides

The per acre cost of insecticides has increased since the 1979/80 Maha, but at a lesser rate than that of weedicides. However, the intensity of application of all insecticides is subject to wide fluctuations. No systematic relationships can be observed between per acre yield and the land of insecticide inputs. (Figure 3). Because of the erratic changes in application rates, it is difficult to explain the steady increase in per acre insecticide cost shown in figure 1. The lack of application of some insecticides have been high while others declined during the same period; often a variety of different insecticice formulations being applied in the same season. The high intensity of certain insecticides in some seasons may coincide with the widespread occurance of certain insect pests.

1. David Bull (1982) A Growing Problem —Pesticide and the Third World Poor.

Moreover, the wide differences in the type and quantity of chemicals may be due to farmers' inability to correctly

identify insect pest infestations and/or farmers ignorance of the appropriate control measures. The fluctuations in insecticide use might also be due to the occurance of multiple types of insect pests in the same reason. Two chemicals, Baycarb and Parathion which have conventionally been applied in a colony unit 2 have registered a decline in 1981/82 Maha season while a series of new insecticides have shown an upward trend. This change cannot be explained from the available information. Similar upsurges of new insecticides have been recorded in other parts of the world because of the emergence of insect pests having resistance to existing insecticides; the application of new insecticides is a necessity under such circumstances.[2]

2. David Bull – Ibid

Therefore, far more research is needed to identify the pattern of insecticide use, insect pest reactions and farmer behaviour with regard to insecticide use. It must also be emphasised that the increase in cost of insecticides eventually decreases the profitability as there is apparently no relationship between the per acre yield of paddy and insecticide inputs.

Seasonal variations in insecticide use

As in the case of costs of weedicides, the cost of insecticides have also been higher in Maha than in Yala (Table 2). However, the cost per acre of insecticides was found to be much less than for weedicides in both seasons. Further, the disparity in cost between Yala and Maha is not great. Variation among farmers is greater for both seasons than for weedicides.

Effect of size of holding

The relationship between cost of insecticides and holding size presented in Table 3 shows an increase in costs with a decrease in holding size during the Maha season. No clear relationship is observed for the Yala season. The variability is greater for the smallest holdings in Maha, while the converse is true in Yala. The high variability indicates that approach to the control of insect pests is much more complicated than for weedicides.

Cost of chemicals in paddy production

From the above analysis it is clear that the per acre cost of chemicals is subject to wide seasonal and farm to farm variation. Chemicals also constitute an important component in the cost of paddy production. For example, for unit 2 the mean per acre cost of chemicals (weedicides, insecticides and fungicides) per season is about Rs.200/– with a range of Rs.118/– in 1979/80 to Rs.273/– in 1982 Yala (Table 2 and Figure 1). The cost of application is about Rs.50/– per acre, hence the total cash cost[3] of chemicals is approximately Rs.250/– per acre of paddy. In 1982 Yala, when the chemical costs rose dramatically, chemicals represented 15 percent of a total input cost[4] of Rs.1617/– per acre.

To what extent is the situation in Gal Oya comparable to other paddy farming areas in the Island ? It is difficult to answer this question because there is no up to-date information available for other areas. A related study was undertaken by Ranatunga et al in several paddy farming areas both in the Wet zone and the Dry Zone in 1977. According to this study the respective per acre costs of agro-chemicals range from Rs.24/– in the Kandy area to Rs.50/– in the Hambantota area; while the percentage cost of agro-chemicals of total material costs of inputs ranged from 4 percent (Kandy area) to 7 percent (Hambantota area). This study was undertaken at a time when the prices of all chemicals were much lower than at present. Yet this study indicates the variability of agro-chemical costs among different paddy growing areas. A notable feature of this study is the high cost of chemicals in the Dry Zone areas compared to that of the Wet Zone. The cost of chemicals therefore constitutes an important component in paddy production costs, which varies according to the agro-climatic areas, among farmers of a particular region and over time.

Conclusion

This study shows the significant position occupied by agro-chemicals in paddy production costs. It also shows that the use of weedicides is widespread, followed by insecticides, while the use of other chemicals is not as high at present. The analysis indicates that the increase in costs of weedicides is mainly due to spiralling prices and is leading to a decrease in farm profitability. It also focuses attention on the differences in approaches to weed control adopted by farmers in the study area. Further, the intensity of herbicide use is apparently not directly related to the yield of paddy.

The use of insecticides, as the study reveals, is more complicated. Insecticide use is apparantly not related to the yield of paddy and the intensity of use itself is erratic. There is high variability in the per acre cost of insecticides both among seasons and among holding sizes. Increases in cost might affect profit margins as their value for paddy production is unclear.

Finally, the study questions the economic justification for present or increased levels of agro-chemical use at Gal Oya. Because of the considerable health and environmental dangers posed by chemical use, further study into these subjects is urgently required.

3. The non-cash cost of chemicals involving the following 2 components is not considered in the present analysis:
   (a) the accidental death and other possible long-term health hazard to human beings and,
   (b) the pollution of environment and disruption of the balance of eco-system causing a social cost to society.
4. Includes cost of all material inputs excluding labour in respect of colony unit 2.

PALMYRAH SUGAR PRODUCTION IN SRI LANKA

K. Sivalingam

The stage has still not been reached, when a definite conclusion can be drawn that manufacture of sugar from palmyrah juice is a viable and economic proposition.

In this paper, presented at the SLAAS sessions in December 1982, K. Sivalingam, Planning Officer of the District Planning Office, Jaffna, maintains that the feasibility of manufacturing palmyrah sugar on a commercial scale merits closer examination considering its potential for increasing sugar production, for using a hiterto unutilised resource, creating more employment and improving the socio-economic status of tappers in the area. He attempts to focus the attention of scientists on this subject in the hope of inducing some of them to play a larger role in technology development for the palmyrah industry and more particularly for palmyrah sugar manufacturing.

Introduction

The Ceylon Institute of Scientific and Industrial Research Bulletin No.2 of 1967 detailed the findings of the Ceylon Institute of Scientific and Industrial Research workers in the field of palmyrah sap, fruit, fibre and timber products. This publication formed the basis for experimental work on palmyrah products conducted at the Palmyrah Demonstration and Training Centre established in 1971 by the Industrial Development Board. The introduction of technology initiated by this Centre resulted in the metamorphosis of the palmyrah cottage industry into an authentic small scale industry.

The Divisional Development Council Programme started by the previous Government to organize and manage small scale industries utilized the available technology for setting up small scale industries. The D.D.C. programme encouraged import substitution industries and the technology was geared for the production of consumer items from locally available raw materials. This provided the opportunity for setting up of 60 Jaggery and Sugar Centres in the Jaffna District. The Palm Products and Sales Co-operative Societies formed in 1972 incurred heavy losses due to the large amounts of toddy that had to be destroyed. The D.D.C. programme served to help the Palm Products and Sales Co-operative Societies with loans to organize the production of jaggery and sugar using sweet toddy, thus converting the excess toddy into sweet toddy. The palmyrah jaggery and sugar production which had thrived under the import-substitution phase of 1970 to 1976 had to close down after 1976 due to the low price of imported sugar. However, it must be noted that recent revision of tarrifs would benefit the palm sugar production. The reason for the revival of Palm sugar manufacture are:

- Under-utilisation of the vast sources of the Palmyrah, the estimated population of which is 7 million palms and of which only 2 percent is utilized.
- Under-employment and unemployment amongst the 12,000 tappers of the District.
- Large wastage of toddy due to the limited market.

The economic viability of the palm sugar programme rests on the following factors:

1. The cost of sweet toddy which is the raw material for palmyrah sugar production and constitutes 60% of the total cost of production
2. The cost of fuel mainly fire-wood, which forms 14% of the total cost of production.
3. Enforcement of quality control for the Palm Sugar Industry.
4. The market for molasses obtained as a by-product in sugar production
5. Recovery rate of Sugar under the technology in use.

1. The price of sweet toddy depends on the price of toddy and will tend to remain high until the present laborious tapping methods are overcome. At present the Palmyrah Development Board is in the process of introducing a device for climbing called the Lift System which is estimated to cost about Rs.500/— per tree. A tapper will be able to climb about 100 trees per day with this device instead of the present 10—15 trees and will be able to supply 100 to 150 gallons of palmyrah sweet toddy which is sufficient for the operation of a Treacle Processing Centre. Thus for 10 Treacle Centres which will supply 250 gallons of treacle for the Sugar Centre, 10 tappers would be sufficient. This equipment could be supplied to tappers through the Palm Products and Sales Co-operative Societies which will recover the money from the payment on the supply of toddy and sweet toddy.

2. Use of wood charcoal in addition to fire-wood has been tried as fuel in the process of concentration of sweet toddy. An electrically heated furnace has been designed for the sugar Centre for improvement of quality. These methods have yet to be implemented by the Palm Products Co-operative Societies.

3. Quality Control for the manufacture of palm sugar is a neglected area and standard quality control procedures have to be strictly enforced by the P.P & S.C.SS. The setting up of a quality control laboratory by the Palmyrah Development Board would be a positive step in this direction.

4. The molasses have not been fully utilized up till now and it is expected that the low-wine centres and the Palmyrah Arrack Distillery will utilize this by-product and offer attractive prices for the molasses thus enhancing the viability of sugar production. The molasses has been priced at Rs,20/— per gallon by the Sri Lanka Sugar Corporation.

5. The recovery of palm sugar under the technology presently employed is under observation and the writer of this paper welcomes suggestions for improvement of the technical aspects of the industry.

In the context of the developments outlined above it is necessary that the technological process of palm sugar production is reviewed and areas of future research outlined. This paper attempts to focus the attention of scientists in Universities and other Institutions on this subject and to induce some of them to pay a larger role in technology development for the palmyrah industry in general and palmyrah sugar manufacture in particular.

PALM SUGAR PROGRAMME

The Palm Sugar Programme which envisages the production of palm sugar at five sugar centres in the District commenced in 1982 under the aegis of the District Ministry, Jaffna. Under the programme it is proposed to produce ½ ton of sugar per day of operation at each Sugar Centre. The Centres and their managements are as follows:

1. Sarasalai . . Chavakachcheri P.P. & S.C.S.
2. Manthikai . . Point Pedro P.P. & S.C.S.
3. Vallai . . Atchuvely P.P. & S.C.S.
4. Kodikamam . . Kodikamam P.P. & S.C.S.
5. Chankanai . . Vaddukoddai Electorate P.P. & S.C.S.

The Sarasalai Sugar Centres started to function from March, 1982 and produced about 3000 kg. of palm sugar up to end of June. The Society operated 4 Treacle Centres from which treacle is processed for the Sugar Centre. In addition to palm sugar, production of palm candy also commenced at this Centre during May, 1982. Total sugar production at this Centre for this year is 2500 kg due to underutilization of capacity.

The Manthikai Sugar Centre commenced production from May, 1982. Regular production was delayed due to machine defects and production will be resumed from 1983.

The Vallai Sugar Centre went into production during June and production will commence from Janaury, 1983. The other centres are expected to operate from 1983. Of the investment of Rs. 337,460/- for equipment for each of the Sugar Centres an equipment grant of Rs.100,000/— was made from the Decentralised Budget. The Societies obtained the balance sum as loan from the People's Bank on the recommendation of the District Planning Office, which is coordinating the programme at the District level. Many problems associated with this infant industry have been overcome with the assistance of the Co-operative Department, the P.P. & S.C.SS and the Palmyrah Development Board and it is expected that the programme will be implemented successfully.

Under the Palm Sugar Programme it was planned that the total production of palm sugar at five Sugar Centres will be 2½ tons per day. Over the 200 days of the sweet toddy season about 500 tons of sugar will be produced.

For the 8 lakhs of people of the District the consumption of sugar is about 12,500 tons at a per capita consumption rate of 35 lbs per annum. At an average yield of ½ gallon /tree for 200 days, sugar from the 100 gallons of sweet toddy will be 75 lbs at the rate of ¾ lb of sugar per gallon of sweet toddy, or 50 lbs at the rate of ½ lb of sugar per gallon of sweet toddy. In order to produce the consumption needs of the Jaffna District at present about 560,000 trees calculated at the lower rate of extraction have to be tapped for sweet toddy. This forms about 8% of the seven million palmyrah palms of the District.

The process of Sugar Manufacture

In the C.I.S.I.R. Bulletin 2 of 1967 Mr. K. Ratnasingham outlined the process of Small Scale Sugar manufacture. The implements employed were simple and the methods used were such that the skill could be acquired by the villagers. Except for a crystallizer and a centrifuge the equipment used was common to both sugar and jaggery manufacture. The equipment and process details were worked out for 10 gallon unit and were suited for a cottage level scale.

The sweet toddy was strained through a wire mesh to remove suspended matter and clarified to remove impurities. Clarification of sweet toddy is carried out by the addition of a saturated solution of triple super phosphate to form insoluble calcium phosphate by reaction with lime already present.

The final phosphate was brought to 6.8. The juice was finally 'boiled to crack' and directly filtered through a cloth stretched horizontally. The clarified juice was directly boiled to rab in an open pan. Wooden ladles are used for stirring operations. The strike point of the rab boiled varied from 108° c — 112° c. The rab is transferred to the inner section of the crystallizer and was stirred at intervals of one hour to promote deposition of sucrose on the grains. Generally about 25 to 35 hours are sufficient for the development of grains.

The sugar crystals in the rab are separated from the surrounding molasses in the cycle driven centrifuge. Small quantities of water were used to wash the grains before discharging. Finally the sugar was sun dried and weighed

With proper clarification and good boiling white crystalline sugar can be obtained. After the first crop which is white, the subsequent crops are brown. About ¾ lb of good quality sugar and .5 pint of treacle could be obtained from a gallon of juice. A combined recovery of 8% on the weight of juice from two crops or boilings can be expected.

sugar manufacturing Centre was set up at Polikandy, Point Pedro in 1957 with the assistance of the Rural Development Society of that area. In 1971 these experiments were repeated by me at the Palmyrah Demonstration and Training Centre, Keerimalai set up by the Industrial Development Board, with the assistance of the C.I.S.I.R. Based on these experiments Palm Sugar Production was undertaken at a few jaggery centres during 1976 — 77 under the D.D.C. Programme. However, Jaggery remained the main product due to the higher profit margin compared to sugar.

Innovations were made during this period in the existing technology like the introduction of an electrically operated centrifuge instead of the cycle driven centrifuge used by the C.I.S.I.R. workers. With the inauguration of the present programme of Palm Sugar Production under the aegis of the District Ministry however distinct changes were made in the Organization as well as in the Process of manufacture and in the Equipment.

A. Organization

Each Sugar Centre is planned to process 250 gl. of Treacle per day collected at 65 Brix at each of the 10 Treacle Centres servicing that particular Centres. The syrup is heated to 110 C to a super saturation stage of 85 Brix and put into the crystallizer for crystal formation and growth. The project officer in charge of each sugar centre will supervise the quality of Treacle collected from each Treacle Centre managed by an O.I.C. The General Manager of the Palm Products and Sales Co-operative Society is responsible for the economic viability of the Sugar Centre.

B. Modified Process

The process adopted from the C.I.S.I.R. had to be modified as production is based on the collection of sweet toddy and transport and bulking in quantity for large scale manufacture of sugar is not feasible due to the deterioration of the quality of sweet toddy on account of formentation. Thus the processing is done in two stages with the first stage being done in widely scattered small scale Treacle Centres and the second stage in centralised larger scale Sugar Centres.

The C.I.S.I.R. Process and the modified process adopted presently in the Sugar Centre are given below in the form of flow charts.

FLOW CHART OF C.I.S.I.R. PROCESS FOR PRODUCTION OF PALM SUGAR

Sweet Toddy Testing and Collection
↓
Clarification and Settling
↓
Evaporation and Super Saturation
↓
Crystallisation and Growth
↓
Centrifuging or Curing
↓
Sugar Drying and Packing

FLOW CHART MODIFIED PROCESS FOR PRODUCTION OF PALM SUGAR

AT TREACLE CENTRE

Sweet Toddy Testing and Collection
↓
Clarification
↓
Settling
↓
Evaporation and Syrupsaturation
↓
To 65 — 70 Brix
↓
Transport of Syrup To Sugar Centre

AT SUGAR CENTRE

Super Saturation of Syrup
↓
To 85 Brix
↓
Crystallization and Growth
↓
Centrifuging or Curing
↓
Sugar Drying and Packing

Equipment

1. The heating of Sugar Syrup is envisaged to be done in an electrical furnace. A prototype furnace was designed at a cost of Rs.8,000/—. The working of the electrical furnace has not been fully studied under working condition and saving in fuel is not therefore known. It is expected that this furnace will be installed at the Sugar Centre after complete study of the furnace.

   At present the open pan furnace designed by the C.I.S.I.R. is in use

2. Equipment for Crystallization and separation of Sugar was designed for the Sugar Centre by M/s. Promoters Engineering Company Ltd. on the suggestions of the District Planning Office. This equipment were made out of stainless steel instead of G.I. used previously.

Drawings show the details of the crystallizer and centrifuges designed by the C.I.S.I.R. and the modified designs made by M/s. Promoters Engineering Company Ltd. Due to increase of cost, it was not possible to motorize the crystallizer sets as planned.

The working of the modified Crystallizer and centrifuge are as follows:

A. Centrifuge

Capacity	: 30—40 Kg per hour (Batch Type)
Basket Size	: 600 m.m. diameter Height: 300 m.
Motion	: 5 H. P. x 1440 RPM — 3 phase

B. Crystallizer

Capacity	:160 Litres
Size	:400 m.m. diameter x 1300 m.m.
Motion	:Manual — 15 RPM

Conclusion

It is felt that the stage has not been reached when a definite conclusion can be drawn that manufacture of sugar from palm juice would be a viable and economic proposition. It is necessary to continue production for some more time and get a clearer picture of the whole scheme to form the data base for perfecting and standardising the pattern of a model unit. With added experience it would be possible to throw light on the following aspects of palm sugar production:

a. Optimum and/or minimum size of a viable and economic unit and the respective requirements of area of operations, trees, tappers and transport.

b. The organizational set up for collection and concentration of sweet toddy into syrup: whether it should be processed in self contained units as envisaged by C.I.S.I.R. or as at present in two stages with the factory being serviced by a network of treacle centres. The equipment will depend on the production Organisation chosen.

c. The scope for reduction of sugar losses in processing through better technology and on this basis, the rate of recovery that could be expected from sweet toddy.

d. The scope for reducing fuel consumption.

e. The desirability of purchasing syrup from tappers instead of sweet toddy.

f. Improvements and modifications necessary in the existing designs of plant and equipment.

g. The desirability of setting up integrated projects where manufacture of sugar will be combined with the manufacture of palm sugar candy, confectionary, jams and golden syrup.

Considering the potential for expansion of sugar production, using hitherto underutilized resources, creating more employment, and improving the socio-economic status of tappers, the feasibility of manufacturing palmyrah sugar on a commercial scale merits close examination,

The metamorphosis of a cottage level industry into a modernised small scale industry based on intermediate technology has opened up several areas for research in the context of modernization of the Palmyrah Sector.

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LAND USE PLANNING IN SRI LANKA

K. A. de Alwis

Sri Lanka's per capita land resources are shrinking with its increasing population and heavier pressures on land; and if present trends continue it is estimated that per capita land availability could be halved by the end of the century. Further aggravating the situation is the fact that in recent years numerous state authorities have been delegated the responsibility for developing and managing the country's land resources. In this paper Dr. K. de Alwis, Head of the Land Use Division, Irrigation Department, argues that it is imperative for Government to formulate a national land use policy that will define the jurisdition of each of these government agencies; establish a definite set of guide lines to be followed by them; and also that specific national objectives in use and management of land are set out. He also outlines an organisational set up necessary to fulfill these objectives and suggests an implementation strategy.

The total land resources of Sri Lanka are limited, being roughly 16 million acres in extent. Per capita land resources, however, are shrinking rapidly with increasing population and, if present trends continue, should be approximately halved by the end of the century. There would be, on average, less than 60 perches of arable land per person by the year 2000. In the meanwhile the demands for land for agriculture, housing, industry, recreation, transport, forestry, etc. will correspondingly increase.

Fortunately, however, land is a renewable resource (except for some limited uses like mining) and can be used as such indefinitely if put to the correct use and scientifically managed.

LAND USE POLICY

Land is a national resource and, therefore, even though a considerable part of it is privately owned, the use of land cannot be left entirely to the discretion of the owners — be they private individuals, corporate bodies or State organizations. The use of any tract of land has a profound impact on the surrounding lands, the catchment in which it occurs, the environment, the economy and the well being of the country generally. The public interest as well as the interests of future generations should be safeguarded by ensuring that the use of land is regulated to give optimum benefits while conserving it as a renewable resource.

The State has always been the biggest single land owner in this country. But until recently, most State-owned land consisted

of forest reservations or waste land having considerable potential for future development but requiring vast capital-intensive development programmes.

After the Land Reform Act was implemented, however, the State also came into possession of nearly 400,000 ha. of the choicest agricultural land taken from private individuals and from local and foreign companies. Thus, the State is today in a position to develop, manage or dispose of a major part of this country's land resources and to exercise considerable regulatory control (through Acts like the Agricultural Productivity Law) over the entire remaining extent.

With the creation of the Mahaweli Authority of Sri Lanka, the Greater Colombo Economic Commission, the District Councils, etc., however, the responsibility for developing and managing the land resources of Sri Lanka has been diffused. Each agency formulates and carries out its own development plans according to its priorities and objectives. Except in the case of the Mahaweli Authority which has made a special effort in this direction, there is little co-ordination among these plans and the environmental impacts of these development programmes are not always considered.

It is therefore imperative that the Government formulates a national land use policy which (1) defines the jurisdiction of each of these statutory agencies, the District Councils, other local authorities the Central Government and private land owners over the general regulation and control of land use within their boundaries (2) establishes a set of land – use guidelines to be followed by government agencies, firms or private individuals, including the prohibition of certain types of land use and management which threaten the resource base itself, and (3) states government and national objectives in the use and management of land.

Land use Planning

The formulation of a land use policy alone will not, however, ensure the rational utilization of the land resources of this country. Legislation should be enacted and institutional arrangements made to see that these resources are utilized in accordance with sound principles of land use planning and management. Unco-ordinated and unplanned land use will lead not only to a waste of capital and human resources but also to possible permanent damage to this valuable natural resource.

What is Land Use Planning ? It is a four – stage process. The first stage consists of a survey and inventory of the physical resources of land such as soil, climate, hydrology, etc. The next step is to decide, on the basis of this information, what possible uses the land could be put to without damaging it as a resource. The third stage is to evaluate the degree of physical and economic suitability of the land for these different possible uses and to state these as a set of economically feasible land use options. (Land Evaluation). The final step is the selection of preferred alternatives for each type of land, based on the land evaluation as well as on the other social, economic and political considerations.

This final decision is usually taken at the highest policy making (i.e. political) level. But since it would be a choice among a number of physically and economically viable alternatives, there would be no danger of land being allocated to uses for which it is not suited if a proper land evaluation preceded the final decision on the use of any tract of land.

Organizational set-up for land use planning

Broad classes under which different uses of land can be grouped are (1) urban uses including housing (2) mining (3) transportation (4) tourism (5) recreation (6) plantation agriculture (7) irrigated agriculture (8) non-irrigated medium and small scale agriculture (9) pasture (10) chena (11) forestry (plantation and conservation) (12) wild life and (13) man-made reservoirs and canals. Decisions have to be taken regarding the suitability of land not only among these broad classes but within each class regarding the details of use e.g. whether to grow rice or sugarcane or cotton on land suited for irrigated agriculture.

Such decisions require background information regarding the soils, climate, vegetation, hydrology, underlying geological material and other attributes of land and also about desirable land qualities for each projected use. For these purposes, an organization with the necessary multidisciplinary expertise-to assess the suitability of land for various potential uses and evaluate the corresponding costs and benefits of each of these uses-is absolutely essential.

An organization of this type would be able to assist in formulating an overall National Land Use Plan and in siting of major development projects. It could also advise various Ministries, Departments, Corporations, District Councils and even private land-owners on the technical and economic feasibility and environmental impact of any proposed project involving the use of land.

Land Management

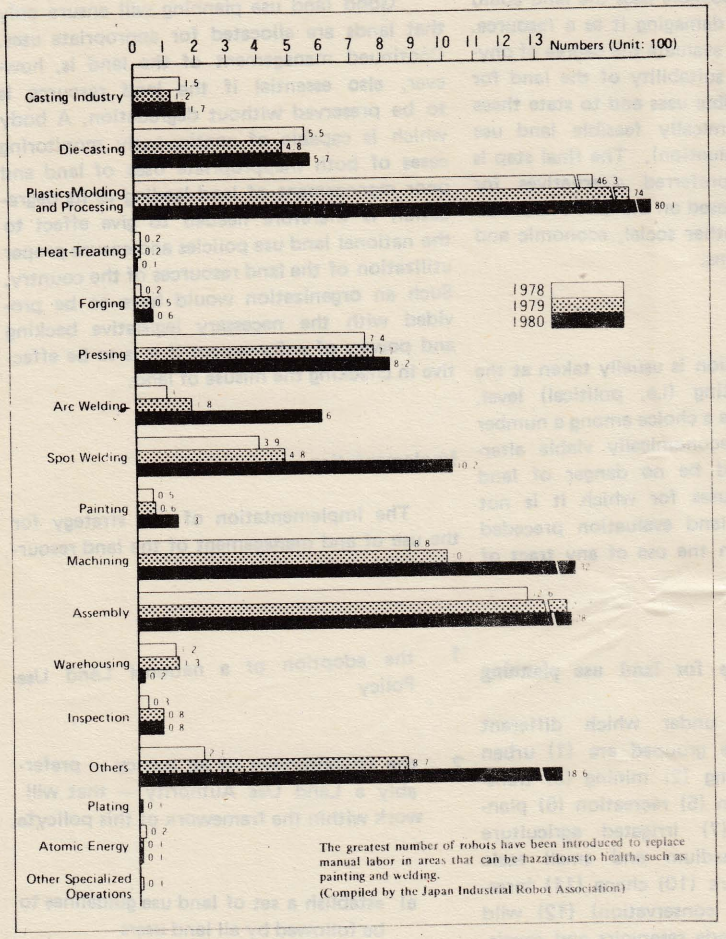
Good land use planning will ensure only that lands are allocated for appropriate uses. Continued management of the land is, however, also essential if the land resource is to be preserved without degradation. A body which is capable of continuously monitoring cases of both inappropriate uses of land and poor management of land leading to its degradation is therefore needed to give effect to the national land use policies and ensure proper utilization of the land resources of the country. Such an organization would have to be provided with the necessary legislative backing and powers of enforcement if it is to be effective in checking the misuse of land.

Implementation

The implementation of this strategy for the use of and management of the land resources of Sri Lanka will require

1. the adoption of a national Land Use Policy
2. the establishment of an agency – preferably a Land Use Authority – that will work within the framework of this policy to.
   a) establish a set of land use guidelines to be followed by all land users
   b) provide basic information on the characteristics of the land resource and its suitability for different uses
   c) provide assistance in Land Use Planning
   d) monitor current uses of land with respect to both the appropriateness of use and the hazard of land degradation resulting from poor management.
   e) have power to take action to correct misuses of land referred to in (d) above
   f) recommend any changes in legislation required to protect the land from degradation and distructive hazards and to preserve it as a renewable resource.
3. the setting up of a high – level inter – Ministerial Committee to co-ordinate policies and activities among different land using agencies and to ensure that the land use policies and guidelines are followed.

Robots being used in specific application



Types of Industrial Robots in Japan

Types	Operations
Manual Manipulator	Manipulator controlled by a human operator.
Fixed Sequence Robot	Pre-programmed to perform a series of operations in a fixed sequence; changing of procedure is difficult.
Variable Sequence Robot	Pre-programmed to perform a series of operations in a fixed sequence; changing of procedure is easy.
Playback Robot	A manipulator is taught by a human being to memorize procedure, position and other information; and can carry out operations by calling up that information to meet the demands of the situation.
Numerical Control Robot	A manipulator that carries out operations designated by a numbering system. (making use of digital switches, punch cards, etc.)
Intelligence Robot	A robot that can decide its actions, using sensors or cognitive functions.

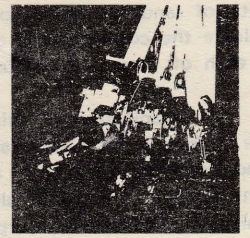
Industrial Robots in Japan

JAPAN'S LEAD IN THE ROBOT REVOLUTION

Few innovations throughout history stand out as much for their technical, economic, social and cultural consequences as that of the computer/microprocessor technology, recognised today as the most important technology of the late 20th century. Whether at home or at work this innovation is now taken for granted in Japan and many countries of the West and is becoming as common and as essential as electric light. A far reaching development from the micro-processor technology is that of industrial robots which can be programmed to weld cars, work in coal mines or in textile factories. Industrial robots are beginning to transform the way the world works.

Although it is a development that promises major gains in productivity the cost by way of displacement of human labour could be disastrous. When the computer shrank in size and cost, it suddenly became practical to use it as the brains to run a robot. Today's robots do not necessarily look or behave like human beings, all they need is mainly a guiding brain (the computer) and an arm with claws for fingers. The computer is simply plugged into an electric outlet; cables run from the computer along the robot's arm and transmit instructions in the form of electric impulses to the claw; for heavy work, robots use hydraulic pressure.

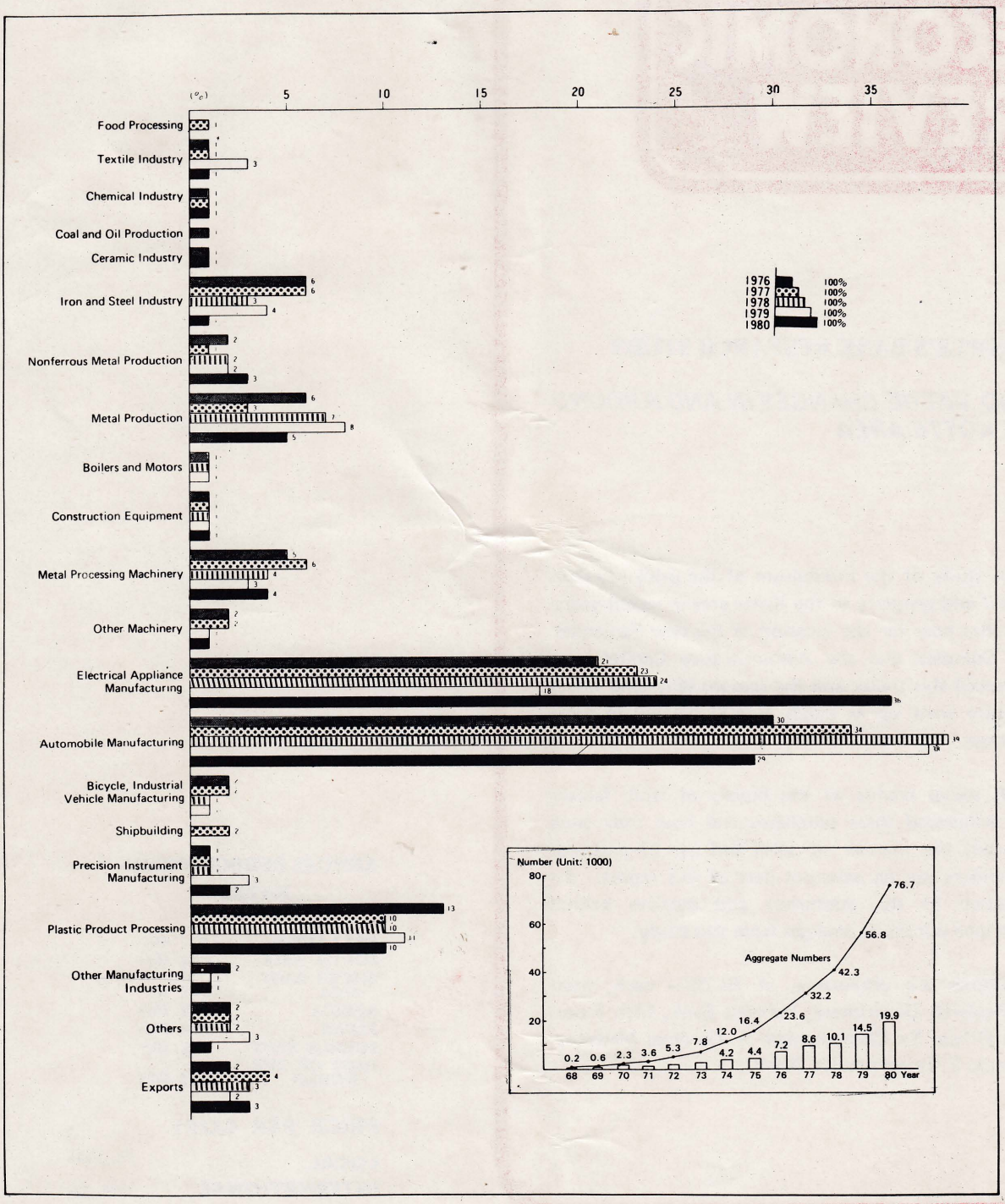
Robot for Extreme Work



Automatic Sewing System
This project aims at establishing the technology required for development of "automatic sewing system" efficiently to perform the small lot production of multiple types of apparels to cope with diversification of consumer needs and shorter life cycle of products.

These steel-collar workers already paint cars, assemble refrigerators drill aircraft wings, mine coal and, for that matter, wash windows; newer robots now on the drawing boards will soon be spraying crops with pesticides, digging up minerals deep under the oceans and repairing satellites in outer space. Not too far off, experts predict, is that landmark day when robots will begin designing and then building other robots.

Robot Introduction According to Industry (%)



- Industrial robots are being used in a variety of industries, with demand being greatest in the automotive and electrical fields.
- In the future, we can foresee application of robots in the fields of social welfare, development of the oceans, industry, forestry, construction, transportation and service industries.

In recent years, the operation of industrial robots in both types and members have increased tremendously in certain parts of the world. For instance, in 1971 from less than 1,000 robots Japan had nearly 20,000 operating by 1981. By 1980 Japan was operating 70 percent of the robots in use in the world ,well over 10,000; compared with 3,000 in the US; 850 in West Germany; 600 in Sweden; 500 in Italy; and about 200 each in Franch, Norway and Britain. Other significant users were Finland 130 and USSR 25, according to TIME magazine of December 8, 1980.

In Japan industrial robots are being used in a variety of industries, with demand greatest in the Automobile and Electrical Appliances manufacturing industries. Research and development aimed at producing 'intelligent' robots for use in a wide variety of applications, including medicine, social welfare and fire-fighting are also in progress here.

ECONOMIC REVIEW

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LAND VALUE CHANGES IN AND AROUND THE KOTTE AREA

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A social profile of the buyers of land, factors that influenced these purchases and how they were financed, the manner of sales and use of proceeds by vendors are an essential part of this report. An indication of the mechanics and motives behind urban land purchases emerges from this study.

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