

**MINISTRY OF LANDS &
LAND DEVELOPMENT**



RESOURCE DEVELOPMENT

The TITLE PAGE is illustrated with a photograph which typifies the back-drop to rural life in our country where the village tank, the *vel yaya*, the temple and the village forest interact harmoniously to provide the basic wherewithal for a cohesive village community.

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RESOURCE DEVELOPMENT

A publication of the Information Service of the Ministry of Lands and Land Development and the Ministry of Mahaweli Development drawing attention, sectorally, to the progress and achievements of the Ministry of Lands and Land Development and institutions thereunder during 1981 and indicating the development work proposed in 1982.

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Foreword

OVER the past four years, we have consistently endeavoured to map out policies and programmes that would improve living conditions in the rural sector. We have had our successes and failures. While planning the Mahaweli Development Programme, which I consider is a massive effort at rural development, up to end of 1980 we have rehabilitated or built anew over 2,700 irrigation works at a cost of over Rs. 217 Million to benefit over 200,000 acres outside the Mahaweli Programme. This no doubt has benefitted thousands of small farmers to get more food and better incomes. We regularised the tenurial rights of over 325,000 peasants who had encroached on State land for a decade or longer, ensuring them security of tenure to increase agricultural production. We have planted 102,809 acres of land with forest trees and promoted peoples' participation in mass planting of trees. We have tried to bring about a system into the way in which our land, water and forests are managed. We have introduced a regular programme of land alienation to provide access of people to land.

There were many other programmes we wanted to accomplish but either failed or faired badly. Illicit felling of timber in State forests and its transport continues inspite of drastic laws introduced to combat them. Illicit occupation of land continues despite a government decision to debar such persons from being eligible to receive land. Institutions for social control, waste of water in irrigation schemes and damage to irrigation structures have not developed at village level as yet. Yet, there is one thing we can be satisfied with—that we have attempted and continue to do so and not given up in despair.

In our successes and failures there is one bright golden thread that stands across this period—i.e., our desire to conserve and develop natural resources for the benefit of our people. Natural resources, particularly land and water, are critical and basic to the needs of our rural people. The State has a responsibility not only to provide access for the rural masses to these resources but also develop them for posterity and to optimise their use.

Of all things handed down to us by our forefathers, our rural life style is one of the things, most dear to our hearts. Proper management of natural resources is a key factor in retaining this style of life.

A common feature of Third World countries attempting to go through development programmes is the movement of rural people, particularly the young, to urban centres. The bright lights and the income opportunities attract them to cities and we do not pretend to be able to stop them by statute or fiat.

*The only way is to make the rural areas more attractive to those seeking urban facilities. The good things of urban life should be introduced to the rural setting—water, sanitation, electricity, better roads and educational facilities to attract people to rural areas, while retaining the best traditions of the rural way of life. Small irrigation works, the **wel yaya**, the village forest and the temple are not merely symbols of a romanticism, they are basic needs of social stability and we are trying to achieve them through different means.*

22.12.1981

GAMINI DISSANAYAKE,
Minister of Lands & Land Development.



His Excellency J. R. Jayewardene, the President inaugurated construction work in March 1981, on the Inginiytiya Settlement Project in the Puttalam District at the invitation of Hon. Gamini Dissanayake, the Minister of Lands and Land Development. The Inginiytiya Project provides for a reservoir across the Mi-Oya with a capacity of 53,000 ac. ft. to irrigate 4,660 acres of new land and 1,870 acres of existing land for double cropping. The project is estimated to cost Rs. 270 million. It is partly financed by Japan. The ceremonial inauguration of construction work was marked by a tree-planting campaign.



One of the problem areas that received immediate attention after the present Government took office was Forestry. The Government has emphasised the crucial importance of forests for the economic and environmental welfare of the Nation and directed its concern to two problems : that of watershed degradation and the reduction of fuel wood energy. Tree planting campaigns sponsored through schools are aimed at creating an awareness of the need for forests and trees for the economic, social and environmental wellbeing of the Nation. The Hon. Gamini Dissanayake, Minister of Lands and Land Development is seen at a tree-planting campaign organized by the Mahanama Vidyalaya, Duplication Road, Kollupitiya, early this year.

Policy and Programmes

The year 1981 was one of continuous budget adjustment to fall in line with government's decisions from time to time to cut back on public expenditure. Capital development programmes were undoubtedly affected by the restriction and uncertainty about the availability of finances. The position was somewhat redeemed when supplementary estimates were approved on 30th September; yet the delay in receiving these funds made programming and development work tremendously difficult. Work on a number of ongoing programmes in irrigation, forestry and land development had to be suspended to accommodate the budget cuts, while all new programmes and construction works were postponed for consideration in the future.

Nevertheless the cut back in expenditure had one salutary effect, in reducing or at least keeping construction costs at around 1980 levels which enabled more mileage to be extracted from the limited funds available.

However, at one stage, at the beginning of the year, there was the dubious prospect of a large number of items of heavy machinery and equipment in government organisations and even in the private sector, lying idle for want of adequate work. At least for Government Departments and Corporations within the Ministry this was overcome by actively looking for work in other organisations on a contract basis to prevent under-utilisation of plant, machinery and skilled labour.

Despite substantial reductions in funds the Village Irrigation Rehabilitation Programme which commenced in 1980 with local funds was buttressed by a World Bank/IDA credit to initiate

a programme for the rehabilitation of 1,200 village works over a period of five years. The programme will rehabilitate 48 works in 1981 and 160 in 1982. This programme stands out as a low investment quick maturing project to offset our imbalances caused by other long gestation projects. Again to offset the cutback in the afforestation programme of the Forest Department which reduced the acreage reforested, from an all time record of 31,235 in 1980 to 20,635 in 1981. The State Timber Corporation came to fill the gap, if partially at least with a programme to reforest 22,000 acres in the cyclone devastated areas. This programme commenced in 1981 with a target of 1,300 acres.

The year 1982, it has become quite clear, is bound to be a difficult one for government institutions with major capital investment programmes. The programme of the Ministry of Lands and Land Development has already been re-curtailed 20 per cent. below the investment programme ceiling. Many on-going activities have undoubtedly to be suspended, curtailed or phased over a longer period. New strategies therefore have to be identified for the ensuing years to make the optimum use of available scarce resources. Three main strategies are proposed for the ensuing year to achieve this objective.

Firstly, current on-going programmes which could optimise the use of available trained manpower, plant and machinery will be strengthened and expanded and new programmes of similar nature will be initiated. Priority will be given to those which would yield quick results and increase productivity at a low level of investment.

Chief among these would be the village irrigation rehabilitation programme commenced in 1980, which will be expanded through 1982. The technical specifications and the calendar of operations of this programme has been rationalised to make the maximum use of funding available from different sources, the Decentralised Budget, World Bank, Asian Development Bank etc. The experience gained by the district and field staff of a range of departments and corporations in building or rehabilitating over 3,000 irrigation works during the past four years has helped to develop techniques, procedures and systems to reduce costs and increase the benefits to the farming community. The National Committee on Rehabilitation of Village Tanks will continue to direct and monitor this programme.

Several programmes for improvement of Water Management in T.I.M.P.* and Gal Oya and Mahaweli areas have been under way during the past few years. A programme on the same lines, but with a lower level of investment will be initiated to cover all major irrigated settlement schemes. In 1982 the programme will cover approximately 50,000 Ac. in 24 scheme. This is being commenced with no additional funds from the budget but merely through a rationalised redistribution of funds voted for operation and maintenance. Strengthening public and farmers institutions at the field level will be a major feature of this programme. It is anticipated that this programme will help to increase cropping intensities and yields substantially. The programme will also help utilise other services by a number of field level officers which remain underutilised at present.

The tree planting programme initiated in 1981 is one other instrument to increase the forest and tree cover in the Island at low investment costs. In 1982, the Ministry will launch a major drive to expand this programme. The Development Councils and District Ministries have co-operated very closely with the Ministry in this programme. The Forest Department, Land Development Department, State Timber Corporation and Water Resources Board together with many voluntary organisations are now geared to supply the required planting material for a sustained programme. Many government institutions and public bodies have volunteered to join in this programme. Similarly, timber and fuelwood consuming organisations in the public

sector and in the private sector as well, have joined the programme with enthusiasm to produce their own requirements of timber and fuelwood.

The Ministry, Forest Department and other institutions will now act as a catalyst in promoting this programme, strengthening the technical assistance and extension efforts. It is quite clear now that the shortest and most rational route to increase the tree cover in the country is through extension and promotion rather than through direct government intervention in establishment of plantations. The response to this programme has been extremely encouraging. Hence the programme will be strengthened through 1982.

The long awaited amendments to the L.D.O.† were approved by Parliament in April 1981. This is being followed by a major programme for issue of L.D.O. grants to allottees who were allocated land from 1935 onwards. The issue of grants to over 430,000 such allottees, who have already contributed in no small measure to food production in this country, will be expanded through 1982 at minimum cost to government. The grant of 'title deeds' to these farmers will, among other benefits, enable them to obtain agricultural credit and other benefits which lead to commercial farming and increase productivity.

Secondly, all institutions within the Ministry are being restructured to run as viable institutions with little or minimum support from the government Budget. The State Timber Corporation, the Colombo District (Low Lying Areas) Development Board and the State Development and Construction Corporation are already self-financing and in fact loans of them contribute to Treasury funds. The Water Resources Board depends on government only for its research and development activities, but is well on the way to be a self-financing institution. Though they work as service organisations to the public sector, the Irrigation Department, Government Factory and the Department of Machinery and Equipment are now managed on a viable basis and will offer an improved and competitive service in 1982 and justify themselves on their own performance. The possibility of revamping the Government Factory with private sector collaboration is under consideration.

Thirdly, the institutions under the Ministry will in 1982 provide a range of activities to in-

* Tank Irrigation and Modernisation Project

† Land Development Ordinance

volve private and public bodies in development programmes with little or no capital investment from the government budget.

Of these the most novel programme perhaps is the allocation of state land to the private sector for forest plantations on a yield sharing basis. This programme if successful will pave the way to major involvement of individuals and institutions in forest plantation with no capital investment by government. Already 6,000 Ac. have been earmarked and the programme will be expanded in 1982.

The Land Development Department now charged with the responsibility of landscaping will expand its programme to serve the needs of the private, commercial sector and will engage in the large scale multiplication of planting material to meet with the much expected demand. The State Timber Corporation will commence processing of timber to meet various public needs and add value to its products. Increased production by sawn timber, wall-panelling and increased production for export of wood charcoal, railway sleepers and luxury timber products, would be some of the main lines which would

strengthen the financial viability of the State Timber Corporation.

The State Development and Construction Corporation Colombo District (Low Lying Areas) Development Board and Water Resources Board will all undertake new ventures with governmental approval to improve their financial stability while providing a competitive and efficient service in the fields of engineering and infrastructure development.

Perhaps the greatest contribution that the Ministry would make in the coming year would be, to place at the disposal of various agencies particularly the Development Councils, the services of skilled technical and managerial staff in our long standing institutions like the Survey, Irrigation, Forest, Land Commissioner and Land Settlement Departments.

With these adjustments it is hoped that the Ministry and its institutions could face the year 1982 with confidence and determination to continue its endeavour to conserve and develop the land, water and forest resources of the country for the greater good of the community.

Progress & Achievements

Review of Progress and Achievements during the four year period ending June 1981, and Future Programmes of the Ministry of Lands and Land Development

The responsibility for the development, conservation and management of the three major natural resources of water, land and forests was brought within the ambit of the activities of the newly established Ministry of Lands and Land Development in late 1978. Since then the programmes of the agencies under the Ministry have been revised and reoriented towards the national objectives of optimal utilisation of the country's natural resources. In addition, the activities of these agencies have been co-ordinated more effectively, and their performance monitored and evaluated continuously. This has resulted in vastly improved performances while, also enabling many of the institutions to expand their activities or venture into new fields. Several policy changes as well as new policy measures have been instituted and a number of enabling legislations enacted in order to undertake the expanded programmes envisaged by the Ministry.

Some of the more important policy changes and legislation enacted during the period were:

1. Decentralisation of the Irrigation Department and the greater delegation of powers to regional Deputy Directors;
2. Greater emphasis on the rehabilitation of major schemes and the introduction of water management practices for improved productivity;
3. Measures to establish a water Resources Council, through the proposed Water Resources Act, to co-ordinate and develop the water resources of the country;
4. Transformation of the Water Resources Board from an advisory body to an implementing agency;
5. Restoration of the forest cover of the island up to, at least 20 per cent. of the total land area;
6. Amendments to the Forest Ordinance to stipulate enhanced punishment for illicit felling, transport and sale of timber;
7. Complete ban on chena cultivation, and the integration of agriculture and community for forestry development;
8. Optimal and scientific exploitation of existing forests and the maximum utilisation of forests earmarked, for irrigation development, while allowing the free import of timber to meet increasing demands;
9. Regularisation of encroachments on state land and eviction of encroachers on state forests and other reservations;
10. For the above purpose, the enactment of the 'State Lands Recovery of possession' Act No. 7 of 1979;

11. Provision of state lands as grants and the enactment of the 'Land Grants Special Provisions' Act;
12. The strengthening of the Land Branches of the Kachcheries with the appointment of additional G.A.A., and departmental land officers to handle land matters;
13. Improving the viability of service oriented organisations under the Ministry, by enabling them to charge for their services, and utilize excess capacity by competing with the private sector in securing contracts both in the public and private sectors;
14. General improvement in training of both the operating and management staff;
15. Land Development Ordinance (Amendment) Act. with the repeal of the 'Sale of State Lands' Law No. 43 of 1973.

The following amendments to existing legislations are proposed to be enacted before the end of the year.

1. Amendments to the Land Settlement Ordinance to introduce speedier settlement procedures;
2. Amendments to the 'Colombo District (Low Lying Areas) Reclamation and Development Board' Act to empower it to operate through out the island, and to undertake civil and other construction activities;
3. Amendment to the Irrigation Ordinance to provide for a Court of Law to exercise jurisdiction in irrigation offences, enhance penalties for offences, and initiate an Irrigation Fine Fund;
4. Amendment to the Forest Ordinance to enhance the penalty for transport of illicit timber and provide for the forfeiture of vehicles, implements etc., used in the commission of offences;
5. Amendment to the Land Acquisition Act to provide for reasonable compensation for acquired property and to reduce hardships caused to owners.

The major achievements of the Ministry during the period under review, have been high-lighted in the next column:

The irrigation development programme of the Ministry was severely constrained by inadequacy of funds due to the budgetary cut backs imposed in 1981. Although most of the cuts were restored subsequently, the momentum lost due to, demobilization etc., set back the progress of these programmes. During the period 1977 to 1981 approx. 3,400 acres of new lands and 30,000 acres of existing irrigated lands have been provided with irrigation facilities, in major and medium scale works. Under the decentralised budget the IRDP programmes and the Village Irrigation Rehabilitation Project, approx. 16,400 acres of new lands and 150,000 acres of existing irrigated lands have been provided irrigation facilities or better facilities. The details are given in the following table:

The number of items and the acreage benefited by irrigation works completed during the period 1977 — 1980 were as follows:

	No.	Acreage benefited	
		Existing	New
(a) Itemised Works	32	11,525	2,461
(b) Decentralised Budget	2,251	135,872	15,000
(c) Integrated Rural Development projects	87	5,237	935
(d) Village Irrigation Rehabilitation Project	133	9,789	440
(e) Major Works	4	16,778	900
		<u>179,201</u>	<u>19,736</u>

Policies and programmes have been formulated to improve water management on existing irrigated lands in major schemes. Emphasis is now placed on increasing the productivity per unit of water rather than per unit of land as advocated earlier. Attempts are being made to enhance the capacity of the farmers to manage their own affairs and sustain and maintain the irrigation infrastructure through a participatory approach. This is being experimented on a pilot scale at the Gal Oya Project, through the assistance of Institutional Officers appointed for this purpose. Ultimately it is expected that this would evolve a suitable institutional framework for the establishment of water users' organisations in irrigation projects throughout the Island.

The following major projects were undertaken with foreign assistance:

1. Tank Irrigation Modernisation Project

5 Major tanks with over 31,500 acres under irrigation were taken up for rehabilitation with IDA and UK, ODN assistance. Two tanks, Mahawillachchiya and Mahakanadarawa with 9,000 in acres have been completed and work is in progress in other tanks.

2. Mahadivulwewa

Irrigation facilities have been provided for 460 acres under the project being undertaken with assistance from the EEC. The balance area of 740 acres are expected to be provided irrigation facilities by the end of the year and the project due for completion in 1982.

3. Muthukandiya Project

The head works and other structures have been completed and irrigation facilities provided for 600 acres under the project being assisted by the Government of Australia. Irrigation facilities for the balance area of 1,400 acres will be completed by the end of 1981.

4. Gin Ganga Project

This project for the protection of 12,000 acres liable to flooding is being undertaken with Chinese aid. The extent protected so far is 8,500 acres. The project is due for completion in 1982.

5. Kirindi Oya

This project, for the irrigation of 31,000 acres of which 20,000 acres are new lands, and for the settlement of 8,300 families is expected to be completed in 1983, at a cost of Rs. 1,200 Million assisted by ADB, IFAD and the German KFW. The contract has been awarded to the RVDB and work is progressing satisfactorily at present.

6. Inginimitiya

This project, work on which was inaugurated by H.E. the President in March 1981, is being financed partially by the Government of Japan. Tenders have been awarded to the Ceylon Development Engineering Co. Ltd., and mobilisation work is proceeding at present.

7. Gal Oya Water Management Project

This project for the rehabilitation of 50,000 acres of land on the Left Bank of the scheme was inaugurated by the Hon. Minister of Lands and

Land Development in March this year. All machinery, equipment and consultants have arrived, and work is now in progress.

8. Village Irrigation Rehabilitation Project

This project for the rehabilitation of 1,200 village works at a cost of Rs. 800 Million is being assisted by IDA. The project commenced in 1980, and 133 items were completed at the end of the year. Approximately 48 schemes have been taken up for rehabilitation or restoration in 10 districts in 1981. Work is in progress at present. In addition to rehabilitation, the project has also included components for introducing water management practices in rehabilitated schemes, training of officers and farmers in water management, and continuous evaluation studies for assessing the impact of rehabilitation, on the farmers' wellbeing as well as on the country's economy.

The Water Resources Board which undertakes investigations for ground water resources, has constructed 325 tube wells so far. In addition, it is working on the development of a suitable device for the lifting of water. Thirty windmills have been installed. Ipil Ipil is also being promoted as an alternative energy source for fuelwood and other purposes.

In the Forestry Sector, the annual reforestation programme of the Forest Department had to be curtailed from 16,000 acres in 1979 to approximately 2,000 acres in 1981, due to financial constraints. Although several foreign funded projects for reforestation have been initiated, the total acreage replanted under these programme, will not match the targets envisaged in the original forestry development programme. The Forest Department has established 87,900 acres under Forest plantations through the Co-operative Reforestation as well as the Departmental planting programme. Of this acreage, 43,500 acres are on chena lands, 6,000 acres under the NADSA Project and 3,000 acres under the IRDP Projects, and the balance in montane and other wet zone areas. Over 2.6 million plants have been issued to the public under the tree planting programme.

The State Timber Corporation produced 500,000 cubic meters of logs, 60,000 cubic meters of sawn timber, 220,000 railway sleepers, 85,000 transmission poles, 720,000 cubic meters of firewood, as well as other items during this period. The STC has also entered into joint ventures with



The Kirindi Oya Irrigation and Settlement Project in Tissamaharama is one of the largest projects taken up for execution recently. Construction work was inaugurated on this project in June, 1978 by His Excellency J. R. Jayewardene, the President and the Hon. Prime Minister, Mr. R. Premadasa with the Hon. Gamini Dissanayake, Minister of Lands and Land Development, during a recent inspection of the work on the Project. The Kirindi Oya project will benefit 31,000 acres of which 20,000 acres will be new lands for the settlement of 8,300 families. The project will be completed in 1983 at a cost of Rs. 1,200 million. BELOW : Hon. Gamini Dissanayake is seen addressing farmers in the existing paddy lands under the irrigable command of the Kirindi Oya Project.





The State Development and Construction Corporation (S. D. & C. C.) which is a major construction organisation under the Ministry of Lands and Land Development is handling a large civil works contract for the Ceylon Electricity Board under the Canyon Power Project. This contract involves a major tunnel. Photograph shows Hon. Gamini Dissanayake, Minister of Lands and Land Development and the Deputy Minister of Power and Energy, Mr. P. Dayaratne inspecting work in the Canyon tunnel. INSET : Hon. Gamini Dissanayake, Mrs. Dissanayake with the Deputy Minister of Lands and Land Development, Mr. A. M. S. Adikari inspecting work on the Canyon Power House in the company of the Chairman S. D. & C. C., Mr. K. H. S. Gunatilaka.

private sector collaboration. A new joint venture Company "Charlanka" has been formed for the production of charcoal. The Corporation which incurred a small loss in 1977 showed a profit before taxation of Rs. 91 million in 1980. However, in 1981 there has been a sharp reduction in the sales of sleepers and logs due to reduced purchases by the Railway Department and general downtrend in the construction sector.

The Land Development Department under its environment programme, undertook the landscaping of several major roads, factories, hotel and housing complexes by instant tree planting by root-balling and marcotting processes. Under the programme for the transfer of valuable trees in areas ear-marked for irrigation development 7,000 valuable trees have been rescued up to now, from the inundation areas of Victoria and Kotmale reservoirs, and transferred to the tree banks of the Department.

In Land Administration, the encroachment surveys completed in 1979 revealed that there were 605, 800 encroachers on 950,000 acres of state land. Up to now 450,000 acres have been regularised to 320,000 encroachers, and the deeds granted to 125,000 persons. Some of the lands encroached cannot be regularised, as they are forest or other state reserves. The encroachers on these lands will be evicted and deserving cases provided with lands elsewhere. Land grants up to 1,600 acres have been given to 2,300 persons. The land grants programme was constrained to some extent, as lands promised by the LRC for the programme, was not given over to the Land Commissioner. The LRC had embarked on its own alienation programme. Under the major schemes 1,800 persons have been settled on 5,084 acres. About 20,000 allottees have been provided with WFP aid in major schemes. Eleven youth schemes were started with 830 youths settled on 1,837 acres. Under the Village Expansion Scheme, 11,350 allottees were settled on 12,600 acres. The Village Expansion programme had to be temporarily halted in order to meet outstanding payments for previous acquisitions. Furthermore lands acquired by other state agencies such as the JEDB and SLSPC, were not available for alienation by the Land Commissioner, thus hampering progress under this programme. A total of 5,280 acres were acquired for various purposes and Rs. 17.2 million paid as compensation. 200,000 acres of land have been released after completion of settlement inquiries in 150 villages.

A project for the training in Planning and Management of settlements has been initiated, and a pilot training programme and a workshop has been conducted as a precursor to the main project, which will be funded by the UNDP and implemented beginning 1982.

Land Surveys have been completed for 600,000 acres under systems A, B and C of the Mahaweli Project. Site surveys for Kotmale, Victoria, Maduru Oya, Randenigala and Uthitiya were also completed. In addition a large volume of surveys were completed for the Irrigation Department (236,300 acres) G.A.A., National Housing Department, UDA etc. Under the Agricultural Base Mapping Project, 50 per cent. of the land area has been surveyed and photographed. Under the Swiss Sattelite Imagery Project 1.1 million acres have been completed in Trincomalee and Polonnaruwa Districts.

Under the land reclamation programme, the Kotte Parliamentary Complex dredging work is progressing with 100,000 cubes of earth work and 250,000 cubes of dredging completed. An extent of 300 acres has also been reclaimed. The area reclaimed in Colombo and other areas was 385 acres. The Reclamation Board which undertook this earned a profit of Rs. 35 million in 1980/81.

In the service sector, the State Development and Construction Corporation completed 91 projects valued at Rs. 167 million. This included the completion of Bowatenne Diversion Dam at a cost of Rs. 23 million. The Canyon Power Project is the major undertaking of this agency at present and is estimated to cost Rs. 125 million. Work on the tunnel has been completed. The Department of Machinery and Equipment completed approximately 400,000 cubes of earth work in irrigation and other civil works, while providing training to over 100 trade apprentices annually. The Government Factory, working on 4 advance accounts has been operating profitably. It has constructed among other items, 7,500 sluice gates, 13,800 hospital beds and accessories, 72,000 brass and other fittings, 36 windmills, 10,600 gas generators, in addition to repair of machinery and equipment.

Future Programme

The Irrigation Department will continue with the implementation of all 8 major foreign funded projects with at least 2 due for completion next year. The construction of approximately 60 other itemised medium or major works will be

continued in 1982, with many due for completion in 1982 or 1983. In addition to the maintenance of major works (700,000 acres) the Department will carry out the construction of several schemes under the DCB and IRDP Projects. The investigations for ground water development for irrigation and other purposes will continue to an accelerated pace, while the Wind Energy Utilisation Programme will be stepped up in the coming years.

In the Forestry sector, the USAID assisted project for the reforestation of the Upper Mahaweli Catchment area and for fuelwood plantations in the Dry Zone which become fully operational in 1981, will be continued with 10,000 acres being taken up every year.

Incentives have been provided for the participation of the private sector in forestry development. Already 4,000 acres have been identified for this programme in 1981. Several other private sector individuals as well as companies have shown interest.

A new programme for forestry extension has been initiated this year with assistance from USAID. This is with a view to obtaining the participation of the people in the reforestation programme and or the dissemination of know-how to the community. This would assist in the implementation of the Community Forestry Project to be undertaken next year.

The Forest College will be expanded with USAID assistance to train Forest Rangers. The ADB sponsored Community Forestry Project covering 7,000 acres each year will be implemented from next year in the districts of Kandy, Nuwara Eliya, Badulla and Batticaloa. The normal reforestation programme of the Forest Department has been curtailed from 16,000 acres in 1979 to approximately 2,000 acres in 1981. A Forest Inventory will be undertaken with UNDP assistance, to prepare detailed Management Plans of all existing forests by 1983.

The State Timber Corporation will increase the production of sawn timber and transmission poles, to meet increasing demands. It will also undertake a reforestation programme of 22,000 acres in the cyclone damaged areas, over a seven year period, with 1,000 acres in 1981 and 5,000 acres in 1982. Further joint ventures in the utilisation of timber will be pursued by the STC.

A training school for Saw Mill Operators and for Timber and Log grading will be established by the Corporation. The Land Development Department will work on an Advance Account basis to provide the services of instant tree planting and landscaping to all public and private sector agencies. It will also enter the lucrative export market for ornamental plants and shrubs.

The construction-wing of the Land Commissioner's Department will be engaged in providing infra-structure for major schemes now under construction. The regularisation of encroachments will be completed by 1982 and the land grants programme, streamlined for expanded activity in 1982. The establishment of Youth Schemes will be stopped from 1982, while the WFP assistance will be continued to cover 30,000 allottees in 1982. Land sales will be continued under the amended Act. More emphasis will be paid to Water Management for improved production in all major schemes, while settlement activities will be continued in new major settlement schemes for over 10,000 families in Kirindi Oya, Ingini-mitiya and other projects.

A Master Plan for the reclamation of low lying areas in the Colombo District will be developed. The Reclamation Board will be transformed into an organisation undertaking civil works in addition to its reclamation work in order to utilize better its manpower and machinery capacity.

The Survey Department will continue with the channel trace, perimeter and other surveys for the Mahaweli Project. Under the Land Grants Programme, surveys for 280,000 allotments will be undertaken in the next 2 years. Surveys for Major and Medium irrigation works will be undertaken on 70,000 acres while, town and other sporadic surveys will be undertaken on 115,000 acres. The Agricultural Base Mapping Project is scheduled for completion in 1990 with 1,800 maps on the scale 1:10,000 earmarked for production.

The Government Factory will continue its activities with efforts to utilise all excess capacity by providing incentives to increase production.

The SD & CC plans to undertake Rs. 120 million worth of work in 1982 and Rs. 130 million worth of work in 1983.

The Department of Machinery and Equipment will continue working as a sub contractor in many major irrigation construction projects.

Land Policy

Demographic patterns in Sri Lanka reveal that the population of the country has nearly doubled since Independence, and over 70 per cent. of this population continue to live in the rural areas. With this increase in population and the pressure for employment, many have looked forward to land as the most dependable resource base. This will continue with many more generations to come. However land is a finite resource that should be treated as a National Treasure, and not frittered away by short sighted ad-hoc policies. But the experience points out that the intensity and closeness of relationship between man and land has not been all that healthy consequent to these developments.

Emphasis on Land Use Planning has continued through the year and more detailed informations and data with guidelines for rational use will be provided in the next year. The competing demands from the vast complex of utilisation patterns will be matched against the physical features and socio cultural aspects, so as to ensure that options available for optimum utilisation will not be unduly denied to the planners in the future.

Land Settlement Ordinance enunciated in 1935, under which disputes on title to land between State and private parties were expected to be determined took its own course of events so much so that the average annual extent of land settlement remained at 48,000 acres. Unsettled title, tends to promote indiscriminate occupation of lands and exploitation of forestry. Proposals for the amendments of the Law to change the procedures for expeditious disposal of inquiries is shortly to be presented in Parliament. Pending the passage of these amendments management changes have already taken place in the depart-

ment. Villages released after completion of settlement work has now increased from an annual average of about 52 villages and about 41,000 acres up to 1980, to 225 villages and 196,316 acres released so far during the year 1981. In some of the areas unsettled nature of title prevented planned allocation of lands to peasants.

Aware of the critical need for land from the landless peasantry, Government has launched on several programmes to alienate more and more lands. In this respect the regularisation of encroachments was one of the main steps taken towards ensuring security of tenure to a large mass of the rural peasantry. Approximately 1 million acres of land occupied by about 650,000 persons over a decade or so were examined in detail and action has been taken to regularise most of the lands on the people who had developed them. This programme should be concluded in a few more months. After nearly 10 years of occupation they are been provided with security of tenure. Those occupying reservations on lands that cannot be alienated will be re-located elsewhere.

Along with this exercise of regularisation, action is being pursued to prevent chena cultivation in the future. Chena cultivation was a system of land rotation which permits regeneration of cultivated lands. This cannot be continued in the future with dwindling extents of land. Such cultivators are provided cultivable lands to prevent them from moving from land to land. Chena cultivation was considered one of the main reasons for the devastation of forest lands depriving people, both requirements of timber and firewood, and causing irreparable damage to the en-

vironment. Avenues for more permanent title and rights to stabilised forms of cultivation as against permitting chena cultivation, has enabled the State to provide a measure of relief to this class of the peasantry, similar to the regularisation of encroachment.

The tenorial system, under which lands have been alienated over the last 40 years, commencing with the promulgation of the Land Development Ordinance in 1935, was based on a system of leases. Subsistence levels of farming continued in large areas. To remedy this situation, permanent title by way of a grant was envisaged in the Sale of State Land Law enacted in 1973. But the development aspects, hitherto enshrined in the Land Development Ordinance was deemphasised and the procedure became cumbersome. Consequently, the Land Development Ordinance has been reactivated, with the reintroduction of Chapters 2 and 3 on mapping out of State lands and Land Alienation. It is proposed to issue land grants to give a permanent title to the allottees under the provisions of the new amendment. The alienees will be entitled to receive grants on completion of occupation and development over a 3 year period in respect of paddy lands and one year in respect of highland. The Programme envisages the issue of over 450,000 grants in respect of approximately 1 million acres of paddy and highland over the next 2 year period. Every grant document will be issued under the seal of His Excellency the President and will contain a survey plan issued by the Surveyor-General. With the issue of a grant the alienee obtains a freehold similar to the Sinnakkara Opuwa. With this permanency of title the alienee will have all the encouragement to make his land more productive and optimise the return.

State acknowledges as a policy imperative the effort made by the peasantry in this country to develop the land with paddy and highland crops, which has ultimately added to the local food resources of the country. Their sweat and toil which has raised the levels of productivity is amply recognised in the decision to issue land grant, is free of charge. The peasant class of this country, who have hitherto received only leases of lands, will now have the fortune to receive free land grants.

Arrangements have been made from 1980 onwards to alienate some of the lands that have been taken over under the Land Reform Laws. They will be given to those who undertake culti-

vation of highland crops and maintain productivity levels of existing crops like tea. Under the provisions of the Land Grant (Special Provision) Law, such lands will be vested in the State and distributed to local landless people.

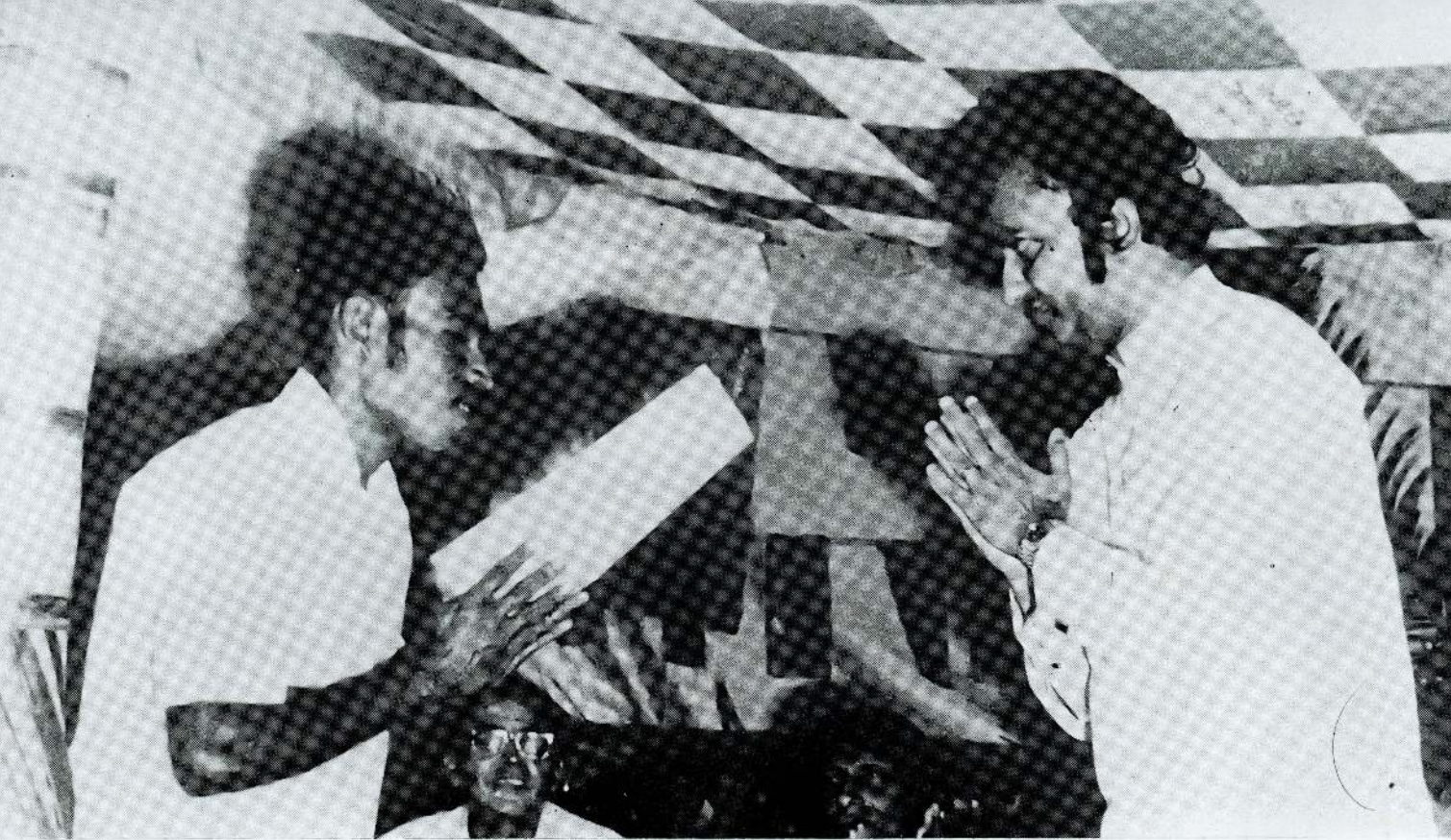
Land Commissioner's Department has continued with the programme of alienation of land under Village Expansion Schemes as well as Major Irrigation and Settlement Schemes like Muthu-Kandiya and Mahadivulwewa. Alienation of land on a planned basis of this nature should discourage and prevent future encroachments on State lands. Approximately 25,000 acres in 24 districts, where such land are available, are earmarked for alienation. The original targets on alienation had to be revised because some of the large estates acquired for village expansion were later found to be managed as large production units by Plantation Corporation. Such lands will continue as plantations under the Management of State Corporations.

Although these policies should enable a large segment of the people to receive lands, it is regretted that at times, other people occupy such alienable lands before plans are finalised. Such unauthorised occupation deprives the State the opportunity of correct land use planning and irrigation management. The application of the State Land Recovery of Possession Law No. 7 of 1979 was being utilised to prevent such encroachments. Unfortunately procedural delays in the implementation of this Law has at times led to delays in eviction of offenders by periods as much as 2 years. With a view to correcting this situation an amendment has been passed, to set a time limit to disposal of cases and eviction of persons. Further the benefit of this Law was also extended to land under the management of Land Reform Commission and other State Agencies.

It has also been found that some of the non-irrigable but otherwise productive lands require further improvement. Some of these lands did not have sufficient infrastructure facilities for optimum utilisation and occupation. On the other hand there are large sections of population whose levels of income exclude them from the category of land receiving peasants but whose desire to invest in lands, should be welcome as a promising entrepreneurship. The benefits of such developable highlands can be given to this class of persons in the future. In fact with approximately 80 per cent. of land under State control, land market is depleted to the extent that such lands are not released to the market.



The Hon. Gamini Dissanayake, Minister of Lands and Land Development with the Hon. E. L. B. Hurulle, Minister of Cultural Affairs and the M.P. for Galgamuwa, Mr. H. M. A. Loku Banda with a group of farmers in the Huruluwewa Settlement Project, during a recent inspection of Huruluwewa by the Hon. Gamini Dissanayake. Padikaramaduwa, in the Huruluwewa Scheme, popularly known as the "Nuwara Eliya Coloniya", has been settled by some of the earliest Kotmale settlers, evacuated from areas prone to earth slips. The Huruluwewa Settlement Scheme was dogged by water shortages from the time it was settled in 1952. In 1976, a canal taken off the Bowatenne reservoir provided supplemental irrigation supplies to Huruluwewa from the diverted Mahaweli waters.



Parliament approved amendments to the Land Development Ordinance in April, 1981, to enable the issuance of LDO grants to allottees of Crown Land, since the enactment of the Ordinance in 1935. The issuance of such land grants to 430,000 allottees will help them to obtain credit and other benefits which will lead to commercial farming. Photograph shows Hon. Gamini Dissanayake, Minister of Lands and Land Development awarding a title deed to a settler at Galgamuwa.

(Below) Hon. Gamini Dissanayake, Minister of Lands and Land Development and the Hon. S. Thondaman, the Minister of Rural Industrial Development visited Vavuniya District to inspect settlement schemes there, recently.



Hence a proposal has been submitted for the creation of a Land Trust which would develop the infrastructure facilities and dispose of these lands on a Sale or Lease basis. The proposed Land Trust can be self-financing, if such sales are encouraged. Main aim of this proposal, is to release lands to an otherwise starved land market and help to utilise private capital resources in land betterment. However, this policy will not be undertaken at the expense of the landless peasantry, for whose benefit the system of alienation of land have been developed over the last 40 year period.

Title Regulation as a secure and stable method of land development has received the active attention of the Government. A Committee has been appointed to submit detailed proposals for introducing this system and in the next few months the proposals are likely to be placed before the Government.

Land Settlement experience in Sri Lanka spanning over a 50 year period has witnessed both success and failure. From the commencement on Nachchaduwa Scheme in 1917 we have come a long way to the settlement programmes in Mahaweli scheme. The twin objectives of relieving population pressure and creating productive employment by impounding water to new lands, have been realised in some of the schemes and not in others. Serious attention has been

drain at the failure to obtain optimum results from some of the schemes. Corrective action, hitherto taken has been of a sporadic nature.

Planning and management of Settlement Schemes so necessary to correct this situation is a complex issue which over the years has proved the need for special training and experience. In order to fill this gap of a continuing vacuum in management, a Pilot Training Programme and Workshop has been organised for the Managers of schemes and Senior Level Policy Makers. It is proposed to extend this Management Training as a regular refresher training programme to update and equip both planners and managers of Settlement Schemes.

Eminent domain of the State to take over and manage land properties in Sri Lanka is governed by the Land Acquisition Act. The operation of this Act over the last 30 year period has been a source of concern, on both procedure as well as the computation of compensation. With a view to streamline and simplify this procedure and provide relief to property owner that Act is being amended. This Legislation is due to be presented to Parliament shortly. These amendments are expected to minimise displacements and inconvenience to occupiers of lands. Properties to be taken over will be ensured reasonable compensation, while at the same time, guaranteeing to the State, the right to take over properties as expeditiously too, where such properties are deemed to be of an urgent public necessity.

Land-use Planning

Agricultural Development is accepted as the backbone of the future development in our country. In this background land becomes the primary resource. The significant position of land in this context has been traditionally accepted. Man's relationship to land with respect to dependence, attachments, attitude, more or less remain the same. However the thrust of socio-economic changes relating to demographic pressures tends to cause disturbances to this relationship. Land is a finite resource, the utilisation of which within socio-cultural patterns require technological advances based on scientific knowledge.

With the increase in population, land holdings per capita is reduced inducing un-healthy exploitation, denudation, jeopardising its unique quality of perpetual usefulness. Rapacious clearing of natural vegetative cover, specially of land with critical slopes, purely to obtain short term agricultural benefits is a social menace. It has to be borne in mind that though some of those who utilised lands are dead and gone and a few of them are living, many more are yet to be born. Land-use Planning should therefore ensure optimum use for future generations. Alternative options in land use, must not be closed hurriedly on superficial and flimsy grounds.

In discharging this function of proper land use planning, the State assumes responsibility specially because 80 per cent. of the land in Sri Lanka is deemed to be within state control.

As part of the comprehensive analysis on natural resources development, this Ministry commissioned a study in 1979 and broad concepts on the management of natural resources were

announced. The Land-use Co-ordinating Committee comprising Secretaries of several Ministries and a Land-use Planning Division established in this Ministry were the direct outcome of this study. With FAO assistance a Consultancy has been instituted to define scope of activities and specially the terms of reference of the organisations. The Agencies and sources in the provision of basic land data inputs for the Data Bank are being identified. The strategy for information flow and necessary linkages with other institutions is expected to be considered in depth within the next year.

Aided by scientific research, the soil and agro-climatic factors can determine crop culture. The ultimate objectives of Land-use Planning should be the maximization of yields (and use) attended by the minimisation of the resource (land) allocated for specific uses. This scientific approach, while laying emphasis on conservation provides the scope for identification and enlargement of potential for crop sustenance (as well as other important uses) and also for intensification of use by adoption of updated crop culture methods and management practices.

The Lower Uva Regional Development Project sponsored by the Canadian International Development Agency (CIDA), though an example of regional land-use planning, has terms of reference extending beyond land-use planning. However, land-use planning is central to this exercise made more sophisticated by a projected analysis of the response of the region to a much wider range of inputs (Appendix 1).

Identification of marginal tea lands, suggesting remedial measures for crop improvement and providing assistance to small holders through subsidy schemes, are important aspects of the Tea Rehabilitation Scheme under the National Agricultural Diversification and Settlement Authority (NADSA). Though an isolated example of land-use planning, this sectoral approach to the Island's principal export crop could easily fit into a national land-use plan.

Although the National Land-use Plan would rely heavily on proven scientific principles relevant to the objectives of conservation and optimisation of yield (or use), the beneficiaries, aspirations with respect to the resource (land) would not be relegated to a position of least importance. Consonant with government policy, grass-roots level participation in the National Land-use Planning exercise is proposed to be ensured through District and Divisional Land-use Planning Committees, some of which are already active.



Land for the People

Major Settlement Schemes

Under the implementation programme for this year 1,381 allottees will be settled in an extent of 3,368 acres in Major Settlement Schemes. The schemes coming under this Programme are Muthukandiya, Mahadivulweva, Inginimiliya and Kirindi-oya.

- (a) Mahadivulwewa Scheme — Target — 575 families.
No. of families settled — 555 families. Extent settled — 1,980 acres
- (b) Muthukandiya Scheme — Target — 800 families.
No. of families settled — 280 families. Extent settled — 700 acres.

Programme of settlement under Kirindi-oya will commence early.

The Implementation Programme under Major Settlement Schemes for the period 1981 - 1983 would be as follows:

	No. of allottees	Acreage
1981	1,381	3,368
1982	5,244	13,678
1983	3,669	9,748
Total	10,294	26,794

Youth Settlement Schemes

	No. of allottees	Acreage
1981	175	375

The target for this year will be 175 youths to be settled in 220 acres in Mt. Hunnagiriya and Matale Schemes in Kandy District. 55 youths will be settled in Walalubindawewa in Anuradhapura District before the end of this year.

Village Expansion Schemes

The target under Village Expansion Scheme for this year is 21,171 acres, 366 Land Kachcheries have been approved with a total extent of 30,426 acres. 235 Land Kachcheries have been held by Government Agents covering an extent of 16,356 acres. Selections have been finalised in respect of 134 Land Kachcheries with an extent of 8,525 acres.

The Implementation Programmes for the period 1981/83 is as follows:

1981	21,171 acres
1982	24,990 "
1983	26,500 "
Total	72,661 "

Regularisation of Encroachments

Out of a total 942,345 acres of State lands under encroachment 465,226 acres have been regularised up to date.

Instructions have been issued to Government Agents regarding Regularisation/Ejectment of balance extents. Encroachers in stream, tank and Irrigation channel reservations will be ejected and possession taken over under the Recovery of Possession Law.

Excess lands available under this programme will be alienated to landless people under Village Expansion.

Issue of Grants under Land Grants (Special Provisions) Act.

Survey Requisitions in respect of 27,266 acres have been issued. Perimeter Survey Plans have been obtained for 10,777 acres. Land Kachcheries held for 12,500 acres.

The Implementation Programme for the period 1981/83 is as follows:

	Acreage
1981	5,234
1982	10,230
1983	9,627
Total	<u>25,091</u>

Issue of Grants under the Land Development Ordinance

430,000 Grants are expected to be issued under this programme by 1983.

Already 827,000 requisitions for copies of diagrams and 45,000 requisitions for land marking have been issued. Instructions have been given to Government Agents regarding the issue of Grants and this Programme will commence in December this year.

A new programme of Mapping out of State Land have been launched during the latter part of this year by appointing Development Officers as Mapping-Out Officers for each District. They will work under the direction and supervision of the Government Agents and Assistant Land Commissioners attached to each District.

The Principal objects of this programme are:

- (i) to protect the interests of the local population, which are apt to be over-looked in satisfying the demand for Economic Development,
- (ii) to secure that various interests of the whole community are not lost sight of e.g., maintenance of necessary timber/firewood supply, protection of sources of water, etc.

(iii) to provide as far as possible that the alienation of land for economic development shall be systematic rather than haphazard,

(iv) to foster economic development by providing ready information to intending investors.

Outcome

The outcome of the Implementation Programme for the period 1981-1983 could be summarised as follows:

- (a) Settlement of 10,294 farm families in 26,794 acres of Agricultural land under Major Irrigation Schemes.
- (b) Settlement of 36,300 families in 72,661 acres under the Village Expansion Programme.
- (c) Settlement of 25,091 families in 25,091 acres under the Land Grants (Special Provisions) Law.
- (d) Regularisation of 297,568 acres or provision of alternative land for encroacher families where necessary.
- (e) Issue of 430,000 Outright Grants to allottees who are presently holding permits under the Land Development Ordinance.
- (f) Mapping-out available State lands for the purpose of systematic land-use planning.

Agricultural Base Mapping Project

A basic requirement for physical resources development planning, at all levels, is information on physiography of the terrain, land-use, roads, location of administrative boundaries, population centres etc., to name a few. All this information is normally made available in small-scale comprehensive maps, supplemented by large scale, more detailed maps. In Sri Lanka the existing topographical map series, at a scale of one inch to a mile, serves the purpose, but its compilation had been completed in 1925. The envisaged systematic revision of these maps had not taken place due to various constraints. These maps, though still in use, should be considered outdated. Further, the contour interval shown in this series is 100 ft. while about 70 per cent. of the land mass has a gradient of about 1 in 10. Besides, about 60 per cent. of all agricultural land units are less than 2 hectares in extent, rendering it impossible for depiction on the existing scale of mapping. With increased development activity now, large-scale topographic maps on internationally accepted metric scales, will be very necessary for preliminary feasibility studies for land-based projects. Also rendered obligatory by Sri Lanka's commitment to metrication, and "Agricultural Base Mapping Project" had

been instituted in the Survey Department, financed mainly by a loan from the United States Government (through the United States Agency for International Development) amounting to US\$4.5 million supplemented by an outright grant of US\$180,000 by the Swiss Government, and a commitment of US\$2.2 million by the Sri Lanka Government. This project is now underway. The expected out-puts of this project are:

- (a) Complete nationwide map coverage at 1/50,000 scale
- (b) Complete nationwide map coverage at 1/10,000 scale
- (c) A User-Assistance Centre

About 1,850 maps at the scale of 1:10,000 and 92 maps at 1:50,000 scale will provide the required map coverage of the entire country. It is proposed to compile about 40 out of the 92 maps, on the 1:10,000 scale from large-scale plans already available. For the rest of the series photogrammetric mapping methods will be employed together with complementary field work. The 1/50,000 series will more or less be a by product of the 1/10,000 series, adopting photo-reduction and generalisation techniques.

New Strategies for Irrigation Development

"I have come up for days through the jungle I now stand on the rock of Inginiyagala and visualise in my mind's eye the site where the future dam should come. Should that come to pass, I would urge a Government of the future to examine the problems from the human angle, for here in the lower reaches under the Pattipola Aru Scheme hard-working peasants live in a state of semi-serfdom, earning but the barest pittance as recompense for the severity of their services"—J. S. Kennedy*.

The above extract from a minute filed in the Ampara Kachcheri reverberates the musing of an Irrigation Engineer who during the course of his duties envisioned in 1931 the birth of the Gal Oya Scheme which came to be established under Senanayaka Samudra. These words of Kennedy rebound in prophetic significance today when we stand in a watershed looking for new directions for future irrigation development in Sri Lanka.

Three years of policy analysis within new perspectives have been able to engender new issues in the maximisation of the potential for the development of the natural resources in the country. The need to plan out an integrated development of the water resources in the country has become a key issue which consists of new challenges and demands for the Government in planning and utilising this scarce resource. Reference has been already made in the previous issues to the draft Water Resources Act which seeks to institutionalise the water resources planning and development in the country within a co-ordinated framework. The effort at consolidating the planned development, management

and utilisation of the water resources is an attempt to address the national level bodies to the urgent need for the development of systematic allocation procedures by recognising its implications and its vital relevance to the development of the country.

In contrast, the allocation and distribution of water to individual small farmers brings out the inevitable human dimensions in the complex relationships between man and irrigation water. Equity and productivity considerations have to be sustained in assuring a predictable supply of irrigation water to the farmer. Although the ethical values associated with equity and productivity considerations are complementary to each other, resource scarcity has already rendered Water Management to be the most formidable challenge to the management of irrigated agriculture.

* J. S. Kennedy, a Scottish engineer joined the Irrigation Department around 1927. Being a keen student, endowed with a brilliant analytical mind he studied the mechanics of village tanks and wrote his *SCIENTIFIC EVOLUTION OF VILLAGE TANKS IN CEYLON*, which sets out the fundamental rules for the study of water resources and storage for irrigation. It has been authoritatively stated that these rules hold good, irrespective of the size of the storage reservoir.

A workoholic, Mr. Kennedy crowned his career in the Department by heading it in 1935 to 1939. Though many illustrious engineers contributed the investigation, design and construction of the Gal Oya multi-purpose project it owed much to the judgement and vision of J. S. Kennedy, who worked closely with the Hon. D. S. Senanayake when the latter chaired the Committee on Agriculture and Lands in the then newly constituted State Council.

It was Kennedy, who selected the site for the Gal Oya dam at Inginiyagala.—Ed.

Irrigation development in Sri Lanka was a symbiotic effort in human settlement and it continues to be the largest investment made by post-Independent Sri Lanka in any sector. In this effort, the emphasis was largely placed upon constructing reservoirs with head works to provide irrigation water to small farmers by setting up irrigation infrastructures and settlement facilities. This policy continued unchallenged into the fifties until the resource constraints caused by domestic financial problems necessitated a review of the settlement policies in relation to their cost-effectiveness. Thus the Agricultural Plan of 1958 pointed out that the expenditure incurred in these schemes should be examined to ascertain whether they commensurate with the return obtained from them and also whether these investments could not have been more profitably utilised on alternative schemes for economic development. Evidently these inquiries resulted in a moderate shift around mid-sixties in policy relating to the horizontal expansion of irrigation facilities to new lands. Thus the inauguration of the Special Projects Schemes in 1967 was an attempt to address the minds of the policy makers to the need to maximise the productivity of the existing lands under irrigation and settlement schemes by introducing better extension methods to adopt new agricultural technology.

The intensive management system formulated for Special Projects through the Project Management approach emphasised achieving higher productivity of lands by co-ordinating and providing the inputs of new technology to the farmer through the rural organisations that were operating at the farm-level. This approach, however, did not emphasise the management and organisation of the agricultural enterprise of the small farmer in relation to the irrigation water which was so critical to the success of the farm-plan. In this approach, land appears to have been considered a more limiting resource than water and the availability of water appears to have been taken for granted. Although these Special Projects did achieve an up-surge in the food production through plans and programmes introduced by the Government, the initial momentum it gathered could not be sustained without the active intervention and stimulation provided by the project staff appointed by the Government to manage these projects. This failure can be attributed to the lack of a plan to establish the necessary capabilities among the farmers for institutional

development to sustain the project continuity through a self-supporting management framework.

These two phases in the irrigation and settlement development in Sri Lanka are already undergoing a period of transition to enter into its third phase of development by emphasising and creating an increased awareness of the limitations imposed by the availability of irrigation water in sufficient quantities. This emphasis is also combined with a programme to develop a suitable institutional framework with active participation by the farmer so as to sustain the operational efficiency and productivity gains.

A policy emphasis which highlights the need to exercise a more sparing use of water in the existing systems and increasing their cropping intensity for enhanced production is also justified by a rationalisation of the investment opportunities available for future irrigation development in Sri Lanka. A large majority of the existing irrigation systems in the country are over 25 years old and many of them have outlived their period of productivity and economic usefulness. In the circumstances these systems call for a massive rehabilitation effort, through Government intervention, which if not heeded would result in large extents of land periodically going out of production thus causing adverse multiplier effects on the rural economy.

The cost effectiveness of diverting the available resources for rejuvenating the established systems is extremely favourable and it provides immediate benefit to a large number of people who are already in these schemes. In contrast, recreating such facilities for settlement by constructing new projects would commit the Government to very high expenditures which it cannot afford without creating delicate sectoral imbalances specially with large expenditure earmarked for Mahaweli Accelerated Programme, Kirindi Oya and Inginimitiya. In any case the new lands available for such developments outside these areas are marginally productive and the return on investment is not likely to provide the best investment alternative.

A policy relation to the vertical expansion of irrigation development which seeks to optimise the production potential by providing for more economic and efficient use of water in the established systems receives eloquent justification and should, therefore receive high priority. The state intervention in these efforts should be

largely directed towards a collaborative programme which evokes direct involvement of farmers and provide the necessary motivation for their active participation. Such participation should also be utilised to enhance their skills so that the farmers could manage their own affairs more effectively by establishing the necessary organisation which represent their interest.

The development of an institutional framework for farmer representation can always serve as a prelude to an effort at rehabilitation. Rehabilitation being the most productive inquiry that can be made to a system operation and management, the data and information that can be provided by the farmers who have a life long experience with the operation and management of the system would be of immense value to take a fresh look at the design and the operation details. Such inquiries which can be made effectively in consultation with the farmers provide the best opportunity to incorporate the managerial contribution of the beneficiaries to the system organisation and management.

Decidedly, a Water Management perspective in irrigation management is an acknowledgement of the intricate human dimensions which are always associated with the use of irrigation water. Previous approaches have tended to disregard the human perspective in Water Management and irrigation problems were for the most part identified as engineering problems. The persistence of the objectives set up by sectoral plans to increase the food production in the country necessitated the adoption of a top-down approach to push the new technology into the farming systems. Management objectives were not explicitly committed to the creation of self-reliant institutional base among the farmers to sustain the levels of efficiency achieved in crop production. Gaps in knowledge and blinkered visions provided by narrow specialisation and disciplines have led to wrong perceptions and policy analysis resulting in formulating short-term goals for management and organisation of these systems.

The development of a Water Management perspective as the principal strategy for future irrigation development in Sri Lanka is initially programmed to articulate the following:—

- (1). Greater awareness of the need to apply appropriate measures for sparing use of water on a Water Management perspective;

- (2). Generation of values and perceptions which relate productivity levels to water availability and utilisation;
- (3). Development of additional capacities and capabilities which can facilitate the adoption of new techniques and strategies;
- (4). Conducting research and development programmes which can widen the scope and alternatives available to the farmer in cropping patterns and crop diversification;
- (5). Policies and objectives which recognise the need to establish a self-reliant management framework through a participatory approach which can effectively utilise the managerial attributes of the beneficiaries.

Programmes initiated by the Ministry contain a mix of all these aspects ranging from rehabilitation efforts to low-key programmes which emphasise a process of learning by adopting a diagnostic inquiry and remedy the situation by bringing out the human potential through the involvement and participation of the farmer. By design as well as by circumstances, the programme take different directions which will contribute at the end to a profitable experience on Water Management.

PROGRAMMES

Five Tank Irrigation and Modernisation Project (TIMP) which includes five tanks in 3 different Districts in the Dry Zone has an aggregate irrigable command of 31,500 acres. The work in Mahakanadarawa tank is complete and Mahawilachchiya is nearing completion. Work carried out in Mahakanadarawa to evolve an efficient system of Water Management based on rotational issues has been very promising and it will be extended to Mahawilachchiya during this year. The programme which sought to promote early cultivation and make optimal use of rain water during the Maha of 80/81 was affected severely by inadequate rains which were some of the lowest recorded for the area. The agriculture programme carried out in Mahakanadarawa have also surfaced the need to adopt practical measures which can insure the crops against losses and damages. The difficulties encountered by farmers in repaying the limited credit facilities provided to them have brought into sharp focus the need to revive credit policies implemented for

the small farmer sector in the country in such manner that long-range investment decisions of the farmer are incorporated, into the scheme.

The organisation of the farmers on turn-out groups, however, was carried out after the rehabilitation work was over. It is expected that this measure would enable the Irrigation Department to ascertain the acceptability of the new design and structures to the farmers within the emphasis on water management.

THE GAL OYA WATER MANAGEMENT PROJECT

This project which commenced its activities in the late 1979 for the Left Bank of the Gal Oya system envisages the following objectives:

- (1). Rehabilitation and modernisation of the Left Bank irrigation system.
- (2). Development and implementation of Water Management capability and a programme for the rehabilitated system by adopting;
 - (a). a participatory approach in system management;
 - (b). enhancing the capabilities of the Irrigation Department personnel by providing specialised training on irrigation and Water Management;
 - (c). on-farm Water Management research programme.

A pilot programme in 4,000 acres of land area is being conducted by the Agrarian Research and Training Institute assisted by the Rural Development Committee of the Cornell University U.S.A. to promote farmer participation in Water Management and develop an institutional framework for water users. This work will also include special studies on Water Management.

The experimental methodology developed in this pilot project envisions the deployment of a specially trained cadre of officers known as Institutional Organisers who will live and move among farmers providing the external stimulus necessary for the facilitation of the farmers to join in Water Management group. These officers are expected to work with a dispassionate integrity and move out of the project area on completion of their mission. Within a matter of 9 months the achievements made by these officers have provided with very encouraging results and it is expected that this methodology would

provide significant data and information on the methods of state intervention which should be adopted in Rural Development Programmes.

The active involvement of the farmers in the rehabilitation work by a process of consultations conducted for each turnout is indeed an acknowledgement of their legitimate right of access to irrigation water and the managerial capacity they possess to share water issued to them equitably. Thus the enhancement of the capacities and capabilities within the system as well as among the farmers and officials is an explicit objective enunciated by this programme for institutional development which seeks to sustain the operational and management efficiency of the system. This project is implemented with the assistance of USAID.

MINIPE PROJECT

The Minipe Scheme is a diversion from an anicut built across the Mahaweli and it has a command area of 15,000 acres. The first settlement under this scheme was carried out in 1939 and later on it was expanded under different stages of development. From 1967 it has been functioning as Special Project.

The Water Management Project which commenced in this scheme in 1979 was initially continued to a pilot area of about 2,000 acres. The initiative was taken by the Deputy Director of Irrigation in Kandy, who on his own attempted to increase the operational efficiency of the scheme by effecting repairs to the more critical areas which called for immediate attention with the small allocations given to the scheme under the Operation and Maintenance vote. The items for repairs were identified and selected in consultation with farmer groups who were motivated to join this venture willingly. Essentially, these repairs constituted a low-key rehabilitation due to the small allocation provided and much of the success was expected to depend on farmer co-operation.

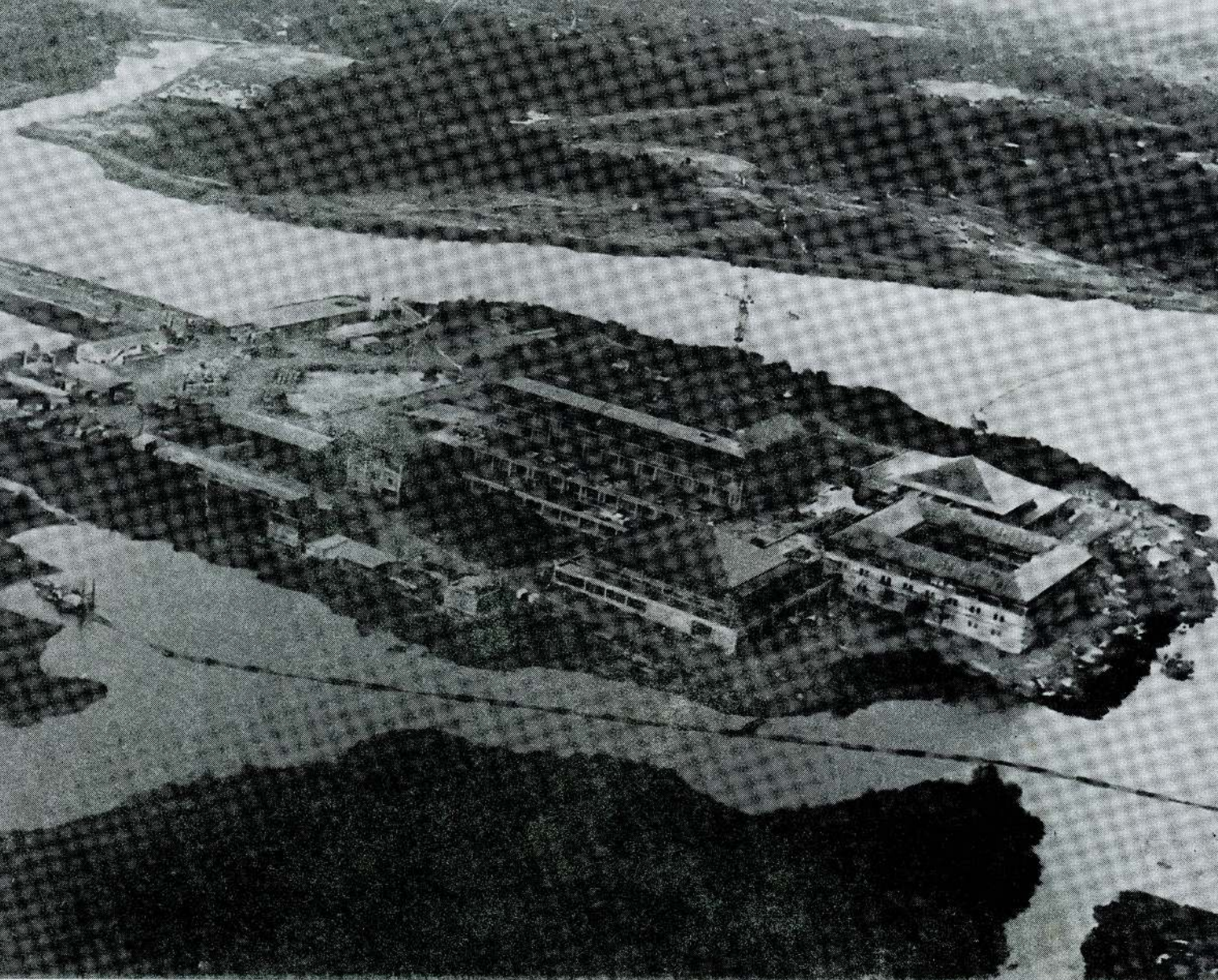
The farmer groups set up for water distribution within the turnout were progressively motivated and developed to acquire management skills which were required for operational decisions. The pilot project has now been expanded to cover the entire project with a Project Committee consisting of farmer representatives elected by the farmers and sub-farmer groups operating at middle level for vertical integration with the

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The Minipe water management project which was launched in 1979 was initially confined to 2,000 acres of the total irrigable command of the Settlement Scheme spread out over 15,000 acres. The project has been progressively expanded and today the whole Settlement Scheme is governed by the project. Even at the time it was started as a pilot project, the Deputy Director of Irrigation, Kandy Region, Mr. N. G. R. de Silva ensured that the project would not only involve farmers, but their school-going children as well. It was an interesting development of going beyond the grass roots level. He went further and enlisted the support of village priests, thereby ensuring support for the project at the temple as well. The Minipe water management project is a truly broad — based peoples' project and commends itself for replication. Pictured here is a meeting of the school's water management committee which was attended by the Hon. Gamini Dissanayake, Minister of Lands and Land Development and the Deputy Minister of Higher Education and M.P. for Udu-Dumbara, Mr. A. M. R. B. Aththanayake.



(Above)

One of the principal works undertaken by the Colombo District (Low Lying Areas) Reclamation and Development Board was the reclamation of about 800 acres and dredging of a lake with a water spread of 300 acres around the island of Duwa in Kotte where the Parliamentary and Administrative Complex is to be located. Known as the Kotte Reclamation Project, this job of work was undertaken in 1979 and completed well in time for construction work to commence on the buildings. This aerial photograph depicts the vast spread of the area reclaimed.



The laying of the penstocks on the Canyon Power Project is an item of work in the civil contract which the State Development and Construction Corporation (S.D. & C.C.) is handling for the Ceylon Electricity Board.

turnout groups. Since the project was established water use efficiency has increased considerably with corresponding increases in the production.

ON FARM WATER MANAGEMENT PROJECT (KALANKUTTIVA)

This Project is implemented by the Irrigation Department with the active collaboration of the Mahaweli Ministry to develop methodologies regarding land preparation, farm and field layout, field channel designs and water delivery procedures which will result in increased production per unit of water. The results of the micro-level studies which relate directly to the farmer and his farm can be successfully integrated as complementary inputs to other research data both in the construction of new projects as well as in rehabilitating established systems.

This project also attaches importance to the applicability and transferability of research findings to the farmer's conditions and environment and hence it combines physical and technical aspects with institutional, economic and social factors affecting Water Management practices.

Under this project, specific project objectives include:

- (1) The development of land preparation and farm irrigation techniques with respect to soil, topography, crops, climate and farmer constraints, paying special attention to crop water requirements, use of rainfall, frequency of irrigation and drainage methods and cropping patterns which will contribute towards more efficient use of irrigation water.
- (2) Development of techniques for scheduling and controlling water within the field channel system to ensure adequate and timely delivery of water to all farms within the system paying special attention to farmer group participation in water utilisation, methods of sharing the field channel discharge and measurement and control of water.
- (3) Development of designs criteria and operational procedures which will permit rice to be grown with upland crops on the same farm or within the same field channel system.

- (4) An understanding of the extension, institutional and administrative requirements to extend the technologies to farmers in irrigation projects in the country.

This project was designed for a period of 5 years commencing from 1979. It is being assisted by USAID.

DISTRICT WATER MANAGEMENT PROGRAMMES

This programme was formulated initially to create an awareness in the implementing agencies dealing with the domestic agriculture programme of the need to think of productivity in terms of water and water management. The Government Agents of the respective Districts were required to select a few tanks initially and monitor the water issues and adherence to cultivation calendar as a prelude to a more intensive programme of Water Management. The emphasis in this instance was largely placed on a diagnostic approach to be adopted jointly by officers and farmers to identify and isolate the problem areas inhibiting the equitable distribution of water. The awareness thus created in identifying the problem areas through a consultative process should serve as a stepping stone for the development of an institutional framework which can serve the interests of the water users.

WATER MANAGEMENT SPECIAL PROGRAMME

This programme is being formulated for implementation in 24 selected major irrigation and settlement schemes. Here again the approach is essentially diagnostic and like other water management programmes, the emphasis is on the organisation of the available resources to optimise the existing potential. In doing so, the constraints would be identified and attended to by working out solutions through local initiative. The objective of this strategy is to enable the farmers and officials to join a common forum which would gradually evolve to provide a base for a water user's organisation.

An intensive management element will, however, be made a special feature under this programme by the appointment of Project Managers and Assistant Project Managers. The main focus of their attention will be to bring about a qualitative change in the scheme which would be conducive for effective co-operation among farmers. It can, therefore, be taken as a dress

rehearsal for a large scale rehabilitation which would be undertaken at a future date on receiving adequate funds.

Admittedly, Water Management is a rational inquiry into ways and means of achieving optimal utilisation of water resources, which are available in limited quantities. Invariably, therefore, it brings out the indelible human dimensions which dominate the complex relationship between man and irrigation water. These complexities have to be understood and resolved principally by constant application of the human perspective for which new policy objectives and skills will be required. It, therefore, constitutes an unceasing quest for learning by identification and relating such issues to the objectives of system operation

and management. In this exercise the development of an appropriate institutional framework should also be made an objective of this learning process since the past approaches have not provided the best alternatives available for such development. As a first step, the programme should be able to create an awareness of the problems and inculcate the necessary disciplines to venture out and meet the challenging demands of the future.

Water Management cannot be any longer taken merely as a desirable step in our efforts to optimise the development potential in irrigated agriculture in Sri Lanka. The time has come when it should be made an explicit objective and a necessary condition in the strategies for future irrigation development in Sri Lanka.

The Lower Uva Development

The Lower Uva Region consisting of the District of Moneragala and the northern portions of the Districts of Badulla and Amparai, contains 13 per cent. of Sri Lanka's land area, but less than 3 per cent. of its people. Living standards are generally below those in the rest of the country, and the Region has long been recognised as lagging in development.

The Ministry has prepared an integrated regional development plan for the Lower Uva Region and has identified and prepared to bankable standards a number of development projects for the Region. A final draft of the report, the Lower Uva Regional Development Plan, was finished in September and is currently being examined by a group of experts brought together by the Ministry for this purpose. Publication of the final Plan is expected by February 1982.

The Plan proposes the implementation of ten projects covering a wide range of economic and social sectors in the Lower Uva. The final form of the projects and priority for implementation would depend on the availability of funds and foreign donor finances. The proposed projects are;

Rainfed Agriculture Settlements: Establishment of permanent rainfed agriculture settlements providing a satisfactory living to farm families now dependent on chena farming. The project would include a minor tank rehabilitation component for these settlements.

Water Storage and Irrigation: Construction of five reservoirs providing additional irrigated land for 61 new farm settlements in various areas of the Lower Uva Region.

Increasing Production on Existing Paddy Lands: Major initiatives in extension services and water management to substantially increase agricultural output on paddylands through the Region.

Livestock Supply : Establishment of twenty livestock pasture farms and one breeding farm to produce milk cows and bullocks as inputs to the Rainfed Agriculture Settlements Projects.

Forestry Development: Development of four major plantation areas including research facilities and 30 communities to manage and harvest the forests. A commercially oriented Lower Uva Forestry Development Company (LUFDCO) would be established.

Tourism and Wildlife: The project makes provision for the expansion of the Yala Park and other wildlife sanctuaries. Tourism would be developed in line with a tourism master plan for the Region.

Fruit Production and Processing: Substantial increase in mango, citrus and lime production providing increased incomes to settlers of the area. Citrus research would be conducted, and assistance would be provided for establishing processing plants.

Human Resources Development: Substantial initiatives in provision of safe drinking water, primary health care and education. A housing programme, urban development and training components would be included.

Agricultural and Economic Support: Establishment of the Lower Uva Agricultural Development Company (LUADCO) to provide credit, marketing

and agricultural inputs and services. A new seed farm would be established and assistance would be provided to agricultural research and training facilities in the Region.

The use of over 100,000 Ha of land (13 per cent. of the Region) would be directly affected by the Plan. The majority of the lands coming under more productive uses would be drawn from inactive chena lands (90 per cent.) the remaining (10 per cent.) would be drawn from existing active dryland (mostly chena) farming areas.

The Plan would support the construction of houses to provide living space for the people of the region. School construction financed by the Plan would provide classrooms to benefit existing and new schools in the region. Safe drinking water would be provided to the majority of the current residents as well as the Plan generated population.

The total investment proposed, is estimated at Rs. 3.2 billion, spread out over a 15 year period. The plan when implemented could provide employment to over 100,000 persons from the 10th year of implementation.

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Village Irrigation Rehabilitation Programme

The Dry Zone has been defined as the region of the country which has an annual rainfall of less than 75" and it covers a wide belt of relatively flat land of the North, North-Central, Eastern and South-Eastern parts of the Island. This region has had a history of settlement and cultivation pre-dating the Christian era. In those times, social and cultural activity, along with the elaborate ritual and ceremonies associated with various aspects of cultivation, was so much a part of village life, and tanks were so important to the life of the community that frequently the names of tanks became the names of the villages. About 90 per cent. of the village tanks are located in the North-Eastern and North-Central parts as well as the South-Eastern parts of the country. Because of lack of rain water as well as the neglect of maintenance of the tanks, the cropping intensity has been reduced, statistically speaking, to less than one crop per year; it is estimated that only 80 per cent. of the acreage under these tanks have a Maha season crop. During Yala season, it is estimated that only about 20 per cent. of the fields are cultivated. Poor water management practices resulting from, and accompanied by, the failure to adhere to cultivation calendars have further aggravated the problem. Abolition of the Irrigation Headman ('Vel Vidane') system, under the legislation in late 50's, had only made the situation more complicated. In late 1970's the Government in conjunction with Donor Agencies introduced a few broad-based development programmes, limited to three or four districts (Kurunegala, Puttalam and Hambantota). There was also the factor that the large Irrigation projects were both heavily capital-intensive and slow-gestating, but sufficient attention had not been paid over the years to the minor irri-

gation sector as a whole, despite its high potential to give employment and to raise income at the lowest level, that of the rural agriculturist.

"The apparent neglect of minor irrigation schemes, which has been observed for some years now, appears to have continued in 1979 Some funds (Rs. 350 million in 1979) had been assigned in the decentralised budget, to be disbursed at the district electorate level; but these funds have been spent largely on schools, roads and buildings and only a fraction has found its way to irrigation. Clearly one of the cheapest and quickest ways of achieving a short-term increase in agricultural output is to rapidly restore and keep these minor irrigation works in good condition, and therefore this sector deserves much greater priority. The larger projects which will yield results after several years, could pre-empt resources available for minor works. The grant of adequate resources for minor irrigation works on a continuing basis, would prevent this". (Central Bank Report 1979). In 1978, 17.82 per cent. of the Decentralised Budget was allocated to the irrigation sector which was the third in importance, but in 1979 only 12.5 per cent. had been allocated to it. The Irrigation Sector had also dropped to 4th place, in 1979.

Programmes

The programmes under the Village Irrigation Rehabilitation Project are intended to cover the entire island, and more particularly the Dry Zone. Although the co-ordinated development of the whole island is envisaged, the project was not formulated as a unified one. Individual donors came forward to help in individual schemes of their choice and by the time a unified plan for

tank rehabilitation was conceived, several individual projects had already commenced. To prevent overlapping as well as to maximise the use of scarce resources of trained men as well as material, and to enable an accurate evaluation to be done, it was decided that only one agency should operate in any one district.

The World Bank aided VIRP—Whereas other projects being executed in the Dry Zone area are being carried out in combination with other aspects of development such as livestock farming and fruit farming, with an irrigation component of varying size the Village Irrigation Rehabilitation Programme aided by World Bank is solely on minor irrigation schemes. However, like all the others, it is aimed at raising income levels of rural people, giving employment, opening farm lands and also improving the quality of life of the rural population by giving them more water, not only for cultivation but also for domestic and other uses.

The scheme itself visualises the restoration and rehabilitation of 1,200 tanks, phased out over a 5 year period. The scheme proposed is as follows:

District	Surveys, Planning and Designs (approx.)	Construction
01. Ampara ...	73	60
02. Bandarawela ...	192	160*
03. Batticaloa ...	50	40
04. Hambantota ...	48	40
05. Jaffna ...	50	40
06. Kurunegala ...	347	300*
07. Mannar ...	75	60
08. Matale ...	19	15*
09. Moneragala ...	120	100
10. Mullaitivu ...	62	50
11. Puttalam ...	36	30
12. Ratnapura ...	134	110*
13. Trincomalee ...	110	90
14. Vavuniya ...	134	110
	<u>1,450</u>	<u>1,205</u>

* Including Anicuts

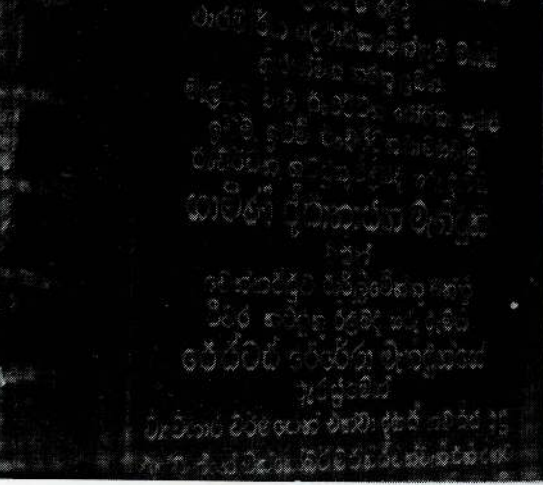
In 1980, the Government of Sri Lanka carried out a "pilot" scheme of substantial proportions on its own resources, prior to the aid agreement becoming operative. The details of this pilot project were as follows:

District	Total No. of items	No. of items comp. in 1980	Acre- age bene. in 1980	No. of fami- lies bene.	Expenditure in 1981
01. Anuradhapura	87	73	7,351	3,693	16,026,977
02. Badulla ...	25	25	926	1,166	1,056,487
03. Kurunegala ...	25	22	787	663	1,881,676
04. Matale ...	06	02	31	226	1,488,350
05. Puttalam ...	09	04	198	110	1,477,470
06. Ratnapura ...	07	07	467	305	1,110,000
07. Trincomalee...	02	02	—	132	94,500

Other Programmes for Village Tanks Rehabilitation—There are other projects with irrigation components of varying size, ranging from the Nuwara Eliya Integrated Rural Development Project with 3 anicut schemes, to the Kurunegala World Bank I.R.D. Project with 9 major tanks and 500 minor tanks and the Anuradhapura Dry Zone Agricultural Project with a programme for renovation/restoration of 600 minor tanks (abandoned or partly operational and needing substantial improvements), over a 5 year period from 1981 to 1985. These projects are operated by different Ministries; vide schedule. However, the National Committee for the Rehabilitation of Village Tanks, working under the purview of the Ministry of Lands and Land Development takes an overview of the irrigation component of these schemes on a national scale, to ensure that there is no overlapping of functions and that the best use is made of available resources of man-power and equipment and that uniform methods and standards of construction are employed on all projects, by having all irrigation work executed by one competent agency, namely the Irrigation Department.

District	Funding Agency/ Country	Period	Irriga- tion Compo- nent Rs.	Work done
01. Kurunegala	World Bank	1979-84	124.5M	9 major tanks 500 minor tanks
02. Hambantota	NORAD	1979-83	12M*	Kirama Oya 87 village tanks
03. Matara ...	SIDA	1979-83	3M*	5 major tanks 19 minor tanks
04. Nuwara Eliya	The Nether- lands	1980-84	7M*	3 anicut schemes
05. Matale ...	World Bank	1981-85	56.95 M	5 major tanks 40 minor tanks
06. Puttalam ...	World Bank	1981-85	143.48M	10 major tanks 200 minor tanks
07. Anuradha- pura	Asian Dev. Bank	1981-85	225M	600 minor tanks

* Financial allocations for 1981 and onwards not included.

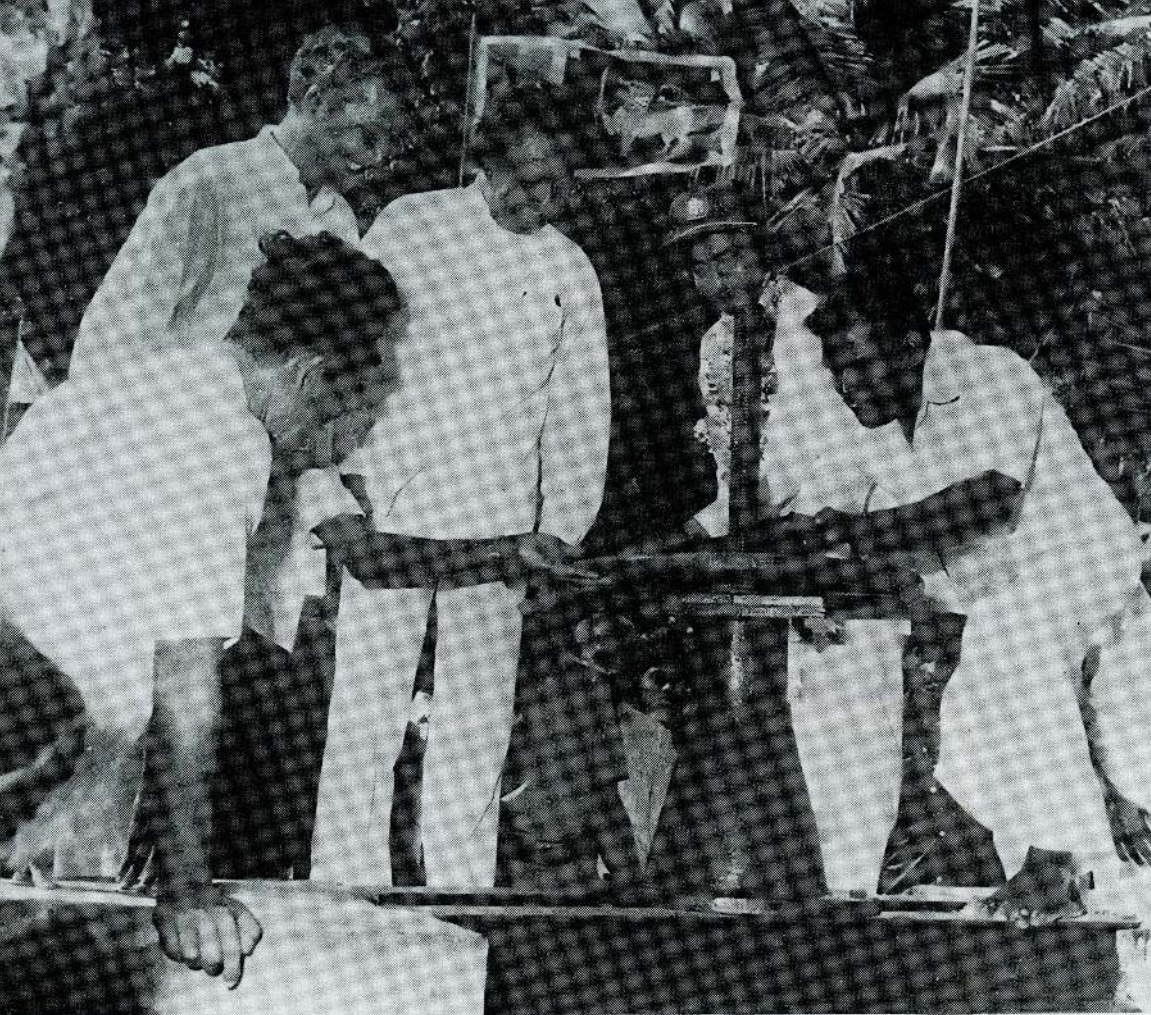


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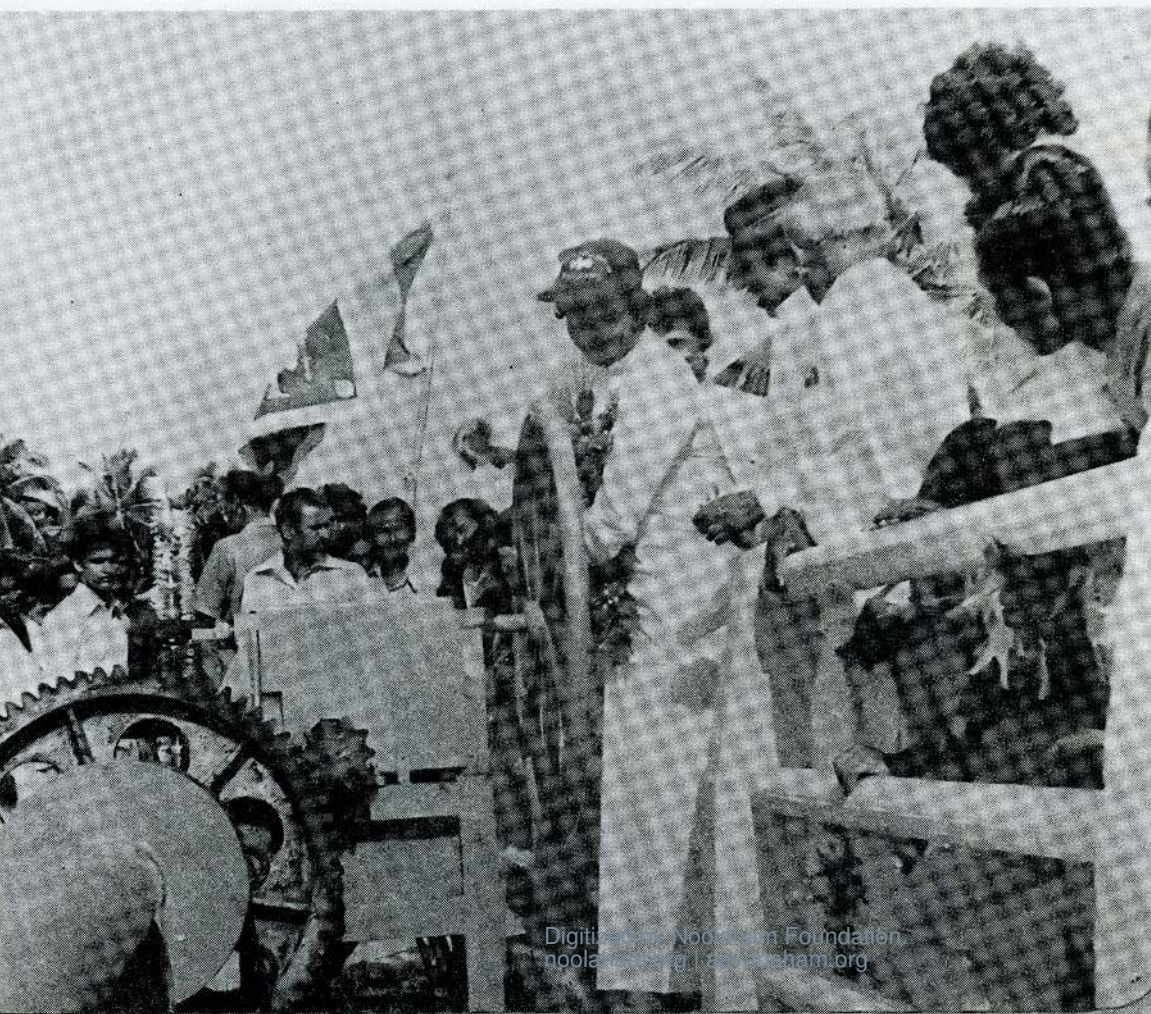
Work on the Wellewa Wewa, an irrigation work in the Wennappuwa electorate falling within the Integrated Rural Development Project of the Kurunegala District was inaugurated by the Hon. Gamini Dissanayake, Minister of Lands and Land Development on 31st October 1981, at the invitation of Hon. Festus Perera, Minister of Fisheries and M.P. for Wennappuwa.



The Hon. Gamini Dissanayake, Minister of Lands and Land Development commissioned the Udapola Kiriuturanwela, an irrigation work in the Polgahawela electorate on May 24, 1981 at the invitation of the M.P., for Polgahawela, Mr. Sunil Ranjan Jayakody.



Improvements to the Tammita Amuna, an important irrigation scheme benefiting Minuwangoda and Gampaha areas was rehabilitated by the Irrigation Department in mid-1981. These improvements have enabled this structure to benefit a larger extent of paddy land. The improved structure was ceremonially commissioned by the Hon. Gamini Dissanayake, Minister of Lands and Land Development. The M.P. for Minuwangoda, Mr. Bennet Gunasekera and the M.P. for Gampaha, Mr. S. D. Bandaranayake attended this ceremony.



In the Matara Integrated Rural Development Project aided by the Swedish International Development Agency (SIDA) 5 major tanks and 19 minor tanks have been developed. Hon. Gamini Dissanayake, Minister of Lands and Land Development inspected these works in the company of the District Minister, Matara District, Mr. Kirthi Abeywickreme recently. On this occasion he also inspected the Kada-wedduwa Reclamation and sea water extrusion scheme.

Although Sri Lanka is a tropical country, yet 2/3 of the cultivable land is in the Dry Zone which has an annual rain fall of between 35" and 75" which falls mostly during the North-Eastern monsoon months. The corner-stone of good water management practice is that water should be available when required, for the purposes required, and in such quantity as could be issued equitably to all fields in the commanded area, whether at the head or the tail of such area. The key factors, therefore, are predictability, equity and sufficiency, for a high degree of productivity. Hitherto the cost factor was not an overriding consideration in implementing village irrigation schemes but social and economic considerations were the main ones. Although the social benefits are still there, operational efficiency is now the key factor and investment is related to land opened up and cultivated, and to population benefited. The new approach is more logical and rational; gives a good spread to the investment and takes the water where it is needed most, in relation to people and land. The need to support a large and growing population where both land and water are scarce, calls for an increased cropping intensity (the current cropping intensity is estimated at approximately 80 per cent. during Maha and 20 per cent. in Yala, the constraint being water). In this situation the conservation of water is a critical factor in the maximisation of potential in the land. This in turn requires disciplined agricultural activity and co-operation among all farmers and cultivators in the command area. When cultivation is done rationally and with a sense of discipline, in order to share a scarce commodity, the cultivation calendar becomes the guide for all agricultural activity in an area; adherence to a cultivation calendar is not merely a prerequisite but also a natural outcome of good water management practice.

Criteria for selection of tanks under the Village Irrigation Rehabilitation Programme

Ideally, a tank as designed should have the capacity to supply sufficient water for the cultivation of two crops to all fields in the command area. However, these conditions do not prevail, but it is one to be aimed at and attained. Accordingly the following priorities have been accepted for the tank rehabilitation programme so that it could have an almost immediate and broad impact.

- (1) Tanks which are still capable of operating as designed but where the safety factor of the civil works is low and consequently preventive rehabilitation is desirable.
- (2) Tanks which are operating at less than designed efficiency and require both remedial and preventive rehabilitation.
- (3) Tanks which are so damaged that the command area has either been abandoned or reverted to rain-fed cultivations.

In addition, the following criteria have been laid down:

- (1) The command area under the tank should not be less than 20 acres. This requirement would be modified if the tank is one in a cascade and requires improvements to provide safety for the tanks downstream.
- (2) Tanks in inhabited areas, that is, where no settlement is involved, with easy access, to be given priority.
- (3) The tank should benefit at least 10 families.

Training

Training facilities under this Project are made available at Maha Illuppallama and Hardy Institute at Ampara. The Department of Agrarian Services had been allocated the function of water management on these tanks. However, the staff appointed to perform these functions did not have sufficient training. The Village Irrigation Rehabilitation Project now has an on-going training programme for both the Department of Agrarian Services and the Department of Irrigation staff to strengthen the capability of the existing staff, increase their efficiency and to continue to maintain it.

Quality Control

In the course of the project formulation process it was found that the quality of work was sub-standard in some items of work that had been already undertaken. With different agencies entering into the development field, crude concepts of construction of bunds, and even of siting them, had crept in. Common faults were that core trenches were not excavated to suitable dimensions, top soil had not been properly removed to accommodate the new bill and consolidation was frequently weak and unsatisfactory. In short, the approach was amateurish and unscientific where technical skills of professionals had not been harnessed for the work. It was in this context that the National Committee for the Re-

habilitation of Village Tanks decided that the Irrigation Department should be the executive agency for the World Bank-aided VIRP. This lead was readily followed in all other projects with an irrigation component, irrespective of its size and irrespective of the funding agency. In consequence of this, the strengthening of the Testing and Quality Control Unit of the Irrigation Department was built into the VIRP and equipment for seven testing units was included in the requirements for the project. Although the project is only for 5 years, the equipment will continue to be used by the Irrigation Department to maintain quality control for a considerable period, from seven centres in the field, as against currently operating from headquarters in Colombo.

Evaluation

Evaluation is a review process of the situation prior to the project implementation stage and after, and is a necessary exercise for the aid-giving agency to satisfy itself that its aid-effort has been put to the intended use, to a desired level, if not to the best possible level. Of course,

it is an even greater necessity for the host country to satisfy itself that it has secured a benefit/cost ratio of at least 1 to 1, from the borrowing exercise. There are not only the measurable monetary and economic indicators of these benefits but other factors such as the social and cultural well-being of the whole man and the improvement of his quality of life go into the reckoning of the benefits from the project. These have to be evaluated by those trained to do so and such a review programme is under way, in respect of the VIRP, as a joint project of the Faculty of Agriculture of the University of Peradeniya and the Department of Agriculture. The Steering Committee of the VIRP has brought together other agencies in related activities and fields of study, such as the Freedom from Hunger Foundation and the Department of Census and Statistics, and seek to monitor and cross-check the progress of the studies and the findings, so that reliable conclusions are arrived at both for the accuracy of the record and as reliable pointers in the implementing of later phases of the same programme as well as for providing sound guidelines for future programmes.

Major Irrigation and Settlement Projects

Among the major Irrigation Settlement Projects which have been initiated after systematic planning and design under the guidance of Settlement Planning Division of the Ministry of Lands and Land Development, Kirindi-oya, Muthukandiya and Mahadivulwewa are some of the Projects which are being implemented on priority considerations. In addition to the traditional objectives of Settlement Schemes like paddy production, providing land for landless, increasing employment and income, etc., the new thrust in these schemes is to introduce an integrated development approach with emphasis on crop diversification for the purpose of maximum utilization of land and water resources. An innovative pattern of settlement in the form of cluster hamlets, civic centres, etc., have been introduced to promote social cohesion and greater community participation in the development objectives of each of the Schemes. A brief summary of each of the Irrigation Projects which are presently being implemented are given below.

Kirindi-Oya Project

This Project envisages provision of irrigation facilities to 11,800 acres of existing cultivated land and irrigation facilities to 21,025 acres of new land in the Tissamaharamaya area in the Hambantota District. A total of 8,320 families is to be settled in this Scheme during the period 1982 - 1985. Each farmer family newly settled will be entitled to World Food Programme assistance for 18 months, the value of which is estimated to be Rs. 71,469,000/- approximately. In addition to the food aid subsidies, Departmental financial assistance for temporary huts, planting material, clearing, etc., will be provided to each settler family, incurring an approximate cost of

Rs. 18,636,000/-. Social infrastructure facilities by way of buildings, roads, dispensaries, etc., at a projected cost of Rs. 37,440,000/- will also be provided under the Project. In the Settlement Programme, 364 families who are presently living in lands that will be submerged by the reservoir, 139 families living in the catchment area and 2,392 families falling within the command area of the Project will receive priority consideration in the process of selection of settlers. Settler Training Programme for farm leaders will be carried out at the initial stages of the settlement, in order to help the farmers to identify the objectives of the Scheme, to acquaint them with the extension services provided and train them on water management techniques, group action, etc., for effective participation in the development programme under the Scheme.

Muthukandiya Project

Muthukandiya Settlement Project situated in the Moneragala District is one of the pioneer exercises where a combination of permanent rain-fed farming and irrigated agriculture are designed for. Irrigation facilities will be provided for double cropping in 2,000 acres and 3,450 acres will be developed for rain-fed agriculture with a settlement programme of 1,400 families. 800 families will be settled by March 1982 in the irrigable area of the Project and the balance 600 families are ear-marked to be settled in the Dry Farming Sector within the period 1982 - 1985. The proposed crops in the rain-fed farming areas will be mangoes, lime, sugarcane, tobacco etc. under water-shed management system and supplementary source of supply from artificial farm ponds. The new settlers in this Scheme

will be issued food under the World Food Programme for a period of 18 months which would incur an estimated cost of Rs. 6,300,000/-. In addition to the food subsidies, each settler will be entitled for payment of Rs. 1,500/- for a temporary hut, Rs. 200/- worth of planting material, implements to the value of Rs. 200/-, and Rs. 400/- per acre for fencing. Further, for purposes of livestock promotion, each settler in the Dry Farming Sector will be supplied with 2 high-breed cows and 1 cow for the settler in the irrigated area under a scheme of Bank Credit. Social infrastructure facilities by way of roads, schools, dispensaries etc. in each of the hamlets and Village Centres are to be provided under the Project. It is also anticipated to replicate this integrated system of settlement in other suitable areas of the Dry Zone.

Mahadivulwewa Project

The Settlement Project of Mahadivulwewa situated in Trincomalee District provides for multiple cropping of 1,200 acres and double cropping of 160 acres with the settlement of 575 families. This Settlement Scheme is composed of mixed communities from Sinhalese, Tamils and

Muslims, who are landless residents in villages around the Project. Settler selection on the basis of communities has been 372 Sinhalese, 165 Tamils and 38 Muslims. Already 550 families have been settled in 3 hamlets. The balance 25 families are scheduled to be settled before the end of 1981 to enable the settlers to commence the Maha cultivation. A Settler Training Programme for farm leaders has been conducted and subsidies and infrastructure facilities on the basis mentioned in the earlier Project are being provided under this project.

Inginimitiya Project

This Project located in the Puttalam District consists of the construction of a reservoir of 53,000 acre ft. capacity across the Mi-oya to irrigate 1,870 acres of existing lands and 4,660 acres of new lands. The estimated cost of the Project is Rs. 167 million. It is expected that the new revised estimates that allow for increased fuel prices will be in the region of Rs. 270 million. This Project is partly financed by the Japanese Government and is scheduled for completion by 1983.

Gin Ganga Project

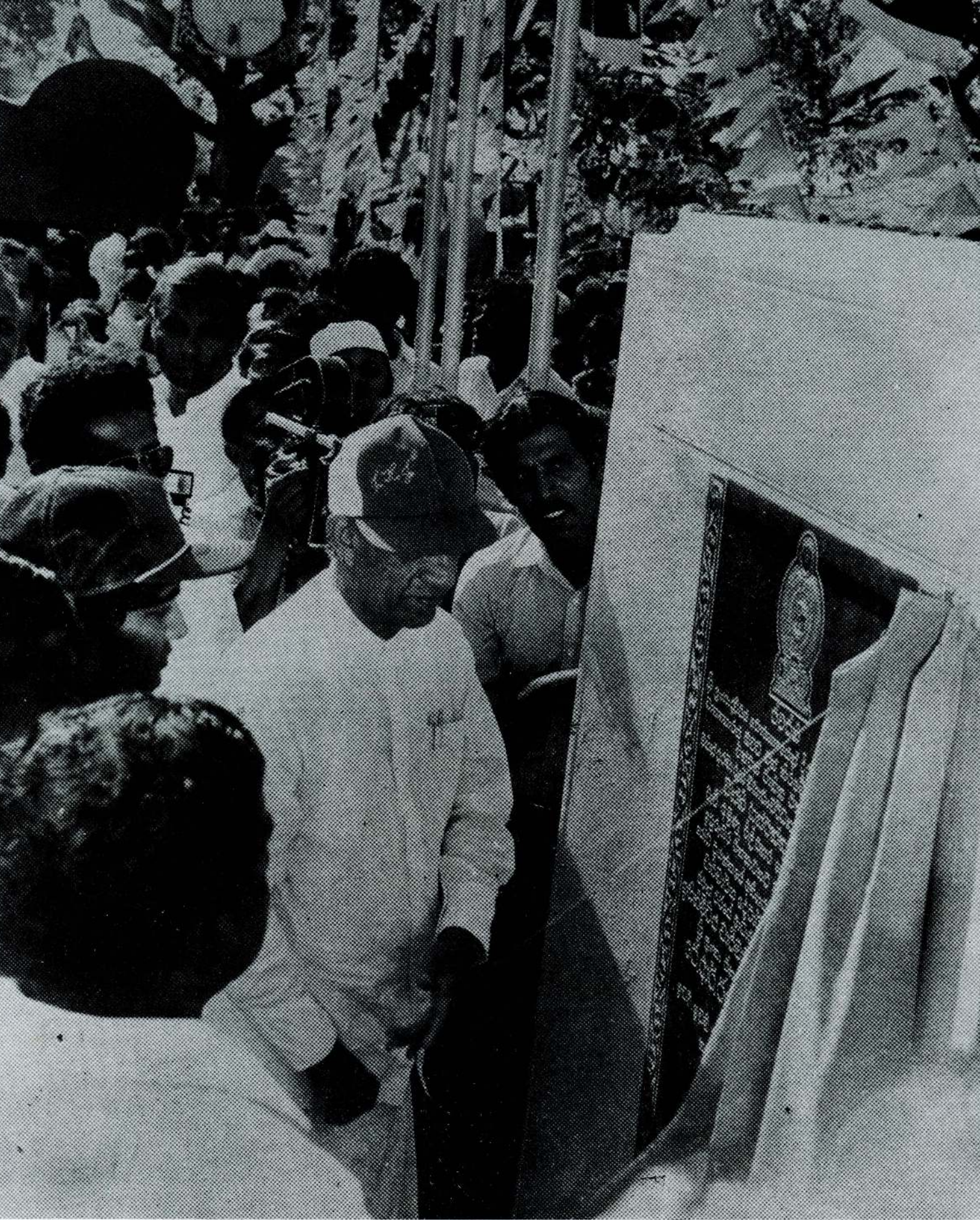
The Gin Ganga rising at an elevation of 4,500 feet is 70 miles long and has a catchment area of 370 sq. miles. The river falls from 4,500 feet to 70 feet in 58 miles but during the last lap of its journey to the sea it drops only 70 feet in 12 miles which is one of the factors towards the occurrence of floods. The average rainfall within the basin is 150 inches a year. The catchment receives rain from both the North-East and South-West monsoons. The storms generally occur from April to June and from October to December and past experiences indicate that a major flood could occur once in every five years. The floods occur mostly in May and November causing extensive damage specially to paddy lands. During major floods about 33,000 people and 6,000 dwelling units and an extent of about 15,500 acres of paddy are affected. The yield of the paddy lands is very low and sometimes as low as 15 bushels per acre per season. During some seasons the major part of the cultivation is a complete failure. Apart from submerging the paddy lands the floods cause lot of

hardships to the population by cutting them off from the rest of the country and destroying their garden crops.

Design

Attempts have been made in the recent past to minimise the effects of floods by the construction of flood bunds. But the results have not been rewarding enough, with the result the paddy cultivation in the area has had a setback. However with the decision to eliminate floods for all time the following design aspects were chosen. The designs were done by the People's Republic of China in association with the Irrigation Department of Sri Lanka.

(i) Construction of bunds from Agaliya down on either banks of the river connecting high spots. (ii) Construction of 10 Pump Houses with electric pumping units with a capacity of 5,030 KW to pump the water collecting on the protected area into the river. (iii) Construction of 21 miles long new transmission lines. (iv)



The Inginimitiya Settlement Project is a major Settlement Project on the Mi-Oya basin. It is located in an area in the Puttalam District, which is one of the least developed in the country. His Excellency J. R. Jayewardene, the President, inaugurated construction work on this project at the invitation of Hon. Gamini Dissanayake, Minister of Lands and Land Development, early this year. Photograph shows His Excellency the President, the Hon. Gamini Dissanayake and the then Director of Irrigation, Mr. R. U. Fernando at the unveiling of the commemorative plaque.



The US Agency for International Development (USAID) aided Water Management Project in Gal Oya is the first major project aimed specifically at improving water management in a major settlement scheme. The project implemented by the Irrigation Department seeks to rehabilitate the irrigation system of the Gal Oya Left Bank, develop a water management capability for the rehabilitated area by enlisting farmer participation in the management tasks. The photograph above shows Hon. Gamini Dissanayake, Minister of Lands and Land Development at the inauguration of the Water Management Project in Gal Oya. The American Ambassador, Mr. Donald Tous-saint; the Deputy Minister of Power and Energy, Mr. P. Dayaratne M.P., for Ampara and the then Director of Irrigation, Mr. R. U. Fernando (presently, Chairman of the Mahaweli Development Board) are with the Hon. Gamini Dissanayake. After the ceremonial inaugura-tion of the Project, the Hon. Gamini Dissanayake and the American Ambassa-dor watched a canal being dredged of silt.



Construction and widening of 22 drainage channels. (v) Construction of an administration and switching station.

Data

(i) Length 113km. (70.2 miles) (ii) Catchment area 960 km. (370 sk. miles) (iii) Average rainfall 3,800 mm. (150 inches) (iv) Maximum flood discharge 523m³ 3 sec. (18,678 cusecs.) (v) Total tea cultivated with paddy 14,100 hectares (35,000 acres). (vi) Total area of paddy affected by floods 6,200 hectares (15,320 acres). (vii) Area of paddy protected by electric drainage 3,188 ha (7,820 acres). Area of paddy protected by gravity drainage 1,720 ha. (1,300 acres). Total: 4,928 hectares 12,120 acres. (viii). Total length of proposed bunds 22 km. (13.6 mls.) (ix) Total length of drainage lines 26.12 km. (16.2 mls.) (x) Drainage—there will be eleven drainage districts inside the bunds. One drainage district of Goluwagoda and Kepu Ela basins will be drained by gravity to the river. The other ten are drained by electric pumping stations with a total capacity of 5,030 kw. (xi) Bunds—overall length 22 km. (3.65 mls.).

Height	5 to 6 metres (16.4—19.7 feet)
Bund top	4 metres (13.1 feet)
S/S	1 on 2.5 U/S & D/S.

(xii) Structures

(i) Constructing a new bridge across Gin ganga. (ii) Construction of six highway bridges crossing channels. (iii) A navigation lock at Wakwella. (iv) Construction of switching station. (v) Construction of administrative station. (vi) Construction of pump houses.

(xiii) Electricity supply—length of transmission line 36 km. (2.4 mls.) from Bataduwa sub-station. Rated voltage of the line 3 Kv. and total capacity 5,030 kw.

(xiv) Telecommunication—an automatic exchange will be installed for communication with each pumping station. (xv) Total estimated cost—Rs. 210,000,000.

CONSTRUCTION

(i) Establishing headquarters in Galle. (ii) Constructing a camp at Halpatota which includes accommodation for Chinese personnel and local staff, stores and mechanical work shop. (iii) Construction of field units of each individual site to accommodate stores, fuel and machinery.

Construction is carried out in the following ways:

(i) By using machinery imported from China manned by local recruits. (ii) By labour recruited by the project and using conventional tools and equipment. (iii) By small scale contractors. The number of recruits by the project exceeded 6,000 in number during the peak period of construction.

PRESENT POSITION OF MAIN ITEMS OF WORKS

Item of Work	Total estimated Quantity	Work already done	Work to be done
Temporary field stores ...	200 Nos.	189 Nos.	11 Nos.
Collecting sand ...	225,000 m ³	182,360 m ³	42,640 m ³
Earth filling from burrow in levees ...	3,260,000 m ³	2,460,000 m ³	800,000 m ³
Strip turfing of levees	200,000 m ²	92,000 m ²	108,000 m ²
Earth excavation in drainage channels	1,155,000 m ³	927,000 m ³	228,000 m ³
Item of Work	Total estimated quantity	Work already done	Work to be done
Rock blasting in drainage channels	25,000 m ³	21,000 m ³	4,000 m ³
Constructing 33 K.V. overhead transmission line ...	36 km.	32.5 km.	3.5 km.
Construction of pump houses ...	10	5	4 under construction 1 to be done
EXPENDITURE ...	Rs. 210,000,000	140,000,000	70,000,000

As at today the scheme is 85% complete.

BENEFITS

The benefits that would be secured by the implementation of the project can be summarised as follows:

(i) 13,000 acres of paddy now subjected to floods will be protected. It is possible to do two cultivations a year, once the project is completed. With proper application of fertilizer the yield from an acre of paddy is expected to rise from the present average of 25 bushels to 60 bushels per acre per season. (ii) About 5,000 dwelling units will be protected completely. (iii) Annual damages sustained by property, roads and crops amounting to Rs. 3 lakhs will be eliminated. (iv) The area will be uninterrupted and better communication and transport facilities that will be conducive for the development of agriculture and small industry in the area. Further this would result in better facilities in transport, health and

education. (v) Sugarcane cultivation can be undertaken on an extensive scale. (vi) The epidemics that usually follow the floods will be eliminated which means better health for the inhabitants. (vii) Reduction of damages caused to rubber, tea and homesteads. (viii) Enhancement of paddy yield in lands not flooded but adjacent to project lands, cultivators of which will receive benefit of the expanded government services related mainly to the project. (ix) employment opportunities for 6,000 people at peak construction. (x) Although the aspect of rural electrification does not form a part of the project the possibility for same exist as the 33 KV line from Bataduwa to Indigasketiya passes through the project area. (xi) New approach roads have been cut to burrow area, which could be used by the villagers. Some of the roads in the project

area were widened and improved. (xii) Training of personnel—several categories of employees like drivers, mechanics, operators have been trained during the period of construction.

The bunds built on both sides of the river stretching from Agaliya to the sea stand as a salutary monument to the friendship between the two countries, the People's Republic of China and the Democratic Socialist Republic of Sri Lanka. The relentless efforts which went into the build-ings of the levees can only be rewarded by the application of modern agricultural methods by the farmers themselves.

The success of the scheme is keenly watched because it could be the prototype for flood control schemes on other rivers in the South.



Forestry and Environment Sector Planning

Forestry is no longer considered a process whereby timber and fuel are supplied to the community. It has far wider objectives. It may well be described as the growing of trees and the management of forest resources for their present and potential contribution to the economic and social wellbeing of society in the future. These contributions include the supply of timber and fuel for day to day needs, water for agricultural projects and a number of non-consumptive benefits of which environmental improvement is the most important.

Soil loss-Forestry Vs. Badly managed Tea Lands

The theoretically acceptable level of erosion is that at which the rate of soil is balanced. This concept is hard to measure. Hence, an alternative is adopted where the soil fertility can be maintained for 20—25 years. Meanwhile the annual soil loss of 2 tons per ha. (0.8 tons per acre) is considered average.

Under medium yielding forest cover the soil loss is as low as 0.3 tons per ha. while in badly managed tea lands it is 70 times higher and the loss is as much as 21 tons per ha.

If Sri Lanka is to achieve these benefits, forestry cannot be planned in isolation. Those agencies concerned with forestry have to be collectively grouped as the Forestry Sector. The Forestry Sector's needs and wants and the development process generated by the Sector should be collectively considered. In other words a Sectoral Forestry Plan has to be prepared.

The main constraint which retards the development and development potential of the Forestry Sector is the lack of quantitative data on forest land and timber resources. Most of the available data is either outdated or not too accurate. Owing to the problems peculiar to forestry and timber consumption, obtaining the required information on forest potential and the timber demand are expensive and time-consuming.

On the basis of a study made by a Swedish Group of Consultants funded by the World Bank, short-term and long-term proposals covering the forestry sector have been made recently. The Government has accepted the necessity of implementing these proposals. However they have been laid by till the financial position improves.

One major step has been taken recently in this direction. The United Nations Development Programme has agreed to finance a Forestry Inventory Project for Management Planning, costing over half a million US Dollars. Preliminary work regarding the project has already commenced and the project will be completed within the next three years. During the end of the project the following main activities would have been completed.

- Preparation of an up-to-date resources map for the Wet Zone low land and the highland.
- Management plans for two large forest groups of natural forests.
- Management plans for plantations in the Wet Zone low land and the highland.

- Provision of an indicative inventory and data bank for long term land-use planning and policy decisions for the Wet Zone low-land and highland.

With this project, the Forestry Sector planning activities will be strengthened to form a separate forestry planning unit which will be responsible for preparation of the Forestry Sector Plan and also for monitoring of on-going projects.

Major policy changes

Preparation of the Forestry Sector Plan is considered the ideal and final goal. Taking into account the available information, the existing situation in the Forestry Sector has been assessed and remedial measures have been taken in April this year to prevent further degradation of the environment which results from felling of forests, and at the same time, to commence forest building up processes, with wider support from a number of agencies which have not considered forestry as one of their legitimate functions till now.

Under the newly accepted policy on forest development, felling of forests have been severely restricted except in the areas to be taken up for development under the Mahaweli Programme and other areas to be scientifically managed under the supervision of the Forest Department. The district administrative authorities have been permitted to issue permits only for minor forest items such as firewood, poles, bamboos etc., from State forests and for varieties of timber of specified species from private lands. The penalties for unauthorised felling and transport have also been enhanced. It is believed that the stringent policies on felling, combined with the legal changes will bring about the desired results in the degradation processes which have been going on for many decades.

The timber and fuel consumption patterns have also progressed regardless of the availability of resources and conservation aspects. As a major step to conserve available resources, the State and Private Sectors have been permitted to import timber in the sawn or log form without restriction. State Corporations and Government Agencies undertaking construction programmes have been directed to purchase their requirements from overseas supplies made available through the State Timber Corporation.

The land we have

Population grows but the land remains finite—25,332 sq. miles only. This means that in 1901 each sq. mile had 141 people or one person would have 4.5 acres.

In 1946 each sq. mile had 263 people or one person had 2.4 acres. Today each sq. mile has 572 people or one person has 1.1 acres. Of the land available, arable land is less than half the available land, or 0.45 acres per person.

Expanded role of the State Sector

The tea industry, various Corporations within the State Sector and well recognized private institutions which are regular users of fuel-wood have in the past purchased their requirements from unidentified sources. These may well have originated illicitly. In order to prevent the eroding of forest resources in this manner, the State has agreed to release suitable lands to those agencies who regularly use fuel-wood as a form of energy to grow their fuel-wood requirements.

In carrying out these activities there would be an increasing demand for technical expertise related to growing of various species in different locations. The Forest Department which had hitherto confined itself to forest management and raising its own plantations will hereafter play an increasingly larger role in providing up-to-date forestry advisory services to those new agencies who will be commencing reforestation activities, to meet their own requirements.

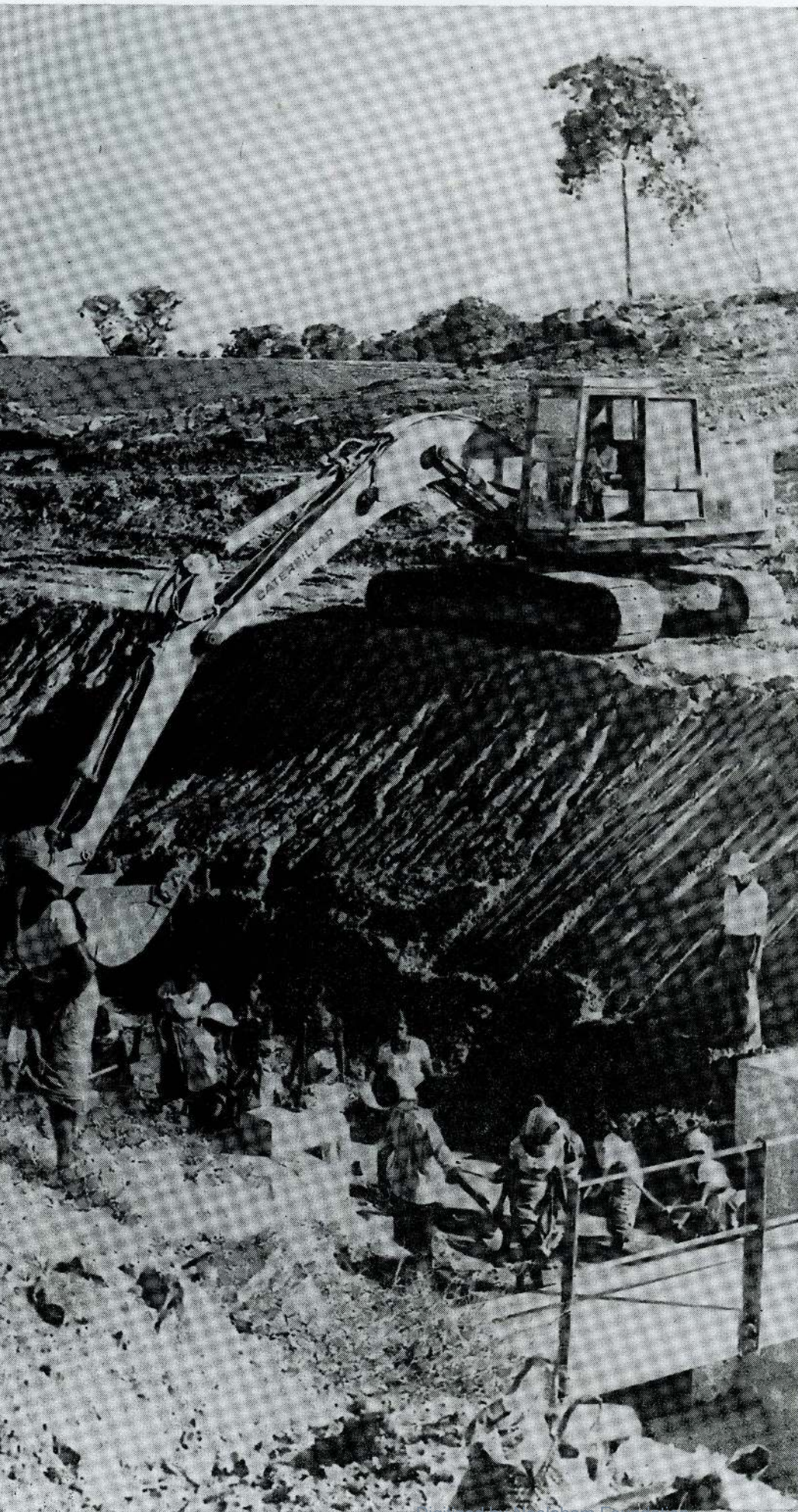
The State agencies who will be pioneering into the new field of raising fuel-wood plantations on a large scale are the Janatha Estates Development Board, Sri Lanka State Plantations Corporation under the Ministry of Plantation Industries, Ceylon Ceramics Corporation under the Ministry of Industries and Scientific Affairs, and the Sri Lanka Sugar Corporation under the Ministry of Agriculture and Agricultural Research. The Ministry of Lands and Land Development is arranging to divert some of the World Food Programme commodity aid to these agencies to be issued to those labour groups directly involved in reforestation activities.



On the recommendation of the Ministry of Lands and Land Development, the Government has banned the cultivation of crops like potato above the 5,000 ft. contour. It is also proposed to plant forests in the upper catchments and watersheds of rivers. Some of these areas are now under tea.

(Below) The Government has also banned chena (slash and burn) cultivation and has set going measures to get chena cultivators to grow forests under an incentive scheme. Photograph shows a chena cultivator triggering off a fire in a jungle for a chena crop.





A Caterpillar back-hoe scraper operating on a canal bund on the Mutukandiya Settlement Project in the Moneragala District dwarfs the man-power—more correctly the women-labour, deployed on the canal bunds. Construction work on this project received momentum with the arrival of new construction machinery from Australia. This project when completed will benefit a net irrigable area of 2,000 acres. Settlers have already arrived and staked their allotments over an area of 600 acres. This extent of land has now received irrigation facilities. This project is aided by the Australian Government. Thinly populated, machine-intensive technology is quite relevant in the Moneragala District.

Firewood for cooking

Ninety-four per cent. of our population use firewood for cooking. Each family needs two tons of firewood each year. This is equal to one million lorry loads of firewood. When forests are getting scarce, unless we grow forests for producing firewood, we may not be able to cook our meals in years to come.

State Timber Corporation takes on reforestation activities.

The State Timber Corporation although not recognised as a user of either timber or fuel-wood, has launched out large scale reforestation activities commencing from cyclone devastated areas in the Eastern Province. In this area, the original teak crop which was damaged by the cyclone was salvaged by the Corporation. With the financial resources and management capabilities available to the Corporation and with the necessary infrastructure, by way of nurseries and technical expertise from the Forest Department, the Corporation will carry out this programme commencing from this year.

Under this programme 22,000 acres of cyclone devastated teak plantations in Vakaneri, Pullumalai and Divulane areas will be re-planted with tree species over period of seven years investing nearly 135 million rupees of the STC's own resources. Taking into account that the land which is to be reforested has carried a plantation tree crop earlier, the soil will be ploughed mechanically and fertilized. The planting and tending operations for the three year period will be carried out using hired local labour. In order to facilitate the supervision and maintenance, a network of jeepable roads will be constructed. During the current year 1000 acres will be planted and supporting facilities such as buildings etc. will be completed. Thereafter the acreage will be increased to 3000 per year and finally to 4000.

Timber for Schools

300,000 cu. ft. of timber is needed annually for desks, benches, black boards and school buildings or 4,500 trees must be cut each year for school buildings.

Private Sector Participation

In keeping with State policy every encouragement is being given to the Private Sector to undertake tree planting activities. This is now con-

finied to providing technical advice and planting material at a nominal cost. A wider scheme has been finalised where State lands denuded as a result of shifting cultivation are to be leased out to the Private Sector for a period not exceeding 30 years for growing of trees as crops, at the same time utilising land for agricultural purposes on a restricted basis.

Charcoal — A way of using residual timber — An S.T.C. Project

In Sri Lanka 94 per cent. of the population use firewood or agricultural residues for their cooking. With the urbanising and the clearing of lands for development and the increasing transportation costs, firewood is becoming more and more scarce and expensive. At the same time our forests are being cleared for development purposes particularly in the Mahaweli area. Underutilized timber species, lop and top and branch wood are becoming available in these areas, in large quantities. Such material is doomed to perish due to the distances to domestic consumer markets. The key to this problem is to convert the residual and unutilisable timber to charcoal, which has less than one fifth of the weight of timber but at the same time higher calorific value per unit weight and burn without smoke. The State Timber Corporation has successfully done this conversion and is now geared to produce 300 tons of charcoal a month. The production is marked in urban areas which are gradually changing over from the traditional use of firewood to the more pleasant and efficient use of charcoal. The proposal to expand the present activities of the STC with foreign participation has been approved. This will enable the improvement of technologies and management skills and step up the production to meet the demands of a larger number of local domestic consumers and even the industry.

Forestry Projects

Land, water and forests are inter-dependent to maintain the delicate balance of the different ecosystems and ensure the desired environmental stability.

Land for forestry will be a diminishing resource in the context of land required for settlement and food production of an increasing population. Therefore an intensive and multiple use of land under forest cover is a dire necessity. This situation has recently changed the policy of classical forestry into people-oriented forestry where the community actively participate in growing forest trees and food crops in the same area (agro-forestry or agri-silviculture) so that the optimum use of the limited land area is ensured.

The role of forest in the catchment is most significant in regulating the stream flows, infiltration of rain water and conservation of soil through accelerated erosion. The forest floor in catchment areas act as porous reservoirs by absorbing, retaining the rain water in the water table and gradually releasing it as a sustained dry weather flow over a long period of time. This also prevents flash floods, silting of reservoirs, sedimentation of irrigable area.

Background Information

Based on a multi-disciplinary study made by a group of scientists, the forest cover in the catchment area is only 9 per cent. This is indeed inadequate by and standards as all major rivers originate from the uplands.

Ninety four per cent. of the domestic cooking energy of the island is provided by fuel-wood while 60 per cent. of the island's population is

rural. The non-availability of fuel-wood at reasonable cost, particularly in the upland markets results in the continued denudation of existing natural forests. A similar situation will be experienced in the Dry Zone with the implementation of the Accelerated Mahaweli Development Programme.

Forests are also required for the preservation of wildlife, production of timber including minor forest produce and for constructional and timber based industries.

The timber to be cleared in the Mahaweli Accelerated scheme not required for immediate use should be converted into charcoal. The remnant species mainly Weera are only used for fire-wood. This species could be converted into charcoal to meet the requirements of domestic cooking and industrial needs (steel, ceramics, mineral and tea factories, bakeries etc.). A study of the actual requirements has to be made to determine the annual acreage required to be raised.

Strategy for Forestry Resources Development

Consistent with the facts stated in the foregoing and Background Information, the objectives of the Development of Forest Resources are twofold—protective and productive. The protective functions of the forest is more important in relation to the success of the Mahaweli Accelerated Programme.

As far as the protective function is concerned, the primary objective is to conserve, protect and scientifically manage the existing natural and man-made forests. Since the amendment to the Forest Ordinance and anticipated further amendments and the functioning of 'Core groups' at



The cyclone devastated area of Rukam was chosen by the Ministry of Lands and Land Development, for a major reforestation drive to rehabilitate the teak forests devastated. The State Timber Corporation undertook the reforestation programme at Rukam with expertise provided by the Forest Department.

School children and ordinary citizens enthusiastically participated in tree-planting at Rukam.

(BELOW) On November 2, 1981, school children in N'Eliya turned out with their colourful bands and schools' colours to participate in a tree-planting campaign around the N'Eliya lake area. Teachers had enthused students to prepare posters on the effects of indiscriminate felling of trees.





The Hon. Gamini Dissanayake, Minister of Lands and Land Development and Mrs. Dissanayake attended the ceremonial cancellation of a stamp, and the issuance of first day covers to depict the importance of forestry. This ceremony took place at Ambagamuwa in Ginigathhena. Looking on, on the Minister's left is the Additional Secretary to the Ministry of Lands and Land Development, Mr. Chandrananda de Silva.

(BELOW) Hon. Gamini Dissanayake, Minister of Lands and Land Development, made the key note address at a Seminar sponsored by the Sri Lanka Association for the Advancement of Science on the importance of Forestry in the Strategy for Development. The Secretary to the Ministry of Lands and Land Development, Mr. Nanda Abeywickreme and the Conservator of Forests, Mr. Raja Nanayakkara participated in the Seminar. Also in the picture are Dr. O. S. Pieris and Dr. Mrs. Thelma Gunawardena.



District level under the Chairmanship of the respective G.AA, the unauthorised activities of felling, encroachments etc. have reduced and in 1982 such activities will be curbed further. For this purpose Divisional Flying Squads have been established in addition to the Flying Squad at the head office of the Forest Department.

Management of existing forest resources had been neglected in the past for more reasons than one—namely budgetary constraints, non-availability of a market for early thinning material and lack of a Working Plan for which the prime requisite is a National Forest Inventory. A Forest Inventory will be carried out with UNDP assistance in 1982. In the meantime an action plan of management will be prepared.

The third strategy is to undertake a massive afforestation scheme of all marginal lands for other forms of land-use. In 1980, a record extent of 31,236 acres were afforested while in 1981 this extent was reduced to 20,530 acres. The target for 1982 is 22,600 acres.

Forestry Projects of Afforestation for protective functions

The forestry component of the National Agricultural Diversification and Settlement Programme (NADSA) was undertaken by this Department from 1979. Upto 31.12.80, the extent planted under this scheme was 5,460 acres. The extent to be planted in 1981 is 1,600 acres and in 1982 an equal extent would be planted. It is understood that this project will be terminated by end of 1982 for lack of World Bank funding.

With USAID assistance an annual extent of 3,000 acres will be planted in the Upper Catchment Area, over a five year period from 1981—when 3,000 acres were planted. In 1982, the target is another 3,000 acres.

Afforestation of derelict and uneconomic tea lands and other lands is another project for minimising erosion, flash floods, siltation etc. Parcels of land are released to the Forest Department by the Land Reform Commission as uneconomic tea lands for afforestation. In 1982, 1500 acres will be planted.

The Sinharaja Man and Biosphere Reserve (recognised by UNESCO) is to be protected. Surrounding this reserve are grasslands caused by slash and burn agriculture. Such lands are being planted annually at the rate of 500 acres as a buffer zone. This programme will be con-

tinued till the entire extent of grassland bordering Sinharaja Man and Biosphere reserve is completed.

The Plantation Sector will be required to adopt soil conservation measures for gully plugging in their estates to minimise erosion.

People-oriented forestry will be given more importance to involve and motivate the people (schools, societies, individuals) to grow more trees wherever possible by a strong and meaningful Extension Service. This will commence in System H of Mahaweli Development Scheme in 1982 with USAID assistance. Demonstration plots will be established in H5 area this year.

Forestry Projects for establishment of Production Forests

Although protection forests take precedence over production forests, the latter is also required to meet the socio-economic requirements (fuelwood and general utility timber) of the population. The Forestry Projects envisaged in 1982 and onwards in this regard sectorally are:

Plantation Sector

As this sector is unable to obtain firewood at a reasonable rate, a policy decision was made that at least 10 per cent. of the acreage of each estate be planted with fuelwood species to meet the requirements of the factories and estate labour. Some estates have already launched this programme and from 1982 all the estates will adopt this programme. In fact food rations valued at Rs. 4.89 million from WFP aid is suggested to be made available for the next four years.

USAID Project

This envisages the raising of 7000 acres of fuelwood plantations annually for 5 years from 1981 provided counterpart funding is available. In 1980, an extent of 2724 acres were raised with USAID assistance. The firewood or charcoal will be consumed by the Mahaweli settler population and the industrial market. Any excess of charcoal after meeting the local demand could be exported, as there is a potential market in the Middle East.

Departmental Programme

Due to budgetary constraints only 1,790 acres will be planted this year under this programme. In 1982, it is expected that 2000 acres would be

afforested, subject to budgetary constraints. The programme under the co-operative reforestation scheme will not be undertaken due to budgetary constraints. The change in policy that only chenaed lands would be available for this scheme, resulted in a poor response despite the increase of first year rewards from Rs. 100/- to Rs. 500/- as these lessees do not have the means for inputs like fertiliser, soil working etc. This may result in an increased acreage of unauthorised chena cultivation.

Integrated Rural Development Projects

These projects are being implemented by the Ministry of Plan Implementation while the Forestry component is being undertaken by the Forest Department, the details of which for 1982 is as follows:

District	Funding Agency	Total extent to be afforested (acres)	Total extent to be afforested in 1982 (acres)
Hambantota	NORAD	5,000	1,500
Nuwara Eliya....	Govt. of Netherlands	5,000	1,455
Puttalam	World Bank	5,000	1,000
Matale	World Bank	5,000	2,300

Private Sector participation

There are about 2 million acres of chenaed land in the Dry Zone, most of which is available for forestry. As the institutional capacity of the Forest Department is limited to afforest such lands within the shortest possible time, action is being pursued to enlist the support of the private sector to launch agro-forestry projects in the abandoned chenaed lands in the Dry Zone. This programme, the magnitude of which is yet unknown, should become operational in 1982 (Maha season). Under this scheme forest species (general utility, firewood and luxury) will be raised.

Community Forestry Project

In the past the forestry development programmes have been mainly confined to satisfy the two cardinal principles of classical forestry namely, protection and production. The modern concept of forestry practices has assumed a more dynamic role encompassing the broad spectrum of social, economic and political aspects of the community.

The need to deviate from the traditional system has arisen because of the twin problem of population explosion and dwindling forest resources and land for forestry.

In this context, forestry has to be people-oriented. In the past forest officers have been oriented towards a policing duty and thereby causing enmity with the local population. This approach has to be changed. The forest officers should act as advisers, forestry extension officers.

While the extension service officers are involved in motivating the public to plant more trees, a separate mobile squad would be in operation in vulnerable areas to curb any unauthorised fellings or transport.

This Project is to be implemented from March 1982. It envisages raising a block plantation of 35,000 acres and raising of small fuelwood lots (1 acre to 2 acres in extent) in about 100 villages over a five year period. These plots may use forestry plots or agro-forestry plots or demonstration plots. This Project will be implemented initially in the districts of N'Eliya, Kandy, Badulla, Matale and Batticaloa.

System 'C' of Mahaweli Development Scheme

About 9,340 acres of chenaed land in System 'C' are to be brought under forest cover. The Forest Department is to carry out this programme over a 4 year period. In 1981 about 250 acres will be planted while the balance acreage would be planted from 1982 and 1984. Proposals are being prepared for the period of afforestation from 1982 to 1984. This total extent will consist of:

- | | | |
|---|------|-------------|
| (i) Afforestation for fuelwood and general utility timber | | 3,805 acres |
| (ii) Enrichment of degraded forests.... | | 5,535 ,, |
| | | 9,340 ,, |
| | | 9,340 ,, |

Wet Zone production forests

In the Wet Zone where production forests can be raised, about 200 acres of Albizzia plantations are raised in barren lands in order to meet the requirements of matchwood, plywood and packaging industry. In these plantations after the canopy closes in 2 to 3 years, underplanting of Mahogany is carried out in order to make the optimum use of the land area. Annually about 5,000 acres of Pinus plantations in the West and Montane zones are raised to provide the long-fibred pulp for the Paper Corporation.

Research Activities

The Research activities of the Forest Department particularly Silvicultural Research will be strengthened from 1982 under the USAID Project.

Impact of the Forest Development Resources

In the first instance, there will be an apparent improvement of environmental conditions in the future (micro climate) due to an increased planting programme.

The fuelwood supply to the rural population will be assured either at reasonable rates or free

of charge under the Community Forestry Project in the years to come.

The afforestation of catchments will undoubtedly minimise erosion, maximise infiltration of rain water into the soil, reduce flash floods and siltation of reservoirs.

The requirements of general utility timber for the rural population will be met at reasonable cost.

Timber and fuelwood are a renewable resource and therefore the above benefits are permanent, of course subject to the availability of land for forestry and budgetary constraints.

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The allocation of earnings will undoubtedly, only enhance erosion, excessive infiltration of rain water into the soil, reduce flash floods and siltation of reservoirs.

The requirements of general utility timber for the rural population will be met at reasonable cost.

Timber and fuelwood are a renewable resource and therefore the above benefits are permanent. It is subject to the availability of land for forestry and budgetary constraints.



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PLANT A TREE