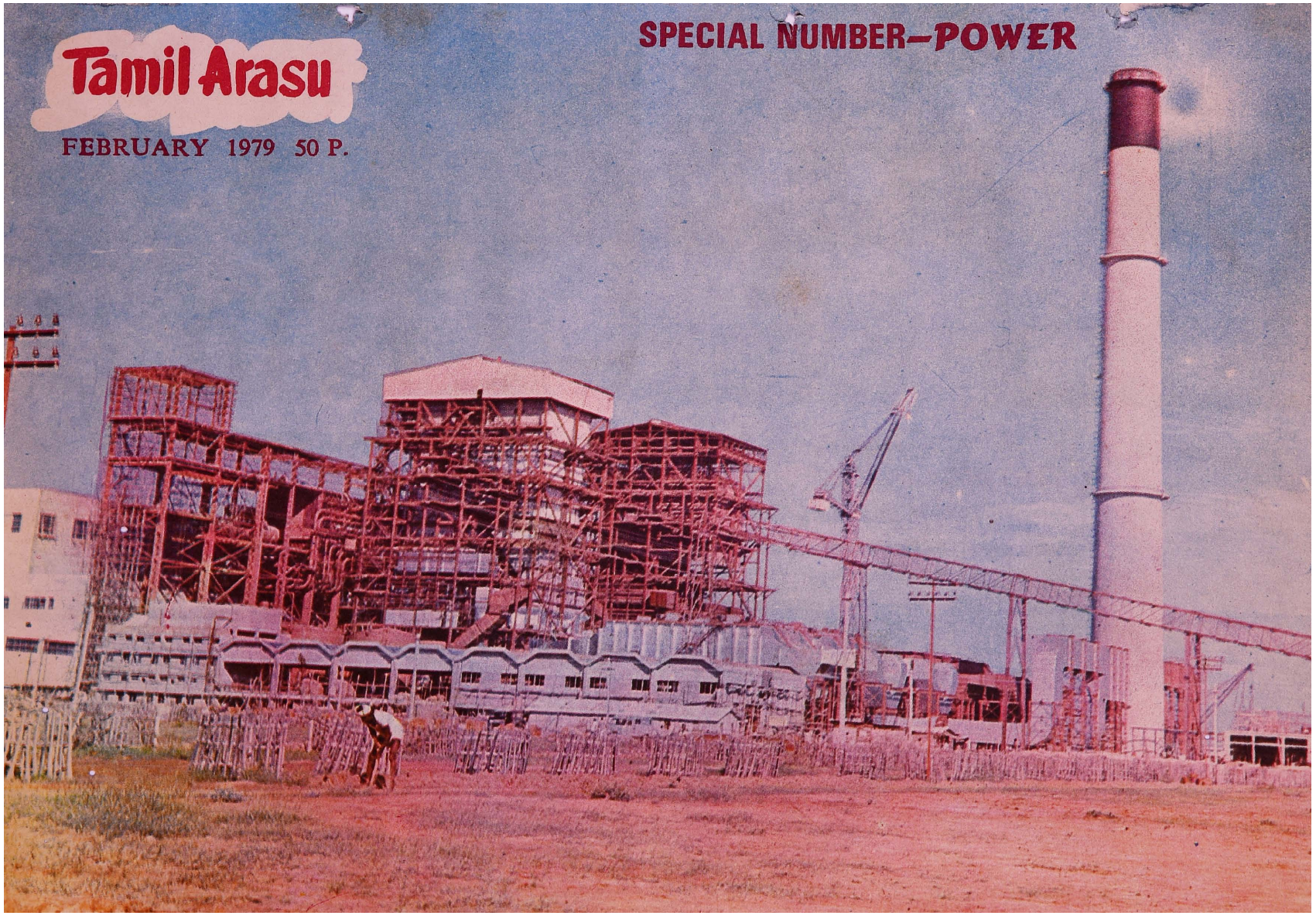
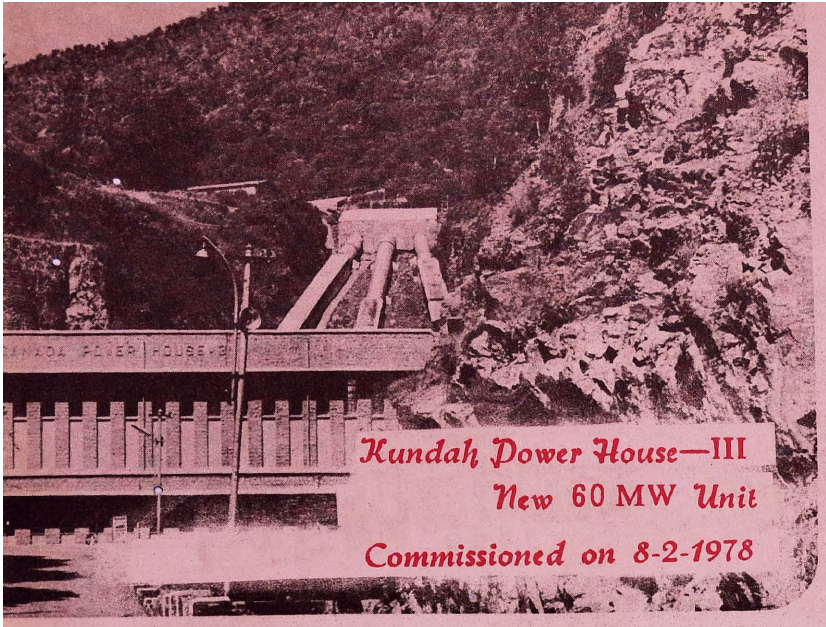
Tamil Arasu

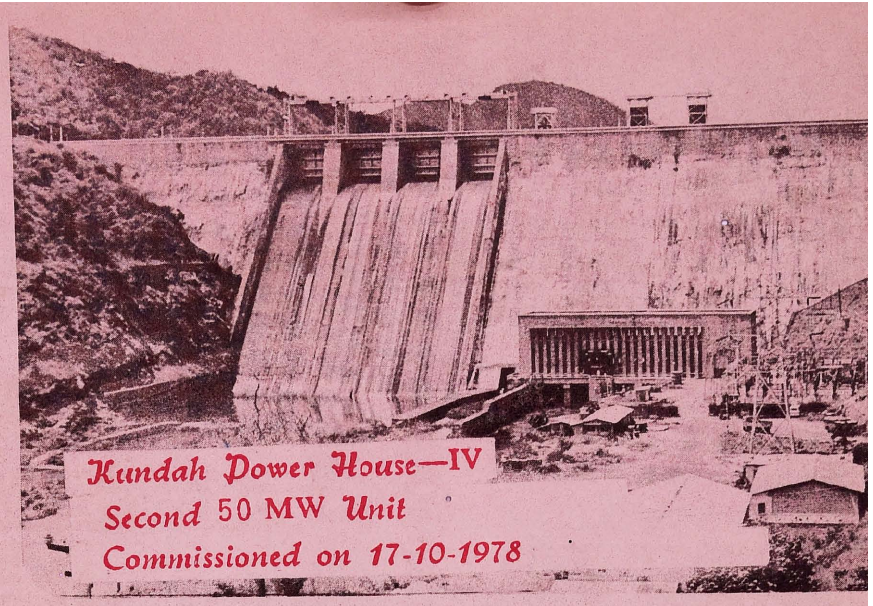
FEBRUARY 1979 50 P.

SPECIAL NUMBER—POWER

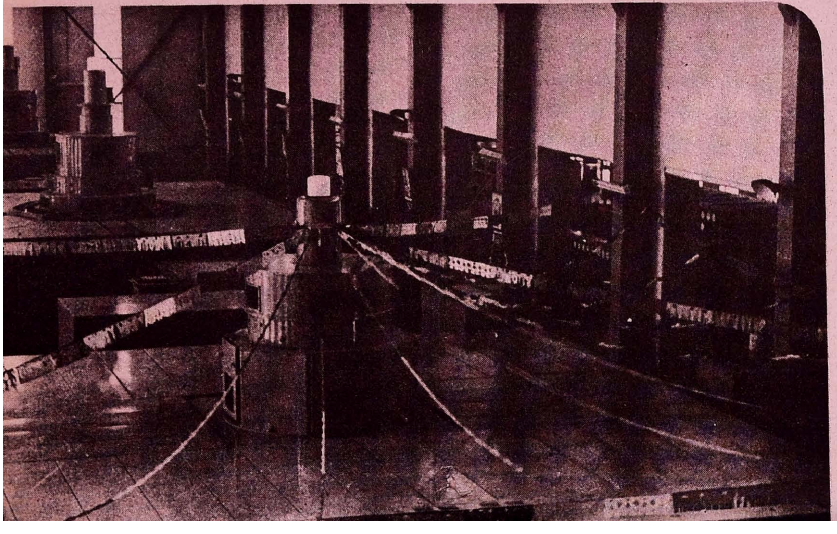


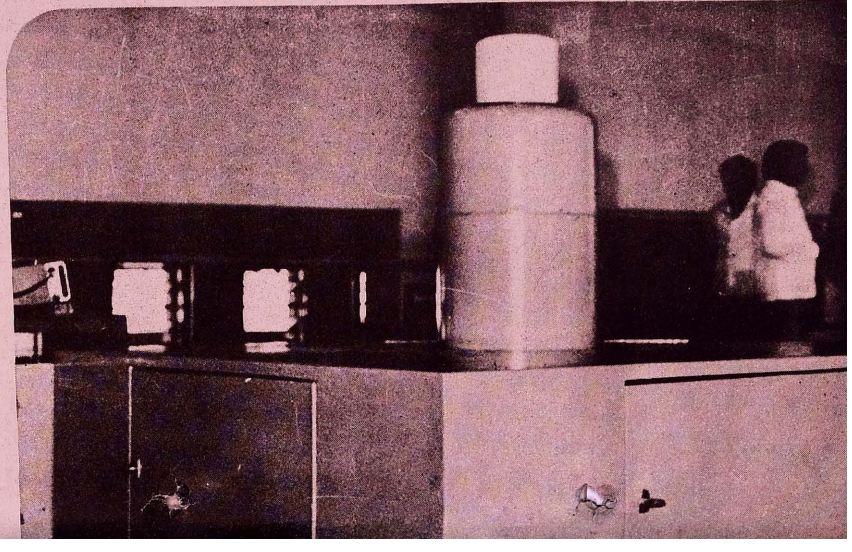


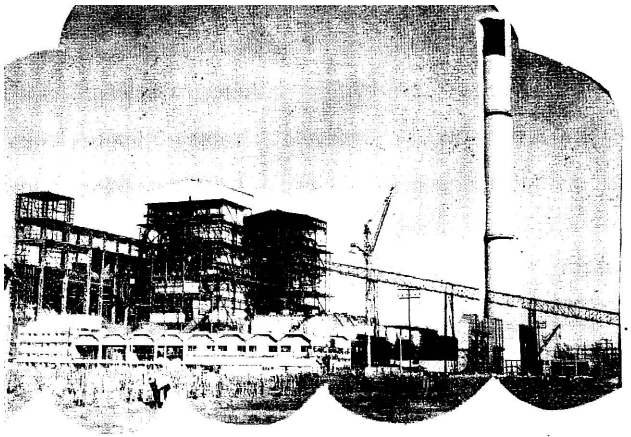
Kundah Power House—III
New 60 MW Unit
Commissioned on 8-2-1978



Kundah Power House—IV
Second 50 MW Unit
Commissioned on 17-10-1978







Tuticorin Thermal Power

A NEW LANDMARK IN POWER GENERATION in Tamil Nadu

Tuticorin, a small taluk centre in the far south of Tamilnadu, had been hitting the headlines, about once in a decade in the past, as a pearl diving harbour. But those who visit Tuticorin now, will be surprised to see it converted into a bee hive of activity. Thousands of workers and technicians and engineers are working there round the clock, with a single minded purpose-to put Tuticorin firmly on the power map of Tamilnadu-and this would be achieved within a month or so from now, with the commissioning of the first 210 MW turbo-generator set of the Tuticorin Thermal Power Project.

As one proceeds towards south from the Tuticorin Railway station, a panoramic view of the giant structures of the Power Station complex with a 122 metre tall chimney will emerge over the vast expanse of the blue sea in the Tuticorin bay and the salt pans. Proceedings further, one will see the steam boiler structures, Power Station building, Indoor switchyard building, the conveyor system of the coal handling plant and the overhead water tanks as the standing monuments of the marathon construction works that has been going on for some time, in building one of the biggest Power Stations in this part of the country.

Estimated to cost Rs. 211 crores, the power station will have ultimately 630 MW installed capacity with 3 units of 210 MW capacity each and supply 3300 million units of energy annually to the Grid.

The steam boilers required for the thermal station, capable of producing 700 tonnes of steam per hour at 540 °C and 139 Kg/om^2 pressure have been manufactured in the BHEL Factory at Trichy. About 9400 tonnes of structural members, L.P. and H.P. Pipes, Boiler drum, Air and fluel/gas ducts, mechanical and electro-static precipitators are required to make a boiler and about 20,000 joints have to be welded. These welds are highly skilled

S. Ramachandran,
MINISTER FOR ELECTRICITY

jobs requiring preheating. TIG welding of root run, welding of other runs with special electrodes, stress relieving and radiography. After erection of Boiler I, hydraulic test, (a major mile stone in the erection and commissioning of a Boiler) was conducted in July 1978.

The Turbo-generator set is supplied by the Hardwar factory of M/s. BHEL. The erection of the turbine and the generator is almost completed.

Tamil Arasu
Volume XI FEB 1979 • Issue 8

Transport of equipments to this project site presented special problems. Special arrangements had to be made for transport of the Boiler drum, a cylindrical pressure vessal of 120 tonnes weight and the Generator stator weighing 175 tonnes by broad gauge rail from Hardwar to Trichy. Then again, as Tuticorin is not connected by broad gauge rail and the BHEL factory at Trichy has got only a broad gauge siding, all the boiler components had to be transported to Trichy by road to avoid transhipment. The tractor trailor of 185 tonne pay load available with the Madras Atomic Power Project was hired for the purpose. The tractor assembly was about 41 metre long and 4 metre wide. Its height with the boiler drum on was 5.6 m. (18'). The vehicle has 14 axles.

The Highways department had also to make 47 diversons along the route specially for this purpose to avoid some weak bridges and culverts on the National and State Highways ; improvements had to effected to certain other bridges to permit the vehicle to pass through. A special Government order was passed for this transport. A convoy of vehicles accompanied with men and equipment all the way to Tuticorin to ensure smooth movement. At the power House end, two numbers 125 tonne electrically operated travelling cranes were required to place the stator of generator No.1 in position on its foundation.

Coal Transport

The coal required for the boilers will be transported from the Raniganj coal fields of Bengal/ Bihar. From the mines the coal will be moved by rail upto Haldia Port from where ships will carry the coal to Tuticorin Port. At the port the coal will be unloaded on to the mechanised conveyor system (capable of carrying 2000 t/hour) by which the fuel will be taken to the Crusher House for crushing and or storage. 1.8 million tonnes of coal will be required per annum for the 3 units. M/s. Poompuhar Shipping Corporation have been entrusted with the transport of coal by sea. They are procuring 30000 DWT ships for this purpose. To begin with they will be utilising the existing ships "Tamil Periyar" and "Tamil Anna".

Cooling water is drawn from the sheltered harbour basin by a channel and closed conduit (in some sections). It will flow by gravity upto the Forebay near the Pump House. A total quantity of 100,000m³/hr will be required when all the 3 machines go in to operation. It will be interesting to note that this quantity of water (100,000m³/hr) will be adequate to meet the water supply needs of the population of ten major cities like Madras. But one need not be perturbed on this account since the water utilised is only sea water. From the Pump house water will be pumped by 9 Nos (out of 12 Nos) 500 KW. 6.6 KV motor driven pumps of 100,000m³/hr. capacity to 14.2m head through concrete tonnels to the surface condensers. After use, the water will flow back to the sea.

Chief Minister's Message

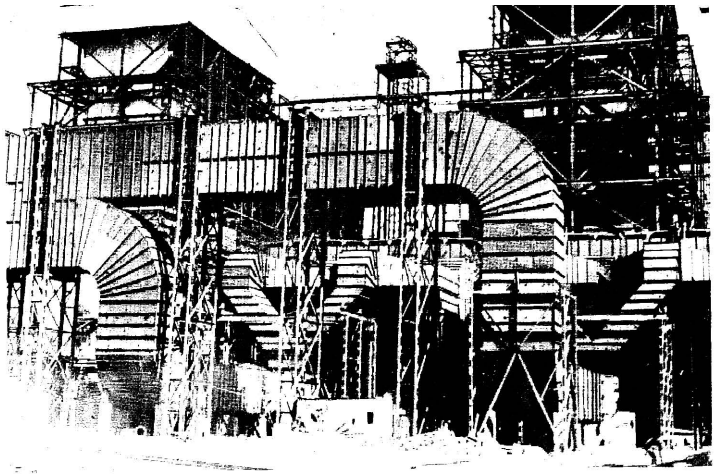
I am glad to know that the first stage of Tuticorin Thermal Plant, the biggest Plant in Tamil Nadu, is to be commissioned. The power demand of our State will be met to a greater extent if the entire project goes on stream.

I congratulate the engineering experts who have worked hard to complete the Plant. I send my best wishes for the success of their endeavour and their continued service in this field.

The use of sea water for cooling is presenting problems of corrosion and marine growth. Corrosion due to salinity is sought to be solved by the use of imported copro nickel for the condenser tubes and cathodic protection for the steel pipes. Marine growth chokes the water way and throttles the water supply to the condenser. Chlorination which is usually resorted to check the marine growth has not been found satisfactory. One other method is to increase the temperature of the water by about 10°C, which also arrests the marine growth. This can be achieved by letting into the sea, a portion of the hot water from the condenser. This system of hot water recirculation is reported to be effective in a few stations abroad. It has not so far been tried in India. The Nuclear Power Station at Kalpakkam is going to have this system and in Tuticorin also this system will be tried.

A detailed study of this problem was also made by a team of Scientists from BARC, Bombay another team from Zoological Survey of India, Madras. These reports are under study.

Raw water required for purification and use in the boiler and for other uses is tapped off from the 20 MGD water mains laid by the TWAD Board from Tambaraparani river to the Tuticorin Industrial complex. A branch line of 7.5 km of 600 mm. dia. pipes has also been laid by TWAD Board upto the Project site. The requirement of raw water is 1.43 MGD.



Electrical Plant

The voltage of generation is 15.75 KV. It is stepped upto 230 KV by a bank of 3 single phase 84 MVA transformers. The supply at 6.6 KV required to run the auxiliary equipments is obtained by stepping down the 15.75 KV through 2 Nos. 15 MVA unit auxiliary transformers. There are two station transformers 25 MVA 230 KV/7 KV required for start up of the station and to feed common auxiliaries.

Four 230 KV feeders have been proposed to evacuate power from the station. Two of them link the station with the Auto S.S. at Tuticorin. Of the remaining 2 feeders one will connect Madurai and the other Neyveli.

M/s. Instrumentation Ltd., Kota Public Sector undertaking are supplying the equipments for measurement and control. Some of the instruments are imported from U.K. (George Kent) while some others are made to Russian design.

We are installing a Data Acquisition System in this Power Station. It will be for the first time that a computer will be installed in a Thermal Power Station in this part of the country to record display salient parameters in the operation of the Plant. M/s. Electronic Corporation of India Ltd., Hyderabad, M/s. Instrumentation Ltd., Kota and our Consultant M/s. TCE are working on the scheme to meet our requirements.

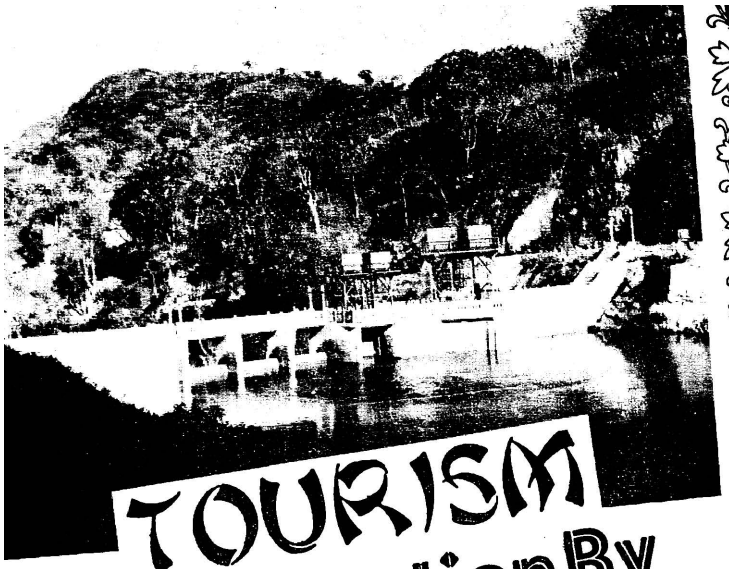
Facilities to Staff

There are about 30 engineers, 250 managerial and clerical staff and 1250 workers directly employed by the Board besides 400 persons engaged by the various contractors. A small township, named 'Tutithermal Nagar' has sprung up and the Board has built about 1000 tenements (multistoreyed blocks based on HUDCO design) for its officers and staff. More tenements are also coming up. School, Hosiptal, Community Hall, Shopping and recreation centres and other facilities have been provided to promote the welfare of the staff engaged in this stupendous task.

Tuticorin Thermal Station, when commissioned will be satisfying a long felt need of firm power in the southern part of Tamilnadu. It will greatly help to stabilise power supply in this region, with much improved voltage and less no. of interruptions of supply, all the more so, during the summer when the hydel generation of the power houses in the south viz. Periyar, Papanasam and Kodayar is poor. It is hoped that the assurance of firm and reliable power will act as an impetus to industrial growth which will in turn result in increase of employment potential and acceleration of the socio-economic development of this region.

Looking at it, even from the entire state point of view, the big thermal station at Ennore in the north (with 450 MW) and at Neyveli (with 600 MW) and Tuticorin in the south (with 630 MW), with all the hydel station in between 600 MW (maximum) and 500 MW (minimum) during non-irrigation periods should make it a more balanced power grid than what it was ever before. On account of this, it is expected there would not be any serious grid disturbances due to imbalance of power as in the past.

In the context of the new generating stations contributing power to the grid, the Electricity Board will have to undertake a fresh study of the power flow at various times of the day and the various period of year, and to monitor the working of the power stations more closely, to effect the most optimum load despatch operation which would also go a long way to minimise line losses and ensure more stable voltage conditions. The Electricity Board may have to introduce computarisation and automation in load despatch centres before long, to achieve this end.



TOURISM
Contribution By Electricity Board

R. M. Veerappan,
MINISTER FOR
INFORMATION & TOURISM

Places of archaeological interest attract most of the tourists. But, once away from one's own monotonus routine, places of scenic beauty and dams and reservoirs with their magnificient mountain and forests back-drop hold an intrinsic charm and interest to the family as a whole.

Hydro-Electric Projects of the Tamil Nadu Electricity Board have abundant tourist spots which will give immense joy and satisfaction.

The Moyar Project on the Mysore-Ooty road is in the midst of a Game sanctuary. There is one deer forest near Maravakandy Forebay dam. This and the Mudumalai Sanctuary are full of sight seeing pockets for tourists.

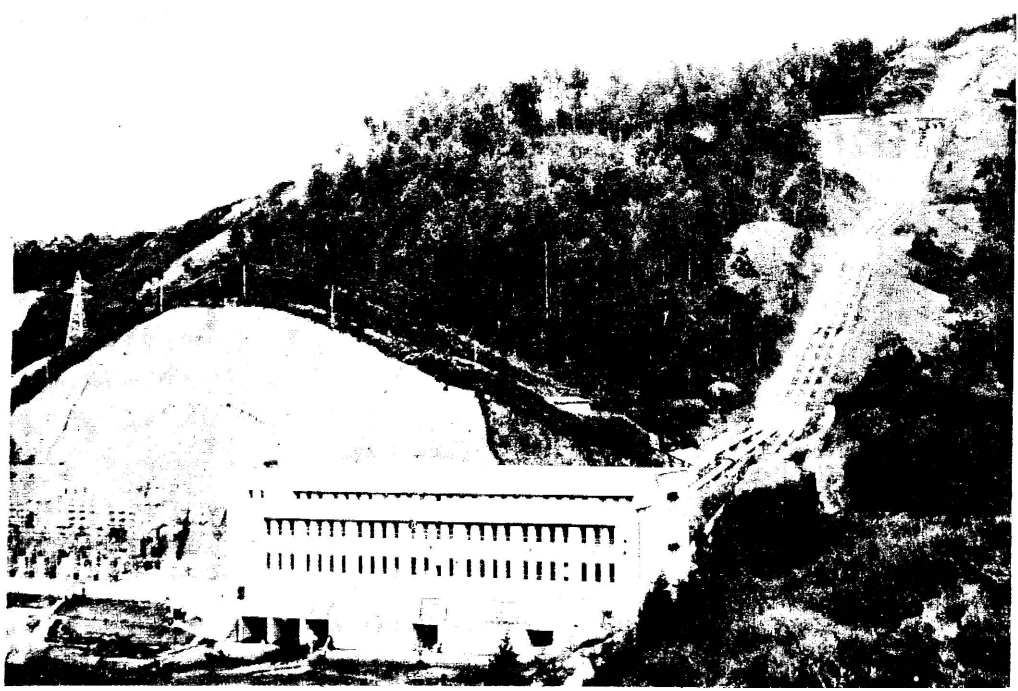
Animal World

Wild animals like cheetah and jungle cats can be seen while climbing down the winches operated at the power house. The travel by Pykara winch will be an experience of one's lifetime. The beautiful views one can have from various heights in the winch over-looking a vast plateau of Karnataka State will rouse one's imagination in absorbing appreciation of Nature's Kaleidoscopic creations.

The serpent like roads in the midst of thick silver oak trees and tea estates with changing climatic conditions from hour-to-hour is apt to tempt any to visit again and again.

It would, indeed, be an exhilariting experience to travel in the midst of thick floating monsoonish clouds and where you can have a real feeling of the dramatic set up of God's creation.

The Upper Bhavani reservoir at an elevation of 2700 m. has a picturesque surrounding. The vast water shed and cloudy atmosphere is something supreb to long for. Not far



from the steep precipieces of the western ghat ranges the whole valley and the distant Arabian sea from this point is a scene which would be green in one's memory for years to come. A solidary, lonely place for a quiest stop-over in the vast green meadow and good walkable road along with ridges to western catchment is something beyond words. A climb to the pinnacle of the Nilgiris is absolutely enjoyable without the least strain of a mountain - climbing.

Even the ride through the road winding itself through forests, meadows, tea estates, potato fields, is a unique experience. Upper Bhavani is the highest point in the Kundah Project complex and hold prospects of a developing tourism centre.

The Kundah Power House III and IV are located in the midst of a thick forest. They are also equally good revelling in bountiful wealth of charm and beauty.

The Anamalai group of power houses too is located equally among picturesque surroundings. There are lovely picnic spots, game sanctuary, etc, in the midst of tea estates.

Periyar Power House and the Suriliyar Power House have good tourist potential in the catchment areas. The Thekkadi game sanctuary is a well developed tourist spot with good hotels and motor launches. The Suriliyar Upper Camp near Manalar dam is surrounded by scenic tea gardens interspread with forest growth. It has a unique charm of its own.

Papanasam Camp

Located near Courtalam and the Mundanthurai Wild Life Sanctuary, the Papanasam camp has always been an important tourist spot and pilgrim centre. With new projects coming up in the vicinity, there is vast scope of tourism development in this area.

The Kodayar basin with Manimuthar on the north and Kodayar in the south is pregnant with much more to see and enjoy. This place is getting rain both during south-west and north-east monsoons. It is very pleasant to see this southern end of the western ranges in changing the climatic and scenic beauty from time-to-time and hour-to-hour.

The Mettur multipurpose-project too has its own beauty spots at Hogenakal and scope for boating in the Stanley reservoir. During irrigation season, when water is discharged for irrigation, it is indeed very beautiful to see the gushing water from the high level and low level sluices and the stepped charge channel.

As both the Government of Tamilnadu and Government of India are equally interested in tourism development, we could therefore expect a rapid development in Tourism in theyears to come.

NON-AGENARIAN CO-OPERATOR

Co-operative movement in Tamil Nadu has a unique record of service for, besides extending credit, market and other items of consumers service, no discrimination of caste, creed and sex was made in enrolling members in co-operative credit organisation. Here is a tale of an old lady co-operator, with green memory of the new dimension of the growth of co-operative activity in her village not far away the city of Madras.

A 93-year old woman co-operator had the proud privilege of being honoured at the inauguration of the All - India Co-operative Week in Madras in November.

Smt. Lalithambal of Thiruvellore taluk in Chingleput district, is the oldest living member of a co-operative. She had another distinction of being the member of the oldest co-operative in the State. Viz., the Tirur Agricultural Co-operative Credit Society in Trivellore.

The society was the first one to be registered in Tamil Nadu as a consumer co-operative under the Co-operative Act. She became a member of the society in 1904 and still retains her membership — a long period of 74 years.

The non-agenarian co-operator was lifted from the car to the dais in Valluvar Kottam in a rattan chair, aided by her family members, and was one of the dignitories seated on the dais at the inaugural function.

Smt. Lalithambal was loudly cheered by the packed gathering at the auditorium when she was presented a shawl by the Co-operation Department Secretary, Selvi M. S. Ramesh, IAS; on behalf of the State Government, as a momento.

A Russian delegate, Dr. Vera Maltovsevich, now in Tamil Nadu to study developments in the Co-operative sector, also presented a member to the oldest co-operator.

Birth Centenary of Periyar-

Tirunelveli Celebrates

The district of Tirunelveli has the privilege of enjoying efficient administration. People in this district evince keen interest in all the developmental programmes. They extend their wholehearted support in helping the Government organise special programmes and drives. This is amply exemplified during the Periyar Birth Centenary celebrations held in Tirunelveli on January 20 and 21. The Periyar centenary is being held in all the districts by the District Administration in collaboration with the Thanthai Periyar Birth Centenary State Committee.

The two day function of the Periyar Centenary celebration in Tirunelveli District is an event of special significance for, the city of Tirunelveli never witnessed such a vast multitude of people as seen on January 21 when the Chief Minister, Thiru M. G. Ramachandran and six other Ministers took part. The highlights of the centenary celebration in Tirunelveli which received the acclaim of all concerned are the float pageantry, the children's Rally, the public meeting and also Women's Meet, Poets, Meet, and Seminar on the various facets of Thanthai Periyar.

The object of organising the birth centenary of Periyar in the districts is to study in depth the social philosophy of Periyar and other underlying principles and take stock of our achievement in translating the dream of Periyar. The Seminar, Poets' Meet and Women's Forum fulfil this demand of the Government.

The 2-day Periyar Centenary function commenced with Nadeswaram on January 20 at 4 p.m., the venue for the meeting was M.D.T. Hindu College High School compound. The Seminar was inaugurated by Thiru K. Rajaram, Tamil Nadu Government Special Representative at New Delhi, under the presidentship of Thiru K. A. Krishnasamy, Minister for Co-operation. Eight speakers, drawn from different walks of life, made an anatomical study of the facets of Periyar's life and Mission. The drama "Needhi Devan Mayakkam" staged by a reputed troupe from Madras at 10 p.m. in the spacious ground of Schafter's High was witnessed by a large gathering.

The Women's Meet under the chairmanship of Selvi Bhagirathi, Principal of Parasakthi Women's College, Courtallam, attracted a wider section of women's population of the city. It was a well organised Forum in which over six lady speakers participated. The 'Poets Meet' held under the same roof at 11.30 A.M. lasted for over three hours. Poets drafted from different avocation read their poems. Thiru Pulamai Pithan, M.L.C. chaired the Meet. The tastefully decorated Pandal was over-flowing. The Poets' citations in prosodic and free styel punctured by pregnant cheers from the audience and peels of laughter were well appreciated.

The evening meeting held at the Schafter's High School under the presidentship of Dr. Navalar V.R. Nedunchezhian was attended by over 1.5 lakhs of people. The Information Minister, Thiru R.M. Veerappan, Food Minister Thiru G.R. Edmund, Social Welfare Minister Selvi P.T. Saraswathi, Co-operation Minister Thiru K.A. Krishnaswamy and Revenue Minister Thiru S. D. Somasundaram attended the meeting besides the local M.L.A.'s and M.Ps.

The unique feature of the celebrations in Tirunelveli is the public co-operation and participation. The entire 5-kilometre route covered by the Float Pageantry was flooded with people. The procession left VOC ground in Palayamkottai at 4.40 p.m. and it took more than three hours to reach the terminus in the town. Fifteen floats depicted the various programmes of Periyar. People of Tirunelveli have not seen such tableaux in the past. It was a novelty to them. The Collector of Tirunelveli who has rich experience in administration and manning public affairs added new items of Contingents to embellish the float procession. The notable feature was that the public volunteered to illuminate their buildings and shops. The illumination skilfully made presented a better look and villagers were greatly enticed by such colourful illumination light arrangment.

The Chief Minister, Thiru M.G. Ramachandran, addressing the public meeting, said that the spectacle of float pageantry was a homage to Thanthai Periyar. School children, teachers, both men and women, NCC, Home guards, Police bands joined the procession. Children in dazzling uniforms, the folk dancers, playing karagam, Kavadi dummy horse, Silampam, Rural dancers in their traditional costumes offered rare and pleasing sight.

The city of Tirunelveli wore a festive look on January 21. Arches, festoons, decorative bounds, illumination and masts of fluttering greens gave a new colour and form to this city.

He referred to the assurance of the Prime Minister on Hindi imposition. "We trust the words of the Prime Minister and he has reiterated the assurance of the former Indian Prime Minister". He appealed to the people to stand united to fight Hindi imposition. No political consideration should colour our effort to oppose imposition of Hindi.

The Chief Minister referred to the participation of women and children in the procession. Dr. Navalar Nedunchezhian presided over the meeting. Thiru G. R. Edmund, Food Minister, Selvi P.T. Saraswathi, Thiru S. Muthu, Mayor of Madurai, Thiruvalargal R. Krishnan, MLA, S. Alagarsamy MLA, N. D. Sundaravadivelu, former Madras University Vice-Chancellor, Abdul Wahab MLC, Tiruvarur Thangaraj and others spoke.

In VELLORE

Vellore was chosen as the second venue for holding the District level Periyar Centenary celebrations and the functions were held on December 25 and 26 in Anna Kalai Arangam and Fort Maidan. Tamil scholars, social reformers and leaders of various political parties participated in the function.

North Arcot District has played a significant rolle in Dravidian movement. It was in Vellore that the title of "Periyar" was given to E.V. Ramasamy. In his key note address the Law Minister, Thiru K. Narayanaswamy Mudaliar recollected his association with Periyar. He said that Periyar stood four square against the legal proceedings that some of the social re-actionies resorted to. The students forum and women s forum organised in this connection attracted a large number of people. Addressing the women's forum, the Social Welfare Minister Selvi. P.T. Saraswathi referred to the ideals that Periyar spread among women to fight against the social evils that imposed barriers against the emancipation of the fair sex.

On the second day, Thiru M.G. Ramachandran, Chief Minister, declared open a portrait of Periyar and addressed the gathering. He also awarded gold medals to the inter-caste marriage couples.

The Chief Minister said that no party or community can claim that Periyar was their monopoly. He was above caste and political consideration. The whole human race can claim him. Referring to the Tamil script reform the Chief Minister said that Tamil has rich diction and tradition and it has to be enriched. The people of Tamil Nadu would stand united to safeguard the Tamil language. The Andhra Bank has come forward to finance individuals to buy autorickshaws. The Chief Minister gave the cheque to one of the loanees.

ELECTRICITY AND AGRICULTURE

P. KOLANDAIVELU,
Minister for Agriculture and Irrigation

The contribution of electricity to the development of Agriculture in Tamil Nadu has been significant. As the surface water potential in the State is limited, the ryots have perforce to depend on lift irrigation. The capital and operational costs of electric pumpset being considerably cheaper than diesel engine driven pumpsets, the demand for electricity from the agricultural sector has increased on a large scale. Whereas, in the early thirties, the Electricity Department had to persuade agriculturists with arranged demonstrations etc. about the efficacy of the use of electric pumpsets, the State Electricity Board has today a backlog of several thousand pending applications for agricultural service connection, that too after giving electricity to more than 8.25 lakhs of pumpsets.

Unique Achievement

The achievement of the State in the matter of extension of electric supply for agriculture is unique. It ranks first among the States in the country, having energised the largest number of pumpsets for any one State. The Statewise number of pumpsets connected with electric power in India is furnished in Table I below :

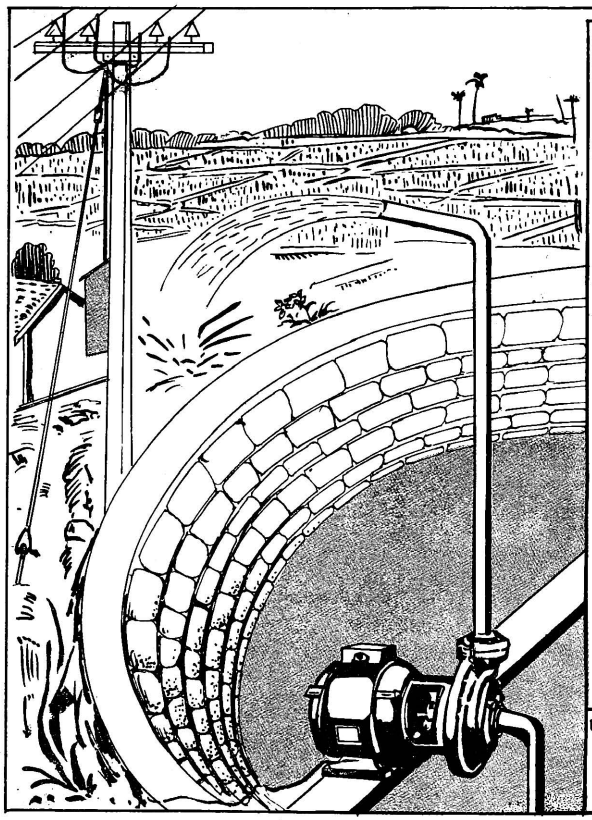
TABLE I

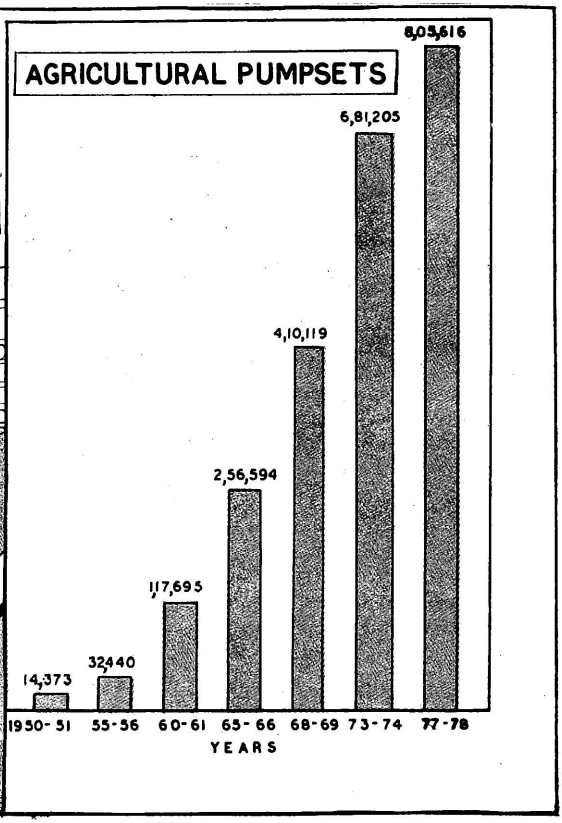
Sl. No.	*State*	*No. of pumpsets / tube wells connected with electric power as on 31-7-1978*
1.	Tamil Nadu	8,16,939
2.	Maharashtra	4,98,829
3.	Andhra Pradesh	3,44,259
4.	Uttar Pradesh	3,05,171
5.	Karnataka	2,66,073
6.	Madhya Pradesh	2,19,910
7.	Punjab	2,01,682
8.	Haryana	1,70,581
9.	Gujarat	1,60,526
10.	Bihar	1,41,824
11.	Rajasthan	1,30,754
12.	Kerala	60,089
13.	West Bengal	21,178
14.	Union Territories	19,225
15.	Orissa	6,578
16.	Himachal Pradesh	1,498
17.	Assam	1,054
18.	Jammu & Kashmir	842
19.	Tripura	145
20.	Meghalaya	47
21.	Nagaland	1
22.	Manipur	Nil
23.	Sikkim	Nil
	Total (All India)	33,67,205

It will be seen that the number of pumpsets connected in Tamil Nadu account for 24.26% of the total for the whole country. It will not be out of place to mention here that the total of 8.23 lakhs of energised wells is against the total of about 12 lakhs of wells in the State. The district-wise pumpsets energised in the State is furnished in Table II below :

TABLE II

Sl. No.	*District*	*Existing wells estimated*	*No. of pumpsets energised as on 1-11-1978*
1.	Chingleput	87,363	68,389
2.	Coimbatore	1,76,613	1,38,191
3.	Dharmapuri	60,689	36,208





4. Kanyakumari	2,000	1,390
5. Madurai	1,15,493	84,010
6. Nilgiris	400	313
7. North Arcot	2,06,052	1,42,968
8. Ramnad	47,975	38,092
9. South Arcot	1,20,667	84,282
10. Salem	1,39,867	92,768
11. Thanjavur	35,676	16,172
12. Trichy	1,02,932	59,420
13. Pudukkottai	31,370	9,405
14. Tirunelveli	69,544	51,272
Total	11,96,641	8 ,22,980

Concessions to Agriculturists

Today, the agricultural sector consumes nearly 26% of the total electric energy consumed in the State. This phenominal achievement was possible mainly because, the State, as a policy has been encouraging electrically operated lift irrigation, by extending a number of concessions to this sector and subsidising the programme to a large extent.

Extension of supply to agricultural pumpsets, scattered over the entire length and breadth of the State is highly capital intensive but financially not viable. Despite this fact, the State and the Electricity Board ventured to connect as many pumpsets as possible. Till June, 1978 the Board sanctioned only those schemes which fetched a gross revenue of 10% on the capital that was invested in the extension. This return was itself very low, since the revenue will not meet even the energy cost, leaving aside interest, depreciation and other operation and maintenance expenses. In many cases, schemes for extension of supply to pumpsets did not even meet the minimum financial requisite. A number of pumpsets had to be denied supply on this score and a number of agriculturist had to wait even for 10 years to get supply. To overcome this difficulty, the Board has taken a decision not to insist on the 10% return and to extend supply to all applicants in the chronological order of their applications.

Till recently, the Board was insisting on the availability of ground water potential, as a criterion for sanction of extension of supply to pumpsets. This stipulation has been causing considerable hardship to consumers. The good rainfall received in the last two years in the entire State has helped to increase the ground water availability. So it has been decided to remove this hurdle also and pumpsets are now provided with electricity without reference to availability of ground water potential.

The tariff for supply of electricity for agricultural purposes, has been reduced from 16 p. to 12 p. for small farmers owning upto 2.5 acres of wet land or 5 acres of dry land and 14 p. for other farmers. The decision to reduce the tariff was taken solely to help the agriculturists, inspite of the fact that it costs 44 paise/unit to the Electricity Board to supply electricity to these consumers and it results in a loss of about Rs. 40 crores in a year to the Board.

Yet another concession that was extended recently was waiver of annual minimum charges. Till recently, consumers had to pay a minimum charge at Rs. 20 per HP/annum, irrespective of whether they consumed electricity or not. In the event of drought and drying of wells, this condition caused hardship to the agriculturists. Hence the annual minimum charge was ablished.

The meter rent which was collected at Rs. 5 per service per month has been reduced to Rs 4 per service per month, in respect of agricultural services.

The other concessions extended to agricultural consumers are —

(*i*) No service connection charges are levied in respect of supplies to agricultural pumpsets. The terminal pole of the Board lines is erected close to the well and supply is made available to the consumer at the terminals of the cut out installed in the distribution box maintained on the terminal pole.

(*ii*) Agricultural services are allowed 3 lights upto a maximum of 150 watts for farm use and the consumption is charged at agricultural tariff which is at a concessional tariff.

(*iii*) No surcharge is levied on the agricultural consumers.

(*iv*) Agricultural services are not disconnected if pumpsets are removed for want of water. If the services are disconnected at party's request for change of motor from one bed to another and similar cases no reconnection fee is levied.

(*v*) The agricultural consumers are charged for the actual connected load even if it is less than the load contracted.

(*vi*) No power cut is imposed on the agricultural consumers during the periods of power cut.

Benefits from Electricity to Agriculture

Studies made by the Planning Commission of India and the National Council of Applied Economic Research on the impact of electricity on the rural sector have established that rural electrification has brought about substantial increase in the irrigated area and in the intensity of irrigation. There has been a shift in the crop pattern — a shift from dry crops to wet crops and a shift to high yielding crops. The benefits from electricity to the agriculturists, in brief, are

(*i*) Reduction in the cost of irrigation.

(*ii*) Increase in the quantity of ground water extracted.

(*iii*) Choice of crop pattern.

(*iv*) Increased intensity of irrigation.

(*v*) Increase in the agriculturists' income.

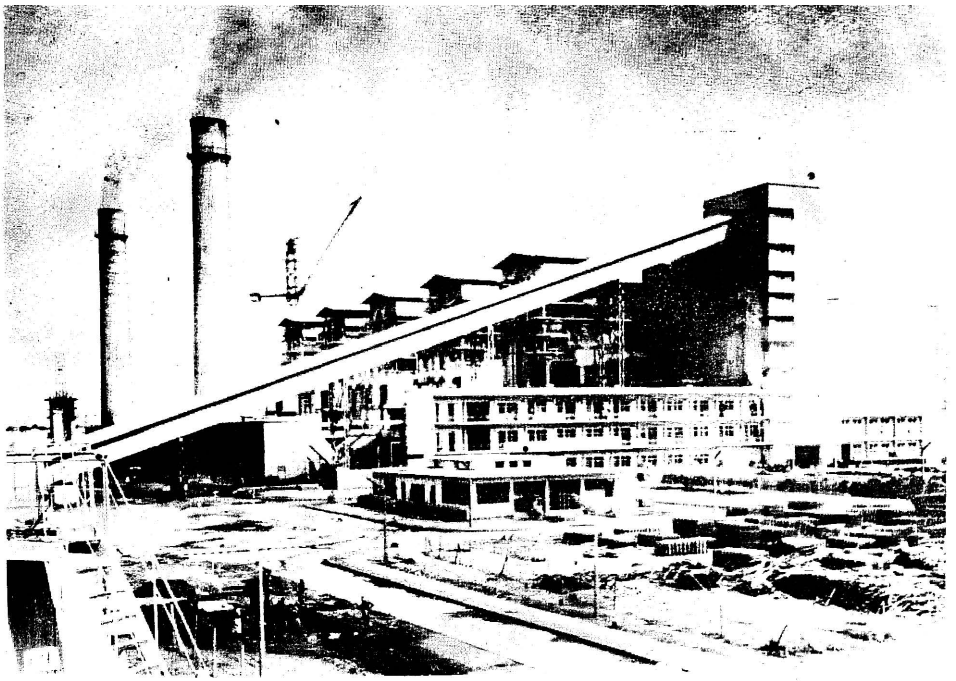
Prospects for the Future

The Tamil Nadu Electricity Board has targetted to extend supply to about 50,000 new agricultural services this year.

Due to concentration on extensive rural electrification, several low voltage pockets have developed in the grid over the years. Adequate attention is being bestowed, now on a priority basis, on formulation of improvement plans, both short term, such as rationalisation of LT distribution, erection of line tap sub-stations and boosters etc. and long term, such as erection of new EHT sub-stations, installation of synchronous condensers etc. reinforcing of existing feeders, erection of new feeders, etc. These measures will help to stabilise supply conditions and to reduce interruptions in supply.

Conclusion

The Tamil Nadu Electricity Board has devoted a large part of its resources over the past two decades on rural electricification. A planned policy of reaching the villages has been pursued by the Board and the Board has achieved spectacular progress in energisation of agricultural pumpsets. The Board is committed to consolidate further its service to the agricultural sector and through it to the society in the years to come.



Alternative Sources Of Energy—

POWER FROM THE SEAS

KOVAI CHEZHIYAN,
DEPUTY CHAIRMAN,
State Planning Commission.

One of the most serious world economic problems in recent years is the shortage of electric energy. There is a close correlation between economic growth and energy consumption—the higher is the per capita income of a country, the larger its per capita energy use. In fact, the rate of growth of energy consumption increases at a slightly faster rate than the rate of growth of GNP. It is estimated that the, demand for energy in the would increase from 9290 meter (million tonnes of coal replacement) in 1975 to 25,241 mtcr in 2000 A.D. and to 71,708 mtcr in 2025 A.D. The average annual rate of growth of energy consumption works out to 4.1% as against the overall economic growth rate of 3.5 to 4.0% per annum.

Modern industrialized countries have been utilizing their energy resources rather too lavishly. The problem of reaching a limit in this resource which in a real sense supports modern civilization, did not strike the attention of the advanced countries until the oil crisis of recent times. The present pattern of energy consumption with heavy reliance on oil and gas cannot be sustained for long. Nuclear energy has gained some importance in the last few years, but it has created its own problems—the requirement of huge capital investments, development of fast breeder technology, availability of nuclear fuel and serious ecological consequences, pollution etc. Industrialized countries of to-day have, therefore, been frantically searching for alternative sources of energy—investigations in the north sea regions and ocean beds for oil, shift to what is called soft energy sources, more careful utilization and fuller exploitation of existing sources, solar energy, geothermal energy and energy from tidal power.

The position in India and Tamil Nadu

The present consumption of electricity in India is about 66.6 billion units, which works out to 118 units per head compared with 9338 units in an advanced country like U.S.A. The All India consumption of electricity in 1982-83 is estimated at 128.8 billion units requiring a generation of 167 million units. This means an addition of about 18,500 MW of generating capacity in the next five years. The generation requirement in 1987-88 is estimated at 265 billion units calling for an addition of between 20,000 and 25,000 MW of capacity in the five year period 1983-88.

So far as Tamil Nadu is concerned, the consumption of electrical energy increased from 5057 m.u. in 1970-71 to 5575 m.u. in 1974-75 and to 6486 m.u. in 1976-77. It is expected to increase to 16574 m.u. in 1982-83 and 29362 m.u. in 1988-89 The system's peak demand went up from 1156 MW in 1970-71 to 1641

MW in 1977-78. The pealk demand is expected to increase to 3262 MW by 1982-83. To meet this demand, the installed capacity will have to be raised to 5440 MW. As against this, theinstalled capacity in the State is only 2424 MW, consisting of 1284 MW of hydro-generation and 1140 MW of thermal generation.

But it should be noted that Tamil Nadu has not been endowed with vast natural resources for power generation. The State has no fossil fuel either, except the lignite deposits in Neyveli in South Arcot district. For the coal-based thermal stations in the State, coal has to be imported from other States. As regards nuclear energy, the slow progress in Kalpakkam brings out clearly the problems and difficulties that would arise when much reliance has to be placed on foreign countries for machinery and other basic capital goods. To add to this, there is the overriding problem of pollution and contamination. Even the hydro stations in the State cannot be used to their maximum capacity since they are seriously handicapped by irrigation demands and vagaries of the monsoon. Hence, there is an urgent need to work out alternative methods of energy development in the State.

Of these alternatives, what appears most attractive is the sea as the source of energy. Tamil Nadu has a coast line of about 1000 Kms. and it is worth considering whether the energy from the sea cannot be harnessed for developing additional electric power.

Modern technology has succeeded in evolving two methods of generating electric power from the sea—one is exploitation of tidal energy and the other is developing thermal energy from the seas.

(*a*) Exploitation of tidal energy has been extensively studied in several countries notably, Argentina, Canada, France, Soviet Union, United Kingdom and Germany. The principle of harnessing and converting the mechanical energy of the tides into electricity is similar to conventional hydro power generation utilising falling water. Tidal energy is discontinuous but in contrast to solar and wind energy, there is a regular periodicity in supply, the periodicity differing with location. Tides occur once in about 24 hours in certain parts of Asia and twice in a little more than 24 hours in the most part along the coasts of the Atlantic Ocean. The position of the moon does affect the occurrence and height of the tides making them vary from day to day, yet tidal energy is predictable and is not seasonal or dependent on precipitation.

Tidal Power

Tidal power is obtained from the filling and emptying of a bay or an estuary that can be closed by a dam. The enclosed basin is allowed to fill and empty only during brief periods at high and low tides in order to develop as much power as possible. A basin is filled during flow tide and closed when the tide recedes so that a difference in head on ebb tide is created or vice versa. When the water is allowed to fall towards the lower side of the barrage which contains sluices and machinery, it operates a turbine which in turn drives a generator producing electricity.

The operating time of tidal plants can be increased and regulated by the use of reversible turbines which allow operation both with incoming and outgoing tides, and by the use of pumps which make storage of energy possible. Also, plants with multiple basins may provide power continuously. These refinements increase total costs and perhaps even cost per unit of output, despite longer operating hours. New ideas and refinements are arousing more interest in the possibility of utilising tidal energy effectively. Instead of a single basin, two or more communicating basins may be built and utilised to give greater flexibility so that one basin generates power during the emptying stage, and water can be turbined between basins. A noteworthy recent development is the device by which turbines are made to operate in both directions of water flow and also to act as pumps.

From the global point of view, it is encouraging to note that a number of promising sites exist for harnessing tidal power, their potential capacities ranging from 2 megawatts to 20,000 megawatts each. The total potential tidal power for all countries is estimated at about 64 billion watts which however, is only 2% of the world's potential hydro electric power. The only full scale tidal electric plant built so far is on the Rance estuary on the channel island coast of France. Its capacity at start-up in 1966 was 240 megawatts ; an ultimate capacity 320 megawatts is planned.

In Tamil Nadu

It is important that in view of the fact that Tamil Nadu is blessed with a fairly long coast line, adequate attention is devoted to the harnessing of this source of energy. The tidal movements have to be studied in detail and the cost of constructing the basins and installation of machinery will have to be worked out; besides, an estimate is to be made of the potential power that can be generated and the cost per unit.

(*b*) Developing thermal energy from the seas—the idea here is to

PULSES

RESEARCH CENTRE FOR TAMIL NADU

The Protection of Pulses in Tamil Nadu is only 1!3 of the total requirement of the State. Thiru P. Kolandaivelu, Minister for Agriculture and Irrigation while participating at the conference of the Indian Agriculture Research Centre in New Delhi in December, 1977 requested for a Pulses Research Centre in Tamil Nadu. The Government of Tamil Nadu have offered to provide lands, buildings and other necessary facilities for the proposed centre in Tamil Nadu. The request was accepted by Dr. S. Saminathan, Director of the Indian Agricultural Research Centre.

To implement this, the Govt. of Tamil Nadu soon will constitute a committee consisting of the representatives of the Tamil Nadu Agriculture Department, Tamil Nadu Agriculture University and the representatives of the Central Government.

capture and convert the solar energy or heat which is stored in the upper warm layers of the tropic oceans into useful power. Such reservoirs of enormous size are found in the sea in which the surface water is heated by the sun at sufficiently higher temperature than water at a deeper level. When two heat reservoirs of different temperatures are available, it is possible to utilise the warm sun-heated surface water by means of a heat engine for converting this energy into useful power.

The power plant consists of a turbine generator set, a boiler, a condenser and suitable pumps. The 82°F water is taken in at the surface of the ocean and pumped through the boiler where it gives up some of its heat to reduce the temperature to, let us say, 79'F in the boiler. This heat is used to boil a high pressure fluid such as propane, ammonia or halocarbon. The vapour boiled off from the fluid enters the turbine and expands through the turbine to give up power to drive a generator. The exhaust vapour from the turbine at low pressure must be condensed on a cold surface. The cold condensing surface is cooled by cold water at 42'F pumped up from deep in the ocean through the condenser, where it absorbs the heat of condensation from the vapour. The condensed liquid is then pumped back through the boiler to complete the circuit. Such a power plant is extremely simple, works essentially like any steam power plant, but operates with temperature differences of approximately 40 degrees, whereas an ordinary steam plant operates with temperature differences of several thousand degrees F between the heat source and the heat sink. That this is a reliable means of harnessing energy from natural source is revealed by the fact that the United States of America, by adopting the ocean temperature difference power system technique proposes to manufacture 40% of the ammonia needed by the country's fertilizer industry, by installing 21 ocean thermal energy conversion plants.

It is clear that the two methods of using tidal wave power and sea water for generating electricity outlined above, are based on simple principles. The workability of the techniques has already been demonstrated in some of the advanced countries of the world. In the East, Japan has progressed in development of this energy. In the recent times when I had occasion to meet some of the industrialists from Japan I was given to understand that development of power from the seas has been done in a big way and they are willing to assist for any development of this alternate source of energy in our State.

Our Hon'ble Chief Minister during his recent tour abroad had also occasion to discuss this matter with foreign technologists and our Chief Minister is keen on harnessing this alternative source of energy. Scientific skill and the exepertise necessary are not lacking in our State and it is not too much to hope that in the near future the use of these methods for supplementing our sources of electric energy would become an accomplished fact.

It is needless to stress the urgency of developing this source of power from the seas by the experts to meet the growing demands for power.

KADAMPARAI HYDRO-ELECTRIC PROJECT

K. CHOCKALINGAM, I.A.S.
CHAIRMAN
Tamilnadu Electricity Board.

With more and more additions to generation capacity coming from thermal, the absorption of off-peak energy will pose a serious problem. Pumped storage plant offers an attractive choice to overcome the dual problem of high peak demand and surplus off-peak energy. Kadamparai pumped storage plant was conceived in the above circumstances.

The site at Kadamparai meets the physical requirements of the Pumped storage plant in that the tail race pond is readily available at Upper Aliyar and a major substation at Udumalpet is available very near enabling minimum investment on civil works and transmission lines.

The project derives its name from Kadamparaiar (a tributory of Aliyar) across which the upper pond is proposed. The project is located in the Anamalai hills of the Pollachi taluk in the Coimbatore district, upstream of the Upper Aliyar dam executed under the Parambikulam-Aliyar Project complex. The scheme is situated in the Poonachi Reserve forest range amidst hills and dales of enchanting scenic beauty and enthralling wild life.

Forebay Dam

The main Kadamparai Forebay dam site is 72 km from the Pollachi rail head and 27 km from the Valparai town in Coimbatore district. The power house site is located 7 km. from the Upper Aliyar dam camp site.

The Kadamparai river is a tributory of the Aliyar river and originates in the Anamalai hills at an elevation of 2150 m. The flow from Devi river and the upper reaches of Aliyar is also harnessed and lead into Kadamparai. The total catchment is about 83 sq. kms. Hydrology assessment based on a long cycle of 26 years establish that the minimum power draw will be 86 cumes in an average year and 38 cumecs in a 90% year. As the 400 MW station requires 150 cumecs, the plant will have to generate 6 hours a day followed by 8 hours of pumping.

The project is mainly designed, in addition to the utilisation of the natural flows from the free and diverted catchments upstream of the Kadamparai dam, as a pumped storage project to meet a part of the likely deficit in the grid during peak hours in future by utilising the off-peak energy that will become available from Tamilnadu grid and Kalpakkam Nuclear station under construction. Thus, the main benefit from this project will be the supply of peak energy to the grid and preservation of the capacity value of the station during irrigation closure season.

Underground Installation

To suit the site conditions and terrain and reckoning also the technical and economic feasibility the project has been envisaged as an underground installation with the power house and water conductor system proposed to be located completely underground. When the project is completed, *this will be the first underground installation in Tamilnadu* and the first in India to operate on pumped storage though this will be the second pumped storage principle project in India, the other project being the Nagarjuna Sagar Pumped storage installation in Andhra Pradesh.

* The Kadamparai dam with a height of 65 m. will impound 29.4 million cu. m. of water and will serve as a head racepond. From the dam a concrete lined pressure tunnel with a length 1065 m. dia. 7.0 m. and with a discharge capacity of 750 cumecs conveys the power draft to surge shaft. The surge shaft is mined in rock to a depth of 83. m. with a diameter of 15 m. From the surge shaft two underground pressure shafts inclined at an angle of 51° to the horizontal and 390 m. horizontal length take off. Each shaft is circular in shape and has a dia. of 4.5 m. It is partly concrete and partly steel lined with a discharge capacity of 75 cumecs. Each pressure shaft bifrcates into two penstock tunnels shaft of 3.0 m. dia. near the power house. Thus there will be 4 pipes to convey the power draft to the 4 units of 100 MW capacity each.

Transmission

An underground power house cavern of 128.5 m. long x 20.4 m. wide x 33 m. high will house the 4 units. From structural stability point of view, the width of the power house has been kept at 20.4 m. Besides from considerations of fire risks, the first stage (2 x 100 MW) power transformers of 7 Nos. 45 MVA 112/30 KV (one spare) have

been proposed to be accommodated in a separate cavern of 29. m. x 19.5 m. x 12.5 m. perpendicular to the power house cavern on the down-stream side. As enough space is not available at this point, the second stage (2 x 100 MW) power transformers of 6 Nos. 45 MVA 11!230 KV will be housed at the other end of the power house cavern in a space of 25 m. x 20.4 m. The step up power transformers are to be connected to an overground switchyard at 895!900m. level through 230 V power cables from where 230 KV feeders take off to Udumalpet. The discharge from the reversible turbines will be delivered to the Upper Aliyar Reservoir through a tailrace tunnel of 1070 m. long and 7.0 m. dia. with a discharge capacity of 150 cumecs. The tailrace tunnel will have a tailrace surge shaft near the power station of height 65 m. and dia. of 20 m. There will be an access tunnel of 974 m. length of D section with 7.0 m. wide and 6.5 m. high. There will be a ventilation cum control cable cum emergency exit (with lift) tunnel (5 m. dia) which takes off vertically to a height of 170 m. and then runs horizontally to the switchyard. There will be two power cables tunnels (2.5 m. dia) for each stage of two machines which run vertically for 170 m. and then horizontally to the switchyard.

Power generated from this station will be transmitted to Udumalpet through 230 KV transmission lines. Power will be drawn from the same station to run the machines as pumps.

The project is estimated to cost 73.40 crores. The work has already commenced and the first unit of 100 MW is expected to go into operation by December '82. The remaining three units will be commissioned with an interval of a year. With the adoption of modern technology in the operation of pump turbine units, this plant will be a useful tool in the hands of the load despatch station to ensure smooth operation of the integrated power system. It can be said with a reasonable certainty that a large and modern pumped storage plant of 400 MW capacity at Kadamparai will enable the state grid to meet the peaking power requirements for some more years to come.

Power Supply For Public Meetings From Board Mains

With a view to prevent electrical accidents and also to avoid scope for misuse of electricity tariff Government have directed that temporary supplies of electricity for installation of lights and/or mikes for public meetings, should be taken/given only from the mains of the Tamil Nadu Electricity Board and not from neighbouring houses, shops, etc. The parties concerned should apply to the Electricity Board for such temporary power connections atleast three days in advance. The Police Department will also here—after insist on the parties concerned producing the permission given by the Electricity Board for power supply, before granting licence to hold meetings. The public are informed that tapping of power from adjoining premises for conducting public meetings is illegal and will entail penal action on both the user and the person who has permitted the tapping.

POWER DEVELOPMENT IN TAMIL NADU

C. SANJEEVI,
Technical Member, T.N.E.B.

The impact of Power Development in any State is reflected in its per capita consumption, number of consumers, Industrial and Agricultural growth, social amenities and alround economic activity.

The advent of Power in the erstwhile Madras Presidency comprising of the present states of Tamil Nadu and part of Andhra Pradesh, Karnataka and Kerala was indeed very obscure. It was also a small beginning as it could be normally expected, in any developing country like India.

The beginning of the present century witnessed some isolated tiny electrical installations in the form of Hydro sets in the Nilgiris and Diesel sets around Madras.

While a Private Company undertook power supply distribution to Madras City in 1905, an attempt was made by Ootacamund Municipality in 1925. Power Distribution had a firm stut in 1905 with the Madras Electric Supply Corporation establishing a Thermal Station in Madras in 1906. This was followed by smaller Municipalities to attempt similar localised distribution of power in their areas.

The State's policy of Power Development was enunciated by Shri C. P. Ramasamy Iyer in 1927. This culminated in formation of Electricity Department under the Government of Madras in the same year.

Pykara Hydro Electric Scheme was the first project taken up for implementation. With the availability of cheap Hydro electric Power, the Textile Mills in Coimbatore switched over to electric drives and load centres like Dindigul, Virudunagar, and Palani also dispensed with their oil engine sets. The Government of Madras took over the Madras Electric Supply Corporation in August 1947.

Pykara Power

The pre-Independance period of 1927 to 1947 naturally saw the slow pace of development, solely dependent on the efforts of the State. Pykara in Nilgiris district, Mettur in Salem district and Papanasam schemes in Tirunelveli district were implemented during this period and an installed capacity of 104 MW was added to the grid from these schemes.

The per capita consumption in 1937 was mere five units. This has doubled up by 1947. The number of consumers rose up to 1.61 lakhs. The energy sales increased from 68 million to 286 million a year or 1.86 lakhs units per day to 7.84 lakhs units per day.

The first Five Year plan was formulated in 1950-51 when an adequate assessment of the resources of the country was not fully made. Under the First Five-Year Plan (1951-56) power development in Tamil Nadu received its initial impetus and the installed generating capacity was increased from 156 to 256 MW with the commissioning of a new hydro station at Moyar and additional generating units at the existing power houses at Basin Bridge, Samayanallur, Pykara and Papanasam. The peak demand for power which was at 110 MW at the beginning of the First Five-Year Plan rose up to 172 MW at the end of the First Plan.

During the Second Five-Year Plan period (1956-61) three new hydro stations, viz. Periyar Power House, Kundah Power House I and Kundah Power House II were commissioned besides erection of additional generating unit at Basin Bridge Thermal station resulting in doubling of installed capacity to 571 MW. The demand for power also doubled up, during the period and reached 381 MW at the end of the Second Plan period.

The Third Five-Year Plan (1961-66) for Madras State also gave high priority for power development. Both hydel and thermal stations were planned to correct the imbalance between hydro and thermal capacities. Accordingly works on the 340 MW thermal station at Ennore were commenced and five new hydro stations, viz. Kundah Power House, III Kundah Power House. IV, Kundah Power House-V, Mettur Tunnel Power House and Sarkarpathy Power House were commissioned. Thus at the end of the Third Five-Year Plan period the installed capacity rose to 1,370 MW including 300 MW in Neyveli Thermal Station under Central sector. The peak demand increased to 717 MW at the end of the plan period.

The next three years were covered by Annual Plans. Because of the constraint on resources, the three Annual Plans largely centered on the implementation of continuing projects and no new schemes were initiated. No capacity additions were, therefore, made during the period (1966-67 to 1968-69) barring 100 MW at Neyveli. The transmission and distribution works and rural electrification programme were continued to be carried out.

The installed capacity of the grid at the commencement of the Fourth Plan was 1,470 MW of which 969 MW a was hydro and and 501 MW thermal (including 400 MW of Neyveli).

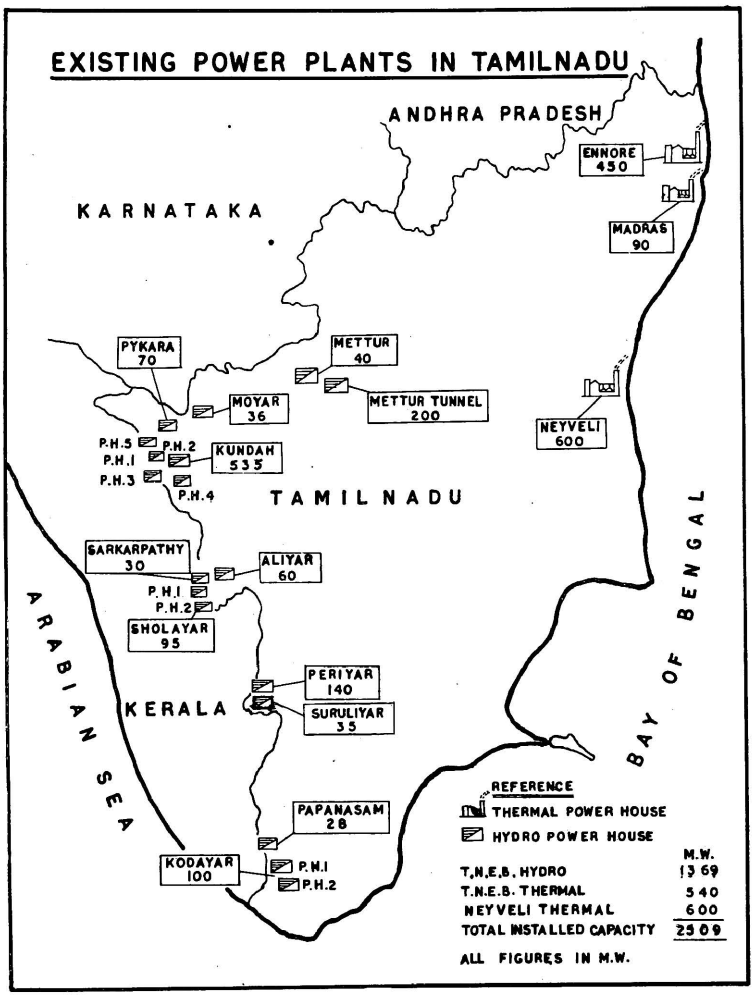
During Fourth Plan (1969-74) as many as 12 units with a total capacity of 825 MW were added. Of these 12 units, five were hydel sets from three hydel schemes with a capacity of 255 MW. The balance is from thermal schemes with an aggregate capacity of 570 MW. The predominant thermal additions is significant viewed from the imbalance of the State grid which was subject to vulnerability because of monsoon vageries.

The draft V Plan (1974-79) contemplated an addition of 935 MW from 5 Nos. schemes (i.e.) Ennore extension 110 MW Kundah IV stage 110 MW, Suruliyar 35 MW, Tuticorin Thermal Station 1st unit 210 MW and Kalpakkam two units 470 MW. O) the additions under centre sector were to account for 50%, the balance 50% coming under State sector projects.

The V plan has been truncated by one year i.e. the plan period has been terminated by March 1978 instead of March 1979.

Notable Notes

A special reference has to be made to certain important events that have also taken place during this period of power development. The department during its inception was headed by Sir Henry Howard in 1927. He was instrumental in the departmently forging ahead and even visualised, the possibility of an integrated grid, nearly three decades ahead. The actual interconnection between thermal and hydro area took place in 1350s. The mammoth project under central sector was established in Neyveli with an installed capacity of 600 MW. Local undertakings distributing power were being taken over by the Government of Madras. The Kundah Hydro Electric complex with a total installed capacity of 425 MW was completed with a generous aid from Canadian Government, under Colombo Plan. Record completion of Periyar Project (140 MW) in 3.5 years, special impetus to rural electrification programmes, introduction of hot line technics for maintenance works, erection of 300 miles long Kundah-Salem 230 KV line up to Madras (first in India). Initiation of works on Madras Atomic Power Project at Kalpakkam, inter connection with neighbouring states through 230 KV lines for power exchanges, drawing up of Master plan in 1970 for rationalisation of T & D were some of the notable events.

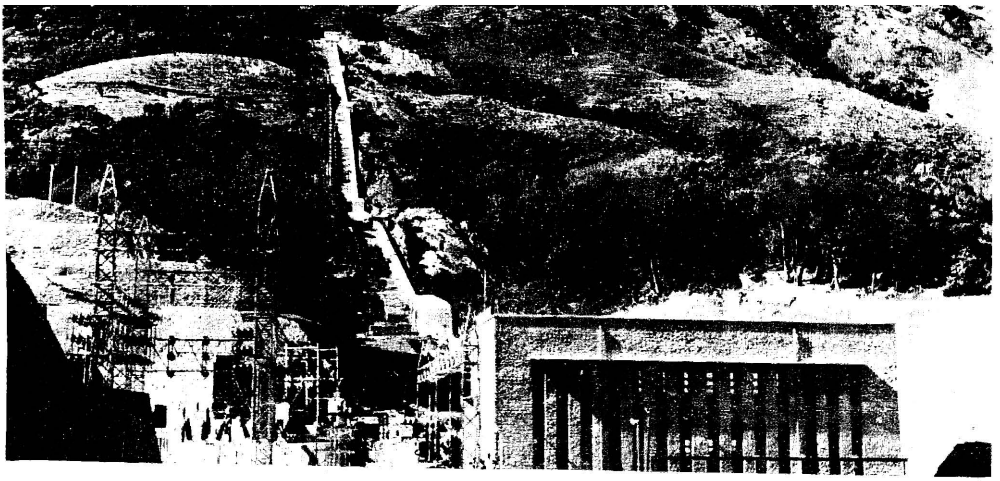


Tamil Nadu Electricity Board has proposed in its Draft Sixth Plan on power, a total number of 15 Nos. New schemes to be taken up for implementation during VI Plan (1978-83) for benefits during and beyond VI Plan. These proposals have been forwarded to the State Government, Central Electricity Authority, Ministry of Energy and the Planning Commission, New Delhi in August, 1978.

The installed capacity of these 15 schemes totals to 2428 MW. Of these, 11 Nos. schemes would be hydro with a capacity of 955 MW and the balance 4 Nos. of schemes would be thermal with a capacity of 1473 MW.

The proposals have been drawn up keeping in view not only the power shortages experienced by the State in the past since 1972-73 but also the present restrictions and the future power needs/deficits anticipated by Tamil Nadu Electricity Board by 1982-83 and beyond.

Among these schemes proposed for initiating action by Tamil Nadu Electricity Board, the Mettur Thermal Scheme with an installed capacity of 2 x 210 MW merits priority consideration not only in view of



the strategic location at Mettur, a major Load centre but also inview of the adjoining Salem Steel Plant under implementation.

The accelerated power development has brought in a green revolution. Agricultural sector is the second largest consumer of the Electricity, accounting for 25%.

The number of agricultural pumpsets so far energised exceeds 8.25 lakhs. Installation of these pumpsets has resulted in substantial benefit to farm irrigation and had given a good support to increase the good production. There has been a shift from dry and light yielding to wet and heavy yielding crops. Both extensive and intensive cultivation have been made possible, besides irrigation to vast additional acreage.

The Industrial sector is the largest consumer of the Electricity accounting for nearly 50%. There has been rapid industrial growth in the State, commensurate power availability. Not only large scale industrial, but a good number of medium and small scale industries have been established, giving rise to considerable employment potential.

The State has electrified more than 98% of villages, hamlets and Harijan colonies. Provision of street lights has been made these villages and hamlets. Extension of electricity theremote corners of the State in rural area has enabled rural industries to come up. With prospects of more power availability in the years to come we can look forward to continued support to all sectors in general and the Industrial and agricultural sectors in particular.

OUR SUCCESS IN ELECTRIFICATION

	TOTAL NUMBER	ELECTIFIED NUMBER	PERCENTAGE
TOWNS	439	439	100%
VILLAGES	15,735	15,525	98.7%
HAMLETS	48,024	4,396	98.7%
HARIJAN COLONIES	25,526	25,040	98.7%

ENERGY CONSERVATION AND ALTERNATE SOURCES FOR THE FUTURE

V. VISWANATHAN, B.E.,
Member, T.N.E.B.

The question whether the natural resources of our planet in terms of energy materials and found would be sufficient to sustain a growing population, and allow its basic needs to be sufficient in the next few centuries has been engaging the serious attention of this generation. Our present society has been evolved on a basis of technological development which has produced a highly material culture and also a high demand for materials and energy. Yet even at today's level of population about two thirds of the people in the world have only the basic materials of life, and many of them live on the verge of starvation and are extremely vulnerable to the consequences of droughts and famine.

The magnitude of the problem is enormous. Global growth of material and better distribution of wealth are unavoidable necessities. At the same time, the realisation is spreading that we are living on a finite planet, and that modern society especially in the most industrialised countries is irresponsibly exploiting the world's non-renewable sources of materials, and energy and destroying enormous areas of once fertile land. There is, therefore, need to concentrate on conservation of energy and also carry-out R & E work on future possible additional or alternative sources.

In our own State of Tamil Nadu, we have reached the end of the tether in the field of Hydro electric developments. In respect of coal fired stations, we have the main difficulty that the cost of transportation of coal is relatively very high, as we have to coal mines within the State. At Ennore the cost of transportation is nearly 80 to 90% of the pit head cost of coal, while for the Tuticorin station it will be as high as 250% of the cost of coal at pit head. Conservation of energy and exploitation of alternate sources of energy other than the conversional once are a must for the future development of this State. A general review of the world trends in this regard is therefore of interest.

Energy Demand

Even with growing energy prices, the world demand for energy is increasing, and will tend to increase steadily in the future as a result of the combination of several concomitant factors ; growth of population, growth of per capita energy consumption, improvement in the standard of living of atleast some of the more deprived part of humanity, need by agriculture for freshwater and fertilisers, energy consuming measures for the protection and restoration of the environment.

In the past 25 years, the world energy demand has increased at the average rate of 5% per year. It is possible to lower this rate of growth to about 4% per year, but it may be exceedingly difficult to do better. In absolute terms, to lower the rate of growth of 5% to one of 4%, would mean, that in the year 2020, there will still be a need for 48 billion tonnes of coal equivalent instead of 79. But if the growth remains on an exponential basis, this reduction substantially only implies a shift of some years in reaching the critical situation and the problem is by no means solved, but only postponed.

World Energy Resources

These fall into four categories :

(*a*) Terrestrial combustible fossil deposits, mainly coal, oil and gas, all originating from solar energy over long periods of time on the earth's histry. All of these are, eventually exhaustible.

(*b*) Nuclear sources, at present mainly from Uranium, but later possibly from other means. These are, in so far as Uranium goes, also eventually exhausible. But there are many prospects of newer ideas which may extend their life greatly, even indefinitely.

(*c*) Sources from continuing current supply of solar energy, at present mainly hydro-electric power, but futuristically direct solar energy, wind poser, tidal

power (actually planetary energy) and almost in the same category, geothermal power. These are inexhausible, and incidentally have zero recurrent 'fuel' cost, independent of inflation as far as this part of their cost goes, a not inconsiderable advantage over coal and oil, especially in the longer run. (The cheapest energy source in the Tamil Nadu grid are from our Hydro electric stations at Pykara and Mettur Dam).

(*d*) More futuristic ideas such as photosynthesis which would use current solar energy from the sun to make combustible fuels, in constrast to using the old accumulated deposits. This source is also in exhaustible and of zero cost so far as the energy from the sun goes, and has a strong long term attraction for development.

Category (a)—Fossil Fuels :

Supplies of coal, which at present produces 80 per cent of the world's electricity, could last something of the order of 100 to 200 years at predicted usage rates, and known available resources but these resources are unevenly distributed between countries, the USSR having far the most. Oil, on which western society is particularly dependent at present because it is used for 80 per cent of transport, and is the only fuel used for motor vehicles and airoplanes, is predicted to last between 30 to 50 years, but the coming shortage will be felt long before that in the form of rising price, as indeed has already happened. Natural gas is similar to oil, but with much smaller reserves. It seems unlikely that science can do anything dramatic to increase resources of these fuels, but much can be done to economise, by improving efficiency of use, and also of finding ways of burning fuels at present wasted, such as mines upcast gas, sewage gas, and industrial exhaust gases. All such ideas will automatically receive more attention as the financial incentive increases with rising costs o coal and oil.

Great savings, probably as great as those to come from science, are immediately available by a slight adjustment of our social habits. A particular case is oil used for transport. Recently many motorists were surprised at the increase in miles per litre to be had by limiting maximum speed. It is a fact of elementary mechanics, that, for any given vehicle the petrol needed to get from A to B increases as the square of the (uniform) speed and that rapid acceleration and braking waste fuel. Even more obvious is that a car with four people uses very nearly the same fuel as one with the driver only, and the number of passenger miles per gallon is therefore nearly four times as great. The lone driver in a luxury car probably uses some 15 times as much fuel as each passenger in a small family car, and doesn't get there all that faster, although he travels in much greater comfort at a heavy penalty in fuel. Of course, there are far fewer luxury cars, than family cars, and the total national extravagance is small, but one passenger cars are a substantial burden on the nation's fuel supplies. As between different modes of transport, the train is much less extravagant and the private car very extravagant. Precise figures are difficult to give because a lot depends on the number of vacant seats, but under optimum practical usage it is likely that the private car uses 3 or 4 times the fuel per passenger as the coach, and 7 to 8 times that for the train. The commercial airliner, when full, is not quite the extravagant fuel user it is sometimes thought to be.

A development of immediate value would be an improved battery for storing electricity, both for coping with peak load industrial demands, and for road vehicles. The electric battery car does not depend on oil fuel, but could use any fuel generating the electricity ; it is quiet and pollution free, and could in mass production be cheaper than a small second family car. An important advantage is that by arranging to have the batteries charged in the night during off peak period, base load for power systems and consequently its efficiency rating could be increased.

Category (c)—Sources based on Solar Energy

These are mainly Hydro-electric power, ocean thermal energy, direct solar energy, wind power and geo-thermal power.

(*i*) Hydro electric power : This is the commonest of all these and the technique is well established. In 1970 hydro sources produced 24% of the total world's electricity from all sources. The total world's resources are probably some five times this. In India, most of the major remaining sources are in the Himalayas. In developed western countries, like Canada. the yare mostly in remote places. Some of the sites have vast potential like Iguasu falls in Brazil where 8,000 tonnes of water are falling 200 feet every second, equivalent to a total theoretical power of 5,000 MW.

(ii) Tidal power : This dates from middle ages and is operating at the Rance (240 MW) Power station in France. The future is limited to local sources and the resources are too small and inconveniently situated to contribute appreciably to world's power.

(iii) Wind power : Wind power development, although inexhaustible and non-recurrent in costs, cannot be said to hold much prospect for world in general as the windy religions are isolated and the potential is not large.

For Tamil Nadu in particular, wind power development does not offer much scope as the windly regions are few and that too seasonal.

(iv) Geo-thermal energy : This is a large and cheap natural source, the full potential of which has not yet been developed as it covers at present only a trivial part of ithe world's energy requirements. This form of energy appears most interesting for the concrete possibility that offers for contributing to a significant extent towards meeting world's future energy demand. For power generation, resources of geo-thermal dry steam are at present exploited. The largest

and the longest term potential for geo-thermal energy is represented by heat stored in the earth's mantle but it is difficult to see how scientists and Engineers could turn this into major world supply except perhaps in the much longer run, if other means fail.

Solar Energy

Direct utilisation of solar energy has remained on a small scale and for power production, it has been used mainly in satellites. There still exists, a high economic barrier and the exploitation of solar energy for large scale application, including generation of electricity would require technologies that are still largely to be developed.

One aspect of solar energy that lends itself to possible exploitation is the heating of the sea water by Sun and exploiting the difference in temperature between surface sea water and sea water at the ocean deapth.

Ocean Thermal Energy Conversion

The idea of using the sun-warmed waters of the ocean to produce practical amounts of power is not so well known to the general public and the scientific community as are the conventional methods burning fossil fuels, generating hydro-electric power, and harnessing the heat of nuclear reactions.

"The basic concept of the ocean Thermal Energy Power Cycle is simple. The sun continuously heats the world's oceans maintaining their surfaces at temperatures significantly higher than those of the near-freezing deep-ocean waters that melt from the polar icegang. This temperature difference, or thermal gradient, is at its largest (about 30 to 35 degrees Farenheit and most nearly constant Valuve in the topical latitudes, 20 degrees above and below the equator. A narrower band of 10 degrees above and below the equator has the added advantage of being virtually free of severe storms the year around.

A heat engine can use the warm surface water as heat source and the cold sub-surface water as a heat sink to convert significant amounts of this thermal energy to electrical energy. Using a working fluid capable to boiling and condensing at these small temperature differences, like ammonia or propane, a closed power conversion cycle can be established that is similar in principle to the cycles used in conventional power plants. The power conversion cycle starts when the warm sea water and the ammonia working fluid each are pumped through the evaporator raising the pressure of the ammonia. The vaporized ammonia then moves to turn the turbine, and the turbine drivers the generator. The turbine exhausts the ammonia into the condenser, where the ammonia is condensed by the lower temperature of the cold sea water (bottom). The reliquified ammonia is then delivered back to the pump, by means of which the cycle is repeated.

In each sector of the ocean, thermal energy is constantly renewed by solar radiation and is already in its "stored" form, so that it can be drawn upon day and night. But while the OTEC principle resembles that used in conventional power plants, the size of the OTEC plant differs considerably. Plants that use conventional fuels operate at high temperatures and rates of heat transfer with resulting high cycle efficiencies in order to extract the maximum amount of energy from the fuel they consume. Given materials capable of withstanding high operating temperatures and pressures, this results in small power plant sizes for a given level of power output. Because the difference in temperature between the heat source and the heat sink is small compared to the thermal difference in conventional power plants, the OTEC Heat exchanger surfaces must be extremely large. Conversion efficiency is small compared to conventional measurement, and large number of sea water must be pumped through the system to generate a sufficiently high level of power output.

However, the small temp. differentials of OTEC plant dictate that it must operate at relatively low rates of heat transfer. The limitation upon the plant performance is then imposed by the size of the heat transfer surfaces that can be economically built and operated at reasonable levels of power output. As a consequence, the demands imposed upon the materials and operating machinery are much less severe, and have to do more with compatibility with sea water and working fluids and not so much with high temp. and pressure capabilities. The approximate 3 per cent of the energy that OTEC extracts from the sea water passing through it at once time is a small amount, to be sure. But the balance of the energy is returned to the ocean reservoirs where it is augmented by the Sun and can be used again later. It is not wasted, as in the case of fossil and nuclear fuels. OTEC power plants operate at low temperatures and pressure involving low stresses and should therefore, be highly reliable, and they draw power from a virtually limitless reservoir.

An experimental plant is being developed in the United States of America on a modular basis for a rating of 60 MW. In the layout of the power module the evaporators are located at the top close to the warm surface water used to vaporise Ammonia and the condensers at the bottom in order to minimise the length of cold water pipe required. Four modules are used in the base line power plant to generate 240 MW gross and a nett power output of 160 MW the difference being power consumed by auxiliaries such as sea water pumps.

The experimental plant is expected to be ready by 1981 and the plant for commercial production by 1986.

The success of this project is of considerable interest to Tamil Nadu for exploiting its own coast-line of over thousand miles with its ever warm tropical sun blessing it almost the year round with its brilliance. It can almost be said that the future large scale power . developmet in our State would very much depend on the success of this project.

Use of KERALA Power

The Chief Minister of Kerala, Thiru P.K. Vasudevan Nair who is also in-charge of Electricity had a discussion on 28.1.79 with the Power Minister of Tamil Nadu, Thiru S. Ramachandran and Thiru K.H. Srinivas, Karnataka Minister regarding the use of surplus power in Kerala. The meeting which took place at Madras Secretariat lasted for nearly four hours. Thiru Vasudevan Nair said in the context of the present agreement between Tamil Nadu and Kerala expiring on February 11, they discussed the topics like the proportion in which the surplus energy of Kerala could be shared between Tamil Nadu and Karnataka, the principles that should govern the price, and the period of the new agreement.

The officials of the three States would undertake detailed discussion on the unsettled issues so that at the next ministerial-level meeting at Bangalore in February 10 definite conclusions could be arrived at.

Under the agreement due to expire next month, all the surplus power from the Idukki Hydro-electric project is to be given to Tamil Nadu. The daily supply to these two States ranged between four and eight million units.

AWARDS FOR TAMIL NADU AYURVEDIC SCHOLARS

Ten Ayurvedic Scholars from Tamil Nadu received the Bhattji Memorial Ayurveda Research Trust Gold Medals at the seventh convocation of the Gujarat Ayurveda University. The medals sponsored by the Hari Om Ashram, were presented by the Chief Minister, Thiru Babu bhai Patel for the best research papers in various subjects.

Our Fight Against the Floods

LAUDABLE SERVICE BY MADRAS CORPORATION

The people of Tamil Nadu, particularly people in the city of Madras were subjected to innumerable difficulties and hardships during December '78. The North East Monsoon which intensified in December created a storm in the Bay of Bengal. As a result Madras city and some of the coastal districts had to bear the brunt of heavy rains and gusty wind. The year end repeated the sad tale of 1977 cyclone and floods.

The Government of Tamil Nadu have never hesitated to undertake immediate relief measures to mitagate the sufferings of the people in Madras City and in effected districts. The Chief Minister geared up the administrative machinary to meet the challenge and to rehabilitate the affected. The Ministers took active part in rehabilitation measures and visited various areas flooded in Madras city. Almost all the Ministers personally supervised the relief measures. Food packets were distributed in many centres, areas and sheltering arrangements had been made in various sectors of the city.

The Chief Minister, Thiru M. G. Ramachandran visited Red Hills, Chemberambakkam, Sholavaram and Poondi, the danger points to the city of Madras. He distributed dhoties, and sarees to the affected persons numbering over 3,200 in Kottur puram. The Chief Minister toured the flood affected areas in various districts for about a week and personally supervised the flood relief work

TheMinisterfor Information and Religious Endowment Thiru R.M. Veerappan, the Local Administrative Minister, Thiru Kalimuthu personally went to low lying areas and consoled the people. The Local Administration Minister made arrangements for immediate drainage of flood water. Orders have been issued to the Corporation of Madras to install amodern drainage system at a cost of Rs.30 crores to pump out the rain water in low lying areas. Thiru S. Raghavanantham, Minister for Labour visited many areas, unmindful of torrential rain and slush to speed up the relief measures. Accomodation was made available in many areas including Saidapet, Guindy, Gandhi Mandapam and Kottur. A grant of Rs.100 was granted to raise new huts.

Rice Supply

The Chief Minister ordered of supply of 20 kilo of rice per family. This timely help was extended to the districts also. Almost all the families who suffered received rice.

Medical Relief

Health and Medical relief is another important factor that got

to be bone in mind. The Corporation Health Department and Government took special interest in preventing the out break of epidemics. 16 mobile hospitals and 9 medical teams engaged themselves in medical relief activities. The Corporation of Madras also pressed 7 mobile hospitals into service and the Minister for Health, Thiru Soundararajan supervised the medical relief work. Another casualty of torrential rain is the communication system. The roads were lashed by the rains. For repair and reconstructions of roads in Tamil Nadu Government have granted Rs.75 crores.

The flood relief work undertaken by the Government has been highly commended by the public as also political leaders. No less a person than Thiru M. Bakthavatchalam, former Chief Minister has appreciated the speed with which the relief work was implemented.

Laudable service by Madras Corporation

Nearly 22,500 families were affected in Madras city. The number of persons who lost their dwellings is estimated to be 1,12,500. 42 buffaloes were dead.

The road dam of Nelson Manickam road has been washed away. The Namacheevayapuram bridge suffered heavy damage. The Kotturpuram area was flooded causing great concern to the civic authorities. The Aziz nagar grave yard looked as a sheet of flood.

The officers and the staff of the Corporation of Madras worked day and night. They did not care for their families and food.

Thousands of affected men, woman children took shelter under Corporation Schools.

Food packets were distributed at 275 centres and the Corporation employees personally distributed the foodpackets to avoid wastage. They supplied food packets 14,63,650 persons within a short period of 10 days. This is really a commendable service done by the Corporation employees. Children were also taken care of 30,000 persons were innoculated. People remember with gratitude the service rendered by the Chief Minister and his collegues and Corporation staff as well.

Vaniyambadi
Flood Victims Rehabilitated

M. A. SIRAJ

Rahmat Nagar (the blessed town) is perhaps the most appropriate choice of name for the colony of rehabilitated flood victims of Vaniyambadi. Aptly the floods came as blessings in disguise.

This mass of people lived amid squalor, insanitation and filth on the embankments and beds of two rivulets of Palar running through Vaniyambadi town only three months ago. Neat rows of uniformly built huts on the healthy environs of nearby hills has replaced that scene which was considered an eyesore. New colony has now a school, a hospital, water taps and street lamps. Thier huts are no longer unauthorised encroachments. Government has allotted them land which they occupy in the new colony. Above all this, the inhabitants of the colony are target of multifarious welfare programmes by a host of voluntary agencies. Floods evoked wide sympathy for them and

welfare organisations pounced upon the opportunity to enlist co-operation of all.

Residents of Vaniyambadi rose to the screams, cries and sobbing of flood victims on the morning of Sept. 26th last year. Flash floods had ravaged 2,000 houses on the banks of Palar, killing 20 persons and uprooting 1,400 families. Floods were due to surplussing of water in Bethamangalam tank. Displaced people stormed into the hospitals, schools and club premises of the town.

Organisations like Muslim Youth Association, Anjuman Khyr Khahe Aam, Jamaate Islami Tamil Nadu, and Students' Islamic Circle pressed their workers into relief works and started supplying food packets among victims. By the evening district authorities also rushed supplies of rice and other commodities. Floods receded within 24 hours but town people disapproved sending back the victims to their old homes, lest the tragedy repeat itself ever again. Talks with District Collector proved fruitful. Government agreed to allot prome boke land on nearby hills and sanctioned Rs.100 for each family. Collector Thiru. A.P. Bhatikar camped continuously at Vaniyambadi and saw the rehabilitation work to end. The very next day bulldozers moved to the scene, ground was levelled, streets were paved, municipality installed street lamps and water supply sysyem fixed taps at street corners.

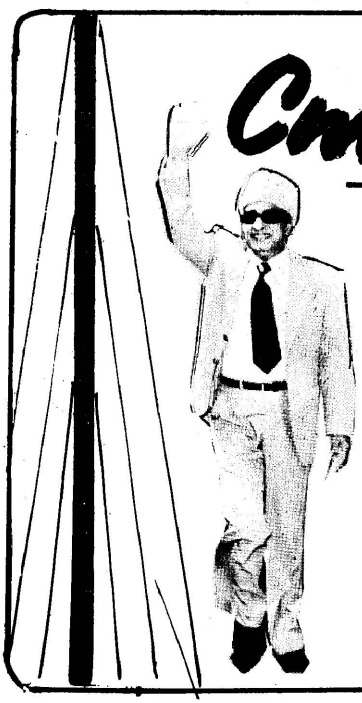
Rotary Club of the town arranged the inoculation of flood victims against epidemics feared Islami Tamilnadu built up a school on hilltop for 200 children. It also undertook the construction of a water tank at the cost of Rs.10,000. Shaheen Association bore the entire expenditure on digging of a huge community well. Marwari community of the town distributed free garments to the children of school going age. NSS boys of Islamiah College built seven public latrines. Muslims of the town are financing the construction of a mosque. An interest less banking society, the Baitul Mal advanced loans to many petty businessmen to restart their business. District authorities bored a well for augmenting water supply.

As soon as the papers of land allotment reached the hands of victims they began streaming into their new abode. A healthy, serene and calm air greeted them on scenic hills. There are no more cesspools breeding mosquitoes or slushy alleys. They have overcome their grief due to loss in flood. Their children will now in the waked of floods. Jamaate have schooling and medical care. A new sense of social awareness has aroused in them. More than anything, they have one consolation that there is someone to take care of them, to wipe off their tears, thanks to the prompt aid of Government and services of voluntary agencies.

Bulldozers have levelled the embankments to restore the original width of the river. According to engineers, fury of floods was enhanced due to construction of flow by encroachments on either side of the river.

Rahmat Nagar is a monument of efficient co-operation between administration, People and voluntary organisations.

CM's Call to Fellow Men



On the eve of Republic Day we have to remember that the Independence of a country which is precious one is achieved after the sacrifices of many great men and brothers and sisters. We cannot forget the fact that the people have made a great sacrifice for the evolution of democracy and its fruition. We reap the harvest of the sweat and strain of countless men and women. Hence it is our duty to remember such martyrs and pay our homage to them.

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The Chief Minister further adds that Anna, expressed his views in such a wayas to respect the norms and tradition of democracy Referring to the criticism of Anna the Chief Minister quoted him saying that Anna chosen a day in 1965 to oppose Hindi because on that day Hindi was made as the official language. Anna wanted us to celebrate Indian Independence day of joy and liberation. The Chief Minister appealed to the people to eschew caste and religion and discrimination. With no love for power and without jeolousy, let us all engage ourselves in constructive activities as men of liberty for the welfare of all.

Madras Tourist Trade Fair

A CATALYST IN NATION BUILDING

Tourism is money spinner. It has been acquiring the drappings of an industry. Not only that. Tourism promotes international understanding and friendship. Barriers of climes and bellicose nationalism are broken. Home tourism brings various sections into closer contact. Tourism promotes national integration and strengthens social contact. The Government of Tamil Nadu have broken new grounds in this field.

The Tamil Nadu Tourism Development Corporation, an undertaking of the Government of Tamil Nadu, has organised the All India Tourist Trade Fair 1979, at the Fairlands, opposite War Memorial, Madras for the sixth year in succession. Spread over an an area of 20 acres on the two banks of the River Cooum, the Trade Fair offers an enticing spectacle.

The Central and State Government Departments, Statutory Bodies, Private & Public Sector Undertakings, Business Houses and many Banks are participating in the Fair. 206 stalls of business houses and sales units have been set up.

The State Governments which have taken up pavilions and stalls include Megalaya, Jammu & Kashmir, Himachal Pradesh, U.P., Punjab, West Bengal, Orissa Andhra Pradesh, Karnataka and Kerala.

ENTERTAINMENT

For the entertainment of the visitors, the Fair authorities have provided an Open Air Auditorium, a Mini-Theatre and an Open Air Theatre. At the Arignar Anna Kalai Arangam, song, dance, drama and music will be performed by eminent artistes. Nominal fee will be collected for very popular shows. At the Mini-Theatre, folk dances like Karagam, Kavadi, Kummi, Kolattam, Therukoothu, Villupattu, Magic Show, Puppet Show, etc are presented. Besides, cultural troupes from other States will also be presenting their shows. Popular feature films are screened everyday on a giant screen at the open air cinema theatre.

For the amusement and recreation of the young and old, the Fair authorities have provided a mini train, a snake park, a crocodile farm, a giant wheel, a merry-go-round and skill games. Pleasure boating is another attraction. There is a separate shopping arcade, where handicrafts and other items from all over the country will be displayed and sold. At the Handloom Bazaar, the choicest handloom fabrics from all over the country are available.

The pavition of Tourism Depart ment represents the Thanjavur Dolls. Fifty feet in height, the dolls quickly bring to the mind of the onlooker the • intrinsic handy product of Thanjavur. Inside the paviltion the sound and light spectacle on the tourist spots in the State attracts a chunk of the visitors to the Fair. The centenary vignette of Thanthai Periyar and Rajaji put up by the Information Department adds new dimension to the landscape.

The tall replica of Anna Nagar Viswesraiah tower (*15*' in height), the exhibits of educational value in Police pavilion, the Kadamparai Hydel Project model, the model of Ripon Building in magnificient form, are a few among novel features of this year's attraction.

Thiru S. Ramachandran, Minister for Electricity who inaugurated the Fair, said that more facilities should be provided in Tamil Nadu for Tourist traffic. The "golden triangular"- Bombay, Delhi and Calcutta- main centres included in the itinerary of foreign tourists by the Centre - should be broken so that a large number of foreign visitors would be able to visit Tamil Nadu and enjoy their

foreign trip. Like Leipzig where people of the world keep their goods for sale Madras serves as a good centre for the South and international community can enjoy all facilities of modern shopping and real socio-cultural fabric of India.

The Fair this year has been organised on grand scale with the large number of participants. The illumination system and other spots of attraction enhance the entertainment value of the tourist Trade Fair. The Anna Kalai Arangam where functions are held and cinema films are exhibited is raised elegantly. The frontage has the portraits of K.R. Ramasamy, N.S. Krishnan, M.K. Thiagaraja Bagavather and P.U. Chinnappa. The dais has been tastefully decorated.

The Fair was inaugurated by the Electricity Minister, Thiru S. Ramachandran, under the presidenship of Thiru R.M. Veerappan, Minister for Information and Tourism. In his address, the Tourism Minister, Thiru R. M. Veerappan, appealed to the Centre to promote tourism development in the South, particularly in Tamil Nadu which has rich potential. The Minister said that the Government of India should help the State to raise permanent basic structures in the Island ground, the Venue of the Fair so that the Pavilions could be erected with less cost in future. He appealed to the Ministry of Defence not to charge high rent for the small strip of land that the Fair authorities have used to put up stalls.

Thiru R.M. Veerappan hoped that 35 lakhs of people would visit the Fair this year as against 25 lakhs visited last year. The Government have a proposal to create an organisation to attend to the Exhibition works in all the districts. The Exhibition organised by Government in Madurai and Salem have testified that the Government would conduct such exhibits on a large scale in the districts for the complete satisfaction of visitors.

Thiruvalluvar Day- Tamil Scholars Honoured

January 15-a happy sunday for people in Madras city. The Valluvar Kottam which has acquired a place of pride in Tamil Nadu for its architectural beauty and aesthetic atmosphere created by the defty hands of the Master sculptures and stapaths.

Very appropriately organised was the Tiruvalluvar day at Valluvar Kottam. It was a day-long function, commenced in the morning. The function was inaugurated by the Governor, Thiru Prabhudas Patwari with Thiru M.P. Sivagnanam, Chairman, Tamil Nadu Legislative council in the chair.

The "Muthamil Kural" - a symposium was inaugurated by the Local Administration Minister, Thiru K. Kalimuthu. He was in his form. His rich experience in Tamil teaching and deep study of Kural kept the audience spell-bound. He cited couplets to show the relevance of Tirukkural to modern man. Messrs. V. Munuswami, K.V. Jaganathan, P. Sundaresan spoken in length on various facets of the immortal work of Tiruvalluvar.

The Governor declared open an exhibition of books on Tirukkural, mostly in foreign languages. Dr. Avvai Natarajan, Director of Translation, earlier welcomed the gathering.

United Fight Against Hindi

Thiru M.G. Ramachandran, Chief Minister, addressing in the evening, said there could be no room for political, religious or other differences in safeguarding the interests of Tamil language. All leaders should express their unanimous view in the form of a resolution to forward to the Centre. If it went unheeded, further course of action could be thought of jointly.

He said the people of every region had the right to protect and promote their own language. That should not be seen as an effort to crush another language. In realising the ideal of elevating Tamil to its legitimate place of honour in all spheres in Tamil Nadu - administration, judicial and the like - considerations of religion, politics, caste and party should be set aside and all leaders should chalk out plans together. In this, there was no need for agitations or black-flag demonstrations.

About the reforms introduced recently to the Tamil script, the Chief Minister said the Government felt that the letters "Ai" and "Ow"could not be dispensed with. He hoped scholars would approve of the Government's stand.

Honour to Tamil Savants

In accordance with its policy of honouring Tamil scholars and thinkers Messrs. T. S. Avinashilingam, G. Devaneyapavanar, K. Appadurai, M.P. Periaswami Thooran and V. Subbiah, all Tamil savants, were honoured with the title of "Sentamil - chelvar".

Eight persons of eminence in fine arts were awarded the title "State Artistes" They were : Thiru Madurai Somasundaram and Dr. Balamuralikrishna (Vocal) Thiru Lalgudi Jayaraman (Violin),Thiru C.S. Murugabopathi(mridangam) Thiru K.P. Sivanandam (veena), Sri Namagiripettai Krishnan (nadaswaram),Thiru Valangaiman A. Shanmugasundaram (thavil) and Tmt. Vyjantimala Bali(dance). A flute artiste will be chosen for the honour on the Tamil New

Year Day. The 'State Artistes' will get an honorarium of Rs.1,000 per month for five years.

Thiru M.G. Ramachandran, who gave away the awards, said the task of selecting the artistes and men of letters was really a difficult one. No extraneous reasons were allowed to creep in. Those who had not been chosen should not think that the Government had ignored or belittled their services to the cause of Tamil. What the Government had done was only beginning; More scholars and artistes would be honoured every year, he said.

To Kakkan

The Chief Minister also distributed cheques to 28 Tamil scholars, who have been granted financial assistance by the State Government. He announced that the amount paid to them would be raised from the originally announced Rs.100 to Rs.250 per month. He also offered a shawl to Thiru P. Kakkan, former Minister, who has been granted a monthly honorarium of Rs.500 and other benefits in recognition of his exemplary conduct in public life. The fourth cover photo shows Thiru Kakkan receiving the casket containing the order.

Mr. C. Aranganayagam, Education Minister, said 'Thirukkural hailed the dignity of labour. It also struck at the root of casteism. Dr. V.R. Nedunchezhian, who presided, pointed out the stress laid by Tiruvalluvar on-intelletual acumen and character for man's progress.

Dr. V.C. Kulandaiswami, Vice Chancellor, Madurai Kamaraj University, Prof. A.S. Gnanasambandam, Thiru K.A.P. Viswanatham and Tmt Nirmala Suresh spoke on various aspects of the message of Tiruvalluvar and its relevance to present-day society. *They commended the Tamil Nadu Government on its programme of honouring and supporting Tamil scholars.*

Appeal to Centre

Earlier, Thiru R.M. Veerappan, Minister for Information, welcoming the gathering, said the Government's idea in celebrating Tiruvalluvar Day was to inspire the people to understand the pristine beauty of Tamil language. He appealed to the Centre to adopt "Tirukkural" as a national work. He exhorted the people to translate the ideas set in Kural. He appealed to the newspaper organisations to help spread of the message of Tiruvalluvar.

Message of Thiruvalluvar

Inaugurating the Thiruvalluvar Day on Jan. 15, at Valluvar Kottam, Thiru prabhudas B. Patwari, Governor, recollected the richness of Tamil language and its competence as a powerful medium to convey complex ideas. He said Mahatma Gandhi had a filial love for Tamil language and the Tamils. He started learning Tamil while he was in South Africa. His autograph in Tamil and some Kural couplets written in Gandhiji's hand in Tamil bear testimony to his love for Tamil language.

Thirukkural has been translated into numerous Western and Eastern languages. The philosophy adumbrated in this work of Thiruvalluvar running to 1330 couplets is universal in appeal and encampasses the cardinal truths of all the religions of the world. That is why it is aptly called as the 'Tamil Veda'. Time and science have not defied its vitality and validity. Kural has a message to the poor, the rich, the ruler and the ruled, the teacher and the taught. All can easily drink the nector of their choice from the perennial fountain of Thirukkural as the overall theme is the art of living. Dr. Albert Schweitzer, a selfless missionary had vifidly commended the maxims of Thirukkural and observed "There hardly exists in the literature of the world a book which contains such lofty maxims".

Kural in Foreign Lanuguage

People all over the world have read and enjoyed Thirukkural. Dr. G. U. Pope, Graul, J. J. Glasev, Rev. Beschi, Rev. John Lazaraus and a host of Indian scholars including Rajaji have translated Thirukkural. It is translated in numerous languages of the world.

Today the human race often finds itself in the brink of self-destruction. The nuclear weapons and the huge amount spent of the so-called developed countries post constant threat to the world peace and tranquility. International conferences on disarmament and limitation of nuclear weapons do not yield the desired result. The reason for such fear is not far to seek. They have not yet realised the great truth that great saints like Thiruvalluvar and Mahatma Gandhiji put forth before the human race.

Thiruvalluvar says

"The beastly men of cruel acts of killing
are indeed

By men discerning deemed as those who are
of meanest breed".

As you all know I am a staunch believer in Prohibition. Needless to say our Chief Minister, Thiru M.G. Ramachandran, is another votary of prohibition. Prohibition is no new social ideal that Gandhiji advocated. He himself said that most of his principles are as old as rocks and hills of India.

In the long line of Advocates of Prohibition Thiruvalluvar stands unique and, any one who abides by the maxims of Kural will certainly get himself baptised as an ardent supporter of Prohibition.

INTEGRATED APPROACH IN AGRICULTURAL PRODUCTION IN PUDUKOTTAI DISTRICT

The unique feature of agricultural development in Pudukkottai District is its Integrated Approach, wherein Reaserch, Training and Extension go hand in hand. This is a pioneering approach to tackle the local problems. It involves mainly, conducting adoptive research projects based on soil, rainfall and other agro-climatic factors prevailing in this district and also taking the useful findings to the doors of farming community, through the extension agency. It also involves the training of field staff as well as the farmers of this district in the implementation of new innovation.

Is the 'Integrated Approach' *viz.*, Operational Research Project paying dividends ? The answer is yes.

New Cropping Pattern

The tradition bound dryland agriculture in this district and elsewhere in Tamil Nadu is raising mostly a single crop per year. To break the traditional practice and also to make the dryland farmers economically sound, experiments were conducted and the results paved the way to raise two crops per year where there was only one crop previously. Result of the experiments also indicated that growing of KM1 or T9 blackgram after the harvest of rainfed Groundnut will fetch a net income of Rs. 700 per acre *i.e.*, Rs. 300 more to the farmers with less investment. This new cropping pattern caught the eyes of the farmers in the entire State of Tamil Nadu and particularly farmers of Pudukkottai district and during the current year blackgram as a second crop is grown in more than 5,000 acres.

One of the constraints attributed for the poor yield in rainfed Groundnut is the poor population. To overcome this hurdle, experiments were conducted with three tier Gorru (Seed drill) and it gave 31% more yield than the crop sown with country plough. This is mainly due to optimum plant population and also by sowing of seeds at a uniform depth required which are ensured in Seed Drill sowing. Further sowing with seed drill is economical costing only Rs. 6/- per acre whereas country plough sowing costs Rs. 12/-. Another important advantage about the Seed Drill is that it is possible to cover about 3 acres a day with a pair of bullocks when only an acre could be covered with country plough. This means a small farmers having about 5 acres can complete sowing in his entire holding in 2 days on receipt of a good shower before the moisture is lost, whereas with a country plough, he has to wait for another rain (which is so erratic) to complete the sowing in current season. This new cultivation practice is followed in all the dry Compact Block Demonstration plots in this district and the results are very much encouraging. Field days were arranged with the progressive farmers of this district at different places and the farmers are highly impressed about this practice and is sure to click in the coming years.

MUSIC COLLEGE AT MADURAI

The Government of Tamil Nadu have sanctioned the opening of a new Music College at Madurai during the year 1978-79. The College provides instruction in Sangeetha Vidhwan Title Course, Vadya Visharadha course and Natya Visaradha certificate course. The subjects taught are VOCAL, VIOLIN, VEENA, MRIDANGAM, FLUTE, NAGASWARAM, THAVIL and BHARATHANATYAM. The College is located in "SUNDARA BHAVANAM", B-3, Deputy Collector's Colony, Madurai-20. Applications for admission to the above course are available at the College office at Madurai.

DISTRIBUTION OF BLANKET FOR NEWBORN BABIES

Tmt. P. T. Saraswathi, Minister for Social Welfare, distributed blankets for the children born on 1-1-1979 in commemoration of the International Year of Child on 3-1-1979 in the Government Hospital for Women, Egmore, Kilpauk Medical College Hospital, Perumalpet Maternity Centre (Corporation of Madras) and Choolai Maternity Centre (Corporation of Madras) for 73 children.

Another milestone is Integrated Approach is the spread of Soyabeans in this district. Experiments were conducted with a number of varieties collected from different parts of our country and also from other countries to find their adaptability to this tract. When it was proved that Soyabean will yield heavily when compared to other pulses, besides its high protein content *viz.*, 43% it was projected in the extension work. When Soyabean was tried in selected holdings during last year, the yield was encouraging (about six hundred kg/acre) and hence it was decided to raise soyabean in 100 locations as a pure crop besides encouraging the farmers to grow soyabean as a mixture in Maize and bund cropping in wet lands. Pudukkottai is the first district in the entire Tamil Nadu to introduce soyabeans in the crop patterns of this district and is definitely the result of our Integrated Approach in Agricultural Development.

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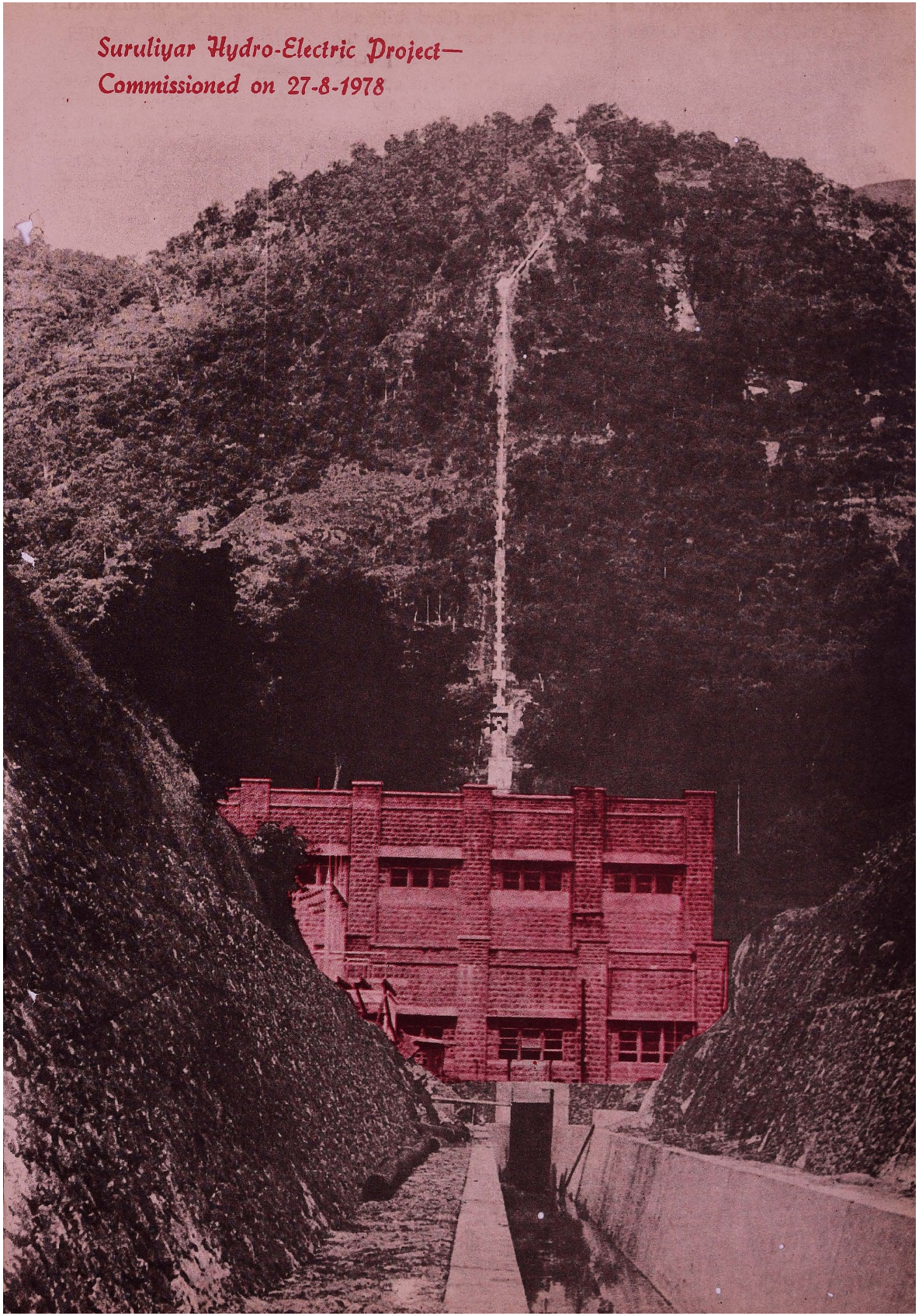

Suruliyar Hydro-Electric Project—
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