

Tamil Arasu

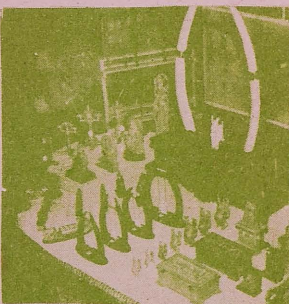
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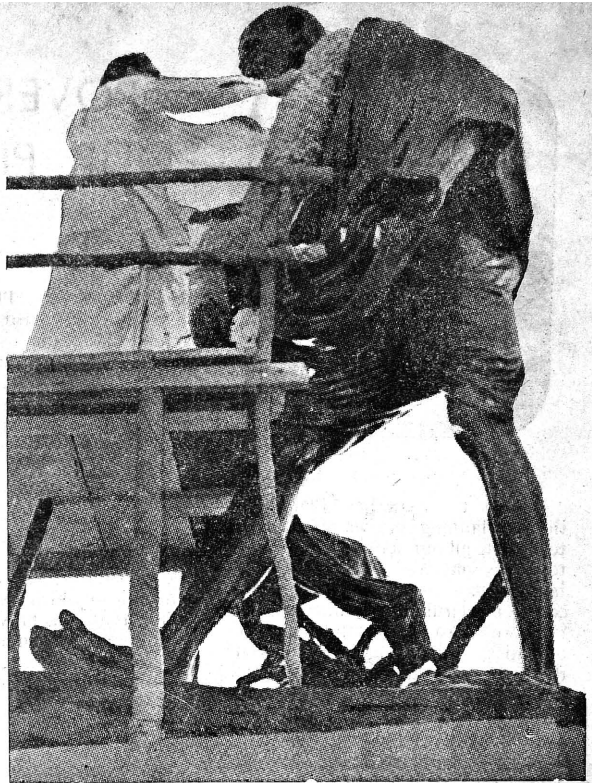
Tamil Arasu

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Dr. M. Karunanidhi, Chief Minister of Tamil Nadu, garlanding the Mahatma Statue at Marina on 2-10-1972.



JAWAHARLAL NEHRU— A BIRTHDAY TRIBUTE

by Thiru K. K. Shah,
Governor of Tamil Nadu.



If Gandhiji brought about a silent revolution in the psychology of the masses, Pandit Nehru nursed the ethos of independent India and Thirumathi Indira Gandhi laid the foundation and raised an edifice of democratic socialism, against surging waves of communalism, religious bigotry, regional prejudices, linguistic differences and ideological obsessions.

In fact, it is Pandit Jawaharlal Nehru's personal contribution to the freedom-loving countries of the world, after they gained independence, that he could avoid a social upheaval in India which would have shaken the balance of power in the world. His success was due to the faith of the common man in his burning patriotism and wise stewardship. Because of his immense identification with the common man, the people trusted him and agreed to wait for equal opportunities for growth and for removal of social inequalities. Nobody would have tolerated concentration of economic power being utilised for political purposes, had it not been of the faith of the people of India in Pandit Nehru who pleaded for time to change the structure. He tried to avoid violent changes so that continuous growth could be assured.

I remember to have questioned Panditji about his extreme generosity to the youth and in some cases, latitude verging on indiscipline. The answer that he gave me disclosed the depth of his thinking and the wisdom of his approach. He said that if the legacy of slavish mentality on account of 700 years of foreign domination is to be wiped out, we will have to create a psychology of fearlessness and freedom from any type of restraint. It may lead to indiscretion, but that can be looked after, and the initiative, generated can be channelised. It is imperative, he said, that freedom of action and freedom of thought should be restored to the youth. This can be done by the Government and the administration taking up a parental attitude and the society taking up an attitude of a trustee.

When the history of Free India is fully written, the period of Pandit Nehru's stewardship will be recognised as the period of constructive dynamism and sagacious stewardship. May we all prove worthy of this great architect of modern India.

POVERTY CANNOT BE OUR PERMANENT GUEST

BY

Dr. M. KARUNANIDHI



In State-level Planning for achieving the growth of the economy at the State level our State is in the vanguard. Our Planning takes in its ambit, even district-level planning and this constitutes a radical planning innovation in the country.

Towards the Brave New World :

The new approach to education adumbrated in the Report of the Task Force headed by Thiru Malcolm Audiseshiah is a valuable contribution which is capable of leading us to the brave new world of our dreams. It can be said without any fear of contradiction that the new ideas thrown up by the various other Task Forces can revolutionise many fields in our country.

It is our prime concern to accelerate the per capita income in our State. The per capita income in Tamil Nadu in 1970-71 is reckoned at Rs. 654. The State Planning Commission has to devise ways and means of enhancing this per capita real income to the level of Rs. 1,308 by 1983-84.

The bane of our economy is no doubt unemployment. Our Planning should enable us to tackle this problem decisively. Simultaneously, the new slant we give to education should also be capable of proving a partial solution to this problem. For, many thinkers have not hesitated to point out that the pattern of educational system is such that it is sowing the seeds of unemployment. In fact I was also moved to give public expression to such a view at a Hyderabad function. The present system of education does not provide enough opportunities for employment, nor does it make the educated fit enough for employment. We must devise a system of education which by itself would enable the educated fit for employment.

Then there is the problem of poverty ; in Tamil Nadu it is

ascertained that over 60 per cent are below the poverty line. Poverty cannot be driven out by means of shibboleths. That goal of socialism has to be achieved only by dint of long-term planning. A long-standing malady like our poverty cannot be got rid of by short-term schemes. On the other hand if we concentrate our energies on such schemes, we may be accused of failing in our duty to take up long term solutions to stem the tide poverty. Poverty brooks no temporary solutions. We can eliminate poverty only by striking at the root causes of poverty which again means that we must devise schemes which will make sure that poverty does not stagnate any longer with us.

We do have the brains that can draw up such dynamic schemes, schemes which can bring about dynamic changes in our economy ; but we should not log down in the stage of implementation. The administrators in charge of implementing these schemes must be capable of thinking ahead, and thinking fast, to overcome likely impediments to the implementation of these schemes. Lame excuses like financial sanction and non-availability of vital machinery should not be cited. It is not that I decry administrative procedures, but only that I do not want officials to drown a scheme in procedures. Procedures are sacred ; but they should not present the appearance of a cat chasing its own tail.

The State Planning Commission has drawn up a perspective plan up to the year 1984 with the objective of—(1) doubling per capita real income.

(2) promoting the mental well-being through a process of humanising economic development ; (3) ensuring full employment, and (4) to attack the worst forms of poverty through all means. It has been assessed that availability of electricity will be the only doubtful factor in the full implementation of this plan.

This is the era of Planning ; in this Planning era we are obliged to confine all our activities according to a pre-conceived Plan. It is also in consonance with our own native edicts in Tirukkural which ordain that we must be resolute in our activities, once they have been decided upon after deep thought. It is on the basis of this edict that the labours of the State Planning Commission should be directed. Moreover it is necessary that we must conceive long-range plans so that our ideals can be realised.

It is true we have been implementing Five-Year Plans as well as annual Plans drawn up as All-India Plans. In retrospect, we find that they have not fulfilled the aspirations of our people nor provided them opportunities to lead a better life free from grinding poverty. The Central Planning Commission has no doubt confessed that the annual growth-rate of our economy has been of the order of 3.8 per cent in the 1951-60 decade and in the next decade of 1961-70 the growth-rate was retrograde at 3.7 per cent. In the context of the present trend of growth-rate, the Planning Commission feels that it will be a Herculean task to even reach a growth-rate of 5.8 per cent by the end of the Fifth Plan.

We are naturally perturbed by these foreboding conclusions. Our anxiety to somehow assure for the people of Tamil Nadu a better deal prompted us to constitute the State Planning Commission. This body is preparing a perspective plan to cover the growth potential in Tamil Nadu in the 12 year span from 1972 to 1984.

Tamil Nadu is deficit in power to-day and has imposed a 25 per cent cut on the use of electrical energy with effect from 1st October 1972. The shortage is estimated at 1,750 m.u. constituting about 33 per cent of the requirements for the period October 1972 to May 1973. While this shortage is on account of failure of monsoon and under utilisation of capacity at Neyveli and Ennore, the power deficit is likely to continue even after completion of Ennore Thermal Scheme, Kundah IV Stage (110 M.W.) and Kalpakkam nuclear plant, mainly because of the inadequate augmentation of generation schemes under the Fourth Plan to meet the power requirements in the Fifth Plan period.

Advance action on Fifth Plan Scheme:

The draft Fifth Five-Year Plan envisages an addition of 640 M.W. under thermal, 480 M.W. under hydro and 200 M.W. expansion at Kalpakkam. These schemes, if taken for execution in Fifth Plan Period cannot be completed in Fifth Plan itself and any delay in completion of these schemes before the end of Fifth Plan will lead to power famine in the State.

It is, therefore, suggested that advance action such as placement of orders for the generating machinery, preliminary works like setting up camps, formation of roads, etc., is taken on most of these schemes in the Fourth Plan period itself. With this in view a provision of Rs. 4.80 crores for 1972-73 Rs.26.25 crores for 1973-74 has been made in the plan proposals for 1972-73 and 1973-74. This provision is mainly towards advance payment for generating machinery, cost of steel for penstocks, etc.

Kundah IV Stage :

The work on Kundah IV Stage though sanctioned as early as 1967 has not been taken up for execution since the question of import of machine has not yet been settled. It is necessary to hasten a decision on this.

Long Term Measures :

Tamil Nadu even after the materialisation of 1,720 M.W. of scheme envisaged in the decade plan, will be deficit to an extent of 1,520 M.W. by 1983-84 and 8,410 M.W. by 1990-91.

Even after the completion of schemes envisaged in Fifth Plan, there will be an uncovered deficit of 560 M.W. at the end of 1978-79. To meet this deficit as well as the increase in demand in Sixth Plan, a 900 M.W. thermal plant with a second mine cut at Neyveli and a 970 M.W. second Nuclear plant in Tuticorin regions are absolutely essential. These plants have long gestation period ranging from 8 to 10 years and unless works on these two projects are initiated in the Fifth Plan period itself, these plants will not be ready early in the Sixth Plan period. Hence action may have to be initiated for investigation, and sanction of these projects immediately.

Early action is needed to utilise the surplus waters on the Western Ghats, and the setting up of a new fertiliser factory adjacent to rice belt of Thanjavur district and the creation of suitable organisations to procure agricultural commodities at floor prices.

As regards industries we seek early clearance of the following

major industrial projects—
(1) Industrial Refinery at Tuticorin,
(2) The petrochemical complex at Manali. Along with development of the major port, a ship building yard should also be located at Tuticorin.

The Sethusamudram project, which we have been pleading for over the last decade or more will cut travel time between east and west-coast ports of the country. It has tremendous defence and coastal trade potentialities and deserves to be taken up during the Fifth Plan.

An equally urgent need is to convert Madras-Madurai-Tuticorin railway line to broad-gauge. This is needed in order to enable the Tuticorin port to serve its interland effectively. This falls in line with the accepted policy of Government of India to have a uniform gauge throughout the country.

The East Coast road from Madras to Kanyakumari (via) Tuticorin should also be taken up as a National Highway.



Tamil Nadu Governor Thiru K. K. Shah was greeted by Chief Minister and a large number of people on the occasion of his 65th birthday on 27-10-1972.

EXCITING POSSIBILITIES OF DECENTRALISED PLANNING IN TAMIL NADU

Tamil Nadu was the first State to set up a State-level Planning Commission. It has been followed by some others like West Bengal, which recently set up a State Planning Board. Gujarat brought out, earlier this year, a three-volume perspective plan, which had been developed by a Working Group set up by the Governor during President's rule. However, the major difference is that the plan was not the outcome of the efforts of a body set up by a popular government. Some doubts have been expressed in Gujarat about the commitment of the present government to the plan. As a first attempt at formalized planning at State level, the Tamil Nadu effort deserves study.

The first thing that is worthy of mention is that the document brought out by the State Planning Commission is not a "plan", as such, and has been called "a Draft Perspective Plan-Frame". It is only 16 pages long and contains a minimum of statistics. The operative words in the title are "draft" and "frame". To take up the second word first, the Commission has only attempted to develop an overall framework for the perspective plan. Unlike the Gujarat Working Group, it has not unilaterally attempted to prepare a detailed perspective plan. In Gujarat three academic and professional institutions were associated with Government personnel, namely the Indian Institute of Management, Ahmedabad. The Sardar Patel Institute for Social and Economic Research and the Operation Research Group. Without going into the merits of the Gujarat plan for the time being, what is worthy of note is the difference in the planning processes. The objective of the Tamil Nadu Planning Commission in publishing only a frame seems to be to facilitate and allow for genuine decentralized planning at the district and block levels. The plan-frame has posted the targets, the problem dimensions and a broad choice of strategy. There are no presumptions about particular solutions and projects to be undertaken State-wise. Such a detailed exercise is left to the districts themselves.

The other word "draft" has rather less significance. As against this, the draft fourth five-year plan published by the Union Planning Commission was a more comprehensive and detailed document and as such, allows greater scope for debate. But the brief draft of the Tamil Nadu Planning Commission, about which some debate would probably be in order, appears less open to change in its basic goals and strategies.

The plan-frame postulates a rather ambitious set of targets socio-economic development. In purely financial terms, it sets for the State a target rate of growth of 7.6 per cent each year on *per capita* real income, raising of the savings rate from about 11 to 18 per cent and the increase of the total State outlay on the fifth plan to twice that on the fourth plan. It proposes a similar increase from the fifth to the sixth plans.

The plan-frame also states the major strategic choices which would guide the decentralized planning. In line with the current debate on the so-called new economics, the document states that, while doubling *per capita* real income by 1984 is a major objective, there are other equally if not more important, and instrumental objectives, such as (1) full employment; (2) a minimum needs programme; (3) the reduction of economic and social inequalities in many dimensions—regional, class and caste-wise; (4) the acceleration of social change to facilitate economic growth; (5) the humanizing of economic development; and (6) the decentralization not only of planning but also the implementation of development programmes and resource mobilization.

As considerations governing the strategic choice, particularly worth mentioning is the observation in the document that many countries have achieved a rise in national income through direct attacks on the problems of poverty and imbalance and through an attempt to generate a "plan ethos" at all levels.

Without being over-enthusiastic, one may anticipate certain exciting possibilities of decentralized, State-level planning in India, using the Tamil Nadu plan-frame as a harbinger. The continental economy of India is far too diverse, intractable in its problems and rich in opportunities for unitary planning, unlike an insular island such as the U.K. or Japan. As an analogy, Europe's experience of development is much more relevant. In twenty years or even earlier, we might well witness on this continent a fascinating variety of patterns in economic and social development. Such variety could admittedly create some glaring inequalities. But then it is the function of the Union Planning Commission to solve problems arising out of such incipient inequalities; it is a problem in inter-State relations. But on the positive side, there can be a great release of energy and creativity. The Tamil Nadu document gives evidence of such creativity and energy potential for growth.

Egalitarian principles pervade the plan-frame and might conceivably guide plan formulation and implementation processes in the districts. As a very simple example, the frame refers to absentee—"landowners"—and not "landlords". It is amazing that such a feudalistic expression as landlord should at all be currency in India still. After all landowners is what they are just like owners of other forms of property and productive resource. We do not, for example, think of an expression like sharelord.

Similarly, the plan-frame proposes that all socio-economic factors, which contribute to "hierarchical relations" in society, will be studied and the findings used for legislation and persuasive social action on a voluntary basis. In other words, the attempt is to improve the quality of life more than materially, and a major block to such improvement is identified as hierarchical relations inhibiting participation.

One of the criticisms of Indian planning so far has been that the

mass of the people, who have been, by and large left untouched by whatsoever development may have taken place, have not been enthused and involved. The Tamil Nadu document specifically mentions the utilisation of the cultural heritage in the form of music, drama, literature, poetry, fine arts, films, folk dance, etc., for generating people's enthusiasm and direct participation in decentralized planning and development. One may recall here the genius of many great leaders, who could in a very simple, direct and powerful way use the legends and heritage of people to mobilize energies for development so massive in its effects that it resembled a nuclear explosion. Each in his own way, Gandhi and Mao achieved this in some measure in India and China respectively.

The planners are proposing a direct attack on one of the well-known problems of economic development—the non-marketability of infra-structure investment. One way in which infra-structure investment can be brought within the ambit of market operations is to price the services. The tolls for bridges and turn-pikes are an example. In particular, with the proposed decentralization in resource mobilization operations, the pricing of services will in some measure be essential for local bodies. The document proposes the formation of autonomous boards or councils to look after the development of roads, water-supply, etc. They may impose cesses and taxes for raising revenues.

The documents also accords prominence to science and technology. As an economy, we have so far relied mainly on the import of technical know-how as part of expensive collaboration agreements. There has been talk of the generation of intermediate technology particularly relevant to the needs of a developing economy. The Tamil Nadu Plan-frame specifically envisages the acceleration of the developments of science and technology in order to harness the human material resources of the State.

The document also gives indications of novel ideas which may come up in the course of decentralized planning. An example is the proposal that the State would stress the need for recruitment of fishermen to the Navy because of their seafaring experience.

Quick results bode well for any planning effort. This helps by improving both the resource base and by boosting morale. One such area of success for Tamil Nadu will be the completion of rural electrification by 1973. Although Lenin's dictum that socialism is equal to electricity plus was not meant to be taken literally, it has a poignant relevance in these days of power cuts. With the network of electric transmission lines reaching all the villages, Tamil Nadu has a valuable means for effecting decentralization and for the promotion of growth-centres and regional planning. However, it is only a base, because power shortage will continue even in 1984. While the document envisages development of all sources of power—hydro-electric, thermal and nuclear—the State widely anticipates dependence on a regional grid.

A major challenge in planning which was till recently relegated to minor importance is the organizational strategy. The Tamil Nadu document appears to be an attempt at genuine decentralised planning. For this purpose, it goes beyond the 13 administrative districts and suggests a new concept of "development districts". These will be a homogenous sub-regions. Twenty-three such development districts have been proposed. Training in planning techniques is already under way for district-level planning officers.

The plan envisages a shift, between 1971-84, in the sectoral distribution of income and population. However, the primary sector's share of the population will decline from 63 per cent to only 60 per cent. Will a shift of this magnitude be adequate for the requirements of the Plan-frame?

The perspective plan-frame can be regarded as a first major step in a series of steps to be gone through in any participative planning process. Those familiar with corporate planning at the enterprise level know that a participative planning process may have to go through the following steps:—

- (1) Issue of top management guidelines stating assumptions about the environment, corporate objectives and targets;
- (2) Alternative plans from geographical and product divisions proposing ways of achieving the targets;

- (3) Examination by the top management and the corporate staff group of the plans proposed by the decentralized units;

- (4) A series of discussions and revisions to arrive at a consensus;

- (5) Detailed programming of the plan in readiness for implementation;

- (6) Inter-linking of the plan and the annual budget.

Candidate Schemes

Likewise the Tamil Nadu State planning process may have to go through a sequence of such steps. The State Planning Commission has set up 15 task forces and 13 planning cells in districts to generate various sectoral projects. A tentative list of "candidate" schemes has been mentioned.

Referring to our earlier point about the possibilities of decentralized planning, it is interesting to note that the Tamil Nadu planning emphasises education specifically suited to the genius and needs of the people of the State. Both physical and social scientists are veering the point of view that learning through one's mother tongue is less taxing and consequently, saves greater intellectual energy for innovation. The document also proposes the reform of University education and the introduction of such things as the semester system. Seven major projects for the establishment of centres of teaching, research, etc., have been proposed. These are likely to lead to a great socio-cultural renaissance alongside of scientific progress. At the same time, English education is not "de-emphasised".

Very Modern Ideas

The plan envisages some very modern and progressive ideas. In the plan, the emancipation of women, nutrition and child care assume great importance. The establishment of 12,500 additional homes for the protection of children and the opening of 2,500 creches has accordingly been proposed.

In its pursuit of the quality of life, the Commission have also emphasised the importance of man's environment and the avoidance of pollution of rivers and air.

CHAMUNDI of CHARAPALLAM

by
DR. M. KARUNANIDHI



[The details of this tale are from fancy of course, but nevertheless,
the narrative is based on history.]

It was in the year 1005 A.D. that the Chola Emperor Raja Rajan embarked on the stupendous task of building a towering temple to be named 'Raja Rajecharam' in Thanjavur. That temple was not to be a labour of mere religious fervour; it was to be a memorial of his victories—an embodiment of the devotion to Art that was ever blazing effulgent in his mind.

At a point in history when the world had more or less come to the conclusion that the glory of the Chola Empire had reached its zenith during the reign of Emperor Karikal Chola it fell to the lot of Vijayalaya Chola to hold aloft the Tiger Flag in Thanjavur. And the credit for bringing very many States under that flag and under the sway of the Chola sceptre goes entirely to Raja Rajan I who was the son of Parantaka Chola II.

GOLDEN AGE.

Raja Rajan ascended the throne on June 25, 985 A.D. Since at the time of his enthronement he was a mature and experienced statesman, history described his reign as the "Golden Age". The Chola empire that he established and consolidated, remained in renown for a period of two centuries. For four or five years after his coronation, the clangour of war was conspicuous by its absence in his land. Only the clangour was absent intensive plans were however being formulated space. Raja Rajan strove to bring under the suzerainty of the Chola Empire those kings and princes of the States surrounding his kingdom. Raja Rajan was aware that the rulers of the regions adjoining the Chola territory could any day mount a threat to the security of his State and in order to guard against such a contingency, he devoted all his energies to the task of stepping up the strength of his armed forces, reinforcing the fortifications and providing a firm base to the economy of the land so that the countrymen may be assured of a permanently prosperous life.

Raja Rajan's son Rajendran was a ferocious tiger in valour—a hero of superior strain who could pile up victories in whichever direction he turned. Rajendran's first wife was Panchavan Madevi. Perhaps it was on account of the love he had for his wife that he had adopted the title 'Panchavan Marayan'. 'Marayam' was in the nature of an award or honour conferred on the commanders by the Monarch. Functioning as

Commander-in-Chief right up to the time of his coronation, Rajendran was bent on expanding the domain of the Chola Empire. Like his father, Rajendran too had a fervent ardour for Art. And his wife Panchavan Madevi was one who could bestow on him the treasures of Art in abundant measure.

The competence and capabilities of both father and son and the abiding affection that had come to fruition between them helped to convert the Chola Country into a veritable fortress of steel.

STRATEGY FOR SUCCESS.

If only Raja Rajan had been shallow brained enough to rest content with the thought: "The crown is on my head and the retinue is by my side: the palace is there, well appointed; and above all I am hailed monarch is this not adequate for a joyous life on Earth?"—then he might have been deprived of his frontiers and he might have paved the way for the Chola Country to dwindle and disintegrate. Raja Rajan, however, was a sagacious monarch who had assessed the shape of things to come; and he was a seasoned statesman who had grasped the psychology of his enemies. Therefore he spent a few years in strengthening his defences still further and in adding to his battalions. Then he proceeded to evaluate the enemies with a view to determining who among them were to be wiped out, who could be won over and cultivated on friendly terms, and who all should be subdued and brought under his sway. After drawing up the appropriate strategy, the serried ranks of his warriors stepped out with the Tiger Flag. The valorous sword swirled, of Rajendran alias Panchavan Marayan, who had himself assumed Command of the vast Army. Lightning streaks in tens of thousands emanated from the sword and they took forward the dazzling splendour of his victories.

Marshalling not only elephant-brigades, cavalry and infantry, but also the navy, Emperor Raja Rajan sought to besiege the enemies; and his war-cries resounded like thunder. In the year 989 A.D., the Chola Army entered the Chera Kingdom. The Pandyan Amarapusangan joined forces with the Chera in order to oppose the Chola Army. The engagement took place in the harbour town of Kandaloorchalai where the

Chola forces destroyed all the vessels of the Chera fleet and secured victory. Having conquered the Chera Country, Raja Rajan decreed that his birthday occurring on Sadhayam during the month of Aipasi was to be celebrated there. From the Chera Country the Chola Army went in pursuit of the Pandyan Amarapusan. The harbour Vizhingam fell to Rajendran. The war in these two States lasted nearly four years.

MAGNANIMITY IN VICTORY

After this expedition, Thanjavur proceeded to wreck vengeance on the King of the Kudamalai region. The provocation was that an envoy sent to that State from Thanjavur had been done to death there. Traversing more than eighteen large forest tracts, Raja Rajan destroyed Ootacamund, the Capital city of the Kudamalai Country and scored a brilliant success. Learning from Rajendran that Meeniza, the ruler of the Kudamalai State, had fought with great valour on the field of battle, Raja Rajan made a gift of the city of Malavi to that intrepid monarch.

Much confusion had been engendered in the eastern Chalukyan country on account of a dispute over the title to the throne and Sakthivarman and his clan had been driven out of the State. Raja Rajan extended his support to the exile and enabled him to become kind after putting to rout the enemies. Further Raja Rajan's daughter Kundhavai was given in marriage to Sakthivarman's younger brother Vimaladhittan and thereby the Chola Kingdom strengthened

its ties of friendship with the eastern Chalukyan State.

Later Raja Rajan emerged victorious in a gory war that took place in Kalinga. Declaring war on Gangaipadi, Raja Rajan annexed its capital Thalakadu and renamed it Raja Rajapuram. Nulambapadi fell almost in the same sweep and Thadikaipadi too bowed its head to Raja Rajan. Thereafter came the invasion into Kollam and the war on Kodungolour. On subduing these two States, Raja Rajan earned the title 'Keerthi Parakrama Chola' that is, Chola of unparalleled renown and valour. In his expedition to conquer all the rulers of the western coast, Rajendran took prisoner the Tuluva and the Konkana, inflicted a crushing defeat on the Chera and the Telugu and thus achieved a matchless victory.

CHOLA OF TRIPLE CROWN

As a mark of a success in the Ceylon campaign, Raja Rajan renamed Northern Ceylon as "Mumudi Chola Mandalam". In this war Anuradhapuram was laid waste and Raja Rajan made Polanaruva and the capital of the Cholas in Ceylon. An edict in Thirvalankadu speaks thus of the Chola Emperor: "In order to get to Ceylon, Rama had constructed a bridge with the help of monkey hordes. Raja Rajan, however, did not build a bridge; he simply ferried his warriors across, through the ships of his fleet, and he put to death the King of Ceylon. Thus Raja Rajan is superior to Rama."

Raja Rajan waged a hard battle against the strong King Sathiyangrian of Irattapadi that formed part of the western Chalukyan Country. Although Sathiyangrian was vanquished in this war and went into hiding, he did not lose his kingdom. As a result of this war, Raja Rajan acquired large quantities of gold and other valuables and it was with this enormous wealth that he set about the task of constructing the Big Temple at Thanjavur. The Temple of Art that is Raja Rajacharam of Thanjavur is as the pillar symbolising the victories of Raja Rajan who had conquered the thousands of islands dotting the seas around the peninsula and who had earned the unique title "Chola of the Triple Crown."

Like the unparalleled and valorous personality of that ancient Tamil hero and stalwart Raja Rajan, the temple too towers against the skies and dominates the scene, blazowing forth to the world the Chola Monarch's military prowess, his slogans in the cause of Art and the effulgence of his politics.

How many indeed were the plans that Raja Rajan drew up in order to raise this Temple? Could all his desires in this regard be fulfilled? Was he able to derive the gratification that he could see in the Temple all he had set his heart upon? Alas, no! Why was it so? This story is the answer to that question



THE BASIC APPROACH OF STATE PLANNING COMMISSION IN 'TAMIL NADU

The State Planning Commission has been entrusted with the responsibility of bringing out a "Perspective Plan" for the period 1972-1984. In order to do this, we constituted 15 Task Forces representing 15 sectors of economy. We have also constituted a "District Planning Cell" in the districts. The Development Districts—23 in all in the State will be the units for District Planning which will take into consideration also the needs of homogenous sub-regions in them. Apart from this, the Regional Plans of the Rural Development and Local Administration Department based on agro-climatic conditions for the 8 regions of the State and last but not the least, certain special studies of Industrial complexes, Growth Centres and Techno-Economic Surveys of a few districts, we have undertaken, will also dovetailed into the Perspective Plan.

All the 15 Task Forces mentioned above have completed their work and their reports are fast coming in. The Task Force reports on Education, Science and Technology, Forestry, Agriculture and Fisheries have already been presented to the Chairman of the State Planning Commission. They have also been released to the public. Within the next two or three weeks, the reports of the remaining Task Forces will also be presented to the Chairman and released to the public.

As a prelude to finalising the Perspective Plan Document which will be released sometime after April 1973, the State Planning Commission has already brought out a Draft Perspective Plan Frame. This gives the objectives and a tentative outline of the strategy, the growth rate and the financial outlays required to achieve the objectives. This Draft which has been placed before the State Legislature has been offered as basis for Statewide discussion to enable the Planning Commission to draw up the State's Comprehensive Perspective Plan for 1972-84. Apart from the Task Force reports, the District Plans will also be in our hands shortly.

The Chief Minister being himself the Chairman of the State Planning Commission, whose purposeful guidance and objective suggestions at all times have been the source of great encouragement to the people who adore the Planning body. Being a true democrat, his belief in public debate on all important issues is noteworthy. In fact it is his insistence that unless there is a total involvement of all concerned, viz., Government Universities, Academic Bodies and Institutions, the Plan will have no real meaning and therefore it must be subjected to a public discussion and constructive criticism that has resulted in the organisation of this Seminar.

As far as the man at the grass-root level in the villages is concerned, the State Plan is at the micro level and can be likened to a great thunder that will reverberate and

M. G. RAJARAM, I.A.S.,
Dy. Chairman, State Planning Commission

be felt by everyone in the State. Then only will be have the satisfaction that he is also a direct recipient of the fruits of planning.

Therefore, the objectives and strategy of the Draft Perspective Plan Frame as approved by the Chairman are as follows :—

(a) Doubling the per capita real income by 1984 ;

(b) Efforts to provide Full Employment by stretching administrative, institutional and financial efforts to the maximum ;

(c) Attacking in a selective manner the worst forms of poverty through implementing the Minimum Needs Programme;

(d) Bringing about social justice by reducing economic and social inequalities ;

(e) Accelerating the process of social change necessary for economic growth by transforming the social structure and social attitudes ;

(f) Promoting cultural activities and community participation in them as a means of Humanising Economic Development Programmes and

(g) Decentralising Planning, development and resource mobilisation.

After the National Development Council meeting in Delhi on May 30th and 31st 1972, a National consensus has emerged that the orientation of the Fifth Plan should be towards the provision of employment opportunities and the basic minimum needs of the people. The approach to the Fifth Plan places special emphasis on the basic amenities which meet the needs of those amongst us who are the poorest, and this marks a departure from the earlier plan formulations and programmes. To the Chief Minister of our State who propounded this in a spirited way at the National Development Council meeting in Delhi the people of Tamil Nadu will owe a debt of gratitude for making them partners in this great adventure of planning for ourselves.

'STATESMAN' PRAISES TAMIL NADU

Only Tamil Nadu, acting upon the Elayaperumal Committee's recommendations, set up a chain of Harijan Welfare Boards at the taluq, Revenue division, district and State levels in 1971. The Centre has commended the scheme to other States, but there is a strong case for making it mandatory throughout the country, with the Union Commissioner for Scheduled Tribes at the apex of the hierarchy, says *The Statesman*.

REQUISITES FOR INDUSTRIAL DEVELOPMENT OF THE COUNTRY

“Firm decision on economic policies is the need of the hour” was the opinion expressed in an emphatic way by Thiru S. Madhavan, Minister for Industry at the State Industrial Ministers’ Conference at New Delhi on 19th September 1972.

Thiru Madhavan, raised many important issues regarding Industrial Development in the Country. He pointed out that State Government can only create and build up infrastructure facilities and better climate for Industrial Growth. Thus the other facilities for industrial development can be provided only by Central Government.

The Minister in the course of his address added:

The uncertainty of our economic policies are the main impediments for our industrial development. As Union Minister pointed out we are all concerned with the slow rate of industrial growth in our Country.

I would request the Government of India to take firm decision on our economic policies. We must be clear on our industrial programme in the various sectors. The Government of India should categorically state as to which industries should be in public sector, private sector, co-operative sector, and joint sector. There should not be any symptom of uncertainty on the sector-wise development. We appreciate the policy of the Central Government regarding joint sector. The Government of Tamil Nadu has put up many projects in the joint sector. I would request the Central Government to take a firm clear-cut policy decision regarding monopoly houses in our industrial programmes. I can assure the Central Government that no State Government will support the monopoly houses in expanding their field of activities. But we have to realise the reality that the monopoly houses have got better organisational ability, financial soundness, marketing facilities, technical know-

how and potentiality for industrial activity. While these facilities are available to those houses, there is no use of preventing them from expanding their industrial activity by way of legislation alone. I would appeal to the Central Government to take a firm decision so far as monopoly houses are concerned. There is no use of asking the monopoly houses to develop their industrial activities in the guise of asking them to put up their industries in the backward areas. We must accept that they have all the facilities that are mentioned above. So, the only solution is the takeover of the monopoly houses and through them promote industrial activities. I would suggest to the Central Government to take a decision for nationalising monopoly houses either on the basis of financial investment or on the basis of industry-wise importance, for example, monopoly houses with more than 5 crore investments or important and basic industries. In our country we have not enough expertise and technology for our industrial development. I would request the Central Government to build up enough organisations to collect statistics, prepare feasibility report and project reports and also build up consultancy services. The other factor is about the technical know-how that we have to provide for our industries. There is no use of preaching for adopting indigenous technical know-how. I am sure that nobody in this country will oppose to have our own indigenous technical know-how. But there is always a delay in deciding, whether to adopt indigenous technical know-how or to get foreign technical know-how. In this sphere also the Government of India should take a firm and clear decision. If they think there is enough technology in a parti-

cular field in our own Country whether it is an Indian based industry or a foreign technology available within our Country, the Government of India should have powers to direct those industries to make available the technology to our new industries to avoid undue delay in deciding about technical collaboration. The other important factor is the shortage of raw material.

In the present system, there are various channels of distribution of raw material. For example, Small-scale, Medium and Large-scale industries, etc. There are allegations, whether rightly or wrongly, about malpractices in distribution. I would suggest that within the State all the requirements of all categories must be assessed by the State Government along with the Central Government officials and distribution must be done at the State Level. Then only we will be able to correctly assess all requirements vs. availability of raw materials. So far as financial institutions are concerned, especially nationalised banks, I would urge the Central Government to set up a Permanent Standing Committee at the State-Level to Co-ordinate the activities of the nationalised banks and the Government Industrial Corporations to promote industries within the State. I would also like to point out that States have difficulties not alone from Industries Department in Government of India but more difficulties will come across in other departments. For example, Steel Ministry, Foreign Ministry, Finance Ministry, Petro-chemical and Labour Ministry. I would urge that the Union Industries department must try to co-ordinate the various Ministries at the Centre to help the State Governments in promoting industries,



Devout prayers and pious music formed the Mahatma Gandhi Birthday Celebrations at Gandhi Illam and at University Centenary Auditorium.

HOMAGE TO THE MAHATMA

The Gandhi Jayanthi Celebrations this year, as befitting the year of the Silver Jubilee of our Independence, was marked by competitive reverence for the Mahatma—The Government organised functions at Gandhi Illam and at University Centenary Auditorium while the Governor organised week-long functions at Gandhi Mantap, Guindy.

Homage to Mahatma :

The celebrations at Gandhi Mantap, Raj Bhavan were organised at the instance of the Governor. Piety and patriotic fervour were features of both functions.

The Chief Minister, who inaugurated the celebrations at the Gandhi Mantap in Guindy, said the State had shown the way to the rest of the country in Harijan uplift, the cause uppermost in the mind of Mahatma Gandhi. Tamil Nadu was the first State to take such a bold step as to enact a law for appointment of Harijans as temple priests and trustees. The Government in Tamil Nadu had been following the principles enunciated by Gandhiji in the past and would continue to do so in the future.

Exhibition on Gandhi :

Tmt. Madhuben Shah, the wife of the Governor of Tamil Nadu declared open an exhibition and documentary film shows organised by the Directorate of Advertising and Visual Publicity and the Directorate of Field Publicity (Ministry of Information and Broadcasting).

Tmt. Shah said the exhibition and the film shows were meant to project not only the life and message of Gandhiji but also the high ideal of self-reliance and the march of the country towards this goal which was dear to the Mahatma.

She said that in the Mahatma, they had the example of a leader who practised what he preached and she thought the exhibition and film shows would be a source of inspiration to the people.

TAMARA PATRAS TO FREEDOM FIGHTERS

The University Centenary Auditorium was the venue for distribution of Tamara Patram to one hundred and thirteen Freedom fighters including nine women. This and the ceremonial Unveiling of the oil chekku which V.O.C. was forced to draw as a punishment for his patriotism lent to the function on October 2, a patriotic fervour.

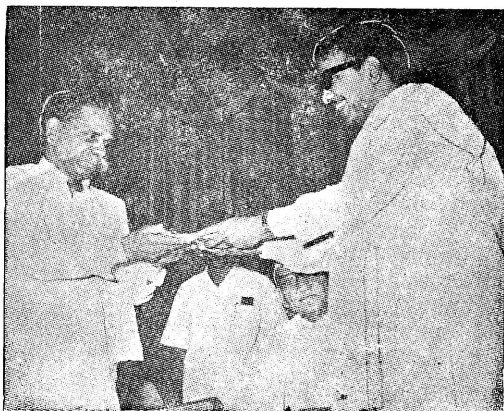
The Tamil Nadu Governor, a Freedom fighter from Gujarat, who was the first to receive the award, said Gandhiji united all the people during the Freedom Struggle. They should take a solemn pledge to stand like a rock unperturbed by differences or provocation. They must consider it their duty to remove poverty and illiteracy. Thiru Shah raising his voice said I am prepared to say from the house top, from my experience in Tamil Nadu, that this State is going to be the bulwark of democracy and socialism in the country.

Unique Occasion :

The Chief Minister said the occasion was unique as the Tamil Nadu Government had always set an example to other States in honouring Freedom fighters. The State Government had recently raised the pension for over 7,000 Freedom fighters from Rs. 50 to Rs. 75 a month. 'To-day we are honouring the Governor who belongs to another State. This only shows how Tamil Nadu is striving its best for national integration', said Dr. Karunanidhi. It was followed by an all party meeting.

Gandhi illam was visited by thousands of people from early morning on October 2. There was non-stop mass spinning and singing. In all, 25 institutions participated in the relay singing and spinning which went on till 7 p.m. Rangoli exhibits were a special attraction. The State Khadi Department did yeoman service in organising the finest spectacle of a large band of volunteers spinning at the Charkha, the symbol of self-reliance. The State Information Department conducted both the functions at Gandhi illam and at the University Centenary Auditorium.

It is beyond words to express the happiness shown by His Excellency the Governor and the Hon'ble Chief Minister when they saw the surging crowd on the opening day of the celebration. In spite of inclement weather and intermittent showers, the green signal given by the Governor to go ahead with the programme proved that people were nearer to Gandhiji and needed some occasion to give expression. Every item of the programme was to the time-schedule and conducted in the best manner possible. The appreciation of the public for such an arrangement in the remotest place of the metropolitan city is a recognition of the services of those who helped them to pay homage to Gandhi. The Police, the Home Guards and the Pallava Transport deserve special mention in this regard. The speakers and the musicians came with a devotional fervour every day, gave their best and enriched the minds of the public by preaching the salient features of the gospel of the Father of the Nation.



Dr. M. Karunanidhi, Chief Minister of Tamil Nadu, is seen presenting the Tamara Patras to Thiruvalluvar K. K. Shah, Governor of Tamil Nadu (Top), Ma. po. Sivagnanam, Deputy Chairman of Legislative Council, (middle) and Tmt. Mrs. Krishna Bharadhi (bottom) on 2-10-72.

Some nations are in the lucky position of having better standards of living than the others. These differences are not due so much to lack of resources as to the different rates of exploiting them, by virtue of their greater advances in technology.

The obligation of providing the better to the less advanced has brought together Norway and India into the "adventure" of the Indo-Norwegian project. The project at Mandapam is the result of an agreement between the Government of Norway and India with the blessings of the United Nations. The project at Mandapam, Tamil Nadu was started in 1963-64.

Aims of Mandapam Project :

- (i) Establishment of Boat Building Yard;
- (ii) Establishment of an Ice Plant-cum-Cold Storage-cum-Freezing storage;
- (iii) Establishment of Fisheries Training Centre;
- (iv) Survey of fishing grounds in the Gulf of Mannar and Palk Bay;
- (v) The Establishment of a Fish Meal Plant, and providing landing facilities and
- (vi) Formation of a fishermen colony.

Boat Building Yard :

The Boat Building Yard is now located in 2 sheds with floor capacity for construction of 28 Nos. of 32 ft. boats at a time. A fully equipped

INDO-NORWEGIAN PROJECT AT MANDAPAM

workshop with facilities for fabrication of materials required for the boat construction programme and for servicing is available at the boat yard. The boat yard employs about 220 persons including carpenters, Blacksmiths, Gaulkers, fitters and supervisory technicians. The total value of machinery, marine diesel engines, tools, etc., contributed by the Norwegian foundation to the Boat Building Yard is Rs. 22 lakhs till date. The Norwegian Naval Architect Mr. Paul Zeiner trained State Officers. The following are the details of boats constructed at this boat building yard from the beginning.

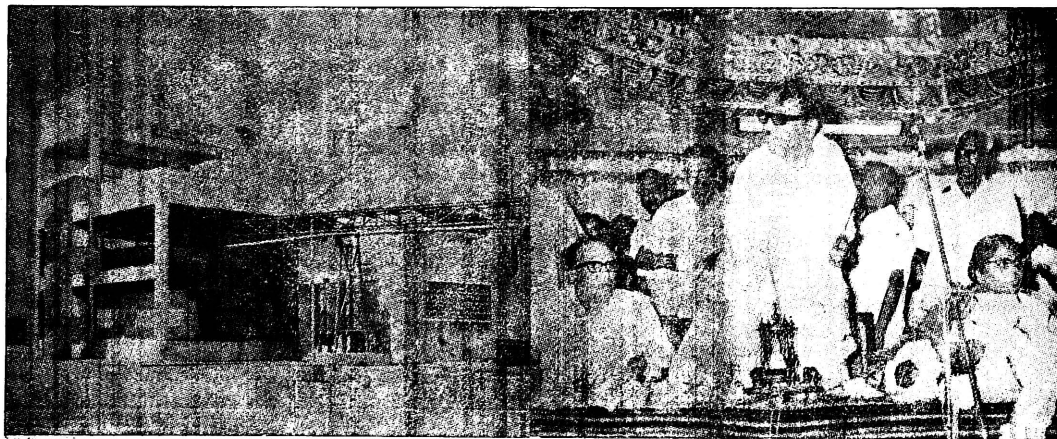
32 footers, 43 1/2 footers.

	Numbers.	Numbers.
1966-67	11	..
1967-68	30	..
1968-69	28	2
1969-70	35	1
1970-71	32	..
1971-72	30	..

THE BIGGEST FISH MEAL PLANT IN INDIA

The Government have also sanctioned the establishment of a Service Centre at a cost of Rs. one lakh and building plans are being finalised for the construction of the same. The Norwegian foundation have supplied special types of tools and equipment not available in India for the Service Centre.

The Norwegian foundation have contributed as aid the entire plant and machinery, costing about Rs. 6 lakhs. In addition, they deputed



The Chief Minister declaring open the Fish Meal Plant at Mandapam,

their Engineers for the erection, operations and training of personnel. The erection work was started during September 1966, trial runnings were undertaken in May 1968 and the plants came into full production in the same month. The capacities of the plant are as follows :—

Ice Plant—15 tonnes per day.
Ice storage—50 tonnes per day.
Cold storage—60 tonnes per day.
Freezing tunnel—8 to 10 tonnes per day.

Freezer storage—50 tonnes per day.

Plate freezer—1.5 tonnes per day.

The entire plant is now run independently by the Tamil Nadu fisheries personnel who have been trained by the Norwegians.

Nearly 200 peeling girls have been trained by Norwegian Processing Experts at this plant for hygienic and scientific peeling of prawns, etc., and filleting of various fish. The frozen shrimps, lobsters and fillets of fish, find a ready market at Madras. With the increased tempo of fishing, it is hoped to take up export of the frozen products from Mandapam to foreign markets.

The fisheries Training Centre was established in September 1964 at the building constructed at a cost of nearly Rs. 3 lakhs. The Norwegian foundation have contributed various equipments like echo sounders, radio telephones, nautical instruments, books on Navigation, Seamanship, Boat Building, etc. Sixty fishermen boys per batch are given to 10 months' training at this Training Centre in fishing using various gear operation and maintenance of marine diesel engines and elementary principles of navigation and seamanship. The Government are giving a stipend of Rs. 50 per month per student during the period of 10 months' training. Hostel facilities have also been provided at no extra cost to them. The following are the achievements.

FISHING GROUNDS

The exploratory survey of the inshore and Deep Sea Grounds in the Gulf of Mannar off Mandapam was one of the important programmes taken up by the Norwegian and Tamil Nadu fisheries personnel. The operations conduc-

ted by M Class fishing vessels of the Indo-Norwegian Project in the inshore area upto 15 fathoms revealed the presence of valuable prawn grounds in 11 to 13 fathoms trawlable at all seasons. These grounds are now being exploited by more than 250 mechanised boats from various coastal districts of Tamil Nadu. Indo-Norwegian Project spared the services of Mr. Christensen, Skipper along with the vessel "M.G. Klaus-Sunnana"

This vessel equipped for deep sea fishing operations has conducted intensive trawling operations ranging from 120 to 200 fathoms. During the exploratory operations Mr. Christensen has discovered valuable deep-sea lobster and deep-sea prawn grounds and he has estimated the potentialities of these grounds as very rich. Incidentally trash fish for the Fish Meal Plant are also available in abundance in these areas. Thus the credit of discovering valuable fishing grounds with an eye on export potentialities has gone to the Norwegian Skipper.

The Tamil Nadu Fisheries Department has sanctioned and constructed 43½ feet. class vessels for fishing in these areas and fishing in the deeper waters are thus intensified by the State personnel as a follow-up of the Norwegian Expert's pioneering work.

Today no part of the catch of the modern fishing industries need be wasted and anything not used for human consumption can be converted into valuable products like fish meal and oil. The biggest Fish Meal Plant in the whole of India has been constructed at the Indo-Norwegian Project, Mandapam, Ramanathapuram District. This plant has a capacity to process 50 metric tonnes of raw materials daily and convert into fish meal. The Plant is automatic and utilises the latest processing techniques and thus maximum efficiency in reduction recovery of bye-product and solids and the maintenance of the quality are also achieved. The protein content of the product is 45 per cent to 60 per cent and is a nourishing diet to the cattle and poultry. The entire plant machinery is an aid from the Norwegian Government. The plant consists of an engine room, a store house, a control laboratory and a transformer house for feeding the plant and other

auxilliary units. The total cost or the plant including the transformes house and other civil works amount to about Rs. 30 lakhs.

The establishment of the Fish Meal Plant at Mandapam has greatly stabilised the price structure of the fishery found on both Palk say and Gulf of Mannar sides of the coast of Mandapam and even at such nearly places as Rameswaram and Pamban. In addition to providing direct employment to nearly 60 workers at the plant and the auxilliary units, it is also estimated that there will be an indirect employment of nearly 1,500 fishermen operating the various mechanised fishing boats for feeding the Fish Meal Plant.

FISHERMEN COLONY.

Twenty-nine acres of patta and poramboke land on the South beach of Mandapam have been acquired for constructing the colony to the fishermen with all amenities. The work of colonisation has been taken up.

A NEW INVENTION.

With the onset of green revolution, the insecticides spraying assumes all the more importance with a view to save the crops from destruction by insects. The spraying of insecticide is normally carried out by powered sprayers or manually-operated pumps. The powered pumps besides being costly are difficult to be handled by an average farmer.

Shri S. S. Khatra of Calcutta had developed a foot operated pump adapted to be used as sprayer when connected to a chamber or container containing the fluid to be sprayed.

The device consists of two small pumps, each comprising a piston running in a cylinder, suitably placed in the heels of specially designed shoes. Just by walking the operator can make the pumps operate alternately under the influence of the pressure caused by his weight on the heels. The sprayer, connected to a chamber containing the insecticide, gets the liquid by the alternate functioning of the pumps and the liquid is sprayed. Due to the light weight of the chamber, it can be easily carried on the back by the operator.

BLUE REVOLUTION IN TAMIL NADU

The commissioning of the Fish Meal plant at Mandapam by Dr. M. Karunanidhi, Chief Minister of Tamil Nadu on 9th October 1972 heralds a good future for fishing industry in the State besides providing boost to the economy of Ramanathapuram district in which it is located. It is the biggest plant in East Asia capable of handling 50 tonnes of fish per day to produce 10 tonnes of fish meal.

The firm foundations laid by the project in the field of mechanised fishing, fish processing and fish marketing, it is believed, will enable the State to build and expand our fishing industry not only to provide employment to a large number of people but also to provide good nutritious food to our teaming millions.

Since Independence India has launched on vigorous fisheries development programmes. Therefore, the progress and achievements of the Indo-Norwegian project have to be considered in the overall perspective of fisheries development in the country as a whole.

Both India and Norway are countries which rank high in world fish production occupying world the 6th and the 7th place among the 15 countries which contribute to more than 50 p.e. of the world fish production in 1970. Whereas in Norway the fishing industry is completely mechanised, India's fishing industry was based on a large number of individual fisherman, using hazardous methods of operation. Norway has advanced in fisheries technology to the extent of complete mechanisation of fishing, fish processing and connected industries during the past generation. In India on the other hand, fishing is essentially concentrated on the inshore belt with low per capita, yield and income. There are also difficult sociological hurdles to overcome in large scale improvement in the Indian fishing industry.

The location of the project in Tamil Nadu at Mandapam, which is a backward region in the State has helped to accelerate the tempo of fishing industry in that region.

GROWTH OF FISHERIES IN TAMIL NADU SINCE INDEPENDENCE.

According to the provisional census figures of 1971, the population of

Tamil Nadu stood at 41.1 millions. The annual per capita consumption of fish was 5.8kgs. This was possible on account of a total fish production of 2.78 lakhs tonnes in the year 1971 made up of 1.58 lakh tonnes of marine fish and 1.20 lakh tonnes of inland fish.

A part from the consumption of fresh fish to the extent of about 63.5 per cent of the catch, the remaining quantity was converted into salted and dried fish or processed to make frozen or canned fishshrimps and lobsters or converted into fish meal. We have been exporting to Ceylon for a long time dried and salted fish which has shown a decline in the last decade. Nevertheless, we have made a good beginning in the exports of frozen products.

Tamil Nadu is situated at a strategic point in the Indian Ocean with easy accessibility to the deep sea fishing grounds. Even though the State has a coast line of 1,000 kms. fishing was so far confined to a narrow inshore belt with about 30,000 indigenous crafts, scattered along 300 and odd landing centres along the entire coast. The development of marine fisheries, which is tradition bound and more in the nature of a subsistence occupation for the fisherman living on the coast into an industry capable of generating employment and substantially contributing to food production, is naturally confronted with various problems.

A suitable design of a fishing boat which can operate on our seas but which will be acceptable to the fishermen from the point of cost had to be evolved. In this context the naval architects of F.A.O. did pioneering work and successfully evolved suitable designs. Gradually, these mechanised boats of 9.1 metres (30) and 9.8 metres (32) found favour among the fisherman of our State.

One of the primary factors which is conducive for mechanised fishing is the availability of certain basic infra-structural facilities like fishing harbours processing plants, quick transport services, etc. Therefore, the successive 5 years plans provided for the establishment of fisheries harbours and landing and berthing facilities. The creation of

such facilities at Cuddalore, Nagapattinam, Mandapam and Rameswaram is the result of such planning. Apart from these minimum facilities in the above places, bigger fisheries harbours at Tuticorin and Madras were also sanctioned. Of these the Tuticorin harbour is in an advanced stage of progress and will be completed by about 1972-73. Work on the Madras Fisheries Harbour will be taken up by the Madras Port Trust as soon as the revised plans and estimates are approved by the concerned authorities.

Currently about 1,200 small mechanised boats including nine 11 metres (36) and three 13.8 metres (43.5) are operating off our coast apart from a few medium and bigger vessels. Among these medium vessels, the Government of Tamil Nadu have commissioned two 17.5 metres (57) steel trawlers, indigenously built. Two more vessels of this type are expected to be commissioned for similar work in the course of a year. A few private companies and entrepreneurs have entered this industry by commissioning boats for offshore and deep sea fishing. Among these, one of the important ventures is the Indo-Icelandic Fisheries Project, who have recently acquired two trawlers from Iceland and commissioned these for deep sea fishing.

■ When the Tuticorin and Madras Fisheries Harbours are completed each of these two will provide space for berthing and anchorage of about 400 small mechanised boats and 50 biggest vessels. This will substantially increase the marine fish production.

When the fisheries harbour facilities are provided and offshore and deep sea fishing grounds are explored, there is bound to be a large response from the leading business houses in the country as well as from the medium class of entrepreneurs to take up deep sea fishing. The development of the marine fisheries in the next one or two decades will be chiefly export-oriented.

Tamil Nadu is in a take-off stage for a rapid blue revolution for exploiting our rich potential of marine fisheries by launching on bold programmes of offshore and deep sea fishing.

GASTRO-INTESTINAL CANCER

By

DR. N. RANGABASHYAM,
M.B. B.S., F.R.C.S., F.A.C.S., F.I.C.S.

Stanley Hospital.

Somehow there is a general feeling among the public that cancer is incurable. The reason for incurability is that we see patients with advanced disease or patients whose general condition is so poor that they are not fit to stand any treatment. Being in my unit we deal mainly with the gastro-intestinal disease. We see patients with gastro-intestinal malignancies.

I wish to discuss some of the common symptoms people develop with gastro-intestinal carcinoma.

Gastro-Intestinal Tract :

The G.I. tract starts from the mouth and ends up in the anus. The food passes from the mouth through the gullet (esophagus) into the stomach. The malignancy can develop in the upper, middle and lower third of the gullet. The gullet being the conducting tube for food, any lesion in the gullet will produce at the earliest, stickiness of the food passing through or some discomfort on taking food. When the tumor is rather advanced, the lesion reduces the circumference of the passage, resulting in difficulty in swallowing or in very advanced diseases the patient cannot even swallow his own saliva. It is rather pathetic to notice that these patients have good appetite but cannot swallow food. Due to lack of intake of food, the patient's general condition runs down and they come to us for treatment when they are just skin and bones. At that stage it takes a long time to make the patient fit for surgery or radiotherapy.

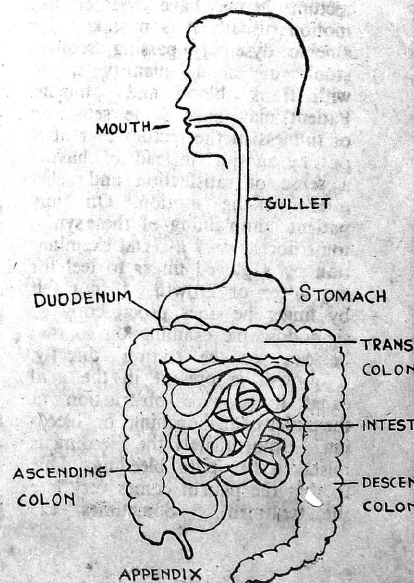
If they come earlier they are submitted for Endoscopy (direct visualization of the esophagus) and if necessary biopsy is taken. In addition, barium swallow is taken so that one is able to locate the site of obstruction. If submitted for therapy at the onset of the disease the cure rate is good. In addition to lung cancer and heart disease, smoking also produces cancer of the gullet.

Another common site for cancer to develop is the stomach. Unfortunately most of our patients come very late due to which our results of treatment are not satisfactory when compared to the rest of the world.

If the patient develops cancer of the stomach, to start with, he may have any of the following symptoms—loss of appetite, distaste for food, vomiting after taking food, vague fullness of stomach after taking food, general weakness, loss of weight and anaemia. Sometimes the patient comes with vomiting of blood, pain in the upper abdomen or back or patient complaining of a lump in the upper abdomen. Some of the above mentioned symptoms can be present in other conditions like peptic ulcer. Sometimes the symptoms warrant medical attention especially if these symptoms occur in apparently normal person above the age of 40 years, the patient needs investigation. In other countries particularly Japan the incidence of cancer stomach is very high. There persons past the age of 40 years are routinely submitted for examination to diagnose the disease at a stage before symptoms appear that is patient has no disability or symptoms (Pre-clinical Diagnosis). Such of these people should be submitted for Barium meal, not well screening and then for

endoscopic examination of the stomach by Fiber Gastroscope. Photograph of the lesion could be taken for further study and cytological examination (Biopsy) can be done from the smear taken from the site of lesion. Unfortunately most of our patients pass the symptoms off as indigestion, stomach upset and general weakness (all they want from the doctor is just a pick-up tonic and they are not even keen to be examined).

Only treatment for cancer stomach is surgery, depending on the site and extent of the disease. A part or the whole of the stomach is removed. Such treatment does not bring about disability. On the contrary they digest the food and even put on weight. The reward of radical surgical treatment is satisfactory if done in an early case. If the disease has spread to the lymph glands, liver or in the blood stream the treatment is palliative or nothing can be done



except for pain to make life tolerable to him as long as he is destined to live. Though the common age group is after 50 years, our youngest patient was 24 years and the eldest was 70 years.

The next common site is the large intestine. The large intestine starts from the caecum and ends up at the anus.

If the proximal colon (caecum and ascending colon) is involved by cancer the growth is like a cauliflower and the patient may complain of dark coloured motion (due to blood), pain over the right side of abdomen, anaemia due to loss of blood. Unfortunately such patients do not develop much symptoms until the disease is advanced. As the motion is becoming solid due to water absorption, if a growth develops in the transverse colon, descending colon or sigmoid colon patient develops obstructive symptoms that is the motion cannot pass through the narrowed passage. So the patient cannot pass motion and gas easily. In addition pain is also super added. If the growth bleeds he may pass blood in the motion. Due to the type of lesion it may present with constipation, maelenic stools (black motion due to blood), due to obstruction. He may develop fullness due to obstruction.

If the growth develops in the rectum he may have dysentery like motion (usually it is mistaken for amoebic dysentery) passing frequent stools of small quantity mixed with frank blood and mucus. Patient may have some sensation of fullness in the rectum ever after passing motion instead of having a sense of satisfaction and relief after passing motion. On any patient complaining of these symptoms doctor does a rectal examination by a gloved finger to feel for any ulcer or growth. If not felt by finger he does proctoscopy or sigmoidoscopic examination so that he can see the rectum directly. If growth is present in the anal canal it produce obstruction at the outlet of anal opening or bleeding. Unfortunately the bleeding is mistaken for piles bleeding. Due to that the patient comes very late the treatment. Sometimes the

dysentery is mistaken for amoebic or bacillary dysentery or sometimes as stomach upset. If a good course of medical treatment is given and still the patient develops recurrences one should extensively investigate the patient. Early stage of large intestine cancer is curable like any other disease and has good progress.

If the patient has growth in the large intestine upto the sigmoid or proximal colon removal of the colon with the growth is done and the continuity is maintained, so that he can pass motion via the anal orifice. If the growth is present in the rectum and anal canal, the rectum and the anus have to be removed and the patient passes motion via an artificial opening made in the abdominal wall by pulling the colon outside—colostomy.

I would like to conclude my article stating when you SHOULD report to your family doctor for his advice and opinion and if need be he will send you to a specialist for expert opinion.

Do not ignore :

1. Difficulty in swallowing.
2. Anaemia and loss of appetite or indigestion.
3. Unusual bleeding from any orifice of the body such as vomiting blood, passing blood in the motion.
4. Change in the bowel habit—
 - (a) Sudden or gradual onset of constipation.
 - (b) Passing mucus and blood per rectum uncontrolled by medical treatment.
 - (c) Sense of fullness or incomplete evacuation even after passing motion.
 - (d) Gas trouble vague fullness of the abdomen with or without pain.
 - (e) A lump felt in the abdomen.
 - (f) Loss of weight due to unknown reason and general weakness not well accounted for.
 - (g) On and off fever due to unexplained reasons.

The above mentioned symptoms may be due to a minor condition or may be due to malignancy. So don't ignore the symptoms. ☉

There is a special clinic in the Government Stanley Hospital for diseases of the stomach and intestines. This Gastro enterology clinic functions on Mondays between 2 p.m. and 4 p.m. Here patients are treated regularly and their progress followed up for periods more than 6 years.

Gastro enterologist, Dr. N. Rangabashyam, M.B.B.S., F.R.C.S., F.A.C.S., F.I.C.S., is the Chief of the Gastro Enterology clinic of the Government Stanley Hospital, Madras. He went to Japan as a visiting professor and he had his training there in endoscopy of diagnosis of early Cancer stomach and large intestines.

His work has won him international repute and he has become the fellow of International and American Colleges of Surgeons.

Dr. Rangabashyam's Surgical Unit consists of Dr. Krishnaraj, M.S., Dr. Ramakrishnan, M.D., and others namely Dr. V. Arumugam, Dr. M. Ramanathan, Dr. A. Sethu, Dr. P. Shanmugam, Dr. C. Mohan, Dr. B.A. Anantharaman, Dr. Shanbouge, Dr. Jagadesan. In the Gastro enterology clinic, about 1,000 cases have been examined and treated. Of these, 600 cases have been treated without operation. Operation is resorted to only under inevitable circumstances, and the operation has been successfully performed in many a complicated case. Operation is done for carcinoma of oesophagus (gullet) stomach and liver. Now partial removal of liver or pancreas is also done for carcinoma with good results.

Dr. Rangabashyam says that stomach disorders are found mostly among the poorer sections in India because of lack of nutritious diet. Lack of nutrition is one of the main causes of stomach troubles, particularly protein.

He approaches the patient taking into account all their professional, social and economic conditions.

He gives us his medical suggestions through *Tamil Arasu*.

HISTORY AND LANDSCAPE OF SOUTH ARCOT DISTRICT

The district of South Arcot is a barren, scorched area and has remained all these years a comparatively backward tract of the State of Madras, both in agriculture and industry. It has, however, an important place in the tourist map of the State, thanks to the historical monuments, edifices, sacred and ancient temples that it contains.

With the setting up of the Neyveli Lignite Corporation it has an important role in the economy of Madras State. The district may in course of time become an important Industrial centre.

The famous Saivite temple of Chidambaram is located in the district. It is an ancient temple of South India and is associated with the concept of Nataraja. The fort at Gingee is a historical monument of beauty and attracts tourists.

The Annamalai University, is located in the district. It is a residential University, having varieties of courses of study. More than that, it has acted as a centre of Tamil language and culture and stimulated several studies.

The district has a chequered history, studded with several interesting episodes of English and French rivalry. It has a fairly equable climate, a few rivers and has little forest but an abundance of minerals in its lignite mines. Any development will primarily depend on the proper use of lignite found in the district.

The coastal district of South Arcot has an area of 4,208 square miles or 10,899 square kilo-metres. It lies on the east coast and to the south of Chingleput district. It is bounded on the north by the Chingleput and North Arcot districts and on the south by the Thanjavur and Tiruchirappalli districts. While the district faces

the sea on the east, it is flanked on the west by North Arcot and Salem districts. Vellar, an important river of the district along with its tributaries, Vasishtanadi and Swetanadi, forms the boundary between Tiruchirappalli and South Arcot districts for approximately 36 miles. The river Coleroon (branching off from Cauvery and also called Kollidam) forms the boundary for 36 miles between South Arcot and Thanjavur districts. Besides the sea barrier on the east, yet another natural border for the district is the Kalrayan hill range which divides South Arcot from Salem and stands on the extreme west of Kallakurichi taluk. Stretching out from Marakkanam in the north to the mouth of Coleroon in the south, the coast line of the district has a total length of sixty-five miles. The northern and western limits of the district are not defined by any well marked natural divisions.

The district has come to be called South Arcot because it formed the southern portion of the area under the sway of the Mughal Nawab of Arcot, during the first decade of the 18th Century. The Arcot regions lay south of the river Palar and the regions constituting South Arcot formed the southern division of the original Mughal Subah of Arcot. This division was made to distinguish it from the northern division of Arcot. Pondicherry lies to the east of Villupuram taluk on the sea coast and north of the Ponnaiyar river.

The district is for the most part a flat plain sloping gently from the west to the sea on the east and also from the north to the south except for a strip of high ground running across the district from Pondicherry to Vriddhachalam. The hills of the district are the Kalrayans, on the south-west border, the Gingee

(Senji) Hills to the south-west of Gingee, the Mount Capper Hill near Cuddalore and the Red Hills to the west of Pondicherry.

The region can be distinguished into the following natural divisions. On the west, the Kallakurichi taluk and the neighbouring regions with the Kalrayans Hills and their undulating valleys are noted for dense woods and green jungles, thus reflecting the unfading charm of nature. The eastern region consists of red-soil tracts and wide-spread paddy fields and green groves of fruit bearing trees marked here and there by broad open-tanks a special characteristic of these parts. The most uninviting part of all regions in the district lies to the north Tirukoilur taluk, possessing mostly arenaceous and virtually barren soil.

On the contrary, the lands in the south, especially those around Gingee Hills are the most fascinating. The presence of numerous hills and hillocks of fantastic shapes, the thick jungles that go with them, the wide expanse of green fields, with fine palmyra trees rising all along their borders and fine patches of blue water in open tanks here and there make up the best scenery of the district.

The southern region of the district, particularly Chidambaram taluk and a few parts of Vriddhachalam taluk, is comparatively green and fertile and is made up of a level expanse of irrigated land which resembles to a great extent, the deltaic part of Thanjavur district. This is in contrast to the rest of the South Arcot district. The sea shore is fringed with a belt of blown sand of Varying width.

Soils of the district are of three varieties, namely, the Tubduvanam area is sandy with 75 per cent of coarse fractions, sandy and fine sand. The soil depth varies from

to 24 inches. The soils are alkaline, with moderate soluble salts with a trace of calcium oxide and magnesium oxide. The soils contain a fair amount of total lime. They are poor in organic matter, nitrogen and phosphoric acid and potash. With the exception of black soil tracts, the district cannot be said to be fertile. In spite of little or no manuring, and the low fertility, the district is renowned for sugarcane and groundnut cultivation. Besides fertile soils with good drainage facilities, sugarcane is grown on a variety of soils, clayey, red loam and sandy. Paddy is raised largely in Chidambaram taluk. Cumbu is the chief crop in soils, red, black and arenaceous. Red ferruginous soil is the predominant variety and it covers over 60 per cent of the area of the district. The comparatively fertile black soil is found mostly, in Chidambaram, Vriddhachalam and Cuddalore taluks. The first two taluks contain over 50 per cent of the black soil area of the district. Red soil covers large extents of Gingee, Tirukoilur and Kallakurichi taluks.

The arenaceous (both loamy and sandy type) soil is found along the coast in the taluks of Chidambaram, Cuddalore and Tindivanam and such area is used for casuarina plantations. Except Gingee, the black fertile soil is found in all the districts. Due to the imperviousness and the moisture-retaining capacity of the black soil, it is best suited for wet and garden cultivation alike. The red soils are suited for dry crops like groundnut and pulses as they are very easily ploughed and require a smaller quantity of rain for sowing.

Past History.

When the Chinese traveller Hieun Tsang visited South India during the 7th century B.C., South Arcot regions formed part of the Tondaimandalam. During the Sangam-age (the first 300 years of the Christian era), South Arcot along with the rest of Tondaimandalam territory had passed into the hands of Cholas. Karikala Chola (50—90 A.D.) defeated the combined forces of the Cheras and the Pandias on the Plain of Vennil (in Thanjavur) and later made an alliance with the Cheras and established friendly relations with the ruler of the Pandian Kingdom.

During the Pallava regime, the Cholas were overthrown by King

Simha Vishnu. South Arcot regions were under Pallava rule for a few centuries only, for they were overpowered by the Pandias. New Chola dynasty founded by Vijayalaya was consolidated by his son and successor Aditya-I (871—907 A.D.) who annihilated the Pandian power at first and later subdued the Pallavas.

South Arcot continued to remain under Chola supremacy along with other regions of Tondaimandalam since Aditya-I was followed by a succession of powerful rulers. The later Chola rulers of 10th Century A.D. were weak and finally along with the rest of the Chola empire, South Arcot regions passed into the hands of a new dynasty called the Eastern Chalukyas.

For a time, the Cholas regained their lost supremacy with the assistance of the Hoysalas of the North. But, with the rise of Jatavarman Sundara Pandia-I (1251) Chola supremacy came to a close, Sundara Pandia routed the Hoysalas and defeated the Cholas and established Pandian power over South Arcot regions.

The sway of the Pandian Kings over the regions lasted little over 50 years. Cheras had little difficulty in over-running the Chola Kingdom. Sundara Pandia again defeated the Cheras and ruled for a short period. The last monarch of the line, Parakrama Pandia was defeated by Ulugh Khan, son of Chias-ud-din Tughlak.

Muslim domination of South Arcot lasted from 1334 to 1378 A.D. The Muslim rule as marked for its persecution of the Hindus. By 1378, South Arcot region came under the rule of Vijayanagar Kingdom. At that time Gingee comprised of almost the whole of South Arcot district and was ruled by petty chieftains.

Nayakship in the region began in 1510 A.D. when Tubakki Krishnappa Nayaka was appointed Nayaka of Gingee. Besides renovating the Gingee fort, he strengthened his position. By about 1610 Gingee fell to Muslims for a while. Gingee Nayaka continued even after the battle of Talikota. The

forces of Bijapur took Gingee from the Golkonda army which was the first to take it.

From 1648 to 1677 A.D. South Arcot was under the control of Bijapur generals. It was in 1677 that Shivaji took Gingee area with the assistance of Golkonda forces. In 1680, Hariji the Maratha chief of Gingee area asserted his individual position. He encouraged the English people to settle down in his territory and thus caused the establishment of factories at Cuddalore, Kunnimedu, Forto Novo, etc.

The Mughal emperor Aurangazeb had an eye on Gingee and after prolonged fightings, the Gingee fort was stormed in 1697 by Zulfikar Khan and it fell into the hands of the Mughals in January 1698. For a time Gingee was under a Hindu chieftain (or Governor) Sarap Singh. During this period, South Arcot suffered due to group rivalries of the Nawab of Arcot, the Nizam and the two foreign powers—the British and the French.

In 1740, Safdar Ali assumed office as Nawab of the Carnatic when Dost Ali and his son Hasan Ali were killed by the Marathas. In 1743, Anwaruddin was installed as Nawab by the Nizam. During the Mughal regime, both the English and French acquired settlements in South Arcot for their trading purposes. During the Anglo-French rivalry, South Arcot district was turned into a cockpit of war. After severe fighting, Gingee fell into the British hands in 1760.

The invasion of South Arcot by Hyder Ali in 1780 was resisted by the English-General, Sir Eyre Coote. In 1782, the French joined hands with Hyder Ali in order to take Cuddalore. Hyder Ali's son, Tippu Sultan later stormed Cuddalore and captured it. In 1783, the place was restored to the English.

The Rivers.

The river system of the district is simple. All the rivers flow from west to east into the Bay of Bengal. The chief of the rivers that flow from north to south are the Gingee river also known as the Varahanadhi, the Ponnaiyar, the Gadilam, the Uppanar, the Vellar and the Coleroon.

The principal river of the district is the Pennar or the Ponnaiyar. Rising in the Chenna Kesava Hill, east of Nondidurg in Mysore State and crossing the Salem district and the southern tip of the North Arcot district, the river centres South Arcot district through Tirukoliur taluk where it receives the waters of Tirunjalur flowing from Tiruvannamalai. Later, the river flows across Tirukoilur taluk and along the boundary between Cuddalore and Villupuram taluks and empties itself into the Bay of Bengal, about three miles north of Cuddalore.

The Gingee rivers rises in the extreme north-west corner of Gingee taluk. This river is also called Sankarabharani or Varahanadhi or Sengi river. Flowing past Gingee taluk in a southerly course into the Villupuram taluk, the river receives on the left Tandaiyar and on the right the Kallar and the Pambayar and empties itself in the Bay of Bengal near Pondicherry. The northern outlet is called the Ariyan-kuppam river and the southern outlet Kilinjir or Chunambar.

Rising the eastern part of Tirukoilur taluk the Gadilam river flows through Tirukoliur and Cuddalore taluks. In Cuddalore taluk, it is joined by Malatter on the right and then it flows into the Bay of Bengal at a point, just north of Cuddalore. This river carries very fertile silt.

The Ponnaiyar and the Gadilam are connected by a river course called the Malattar which serves to carry the surplus waters of the former into the latter.

The Coleroon which splits off from Cauvery river in Tiruchirappalli district is more a river of the Thanjavur district. It flows on the southern boundary of Chidambaram taluk for 36 miles and joins the Bay of Bengal, six miles south of Porto-Novo.

The Vellar river is formed by the junction of the rivers Vasishtanadhi and Swetanadhi which rise in Salem district. The Vasishtanadhi enters the South Arcot district through the Attur pass just south of the Kalrayans and forms the boundary between the district and Tiruchirappalli for sixteen miles. After it joins

the Swetanadhi, the united streams still follow the boundary and the river flows for another twenty miles gathering the waters of Manimukthanadhi, Gomukhanadi, and Mayuranadi which drain the eastern slopes of the Kalrayans. The river then passes through Chidambaram taluk and joins the Bay of Bengal near Porto-Novo.

There are backwaters on the Sea-coast caused by the sea-water breaking into the water courses of streams and rivers. These backwaters are found near Cuddalore and on the east coast of Tindivanam taluk. A typical back water is the Kaluveli swamp in Tindivanam taluk which is 31 square miles in extent.

Forests :

The forests of the district can be divided into three groups, that on the Kalrayan Hills, that on the high ground and on the lower Gingee Hills and that on the coast in the Kalrayans the forests are of ever green type on the highest elevations and in the moist and sheltered ravines and deciduous belt they extend eastwards for a considerable extent. The mixed forests occur in the Gingee area where the ever green type dominates over the deciduous type. In the coastal areas, the forest is chiefly ever green and is associated with several deciduous varieties of trees.

The district cannot be considered rich in forests. Its reserved forests are included in the Cuddalore and South Salem Forest Division. The total forest area of the district forms about 5 per cent of the total area of the district. Nearly two-thirds of the forests of the district are found in the three western taluks of Kallakurichi, Tirukoilur and Vriddhachalam. In Chidambaram, the forest area is comparatively smaller than elsewhere.

Mineral Resources :

The peculiar geological feature of the district has given us one of the richest mineral resource in the lignite or brown coal in Neyveli regions. The gneissic formations are mostly in evidence in the west of the district, from Tyaga Durg in the south to the Gingee Hills in the north. The next, the fossiliferous cretaceous lime-stones are

exposed in only two limited areas—a piece of country fifteen miles by five round about Parur, six miles north-west of Vriddhachalam, and an area some 12 miles by 6 lying between the Red Hills west of Pondicherry and the high ground round Tiruvakkara.

The Cuddalore sandstone formation which is a more recent sedimentary deposit in this part forms the Red Hills near Pondicherry and the Mount Capper Hills south-west of Cuddalore. The alluvial beds are two in number, namely, that of the Vellar and that of the combined Ponnaiyar, Gadilam and Gingee rivers.

Lignite is found to occur mainly in two areas of the district, in the Aziz Nagar region and in the Neyveli tracts. Neyveli is situated nearly 20 miles south of Cuddalore and the brown coal here is now being exploited lignite, which lies under an over-burden of about 180 to 220 feet covers an area of about 100 square miles having a probable reserve of about 2,000 million tons. Associated with the lignite, there is a vast reserve of white refractory clay.

Iron ore is also found to occur in limited quantities along the banks of river Pennar in Kallakurichi taluk. Laterite is found over a wide belt of the country between Pondicherry and Vriddhachalam, in the red soil tract round about Srirushnam and Palayamkottai and to the east of Vriddhachalam. Limestone occurs in Pondicherry and the neighbouring areas of Tindivanam taluk. Clay deposits are found in large numbers. On the Kalrayan range and in Kallakurichi taluk, magnetic iron ore occurs. It is found in small sizes in a few other areas of the district. Fine clay deposits are found in places like Pannikuppam, near Panruti, Maligampattu, Tiruvendipuram, etc.

In spite of the absence of fertile soil and perennial rivers, the district compares favourably with other districts and does not lag behind. The presence of numerous streams, streamlets, tanks and wells tater to the needs of agriculture while the mining of lignite has ushered in the era of heavy industrialisation in the district.

VEERANAM PROJECT

A GREAT ENGINEERING FEAT

Madras, the fourth biggest City in India, is not unoften beset with acute shortage in drinking water-supply as its source of supply, i.e., two tanks in a nearby area, is rainfed. Further the City's population is expanding at a faster rate. As it has become the recurring problem of the City's administration every year, the Tamil Nadu Government have embarked upon a big water-supply scheme to get perennial water-supply to the capital City of Tamil Nadu. This scheme has come to be known as the *Veeranam Project* as the water for the scheme is to be drawn from the Veeranam Tank in the South Arcot district.

The estimated cost of the scheme is Rs. 21.30 crores and is designed to supply 40 MGD. The Veeranam Project works have been taken over by Tamil Nadu Water-Supply and Drainage Board and the project works are under execution now, the progress of work nearing the peak.

The Scheme :

The scheme is for taking 40 MGD of Water from Veeranam tank in Chidambaram taluk, pumping it from Veeranam tank to treatment works at Vadakuthu and pumping it again to Madras after treatment. The water is to be conveyed to Madras by 167 mm. (66") diameter prestressed cement concrete pipes for a length of 219-kilometres.

The works involved are : Construction of an intake tower in Veeranam lake, construction of connecting conduit 200 mm. long connecting the lake and the sump, construction of sump and pump house and erection of pumpsets for pumping raw water from Veeranam tank to treatment works at Vadakuthu, laying 66" diameter prestressed cement concrete pipes for raw water main, construction of 40 MGD treatment plant at Vadakuthu, construction of sump and pump house and erection of pumpsets for pumping clear water, laying pipe line up to Madras, construction of bridges for road, railway and river crossings and fixing section valves, air valves, scour valves, break pressure tanks, etc.

Veeranam Tank :

The Veeranam tank is a major irrigation tank in Chidambaram taluk in South Arcot district. It is one of the biggest in the State with a water spread of 25.90 sq. km. The maximum width of the lake is 5.64 km. The tank has an ayacut of 18,000 h.a. (44,500 acres). The scheme has been so designed as not to effect the irrigation interests under the tank adversely.

Intake Tower :

The Veeranam tank is about 16 km. long from Lalpet at its southern end to Sethiathope at its northern end. It is proposed to tap the water from the northern end of the tank near Sethiathope. An "Intake tower" has been constructed inside the lake at this point. This is a complete reinforced cement concrete structure, octagonal in shape. The size of the Intake tower is 34 ft. dia. (inside) between two opposite faces and it is 24' 0" deep. Water will be drawn from the lake into the Intake tower through the openings left in each of 6 faces. The openings are provided with steel shutters. Openings are provided in different levels so that surface water for about 2' 0" depth alone is drawn into the tower. This is essential for a drinking water-supply scheme. Provision has also been made for drawing another 40 MGD of water if found necessary at a later date and if there is surplus water in the tank.

Sump, Pump house and Pumps :

The water from intake tower will be taken out across the tank bund and led into a sump through a twin box reinforced cement concrete tunnel like conduit of size 4'-3" x 4'-0" each. This work on the conduit 200 m. long has also been completed now. From the sump raw water will be pumped to treatment works at Vadakuthu by 6 pumpsets (including 2 Nos. of standby) of 450 H.P. each at the rate of 30,450 gallons per minute. A pump house will be constructed at head works to house the raw water pumps.

Treatment Plant :

A 40 MGD treatment plant is under construction at Vadakuthu. The raw water received from head works will be subjected to chemical treatment consisting of application of lime and alum. Water after chemical treatment will be led into 4 clarifloculators 150' 0" dia. and each having a capacity of 10.5 million gallons for coagulation and settlement. The water will then be filtered through rapid sand filters and after filtration it will be chlorinated. The treatment plant will have a capacity of 18,27,000 imperial gallons per hour.

Clear water reservoir, sump, pump house and pumps :

The filtered water will be stored in a clear water reservoir having a capacity of 2 million gallons and it will be led into a sump to be pumped to Madras by 6 Nos. of pumps 600 H.P. each at the rate of 27,770 gallons per minute.

As already mentioned, the raw water and clear water will be pumped into and conveyed by 167 mm. (66") diameter prestressed Cement concrete pipes for a length of about 219 km.

Two factories have been set up one near Thirukalukundram and the other near Panruti for manufacturing P.S.C. pipes 66" dia. and the factories have reached the production stage. Each pipe will be 6 m. long and about 36,500 pipes will have to be manufactured. The pipes will be laid underground almost throughout its length, in trenches 9' to 11' depth, the top of pipe being 3' to 5' below ground level. Thiruvalargal Satyanarayana Brothers (Private), Limited, Madras, in collaboration with the Vaccim Concrete Company Athens are the contractors for manufacturing, conveying, laying and jointing these huge prestressed cement concrete pipes.

Prestress of the Component works :

The intake tower in Veeranam tank and the connecting box conduit 200 m. long have been completed. The construction of treatment plant at Vadakuthu has been taken up

by the Contractors Thiruvallur Asia Engineering Company and is in full swing. The contract for the manufacture of pumps has been awarded to Thiruvallur Chandrie and Company Private Limited, Madras and the pumps are being manufactured by the firm. Sluice and other valves are also being manufactured.

Land acquisition for the land required for the pipe line and other component works is nearing completion. Excavation of trench for laying the pipe line has been taken up in almost all places from Sethiathope to Madras and it has been completed in many reaches and kept ready for laying the pipe line.

The pipe line is to cross major rivers like Vellar, Gadilam, Ponnai, Kiliyar, Palar and Adayar and it has to cross national highways, and other roads as also the railway line in 3 places. Construction of bridges for road crossing have been taken up in almost all places and it is in different stages of construction. One out of the three railway culverts has been completed. The second one is in progress.

River crossing works.

The river crossing works across Adayar, Palar, Ponnai, Gadilam and Vellar are the major component works of the project and the works across Adayar, Gadilam and Vellar have been taken up and are in progress.

Power supply.

The Tamil Nadu Electricity Board have sanctioned the required power for the raw water pumpsets at Sethiathope and clear water pumpsets at Vadakuthu. Two 110 KV. sub-stations are being erected by the Electricity Board one at Sethiathope and the other at Vadakuthu. The sub-station at Sethiathope is nearing completion and that at Vadakuthu is being taken up.

SCHEME FOR WATER-SUPPLY TO RURAL AREAS.

The Veeranam Project is a project of the Tamil Nadu Water-supply and Drainage Board. What is more important is that a crash programme for providing protected water-supply to the entire rural belt

in Tamil Nadu, costing over Rs. 40 crores has been drawn up and is being implemented in stages.

Thiru Kandappan, Chairman of the Tamil Nadu Water-supply and Drainage Board has worked out the *per capita* cost of the water-supply schemes as being around an average of Rs. 100. The cost was high as Rs. 170 in Dharmapuri, the reason being that the source of water was far removed from the distributing end. The real trouble was in respect of rural areas, where it was not possible to recover the cost of the schemes from the poor. Hence a scheme to pool contiguous areas and give them supply from a centre common to a group of villages was being worked out. The Government was footing the bill for small panchayat areas. In respect of urban areas the State grant basis had been given up. There were 740 towns in the State with a population of 5,000 and more in each and the Board had hardly covered 200 towns so far with protected water-supply.

The crash programme has already been launched in Dharmapuri and Ramanathapuram districts and Rs. one crore worth of works would have been executed by the end of March 1973. Already 150 feet deep wells are being taken up with the aid of scientific instruments provided by WHO, UNICEF and the Central Government. Rigs and related instruments resistivity motors, etc., were in use and trained geophysicists were at work. Out of 150 wells sunk only six had failed to hit the water source.

It had been estimated by a survey that there were 5,800 areas in the entire Tamil Nadu requiring water-supply. Four thousand and odd had absolutely no water source, 2,000 were chronically endemic areas, where water-borne diseases abounded and 11,000 were having some supply, but it was quite inadequate. The Rs. 40 crore allocation was to provide protected water to these needy areas.

Round-the-clock supply.

For ensuring purity of protected supply, the Chairman feels if there was round-the-clock supply, the contamination of pipe water was minimised, because contamination came mostly from water logged low-lying areas where the seepage was high and any pinhole in the pipe

would be enough for the enveloping foul water to flow into the pipes, especially when there was no flow therein. Therefore the Tamil Nadu Water-supply and Drainage Board is trying to see if such a round-the-clock supply could not be experimented upon in some towns and cities. Stringent checks and inspection of water mains and the water flowing therein must be done periodically and the Board had plans to do it.

Not even a half a dozen towns had comprehensive drainage. The Central Government conducted a health survey throughout the country and has isolated 11 towns in Tamil Nadu as health hazards and Kumbakonam figured in that list. The Water-supply and Drainage Board was therefore, trying to implement the drainage scheme in these towns first, including the work of re-starting the Kumbakonam Drainage Scheme given up mid-way long ago.*

IMPROVED TRACTOR.

Conventional tractors are provided with the well-known three-point linkage and single-acting hydraulic ram for lifting, holding and lowering of mounted implements. The drawback of this system is the complicated design and the inconvenience to the driver in having to manipulate two or more control levers.

The indigenously developed 'Swaraj' tractor incorporated a novel simplified hydraulic system that can effectively control the working depth of single operating lever. The new system also incorporates a new type of control valve and associated linkage and the necessary feed-back mechanism with a pump combination.

The single lever automatic depth-cum-position control system has improved the manoeuvrability of the 'Swaraj' tractor so as to suit the operational needs and ground conditions particularly in small fields. The development has placed the indigenous tractor in a more advantageous position vis-a-vis other tractors currently being manufactured in India under foreign collaboration. The improved tractor has been licensed for commercial exploitation to Punjab State Industrial Development Corporation Limited, Chandigarh.

CENTRE OF ADVANCED STUDY IN MARINE BIOLOGY AT PORTO NOVO

The 'Centre of Advanced Study in Marine Biology', Porto Novo, is an integral part of the Department of Marine Biology of the Annamalai University and was started in October 1963. It has since developed considerably and found a place on the map of the world. It has certain unique opportunities for marine biological work and has been striving hard to avail them for original investigations of a high standard.

Biological Opportunities.

The location of the research laboratories at Porto Novo affords a wide range of excellent opportunities for estuarine and marine biological studies. The estuary, backwaters, neritic waters and fresh water head of the estuary are all easily accessible from the laboratories. The region is also interesting on account of the dense and extensive mangrove swamps and the presence of sub-marine canyons at about fifteen miles from the laboratory.

The biological potential of the locality is rich and varied and available for study practically throughout the year. The plankton and interstitial fauna are particularly rich. Checklists have been prepared so far for 350 species of fish, 150 species of diatoms, 50 species of yeasts, 60 species of polychaetes, 100 species of molluscs, 60 species of copepods, 60 species of crabs and for representatives of other small groups.

Equipment :

Two sea worthy 33' boats, fitted with diesel engines are available for work in the inshore waters. Two smaller boats with out-board motors, and a dug-out canoe are available for work in the backwaters. Equipment is available for investigations in hydrography, planktonology and marine and estuarine ecology and for some aspects of biochemistry, microbiology, cytology, embryology and physiology.

The 'Centre' has a good library. Collected reprints of published papers and proceedings (or abstracts) of Seminars are issued periodically.

Teaching method :

The Department of Marine Biology and the 'Centre of Advanced Study in Marine Biology' have been working as an integral unit, participating in both teaching and research.

The method of teaching for the M.Sc. classes needs special mention. Formal lecturing is reduced to a minimum. The students carry out assignments under the guidance of the teachers and do considerable library work. They are encouraged to develop initiative and self-reliance in studies.

The syllabus for the M.Sc. includes Physical Oceanography, Chemical Oceanography, Hydrography, Planktonology, Biological Oceanography, Physiology of Marine Organisms, Marine Ecology and Fishery Biology. Emphasis is laid on modern aspects and quantitative approach. Background knowledge in Biophysics, Biochemistry and Biostatistics is provided and intensive field work is also provided.

Programme of the 'Centre' :

In view of the rich and varied fauna and diverse type of biotopes present in the locality, the Centre has a rather broad based programme. However, it lays emphasis on (1) Quantitative marine and estuarine ecology, (2) planktonic studies, (3) Chemical studies of the waters and organic production, (4) studies on invertebrate larvae, (5) culture of marine blue green algae, (6) circulation in estuary, (7) microbiological studies of the estuarine and marine environment, (8) faunistic studies and (9) serological and electrophoretic studies.

The work at the 'Centre' has included so far (1) studies of the marine blue green alga., *Trichodesmium erythraeum* in laboratory cultures and inshore waters, (2)

quantitative studies of plankton, (3) photosynthetic pigments in estuarine and neritic waters, (4) studies on primary production, (5) quantitative estuarine ecology, (6) Mixing and circulation patterns in the estuary, (7) Cytotaxonomic studies of molluscs and fishes, (8) some biochemical aspects of invertebrate collagens, (9) electrophoretic (disc electrophoresis) studies of sera of fishes haemoglobins and body fluids of molluscs, (10) yeasts in estuarine and marine environment, (11) patterns of distribution of intertidal organisms, (12) intra-specific variation of the elupeoid fishes and biology of a moulting fish, (13) Invertebrate larvae, (14) chemical Oceanography of the estuary, etc. The laboratory culturing of *Trichodesmium* has been a very important contribution from the 'Centre' as this has not been achieved so far in other laboratories in the world. The 'Centre' is aiming at the development of a School of Quantitative Ecology (estuarine and marine) with an integrated approach from different disciplines.

Seminars and Symposia :

Seminar on 'Some Aspects of Plankton Research' was held at the 'CAS' in Marine Biology from March 23rd to 25th 1964. Prof. J.E.C. Raymont Head of the Department of Oceanography, the University Southampton addressed the participants. Twenty papers were presented and 39 delegates from different parts of India participated in the seminar.

Seminar on Some Aspects of 'Crustacea' from June 23 to 26th 1964. Dr. H. S. Rao inaugurated the seminar. Nineteen papers were presented. The participants included Miss Jutta Feest from Munster, West Germany and Dr. A. C. Broad from the Ohio State University.

Symposium on 'Oceanography' from 22nd to 24th February 1965. Foreign delegates : (1) Dr. L. H. N. Cooper F.R.S. (Plymouth), 2. Dr. Hohendorf (Kiel), 3. Dr. Denz (Kiel) 4. Dr. Ya.Birshtein (Moscow). Ten papers were discussed.

Symposium on 'Some aspects of Hydrobiology of shallow Waters', from March 24th to 27th, 1969. Dr. M. Vannucci, Director, Institute of Oceanography Universidade de Sao paulo, Sao paulo, Brazil inaugurated. She gave a lecture on 'Meduseae as indicators of water masses' 24 papers were presented.

Summer institute (special) on 'Quantitative Marine Biology' for College Teachers was held during the summer of 1967 on all-India basis. The course included method of quantitative biology, history and nature of scientific thought and scientific method, statistical inference and design of experiment with reference to Marine Biology. Dr. Owen, University of Tennessee, was the American Consultant.

arranged by the U.G.C. in consultation with the British council in U.K. and in India.

Summer Institutes :

Summer Institute of Biology for College Teachers was held at the C.A.S. in Marine Biology during the summer of 1964. Dr. Jorgen M. Birkeland, Ohio State University was the American Consultant.

Under the Commonwealth Educational Co-operation Programme, visits by the staff of the 'Centre' to the Marine Institutions. U.K. as well as by the staff of different Marine and Oceanographic Institutions in U.K. to the 'Centre' are

In collaboration with the Bureau of commercial Fisheries, U.S. Department of Interior, Fish and Wild Life Service, a P. L. 480 scheme on 'Clupeoid fishes' for three years was initiated in 1967. Dr. Frederick H. Berry who was the Project Officer on the part of U.S. Bureau of Commercial Fisheries visited and worked at the Marine Biological Station from 13th to 20th September 1967.

The CAS in Marine Biology is also participating in the International Biological Programme.

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T. N. A. U. RESEARCH ON SWEET POTATO

In Tamil Nadu sweet potato is being grown over an area of 5,000 hectares as a staple food crop. These tubers can substitute rice to an extent of 25 per cent in the daily diet. This contains "A" and "C" Vitamins and the flour of this tuber can be well mixed with wheat flour for the nutrient food. This can be better cultivated as an irrigated crop. About 30 man-days are required to produce one tonne of tuber, while 153 man-days are needed to produce one tonne of maize. Sweet potato is among the few crops which can offer attractive returns within 4½ months with little investments. There is a vast scope for increasing the area under this crop which will again pave ways for many Agro-Industries like starch manufacturing, tooth paste, etc. Hence the suitable package of practices for this crop need be research oriented.

Among the cultural practices, optimum time of sowing and best type of planting materials are important ones.

Experiments conducted on this aspect at Olericultural Unit of the Department of Horticulture in sweet potato, have indicated the following:

Sweet potato has so far been propagated by planting different sources of planting material from a plant. Hence experiments were conducted at Tamil Nadu Agricultural University for two years to find out the actual source of the vine of sweet potato to be used as planting material, i.e., terminal, medium cutting of the vine and tuber slips. The results of the experiments have indicated that the superiority of terminal cuttings for use as planting material.

With regard to time of sowing experiment the crop was sown from June to November at fortnightly intervals over a period of two years. Higher yields have obtained from the crop sown during second fortnight of September with 25.20 tonnes/hectare and closely followed by first fortnight of October with 25.02 tonnes per hectare.

Foliar application of the nutrient^s were effective in increasing the yield of sweetpotato. Application of 80 kg. of nitrogen per hectare in equal split doses through soil application at the time of planting and the other half through foliar spray at 30, 60 and 90 days after planting, considerably increased the yields to an extent of 23 per cent than soil application.

Experiments conducted for fixing up the suitable varieties to Tamil Nadu, V2, V6, V8 and V12 have given higher yields. It was observed that 'V' varieties have established their superiority in respect of yield. Among hybrids, H3 was most promising. It was also found that some of the local types such as local Musiri Thandal (SP.1), Local Musiri (SP.4), Local Ratnagar (SP.13) and Local Alangulam Red (S.P. 18) have high yielding potential.

Source.—Communication Centre —Tamil Nadu Agricultural University, Coimbatore-3.

The Tamil Nadu Industrial Investment Corpn., Ltd.

The Tamil Nadu Industrial Investment Corporation is sponsored by the Government of Tamil Nadu to provide all types of financial assistance to industrial units in the State of Tamil Nadu and Pondicherry. The financial assistance is given to all types of units including proprietary, partnership and Joint-stock companies. Special schemes have been framed to help Technocrats and Rural Medical and Veterinary Practitioners. Concessional terms have also been offered to backward areas and backward districts.

The terms and conditions of assistance

Minimum: Rs. 1,00,000 (for small-scale industries : Rs. 25,000).

For Technocrats and Rural Medical Practitioners : Rs. 10,000.

Maximum: Rs. 25,00,000 (Rs. 2 lakhs and Rs. 1 lakh in the case of Technocrats and Rural Medical Practitioners respectively).

Rate of Interest

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AGRICULTURAL PROGRESS IN SOUTH ARCOT DISTRICT

[This article describes the phenomenal growth made in South Arcot district in the food front during the last five years, i.e., 1967-1972—Ed.]

Rice production in South Arcot may be second only to that in Thanjavur district, the rice bowl of Tamil Nadu. This district also occupies a pre-eminent place in sugarcane and groundnut cultivation. And this district is not an exception to the phenomenal growth that Tamil Nadu has seen in the food front during the last five years, thanks to the vigorous steps and schemes taken up and executed by the Government in this State.

South Arcot district:

The total area of the district is 27 lakhs acres, out of which as many as 17,43,817 acres are cultivable lands. Wet lands in this district works out to 3.5 lakhs acres in area in which more than one crop is cultivated and harvested. They get their water-supply from the rivers, PENNAIYARU, KEDILAM, KOLLIDAM, VELARU, MANIMUTHARU, KOMUGI, MAYURANADHI, PAMPAIYARU, PARANI, DURINGJALARU, SANGARA-PARANI AND THONDYARU.

The river Kollidam supplies water for irrigation in Chidambaram taluk; Cuddalore, Virudhachalam and a part of Chidambaram taluks draw their water-supply for irrigation from the river Vellaru; Manimutharu in undates the Kallakurichi and Virudhachalam taluks and Tirukoilur and Villupuram taluks get their water-supply for irrigation from Ponniyar.

Besides the rivers, there is a dam at Veedur known as Veedur Dam which supplies irrigation water for 2,200 acres in Tamil Nadu and 1,000 acres in Pondicherry State.

There are also a number of tanks in this district. They are the VEERANAM TANK, the PERUMAL TANK and the WALAJAH TANK. Among them

the Veeranam tank is the biggest one not only in the district, but also in the whole State.

During the last five years, i.e., 1967-1972 the irrigation facilities in the district have increased manifold. Almost all tanks in the district had been desilted, enlarging their water storage capacity to the maximum extent possible. In 1967-68 the number of tanks usable for irrigation was only 5,505 whereas the number had increased to 9,482 in 1969-70.

Wells also play a predominant part in the agricultural operations of the district. In the year 1967-68, there were only 1,03,776 wells in the district, and the same had increased to 1,43,725 in number in 1969-70 thanks to the additional loan facilities offered to farmers by the Government through the Co-operative Societies all over the State. In the succeeding two years another 1,500 wells were sunk in the district. Simultaneously about 710 filter point tube-wells were also sunk.

Tanks Improvements :

During the period of acute drought in Tamil Nadu in 1969-70 a lot of amount had been allotted and spent for the improvements of tanks in the district. As much as Rs. 20,19,200 had been spent to desilt and re-rovet the tanks in Chidambaram taluk alone; a sum of Rs. 3,06,000 was spent for the improvement of tanks in Cuddalore taluk and for the improvement of spring canal that runs in the area of Mugaiyur in Tirukoilur taluk as much as Rs. 2,83,600 had been expended. And a dam was built across the river. Varaganadhi near the village of Selvapuri in Gingee taluk at a total expenditure of Rs. 1,29,00,000. A sum of Rs. 2,47,500 had been spent on the improvement of the

canal that flows from Puliur Dam which benefits the irrigation of lands in Villupuram and Virudhachalam taluks. In total the State Government had spent to the extent of Rs. 2.45 crores for the improvement of irrigation facilities in this district alone since 1967.

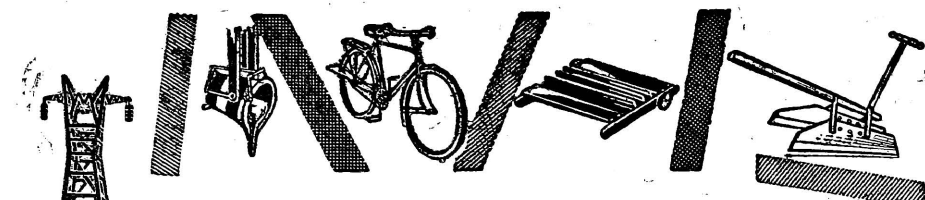
Further to desilt the [Mattigao tank and for other irrigation works in Tirukoilur taluk a total sum of Rs. 2,59,200 was allotted and spent.

Drainage Improvement :

Drainage facilities are part and parcel of irrigation amenities. So a good deal of attention had been paid to improve the drainage facilities to irrigated lands in this district at a great cost. In Chidambaram taluk alone a sum of Rs. 1,45,600 had been spent on this account—Rs. 9,300 had been spent to provide drainage facilities at Kuriamangalam and Keel Moongiladi village; Rs. 88,500 had been spent on the drainage improvement at V. Puthur village in Tirukoilur taluk and Rs. 15,550 had been spent in Tindivanam taluk on this account.

Modernisation of Agriculture :

To improve the cultivable methods, a number of schemes have been put in operation in this district. Liberal financial help to the farmers to sink tube-wells and filter wells, to purchase bulldozers, tractors, plough implements, etc. on instalment basis and to set up electric and oil pumpsets have been provided by the Government to the farmers in large number. Besides these, the radical land reform measures introduced by the Government have also added to the modernisation of agricultural methods in the district. [R.N.]



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AGRICULTURAL RESEARCH STATION AT PALUR

Of the two Agricultural Research Stations, that at Palur is one of the oldest of the agricultural farms of this State. It is situated in the village of Pallavarayanattam on the Cuddalore (Gudalur)—Panruti Road, about 4½ miles from the Nellikuppam railway station and about seven miles from Panruti. Its area which was originally some 16 acres of dry land and 5 acres of wet land now consists of 53 acres (18.65 acres of wet land and 34.40 acres of dry land). Its main object originally was to study all aspects of groundnut cultivation. But, as research on groundnut is now being mainly done at the Tindivanam Station, only yield trials of promising selections evolved at that station and the multiplication of seed strams suitable to the district are now being carried on at the Palur Station. The Palur station is also now engaged in evolving improved strains and methods of cultivation of paddy, sugarcane, cumbu, ragi, varagu and cotton.

The station has done much useful work. In the case of groundnut it has shown that certain varieties such as Madagazcar, Caroluna, Senegal and Barbados can be cultivated with as much advantage as the popular Mauritius or the Mazambique variety; that mixed cropping is better than rotation; that cumbu is the best cereal for mixed cropping with groundnut on dry lands; that manured plots give slightly higher yields than the unmanured plots; and that the plots manured with lime give the highest average yield. In the case of paddy, it has shown that the seed-rate can be reduced to avoid wastage; that 2½ lb. of seed sown on a cent of nursery give healthy well-grown seedlings; that the planting of one or two seedlings per hole yields better results than the planting of one or 10 or more in bunches in a hole; and that the spacing of 6 inches between plants is more than enough. It has also shown that bulky organic manures are better than oil cakes for paddy cultivation, firstly because of their cheapness and secondly because of their capacity for producing bigger crops; that 6,000 lb. or green-leaf manure per acre is the optimum required forakar or samba

crop; and that artificial manure, phosphate and ammonium sulphate, produce better results when applied in addition to green-leaf manure. It has moreover shown that for the kar crop PLR2 Chitrakali, SW7 sornavari and SLO 16 Kasipichodi varieties and for the samba crop CO2 Poombalai, GEB24 Kichilisamba, HSD5 Kartigai Samba, PLR Garudan Samba and CO19 Chingleput Sirumani varieties are the most suitable. In the case of Sugarcane it has demonstrated that 12,000 sets of top portions of cane per acre are sufficient for planting; that no advantages is gained by planting more sets; that a spacing of 3 feet is enough between the lines of the crop; that the best time for planting is February to April; that the removal of dried leaves from the growing crop (trashing) reduces the incidence of cane-fly (leaf-hopper); that the growing of cane in alternate years, in rotation with other crops like groundnut, ragi, cumbu and paddy, though profitably for a few years in the beginning eventually exhausts the soil and thereby reduces the profits; that such growing once in three years in rotation with the other crops yields the best results; that ratooning for a number of years instead of planting which is practised in several places to reduce the cost of cultivation, produces crops of stunted growth subject to diseases and pests and, therefore, in the long run, holds out no advantage over planting; and that a combination of groundnut cake and ammonium sulphate capable of supplying 250 lbs. of nitrogen is the best manure for cane cultivation. It has also demonstrated that Red Mauritius and Ashy Mauritius are superior to "Namadhari" Rastah and "Nanal" that Fiji B, a short thick variety locally known as "Pannikarumbu" is better than red and Ashy Mauritius; and that CO419, CO449 and CO527 are even better than Fiji B. Some of these new varieties have, it may be stated, more or less completely replaced the local types. In the case of cumbu, ragi and varagu, not much progress in research has been made by the station. It has, however, shown that Perum ragi FR 382 gives the highest yield and that

AKP1 is also a promising ragi strain. And finally in the case of cotton it has shown that Cambodia type CO2, CO3 and CO4 could be sown successfully both in the dry and wet lands of the district.

VERSATILE HYBRID CUMBU HB. 3.

The local Cumbu Varieties have been almost replaced by the hybrid varieties, due to the easy cultivation practices less incidence of pests and diseases, higher yield potentiality and short duration. To locate the best suited hybrid variety for the Bhavanisagar tract and to evolve package of practices hybrids HB. 1, HB. 3, HB. 4 and X.3 were tested at Agricultural Research Station, Bhavanisagar of Tamil Nadu Agricultural University at different levels. The testing was done under rainfed as well as irrigated conditions.

In the three seasons under irrigated conditions, HB. 3 was outstanding with an average grain yield of (on all levels of manures and for 3 seasons) 2,570 Kg. per hectare.

Average grain yield kg/ha for three seasons and 27 levels of manuring are given below:—

HB. 3—2,570 kg.
HB. 4—2,120 kg.
HB. 1—2,032 kg.
X. 3—1,232 kg.

The economic manurial requirement of HB. 3 under irrigated conditions was found to be 150 kg. of nitrogen, 38 kg. of phosphoric acid and 25 kg. of potash per hectare. At this level of manures HB. 3 recorded 3,235 kg. per hectare.

Rainfed Crop—

The two years trial under rainfed conditions has also proved the superiority of HB. 3 over the released hybrids.

HB. 3 cumbu has given an average grain yield of 1,432 kg. per hectare, i.e., 31 per cent increased yield over the other hybrid cumbu varieties.

The optimum manurial schedule was 50 kg. of nitrogen, 25 kg. of phosphoric acid and 5 kg. of potash in which it has given 1,000 kg. per hectare.

PROSPERITY BRIGADE IN SOUTH ARCOT DISTRICT

Prosperity Brigade was started in South Arcot district on 17th November 1967 by Dr. Anna, the then Chief Minister of Tamil Nadu. Since then it has carried out creditable work in the district fulfilling the purpose for which it was originally started.

South Arcot district comprises as many as 34 Panchayat Unions. Each Union has its own Prosperity Brigade manned by the energetic and enthusiastic youths of the area. At the level of revenue divisions, there are four group of Prosperity Brigade and above all the district committee acts as the apex body of the Prosperity Brigade at the district level and controls and directs the overall training and activities of the cadets of the brigade.

In each and every Panchayat Union, there is a central office of the Prosperity Brigade, as there is an office at the district level. Every month more than 300 cadets are trained by the Police Officials at the district headquarters office.

The Prosperity Brigade, during its existence for the last five years, has rendered a good account of itself by constructing buildings for Radio Stations, schools, etc., at a little cost to the Exchequer of the State Government as almost all the manual labour is rendered free of wages by the cadets of the Prosperity Brigade. The Government supports and supplements their actions and activities only with the implements and building materials. The year-wise turn-out of the Prosperity

Brigade would speak out the fact of the magnificent and meritorious service rendered by the cadets of the Prosperity Brigade.

Year.		Number of works carried out.	Worth in RS.
1967-68	..	49	1,02,000
1968-69	..	105	1,45,600
1969-70	..	235	1,85,700
1970-71	..	499	2,73,000
1971-72	..	76	2,76,000

From the above figure, it is clear that every year the service of the Prosperity Brigade in the district is on the higher side which means increased benefit to the society. ☺

MAT WEAVING TRAINING INSTITUTE

A Mat Weaving Training Institute for Harijan Women has been functioning at Setti Thangal, a village near Kattumannar Koil in Chidambaram taluk. This is an institute run by the Department of Industries and Commerce of Tamil Nadu Government.



In this Institute one year training course in mat weaving for women is conducted. As many as 20 women are undergoing training this year in this institute. Each trainee is provided with a stipend of Rs. 40 per month throughout the training period. After completion of training, each trainee is given a loan of Rs. 400 to carry on the mat weaving in her house.

The aspiring women applicant to join this institute need not have studied much. A little working knowledge in their mother-tongue is enough.

Now there are ten weaving units in this centre. Raw mat-grass is being got from Karur in Tiruchirappalli district. Rutting is done in the numerous canals of the taluk. This institute is in charge of a qualified women instructor. ☺

EDUCATIONAL FACILITIES IN SOUTH ARCOT DISTRICT

The Scheduled Castes and the Scheduled Tribes people form nearly 25 per cent of the total population of the South Arcot district. Thanks to the incentives and inducements meted out to them by the Government, they are slowly but surely, catching up with other caste Hindus communities in the matter of education, employment, etc., in this district, as in other districts, in Tamil Nadu :

The taluk-wise particular of the Scheduled Caste and tribe population is mentioned below:

<i>Taluk name.</i>	<i>Scheduled Caste population.</i>	<i>Scheduled Tribe population.</i>
(1)	(2)	(3)
Gingee ..	49,999	3,681
Tindivanam ..	162,530	4,602
Villupuram ..	85,673	1,052
Tirukoilur ..	106,830	945
Kallakurichi	104,412	540
Virudhachalam.	108,728	1,350
Chidambaram.	133,725	717

Education :

In South Arcot district, there are as many as 2,034 Elementary Schools, 380 Higher Elementary Schools, 195 High Schools, 126 Senior Basic Schools, 428 Junior Basic Schools, 1 Oriental language Middle School, 1 Oriental language High School, 5 First Grade Basic Schools, 1 Jail School, 1 School for the blind, 4 Adult Education Schools and 1 Nursery School. Besides these, there are 10 Teacher's Training Schools, 7 for men and 3 for women and five colleges apart from the Annamalai University at Chidambaram in the district. As many as 8,547 trained teachers are working in the elementary schools and 3,747 teachers are serving in the high schools in the district.

In total, more than 23 thousand students belonging to the Scheduled Castes are in the schools. They are provided with free boarding and lodging facilities to the maximum extent possible. In 1968-69 there were only 42 students hostels in the district accommodating 3,586 Scheduled Caste students. They were maintained and run at a cost of Rs. 7,47,944 by the Government. Apart from these, there were 5 Government-aided students hostels and 3 public aided students hostels in the district. But in 1970-71, the wholly Government supported students hostels for Scheduled Castes and Tribes pupils have increased to 44 in number accommodating 4,706 students at a cost of Rs. 8,48,355. Further, arrangements have now been made to teach students in the hostels themselves with the appointment of 31 part-time teachers.

For mid-day meals to students, the Government had spent Rs. 5,16,640 for 12,906 students in 1968-69. The corresponding figures for 1969-70 are Rs. 4,91,868 and 13,378 students. The spent amount for 1970-71 for the same purpose was Rs. 5,40,568 for as many as 13,526 students.

Apart from these facilities, the Government is offering help to the students of these communities in many other ways. They are helped with financial assistance to purchase books and cloths, and are offered scholarships for tuition fees. In 1968-69, as many as 274,448 economically and socially poor students were offered Rs. 11,57,339 as scholarship; in 1969-70, a sum of Rs. 13,88,145 was allotted to meet the expenditure on the account of scholarship to as many as 37,523 students and in 1970-71, as many as 48,386 students were provided with scholarships at a total cost of Rs. 1,93,30,750.

The State Government has embarked upon a noble scheme to provide the pupils belonging to the

Scheduled Castes and Tribes, with school uniforms. On this account, the Government had spent to the tune of Rs. 2,76,400 in 1969-70 and Rs. 25 lakhs in 1970-71. As much as a sum of Rs. 2,67,303 had been spent in providing slates and pencils to the students of the suppressed and oppressed communities in 1970-71. Thus the State Government is rendering yeoman service to the upliftment of the poorer section of people through education as in many other spheres, in this district.—(R.N.)

SPACING FOR CHILLY CROP

Tamil Nadu Agricultural University conducted spacing trials for chillies at Agricultural Research Station, Bhavanisagar during 1971-72 to evaluate the performance of improved chilly varieties B-70 A-1 (Assam type), B-24 A2 (a selection from Bihar), C-63 A5 (from Ceylon) along with local Gundu at three spacing, i.e., 60 x 60 cm., 45 x 45 cm. and 30 x 30 cm. The crops were given a basal dose of 25 tonnes of compost and 25 kg. of phosphoric acid and 25 kg. of potash. 70 kg. of Nitrogen was top dressed in two split doses on the 30th and 75th day after planting. Forty days old seedlings were transplanted and riped fruits were picked from 120 days onwards up to 240 days.

It was found that the closer spacing of chillies, i.e., 30 x 30 cm. has given 65 per cent increased yield over wider spacing (60 x 60 cm.). In this trial, the Ceylon type C-63—A-5 has given the maximum yield of 2,367 kg./hectare at a spacing of 30 x 30 cm. and also recorded significant yield increase over the other three selections. For obtaining economic yields, the chilly is to be planted with a spacing of 30 cm. x 30 cm. to give a population of 11 plants per square metre.

Source.—Communication Centre, Tamil Nadu Agricultural University, Coimbatore-3.

MATHIAS NAGAR IN MADRAS CITY



The overall view of Mathias Nagar a housing colony built for the Poor at St. Thomas mount.

In the midst of the massive slum re-housing drive undertaken by the Government in Tamil Nadu, the news of a private agency which comes forward with a project of a Housing Colony, makes pleasant reading as it renders invaluable service to its beneficiaries and to the country at large, by sharing at least a part of the burden of a Welfare State, which has the obligation to provide a roof over the head of every citizen. To the Salesian Fathers of Don Bosco, goes the credit of having sponsored one such colony at St. Thomas Mount, about 8 miles from Madras City.

At the foot of the Hill, there are 28 houses in a row and immediately behind on the rising slope are two rows, each of eleven houses. In these days of acute housing shortage one should be grateful for a house with a living room, a bedroom, a kitchen and a bath-room, spacious enough to accommodate a family of half a dozen members.

The Cantonment authorities at St. Thomas Mount have extended every co-operation and help in providing essential amenities. Three water taps have been provided and a pukka road and street lights have been promised to the colony. There is a proposal to dig a well with an overhead tank, which will assure an independent and permanent source of water supply to the colony.

The moving spirit behind the entire project was Fr. J. Baracca S.D.B., an Italian Salesian Priest

who built 46 of the 50 houses, with money collected by him from thousands of Italian people, most of them with very moderate means, during his visits to his home country. His appeals on behalf of the poor and the homeless in Madras, which he made over the Radio and TV in Italy, as well as through letters and personal contacts, evoked generous response. Of the remaining four houses, two were donated by the French, and one each by the Santhome Cathedral Basilica and St. Mary's Co-Cathedral in Madras.

Fr. Baracca, a dedicated social worker, has left Madras for good, after 33 years stay in India. Before leaving he laid the foundation stone for a Community Hall at Mathias Nagar and promised to try and send some aid from Italy for its completion, giving thereby, a tangible proof of his continued interest in the country, where he had spent the best part of his life.

Mathias Nagar has been named after the late Dr. Louis Mathias S.D.B., a great French Missionary and a well-known social worker, who had spent over thirty years in this city, first as Archbishop of Madras and then as Archbishop of Madras-Mylapore. He built over 100 tenements and numerous social welfare and charitable institutions in the city for the sick, the aged and the abandoned, irrespective of caste, creed or religion. He died at Legnano in Italy, on 3rd August 1965, and his remains were brought to Madras and buried in the San Thome Cathedral, according to his last wish.

The land on which Mathias Nagar stands has been donated by the Most Rev. Dr. Rayappa Arulappa D.D., the present Archbishop of Madras-Mylapore. The houses have been allotted to Burma repatriates and some poor families of St. Thomas Mount.

Mathias Nagar was inaugurated by Thiru S. Madhavan, Minister for Industries, Government of Tamil Nadu, on the 15th of April of this year. In his speech, the Minister expressed great appreciation and thanked the Christian missionaries for their dedicated services in the medical, social and educational fields in this State and all over the country, even in the remotest villages of India. His Eminence Cardinal William Conway, Archbishop of Armagh (Ireland) who had come to Madras as the Special Envoy of Pope Paul VI to the 19th Centenary Celebrations of St. Thomas, presided over the inaugural function.

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THE WORLD IS NOT YET READY FOR SARVODAYA

Last Message of Donald Groom.

I have been for the last three years* in the extraordinary country called Australia about which Vinobaji had often spoken to me. Well, there are vast areas of land in Australia for the land-gift movement. But I am afraid, most of the land in Australia is the kind that many people would not like to have. In fact, I left Australia two weeks ago to go to London. I flew from Sydney on a Jumbo jet, 400 people in the plane, 600 miles an hour, and for four hours we travelled over the desert of Australia over the vast stretches of worthless land. One of the extraordinary things about Australia is that two years ago, in 1970, they celebrated the discovery of Australia by the British.

The aboriginal people of Australia had been there for the last ten thousand years or so and probably they had migrated from India. There is very strong conjecture in Australia that the aboriginal people came originally from amongst the Dravidians of this country in the pre-Aryan period. They were the first sea-faring people who inhabited Australia. The nearest link

between the people of the other parts of the world and the Australian aboriginals is their ethnic similarity with the Todas of Nilgiris. The Todas look almost like the aboriginal people of Australia and they have a culture which is near to Vinoba's concept of Sarvodaya. The fact that the land belongs to nobody but to Bhagwan (God) and we belong to Bhagwan needs no elucidation. This is what the aboriginal people of Australia too believe. They have believed it traditionally all their lives. It is only now that we are discovering this, in spite of all our ignorance, all our pride. We in the outside world did not know anything about these aboriginals.

The British in Australia tried to wipe out the whole of the aboriginal people. This is one of the most

terrible sins that mankind has ever perpetrated. This is what I came to feel during my stay in Australia for a few years. I wanted to do something to rectify the wrong the white man has perpetrated in Australia, just because the peace-loving aboriginals do not take up arms, just because they are not an aggressive people. Only because they believe, that they belong to the earth that belongs to all in common, they are not to be looked upon as something less than human beings, that they had to be denied even an existence. The aboriginal people in Australia have no human rights or civic rights at all anywhere, in any way. It is an extraordinary situation. They cannot buy land or hold land, though the whole land belonged to them for nine thousand years or more before Captain Cook and his people came to Australia.

Australia far bigger than India ; its area extends for three thousand miles from North to South and three thousand miles from East to West. There are only thirteen million people living in it in contrast with the 550 million or so in India. This is one of the extraordinary features in regard to Australia.

Ever since I left India taking with me the spirit of Sarvodaya and the message of Vinobaji, I have had this consciousness burning within. Wherever I had been, I have continued to look towards this country for inspiration and guidance. I am always longing to know what is happening here, in India where the people have had the privilege of inspiration from two of the world's greatest figures—Gandhi and Vinoba. The reason why I feel specially enthusiastic about this is that in the present-day western world it is this message of Gandhi and Vinoba that is the most appropriate means of salvation. There is no doubt about this. It is only in the field of implementation of translating it into practice, of putting it together in the fabric of human life, that we have largely failed, both in India and in the West. The question is to find out how we can apply the philosophy and the message of Gandhi and Vinoba, in our day-to-day life, how we can effectively make it a living force within our society. It is not to be just a piece of theoretical knowledge the acquiring of which gives us pleasure, but a dynamic force that has the ability to change the very social structure, to change the way of life of the people, to influence the policies and ideas in society as a whole.

We have not yet learnt how to apply Gandhiji's principles in world affairs so as to make them a powerful, revolutionary force within society. Let us create a society which imbibes and reflects the philosophy and principles that he stood for. We, in the western world, wherever we are, are just as weak or as strong as people in India are. There is no difference whatsoever about this matter. I feel that even in India, the basic challenge to the Sarvodaya movement is to make it an effective force to influence the life of the people, to influence the policies of the Government and to create a society based on its principles.





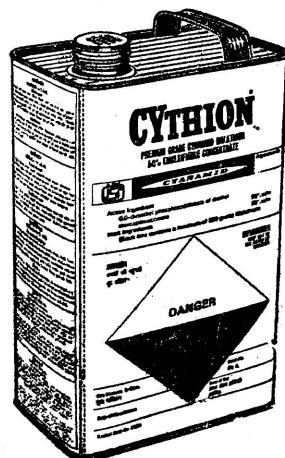
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CARE

OF CHILDREN'S HEALTH

The children of today, are the leaders of tomorrow. What your child is tomorrow depends to a large extent on what you feed him today and what you fed him yesterday. Yes, unseen by you, the child's brain is slowly developing right from the time he is conceived. By five years of age, 9/10ths of the brain has already developed. Only a diet that is properly balanced can ensure the steady and healthy growth of the child's brain and body.

WHAT IS A BALANCED DIET.

Each food you eat offers a certain nutritive value, depending on how much it contains of the 5 major ingredients of nutrition Proteins, Fats, Carbohydrates, Vitamins and Minerals. A diet that gives you the right amount of all these ingredients is the balanced diet. During pregnancy, while nursing and in early childhood, special demands as made on the body and the need for a balanced diet is the greatest.

REMEMBER.

A large section of the population suffers from malnutrition, why? Because their diet suffers from insufficiency of the essential items of supplementary and protective foods such as proteins, vitamins and minerals.

A housewife may feel that a balanced diet is an expensive diet. It need not necessarily be so. She can fit this in the limited budget available at her disposal by preparing low-cost balanced diets and avoiding waste. Certain desirable changes in food habits would also give encouraging results.

Certain methods of cooking foods by prolonged boiling, etc., result in considerable loss of proteins, vitamins and minerals. Scientific methods of preparation and utilisation of food help in preventing these losses.

THE FIVE BASIC INGREDIENTS OF GOOD NUTRITION.

Proteins are essential body builders. Most of the cells in your body and brain are built from proteins. Proteins regulate body processes, provide resistance to infection. All living matter contains proteins. Protein is life itself and this is available in abundant quantity and quality in eggs, dal and pulses, meat, fish, groundnuts and beans, milk products, fortified bread (like Modern Bread), rice with dal (Khichri or iddies), fortified atta, Balahar multipur pose food, etc.

Carbohydrates is the body's basic fuel. They are the most commonly found and inexpensive sources of energy. Potatoes and other roots, sugar, jaggery, sweets, cereals (iddies, chappatis, breads, rice), bananas provide us with abundant supply of carbohydrates.

Fats like carbohydrates, also provide energy. But weight for weight they deliver twice as much energy as carbohydrates. Fats are also essential for absorbing important nutrients, like Vitamin A, which may be got in oil seeds, vegetable oils, coconut, whole milk, fat (butter, ghee, meat fats) and nuts.

Vitamins are substances that are required in small quantities by the human body, but vitally necessary because the body cannot function properly without them. Vitamin A is essential for good eyesight. Vitamin B Complex is necessary for utilisation of carbohydrates and for prevention of disease like 'beri beri', pellagra anaemia and certain skin disorders. B Complex includes vitamins like thiamine, riboflavin, niacin, pantothenic acid and B12. Vitamin C builds resistance to infection. Vitamin D is for strong bones and teeth. Vitamin A is to be got in milk products, butter, eggs, animal liver, spinach, carrots, mango, papaya, tomato, fish-liver oil; Vitamin B Complex abounds in foodgrains, runts, pork, mutton, liver, fish fresh, peas and beans, potato yeast, fortified bread, bajra, parboiled rice, lentils, milk; Vita-

min C can be had from amla (Indian Gooseberry), citrus (lime and orange), pineapple, guava, papaya, cashew fruits, leafy vegetables (cabbage, cauliflower, radish), tomato, drumstick leaves, and Vitamin D is abundant in sunshine, eggs, milk and milk products, fish-liver oil.

Minerals are equally important to good health. Some of the important mineral nutrients include calcium, phosphorus, potassium, sulphur, sodium, iodine, fluorine, chlorine, magnesium and iron. They help regulate important body balances—water balance, acid balance and oxygen balance. Also iron is absolutely essential for blood and calcium for bones. Minerals are got in milk and milk products, fish, dried fruits and leafy vegetables, cereals, oils seeds, ragi fortified foods like Modern Bread, Balahar, etc.

THE FOUR CRITICAL STAGES IN YOUR CHILD'S GROWTH.

Before birth.—During the full nine months the baby is in your womb, his well-being depends completely on your diet. It is at this time that your nutritional requirements are increased as your body has to sustain itself as well as nourish the child.

The importance of proteins at this stage cannot be over-emphasised. Lack of proteins in your diet can permanently impair the formation of your baby's brain, body tissues. It can lead to both mental and physical retardation and cause further complications in your baby's healthy birth.

As the need for extra proteins is the greatest. Your diet should include a large amount of milk, curds, cheese, eggs, meat or special protein preparation, etc. Green leafy and other vegetables, and fresh fruits are also necessary for their vitamin and mineral content.

Birth to six months.—Till your baby is six months old your milk is certainly the best food for him. But remember, he can only be

as well fed as you are, for the nourishment in your milk depends on the nourishment you take. During the lactation period, the need for a nutritious, well-balanced diet is greater, as your body has to sustain itself as well as nourish your child.

Added amounts of proteins, carbohydrates, Vitamins and facts are required. A large amount of milk and milk products, vegetable, eggs, meat, fish, rice, wheat and other cereals, fresh fruits juices, should comprise the major part of your diet.

It is probably at this time that your baby is closest to you and needs you all the time he is awake. A schedule of his feeding times should be slowly formed, because it is advisable to train your baby to a regular feeding schedule from the start.

By making a schedule, you not only discipline your baby but also make it easier for yourself. A baby fed regularly and receiving a sufficient amount of breast milk, needs little else to keep him healthy and happy for the few months.

After your baby is two months old, he needs increased amounts of certain nutrients, not available in breast milk which are necessary for the formation of strong bones and teeth. You should give a little fruit juice for extra vitamins, plus a little egg, any cereal and soup. These additions in your baby's diet are specially necessary if you are not feeding him yourself. Multi-vitamin drops and cod-liver oil are also essential for your baby, especially in winter. You should give vitamin C drops too. They protect the child from coughs and colds.

Your baby should also be given some boiled, cooled water before he is put to bed at night. This is all the more important in summer.

BETWEEN SIX MONTHS AND ONE YEAR.

After the first six months, your milk is not able to provide sufficient amounts of all the nutrients needed to maintain your baby's growth. By this time the output of mother's milk diminishes.

A recent survey showed that Indian mothers tend to overlook this fact and insist on feeding their

babies, sometimes up to 18 months. If your baby is to maintain the expected rate of growth and remain healthy and well-nourished, supplementary feeding has to be resorted to from about the sixth month. Your baby should be slowly trained to take animal milk. He should be given at least 16 ounces or 2 glasses of animal milk right through early and late childhood. Fresh fruit juices such as orange juice should also be given. It serves to supplement some of the protective nutrients not present in milk, mashed, boiled vegetables, soft khichri, egg mashed bananas can also be added to your baby's diet, around the 7th or 8th month.

When your baby starts cutting his teeth, it is time to change him over to chopped or lumpy food. Chopped vegetables, minced meat, soft cooked rice and a piece of toast or hard biscuit would be ideal for him to chew. Do not forget the need for plenty of water. It is also better to allow your baby some choice in his food. A baby's appetite varies from meal to meal and from day to day. There is no harm in occasionally allowing your baby to eat larger amount of some food he prefers. Neither should you worry when your baby develops a temporary dislike to any particular food. Forcing him to eat can lead to vomiting and unnecessarily upset your baby.

Teething, a cold or other minor illnesses may have affected his appetite. If his appetite does not return to normal soon, it is advisable to consult a doctor.

BETWEEN ONE AND FIVE YEARS.

All the rest of your child's life will only be as complete as the diet he gets during these important years. There should be a fairly strict feeding schedule, without either too long or too short an interval between successive feeds. As your child grows, his meal times can follow those of the rest of the family. The food your child needs now can be classified under four groups. This provides an idea of the relative importance of the different types of foods his diet should contain.

Group I.—Milk at least 2 glasses a day. Dal, beans, meat or fish boiled, at least once a day. Egg prepared in any form—one a day or

a minimum of four eggs a week. These are sources for the body-building proteins.

Groups II and III.—Green leafy and other vegetables, cooked twice a day. Fruit stewed, mashed or as juice once a day. Extra fruit may be substituted for vegetables and vice versa. These are the vitamins and minerals for protection and resistance against infection.

Group IV.—Two servings of rice or wheat, bread and potatoes twice a day. These are the energy giving carbohydrates. One tea spoon a day of fish liver oil should also be given. As your child is now using up a great deal of physical energy, the carbohydrate content in his diet should be increased. It is advisable not to give the following foods to children below 5 years of age :—

(1) Over-pungent curries and highly spiced dishes.

(2) Fried or roasted foods of any kind.

(3) Excess sugar, sweet foods and sweet meats.

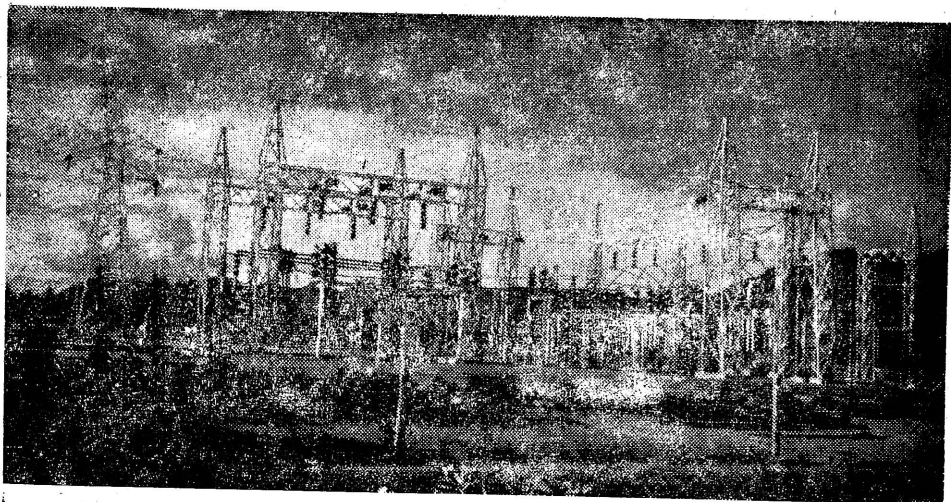
(4) Tea, coffee and other stimulants.

It is vitally important to plan your child's diet with care, from the very beginning and to give him the proper nutritious foods, that he needs. With just a little planning you can get a good balance in both your child's existing diet and your own. The symptoms of malnutrition many show only when it is too late. Act now: And ensure a bright future for your child.

CHILDREN IN TAMIL NADU.

There are 7.9 million children below six years in Tamil Nadu. Of these, approximately 55 per cent subsist below the poverty line. This means the feeding programmes will have to cover nearly four million children among whom 1.72 million are likely to be below three years.

However, Tamil Nadu is way ahead of other States in school nutrition with the midday meals scheme which is in operation in 36,603 elementary schools, catering for 18.2 lakh pupils for 200 days in a year. It is proposed to be continued with improvements in the nutritive quality of the food and better nutrition education.



ROLE OF ELECTRICITY IN TAMIL NADU'S INDUSTRIAL GROWTH

The era of accelerated industrialisation in the State emerged with the growth of electricity. As a result of rapid development of power in the State, Electricity—intensive industries such as cement, heavy chemicals, fertilizers and aluminium have come up even in the industrially backward districts of Tirunelveli and Ramanathapuram. Further the rural areas have also become industry conscious, resulting in the springing up of a number of textile, sugar and small-scale industries in the different parts of the State.

The various categories of industries, availing high tension electricity supply from Tamil Nadu Electricity Board as on 31st March 1971 are indicated below :—

1 Textile	203 Nos.
2 Cement	8 Nos.
3 Tea Estates ..	89 Nos.
4 Steel	50 Nos.
5 Aluminium ..	9 Nos.
6 Chemicals ..	20 Nos.
7 Paper and straw board.	10 Nos.

CONCESSION TO HIGH TENSION INDUSTRIES.

(a) In the case of new industries the following concessional tariffs are charged for the first five years

after the commencement of production :—

For the first three years.	662/3 per cent of the high tension rate under tariff I (A) or I (B) as the case may be.
For the fourth year.	80 per cent of the high tension rate under tariff I (A) or I (B) as the case may be.
For the fifth year.	90 per cent of the high tension rate under tariff I (A) or I (B) as the case may be.
For the sixth year.	Full tariff.

The above concession shall apply to both unit rates and maximum demand charges. This concession shall not, however, be applicable to a consumer who utilises power from his own generating units or make

other arrangements for production purposes and utilizes the power supplied by the Board for auxiliary purposes only.

Notes : (1) This tariff concession is applicable only once to a consumer for new industrial undertaking and will not be available for subsequent expansion or diversification of production.

(2) If a consumer starts a branch mill for the manufacture of the same products, the branch mill is not eligible for the concession.

(i). (b) New industries which work a night shift, i.e., between 9-30 p.m. and 5-30 a.m. the next day, will be given a further concession of 40 per cent on the average "Energy rate" only (i.e., exclusive of "Demand Charges"), for consumption during night shift for a period of five years. This concession shall apply to the average energy rate arrived at after giving the new industry concession referred to in item (i) (a).

(i). (c) Industries which introduce a night shift newly will be eligible for the 40 per cent tariff concession mentioned in item (b) on the same terms and for the same period of five years for consumption during stipulated hours.

(i). (d) New industries in and around Mettur Township which

avail of power only during the Irrigation season (15th July to 15th January) shall be given a tariff reduction of 25 per cent. This concession shall be in addition to the other concessions applicable to the new industries mentioned in items (a) and (b). If such industries take power during non-irrigation season this concession shall not be applicable.

(i). (e) New industries to be set up in industrially under-developed areas notified as such by the Government will be given a reduction of fifteen per cent of the tariff. This will be over and above the concessions to new industries specified in items (a) and (b).

SMALL SCALE AND RURAL INDUSTRIES.

Apart from the growth of large scale industries, the development of small scale industries in recent years has been quite spectacular. This is indeed a striking result of the availability of electricity which has contributed to decentralisation and growth of rural industries in villages.

The pattern of consumption of electricity for a total unit of about 5,500 million during 1971-72 which would give an idea about the utilisation of benefits of electricity as between industrial and agricultural consumption is approximately as follows :—

Industrial	..	50 per cent.
Agricultural	..	23 per cent.

ELECTRICITY FOR DOMESTIC USE.

Of the 23 lakhs of total consumers, about 12 lakh consumers use electricity for domestic purposes of lights and fans. Assuming five persons in a family, this amounts to at least 60 lakh persons in Tamil Nadu having the benefit of electricity at home, i.e., one in every six of the total population in Tamil Nadu has already become a regular consumer of electricity at home. This is by no means a small achievement for a backward country like ours. Incidentally domestic usage of electricity in Tamil Nadu is more than the All India average.

The installed capacity as on date (July 1972) is 1,544 MW, 17 Hydro stations totalling 1,224 MW and

2 Thermal stations totalling 320 MW. This does not include the present installed capacity of 600 MW of Neyveli Thermal Station.

Work on the 4th unit of 110 MW at Ennore Thermal Station is fast progressing and it is expected to be completed in another year. The following schemes are under execution :—

(1) Kundah IV stage extensions, envisaging installation of additional 60 MW and 50 MW units at Kundah Power House III and IV respectively.

(2) Naduvattam diversion scheme to facilitate additional generation of 60 MW at Pykara and Moyar Power Houses.

(3) Installation of a 5th unit of 110 MW at Ennore Thermal Station.

(4) Atomic Power Station of 470 MW installed capacity at Kalpakkam (Government of India undertaking).

Besides the above, the following schemes are also being taken up for execution :—

(1) Suruliar Hydro Electric Scheme—35 MW.

(2) Servalar Power House under upper Thambaraparani Hydro Electric Scheme—30 MW.

(3) Nellithorai Hydro Electric Scheme—50 MW

(4) Kadamparai pumped storage scheme (First stage) (ultimate 400 MW)—200 MW.

The following schemes are also envisaged before 1980 to meet the constantly growing demand :—

(1) Additional Installation at Kalpakkam Atomic Station—470 MW.

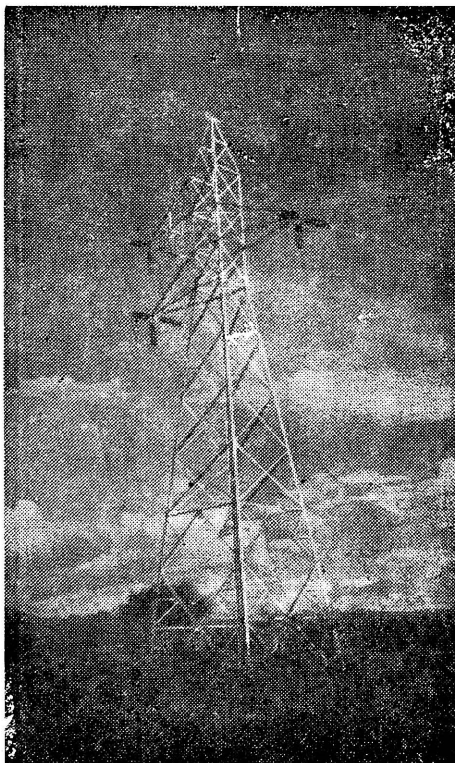
(2) Thermal Station at Tuticorin—400/600 MW.

(3) New Thermal Station at Mettur—220 MW.

(4) Second Lignite based Thermal Station at Neyveli—600/1,000 MW.

(5) Additional installation at Ennore Thermal Station—200 MW.

(6) Additional hydro power projects (at places like Cholatipuzha, Pandyar, Moyar, Paralayar, Pykara ultimate stage, etc.)—300 MW (approx.)



FERTILIZER REQUIREMENTS FOR HIGH YIELDING RICE VARIETIES

With the introduction of high yielding rice varieties possessing a new plant type, adoption of improved cultural and manurial practices during various growth phases of the crop is a serious concern of the farming community as well as the technicians and extension personnel. All the recommended dwarf indica varieties are not absorbing the nitrogen and other nutrients in the same fashion in different soil types. On account of the soil heterogeneity, nutrient status as well as seasons changes, slightly variable levels of NPK are recommended. Most of the high yielding rice varieties record uniformly high yields during hot weather periods rather than the cold weather period. Nearly a third of the total cost of cultivation per acre has to be accounted for the fertilizers and their application. Therefore, with a view to increase the nitrogen efficiency that is associated with high yields, proper cultivable and manurial practices have to be adopted.

In general, application of 75 kg. of nitrogen, 35 kg. phosphoric acid and 35 kg. of potash is recommended for a high yielding rice variety grown over an acre. The entire dose of phosphoric acid and potash in the form of superphosphate and muriate of potash is applied as basal dose during the last ploughing. A part of the nitrogen in the form of ammonium sulphate or urea is applied in the puddle on the day of transplanting. Other than these straight fertilizers, whenever complex fertilizers or mature mixtures are used, the recommended nutrient requirements should be borne in mind. Under conditions where there is good water supply and drainage facilities are adequate, the best practice is to broadcast the fertilizer on a drained soil. Broadcasting ammonium sulphate or urea into deep layers of standing water results in a lower availability to the rice plants, as losses may occur through run-off and absorption by aquatic plants. In permeable soils, topdressing nitrogen into a shallow layer of water, say about 2 cm. may be as good as topdressing on

a drained surface and under those circumstances, the inlet and the outlet of the cultivated field have to be closed. In the line planted crop a shallow incorporation of the nitrogenous fertilizer by means of a rotary weeder may improve the nitrogen efficiency. In order to control the weeds, a thin film of water has to be maintained in the cultivated field.

Since, the dwarf high yielding rice varieties exhibit a nitrogen response, optimum times and rates of nitrogen application have become very important for obtaining the maximum response from the applied nitrogen. The practice of supplying N at half the dose or slightly whereas basal application and the rest in one or two-top dressings has already gained wide acceptance among the ryots. But some more refinements to judge the correct stage of the crop before applying nitrogen will no doubt improve the overall efficiency of nitrogen. For example, consider that half the recommended dose of nitrogen is applied at the time of transplanting. The remaining half has to be divided into two portions and one is applied at the active tillering stage (15 to 20 days after transplanting) and the other is applied at the panicle initiation stage (60 to 75 days after transplanting). In sandy type of soils or whenever a medium duration rice variety is grown, one more topdressing of N is recommended at the booting stage to get good yields. Therefore, optimum time and rates of application of nitrogen promote tillering, help to produce heavier panicles associated with good test weight (1000-grain weight) and increased protein content of the grain. The incidence of a pest or the severity of a disease depends upon the level of nitrogen and its times of application. The involved loss can be considerably minimized if two or more topdressing are adhered to.

One should realize that the optimum times and rates of nitrogen application depend on various local factors such as soil type, water management, weather conditions,

practices of N application and growth duration of the variety. The following general guide lines have been formulated after a detailed agronomic trials over a wide range of conditions :—

(1) Depending upon the soil conditions and irrigation facilities the nitrogen can be applied in two to four split doses.

(2) For every one topdressing, the quantity of nitrogen should not exceed 12 kg. N per acre.

(3) For soil with low N, supply relatively more nitrogen at planting.

(4) For soil with adequate N, the recommended nitrogen level has to be reduced and a small quantity is applied as topdressing.

(5) For the low tillering varieties, relatively more N at early stages of the growth has to be supplied.

(6) For the early maturing varieties, large portion of N has to be given in the basal dose.

(7) In the case of long duration varieties, three or four split doses of N have to be provided.

(8) If there is slow initial growth due to cool weather, more N has to be given as topdressing.

(9) To avoid bacterial leaf blight and blast, the nitrogen should be applied in many split doses.

(10) In the direct sown crop, the basal dose should be reduced and the topdressings are given three or four times.

(11) When aged seedlings are used, the basal dressing should be more and the topdressing is less.

(12) For a rainfed crop, a few small topdressings are given preferably on rainy days.

If the above guidelines are followed, the ryots can step up paddy yields.

Source.—Communication Centre, Tamil Nadu Agricultural University, Coimbatore-3.



RUSSIAN SUN- FLOWER SEED GIVES HIGHEST OIL YIELD



By

K. S. BHATIA

Is there a solution to the problems of the Indian oil industry by the shortfalls in oil seeds production? There is one, say the experts, and that is to develop sunflower seed cultivation as a substitute to others.

Sri Fakhruddin Ali Ahmed, the Union Minister for Agriculture, said recently that "our experience with regard to sunflower has been extremely good. It was on the basis of our import of the sunflower seeds from the USSR that we have embarked on a major programme of development and hope that, within the next few years our oil and protein deficiency would be considerably reduced....."

Russian sunflower seed varieties have given in India the highest oil yield per hectare according to findings of agronomists from trials sponsored by the Central Government during 1969-70 and repeated on a wider scale in 1970-71.

The projects of 1970-71, spread over a number of states, indicated the superiority of sunflower over groundnut which is widely grown in the country as raw material for edible oils in the country. The States covered were Andhra Pradesh, Maharashtra, Mysore, Gujarat, Madhya Pradesh, Rajasthan, Uttar Pradesh, Orissa, Punjab, Haryana and Jammu and Kashmir.

Russian sunflower varieties such as *Peredovik*, *Armavirskij* 3497 and *Vniimk* 6931 developed at the All-Union Research Institute of Oil Seeds at Karsnodar in the Russian Federation were used for trials. Sunflower oil content was estimated at 45 to 50 per cent as against 20 to 25 per cent in groundnut which so far was considered as a top oil-yielding variety. That is why over 80 per cent of the total groundnut production in the country is consumed by *vanaspati* manufacturers.

GOOD SUBSTITUTE.

Thus it appears sunflower has come to be considered as a substitute for groundnut not only because of its high oil content but also because of its adaptability in India's agro-climatic conditions.

Sunflower has other distinctive advantages according to the agronomists. For example, sunflower matures in a short period of 90 to 110 days as against 160 days taken by groundnut; sunflower grows in diverse soil conditions from hilly to plain zones, in soils ranging from heavy to sandy loam, in the sandy arid wastes of Rajasthan to the heavy black cotton soils of Tamil Nadu. Besides, sunflower was found drought resistant because of its deep root system and could be grown both in *rabi* and *kharif* seasons. However, sunflower gave best results in the North *rabi* season sowing and in the South *kharif* sowing. The average maturing period ranged from 80 to 90 days. The lowest maturing period of 65 days was recorded at Digraj and Coimbatore.

The average sunflower yield in rainfed conditions was 841 kg. per hectare with 45.52 per cent oil content. Oil yield was 377 kg. per hectare. In irrigated areas (Uttar Pradesh, Mysore, Andhra) the average yield was 1,565 kg. per hectare and oil recovery 712 kg. per hectare.

As for the cost factors, it was found that the cost of cultivation averaged Rs. 550 per hectare in rainfed conditions and Rs. 50 extra in irrigated areas. And the return per hectare is about Rs. 1,300 per hectare.

The results of the trials in adverse soil and climatic conditions proved to be equally encouraging. At the dry land farming research station at Sholapur, where the land is poor and rainfall low, an yield of 700 to 1,000 kg per hectare was obtained. Here fertiliser was used only moderately.

Studies at the Sholapur research centre showed that for optimum sunflower yield it is essential to have uniform spacing between plants in row and that there should be adequate insect population for cross pollination. It was also found that the crop requires adequate moisture in the soil and that irrigation is not required after the crop is 70 days old in dry lands.

For seed treatment, the traditional fungicides were used. Plant mortality at pilot plant projects was negligible. Sunflower has shown its resistance to many pests which affect other oil bearing seeds. The only pest *Heliothis*, a caterpillar, affected sunflower in Kolar district. A suitable pesticide to control, *Heliothis* is under research.

The findings of some of the centres show that sunflower gives a high yield in spite of vast differences in climatic conditions : for example, the yield at Akola was 1,110 kg. per hectare while at Jodhpur it was 630 kg. per hectare, as against 520 kg. yield of groundnut per hectare at Akola to 410 kg. per hectare at Jodhpur. Sesamum ranks third with 260 kg./hectare at Akola to 130 kg. hectare at Jodhpur. The average for all centres are : sunflower 820 kg. per hectare, groundnut 470 kg. per hectare and sesamum 230 kg. per hectare.

PROMISING RESULTS.

Encouraged by these promising results, the Central Government has sponsored an all-India sunflower cultivation scheme with a targetted area of 350,000 hectares for a crop yield of 250,000 tonnes by the end of 1973-74.

The Central State Farms at Suratgarh, Hissar and Raichur have started sowing different Russian sunflower varieties to raise a substantial sunflower seed potential.

The question naturally arises : is sunflower the answer to the shortages in oil ? It is admitted that the shortage is due to low oil bearing capacity of the oil seeds grown in India, and also due to the fact that only 5 per cent of the area given to oil seeds is irrigated. The shortage has also created, another problem : the oil mills in India utilise only 50 per cent of the installed capacity.

The production of oil seeds in India rose to 56 lakh tonnes in 1955-56 from 51 lakh tonnes in 1950-51. In 1960-61, production was 65 lakh tonnes as against the second plan target of 75 lakh tons. In the third plan period, it rose further to 74 lakh tons against the target of 96 lakh tonnes. The shortfall widened to 22 lakh tonnes.

The estimated demand for vegetable oil seeds in the country in 1973-74 is about 125 lakh tonnes to meet the annual requirement of 44 lakh tonnes of oil. The production target in the fourth plan, however, is 105 lakh tonnes. Even if the Fourth Plan target is realised, there will remain a shortfall of 20 lakh tonnes.

SHORTAGE.

It is against this background of continuing shortage of oil seeds that sunflower cultivation is being given priority. *Vanaspati* manufacturers in the country find in sunflower a potential source for edible oil. Sunflower oil can be used in liquid form in blending with *vanaspati* or consumed as hydrogenated oil.

The impact of sunflower on oil seeds production and the vegetable oils industry can be substantial. It can not only bring about self-sufficiency but surplus. But a great deal of further research is required to shift over to sunflower cultivation. That is why India and the Soviet Union have entered into an agreement on April 10, 1972 for scientific and technical co-operation in agriculture under which both countries will exchange scientific specialists in agriculture in order to study the experience of each other. India is interested in the Soviet experience in cotton and sunflower cultivation and a number of Indian delegations are expected to go to the Soviet Union to make studies in these fields. It is hoped that these studies will help India to develop sunflower cultivation on an extensive scale.

SOVIET EXPERIENCE.

In this connection R. N. Sedak, the Soviet Deputy Minister for Agriculture who signed the agreement said "India started using the seeds of a new variety of sunflower several years ago. That was produced by the well known Academician Pustovoit. This variety of sunflower gave a yield up to 2,000 kg. per hectare which is much higher than yields in India. The Indian specialists in agriculture are planning to further increase the production of sunflower. For this they will be given training in the Soviet Union".

NEW BULLET PROOF HELMETS

The jaws of army and policeman will henceforth be relieved of the heavy steel helmets thanks to the efforts of Shri Joseph Nejedly of Praga Industries Private Limited, Coimbatore, who has developed new bullet-proof helmet made of fibreglass reinforced plastics. This light weight helmet not only substitutes the existing steel helmet but also possesses all the advantages of a bullet-proof steel helmet. Due to the low thermal conductivity of glass reinforced plastics, it has very good thermal insulation properties and affords protection from both cold and hot extremes.

The new helmet is made by first preparing specially woven patterns from selected guages of fibreglass, blending with polyester resin and subjecting to high compression in a hydraulic press. The antiballistic qualities of the helmet are achieved by ensuring precise control of temperature, correct glass to resin ratio, application of appropriate pressure during compression and by employing the right type of glass reinforcement. The whole material is so structured that the *missile impact* is dissipated in outward directions whereas in the case of a steel helmet the bullet would to a greater extent dissipate its force by drawing the metal at the point of impact-possibly causing fatal injuries. The technology involved in making these helmets can also be adopted for producing head gears for Tank-crew, Parachuters, etc. This development is likely to save substantial amount of foreign exchange to the country.

Inventions Promotion Board has awarded to Shri Joseph Nejedly a sum of Rs. 5,000 for developing a new material for making bullet-proof helmets and a Bronze Shield to Messers. Praga Industries Private Limited for successfully substituting imported bullet-proof helmets.

THE TAMIL NADU

PUBLIC BUILDING ACT AMENDED

LICENCES FOR PUBLIC BUILDINGS.

The Tamil Nadu Public Buildings (Licensing) Act, 1965 (Tamil Nadu Act 13 of 1965) was enacted in the year 1965 to ensure the structural stability and soundness of all public buildings. Though this Act came into force on the 1st April 1966, the time limit for submitting applications for obtaining licences as specified under sections 3 and 4 of the Act had been relaxed from time to time by the Government.

2. The Act has since been amended by the Tamil Nadu Public Buildings (Licensing) Amendment Act, 1972 (Tamil Nadu Act 28 of 1972) so as to bring only essential categories of buildings under the purview of the Act. The aforesaid amending Act has come into force on the 1st October 1972. Under the Act as amended, licences have to be obtained only in respect of buildings which have an area not less than one hundred square metres and also in respect of the continuance of use of any existing public building as a public building. The definition of 'public building' as amended by the aforesaid amending Act will cover the following categories of buildings, namely :—

(i) School, (including a tutorial school) or College (including a tutorial college) or University or other educational institutions ;

(ii) hostel ;

(iii) library ;

(iv) hospital, nursing home, dispensary, clinic or maternity centre ;

(v) club ;

(vi) lodging house, boarding house or hotel ; or

(vii) choultry, and the buildings ordinarily used for public meeting or for celebrating marriage functions or for holding parties.

3. As the last relaxation given for submission of applications for licence expired on 30th September

1972, the licences as required under section 3 or 4 of the Act should be obtained hereafter by every owner :—

(i) who intends to use any building (not being existing public buildings) as a public building ; or

(ii) who intends to continue to use an existing public building as a public building.

In the case of existing buildings, for which licence is required under section 3 (2) of the Act, applications should be submitted to the competent authority within a period of six months from 1st October 1972, i.e., up to 31st March 1973.

4. The Government have already issued the Tamil Nadu Public Buildings (Licensing) Rules, 1966 for regulating the issue of licences. These rules will continue to be in force even after the amendment to the Act. Under these rules any owner or occupier or lessee, etc., who intends to use any existing building or new building as a public building should apply for a licence to the authorities mentioned below in the form prescribed under the Rules :—

(1) *Personal Assistant to the Collector of Madras*.—All buildings in the City of Madras including Fort St. George with the glaxis.

(2) *Revenue Divisional Officer*.—All buildings owned or occupied by the Central Government or the State Government or a Municipality or a Panchayat Union Council or a Township Committee within his revenue division.

(3) *Tahsildar*.—All buildings in his taluk other than those for which the Revenue Divisional Officer is the competent authority.

(4) *Personal Assistant to the Collector of the Nilgiris (General)*.—All Buildings owned or occupied by the Central Government or the State Government or a Municipality or a Panchayat Union Council or a Township Committee within the Nilgiris district.

(5) *Tahsildar in the Nilgiris district*.—All buildings in his taluk other than those for which the Personal Assistant to the Collector (General) is the competent authority.

5. Applications for licences should be accompanied by a certificate of structural soundness in the form prescribed in the rules issued by an Engineer registered in accordance with the rules made under the Act. Applications not accompanied by a certificate of structural soundness referred to above shall be liable to payment of a fee at the rate of 0.05 per cent on the cost of the building, subject to a minimum of Rs. 50 and a maximum of Rs. 1,000. The following are the fees which should be paid for issue of licences in regard to various categories of buildings indicated below for which applications have been sent with certificate of structural soundness :—

Fees.

(1) Buildings, the cost of which exceeds Rs. 2 lakhs—Rs. 50.00

(2) Buildings, the cost of which exceeds Rs. 50,000 but does not exceed Rs. 2 lakhs—Rs. 25.00

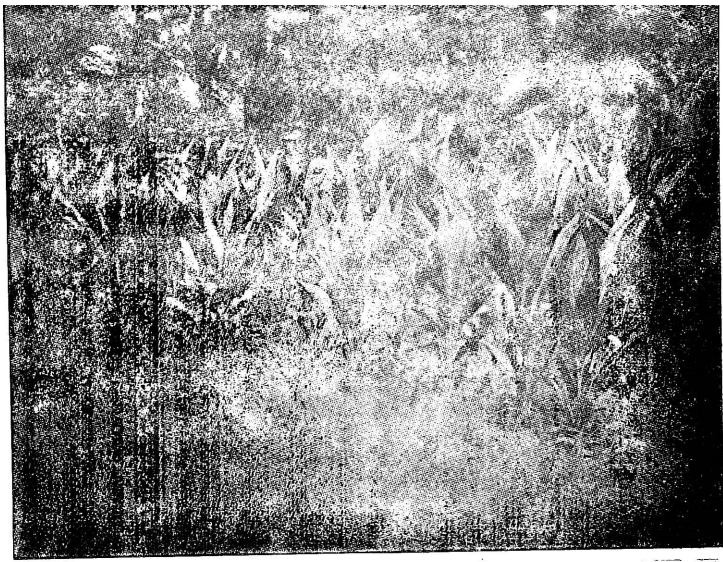
(3) Buildings, the cost of which does not exceed Rs. 50,000—Rs. 10.00

URBAN STATUS DEFINED.

The urban areas in Tamil Nadu have been delimited by a working administrative definition (a) They should have a unit population of 5,000 or more and population densities not less than 1,000 per square mile (b) 75 per cent of its inhabitants should derive their livelihood, in order to qualify for urban status, from non-agricultural occupations.

This helps a rational method of determining the units of municipal action in which high densities also render populations living in proximate groups susceptible to waterborne epidemics and a host of vectors and contagions. Added to the 340 population concentrations, which are urban by the above definition, are 400 new townships and town Panchayats have been named by Collectors.

HOW To RAISE A COCONUT GARDEN



The area proposed for coconut plantation should be cleared and planting holes marked out at the appropriate places.

If the land is slopy and subject to erosion, adopt soil conservation measures. If the ground water level is very high and the soil subject to water-logging, raised mounds or bunds may become necessary for planting. Fence the site properly to prevent cattle trespassing. Also explore the possibility of tapping the ground water for irrigation at least during the initial stages of the plantation.

Planting Distance :

Spacing is adjusted in such a way as the fronds of the adjacent palms do not overlap and plenty of sunshine is available for the palms to grow properly. Where the palms are over-crowded they grow tall and lanky and fail to give satisfactory yield due to the intense competition between palms for nutrients, moisture, light and air. In India, the general recommendation is a spacing of 25 to 30 feet for the ordinary tall palms.

Recent spacing studies done in Jamaica with the Jamaican tall variety have shown that closer planting results in a reduced per-palm yield, but a higher per unit yield (i.e., yield per acre is higher). The highest yields per unit, have been recorded at the closer spacings and the reduction in nut output per palm at these spacings has been more than compensated by the greater number of palms per unit area.

The experiment also revealed that at the 22 and 25 feet spacings only a few weeds grew, whereas frequent weed control was necessary at the 30 and 35 feet spacings. Further the occasional losses of palms which are common in a plantation will not materially affect the per unit yield with a high density planting whereas the yield will be reduced markedly in a thinly planted area.

Another useful development in coconut spacing is the hedge planting method. In this method the population per unit area is increased by adopting a closer spacing within rows. Single and double

under normal conditions. In the case of planting on the sides of channels or bunds in single rows, a still closer spacing of about 15 to 20 feet can be adopted.

Method of planting :

Plant the seedlings at the optimum spacing and in regular rows so that intercultivation operations with improved implements can be carried out with ease. Two different methods of planting are common in the country. They are the square and the triangular methods. In the square method, the distance between the palms within the row and the distance between the adjacent rows will be the same. In the triangular method, the seedlings are planted at fixed distance at the corners of an equilateral triangle. The square method, is easier to adopt and is more popular among the growers. In the square method, under-planting becomes easy when the original palms becomes senile. The advantage of triangular method is that nearly 15 per cent more palms can be planted in a unit area.

C. A. THAMPAN,
Director,
Coconut Development
Directorate.
Cochin.

hedge plantings can be practised and in both the methods, usual row to row distance is maintained but with closer spacing within each row. However, no research results are available regarding the optimum spacing in hedge planting.

Even though the present thinking is in favour of adopting a closer planting no definite recommendations can be made for adoption in India in the absence of experimental evidences under local conditions. However, a planting distance of 23 to 25 feet can safely be adopted

The Planting Holes or Pits :

The planting holes or pits are usually prepared two or three months before transplantation. Burn organic refuses in the pit to char the sides which will prevent termite attack. In hard laterite areas addition of about two to three kg. of common salt per pit is useful to soften the laterite. While the pits are dug, the surface soil is kept separate and the sub-soil is used to form small bunds all around the pit for preventing surface water from flowing into the pit.

The size of the pit will depend upon the soil texture and the ground water level. In hard laterite soils and in soils where the ground water is very deep, open deep planting holes. A planting hole of 5 feet cube ($5' \times 5' \times 5'$) is necessary in hard laterite soils. In light and sandy soils where the water table goes down very deep during summer, planting holes of $3\frac{1}{2}$ feet cube will be sufficient. Shallow planting holes should be adopted in areas where water table is comparatively high. In low lying areas subject to flooding and in areas where water table remains very near the surface for a considerable period of the year, seedlings should be planted on raised mounds. The intervening space between the adjacent mounds is filled up gradually to form continuous bund.

Planting :

Before planting, the bottom of the pits should be loosened and a mixture of top soil, river sand and wood ash added to about 3/4 feet in depth. Addition of river sand is beneficial to prevent termite attack. In sandy soils and in areas where drought conditions prevail, it is a good practice to put two layers of coconut husk at the bottom before putting top soil. This will absorb moisture during rainy season and will make it available to the young plants during dry period.

Plant the seedlings in small holes dug at the centre of the pits in such a way as the top of the husk of the seednut is just visible outside. The soil around the seedlings should be firmly pressed, but should not be allowed to cover the collar of the seedlings nor get into the leaf axils. The seedlings should be supported properly by giving suitable props for about a year so that the root growth and development are not affected by wind or other interferences. Under normal conditions, a depth of about 3 ft. to $3\frac{1}{2}$ ft. is recommended for planting in India. Shallow planting and planting on raised mounds of bunds are recommended under conditions where water-logging is possible.

The planting season depends upon the local climatic conditions. The proper time will be at the start of the monsoon. May to June and October to November are the best periods for transplantation on the West Coast of India. Planting before the monsoon with adequate provision for shading and watering has been found to result in the early

and better establishment of seedlings. Where water logging is possible, plant either after the heavy showers are over, or long before the start of the monsoon.

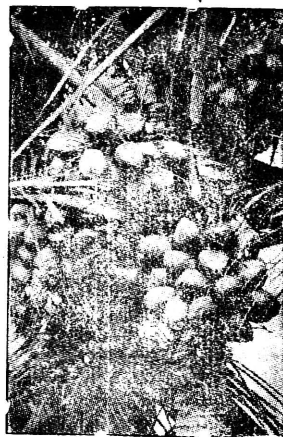
Care of young plantations :

From the time of planting to the third or fourth year, the palms should be well looked after.

The seedlings should be protected from stray cattle till they attain sufficient height. This can be done either by fencing round individual plants or by fencing the entire garden. In the first year of planting, see that water does not stagnate in the seedling pits during rains. The surface water should be diverted away and the pits should be cleared of rain water as often as possible. The collar and leaf axils of the seedlings should not be covered by the soil washed down into the pits. Such soil should be removed promptly. The seedling holes should be widened and filled up gradually as the seedlings grow and form the stem.

Water the seedlings during the first three years. Watering becomes necessary during dry periods or when the rains fail. In the first year, irrigation at the rate of four to 25 litres per seedling, at least twice of week, should be resorted to. An alternative is to place three porous mud pots of the capacity of over 5 litres each near the seedlings and fill them with water at frequent intervals. The water in the pot will become slowly available to the seedlings. The pots enable the moisture spread uniformly both in depth and on all sides. Refill the pots at weekly intervals or even at longer intervals. Properly watered seedlings grow fast and flower early.

During summer months, the seedlings should be shaded properly. Shading reduces casualties and the frequency of watering. Coconut leaves or palmyra leaves can be used for it. The shading can be dispensed with after two years. Keep down the weed growth around the seedlings. A circle of about 3 ft. in radius should always be kept free of weeds and the area mulched with the dried weeds or any other organic mulches. Mulching conserves soil moisture and also regulates soil temperature. As the palm grows, the size of the circle can be increased or the entire garden ploughed or dug up.



At the end of the first year, the gaps caused by loss of seedlings should be filled up. Similarly all the unhealthy and defective seedlings should be removed and made good by fresh planting. This process may have to be continued for about five years after transplantation.

Liberal fertilizer treatment is also recommended for young palms. Young palms receiving adequate supply of nutrients will grow rapidly and will have a short non-productive period.

Since the newly transplanted seedlings take more than five years to flower, some income can be obtained by cultivating suitable intercrops during this period. Pineapple, tapioca, bananas, dry paddy, millets and pulses are suitable for the purpose. These crops should receive enough fertilizers. Intercropping will benefit coconut palms as well, provided enough fertilizers are applied to the intercrop. Intercropping without the use of fertilizers is definitely harmful to the young palms.

Termites, rhinoceros beetle and the leaf eating caterpillars are the common pests found to affect the young palms. The seedlings should be inspected frequently and prompt control measures taken if affected by any pests. Prophylactic sprayings with suitable copper fungicides should also be given against shoot rot and bud rot diseases. Usually the seedlings which do not receive enough potash are found to become easily susceptible to the various diseases of fungal origin. A proper balance of major nutrients should be made available to the young palms, especially with respect to potash. This will help the palms to resist the incidence of various diseases.



With the implementation of land reform measures and distribution of cultivable lands to the landless, the need for devising mixed farming has increased as these constitute what are described as non-viable farms. The limited land and water at the disposal of non-viable farmers can be put to the maximum use, if these could be diverted from cultivation of crops to raising of livestock. There are many livestock enterprises like poultry farming, dairy farming, piggery, sheep rearing, etc. The diversion of lands in water scarcity areas from agricultural crops to development of livestock enterprise has a built-in advantage of correcting the imbalance between the viable and non-viable farmers.

Package Programmes.

A package approach to development of livestock enterprises is being followed in Tamil Nadu. A survey of the entire State in terms of the quantum of rain and availability of other water resources and the extent of their inadequacy is availa-

ble. In addition a soil survey map, which also shows all regions having insufficient rain and water resources marked on it, is also available. These two maps, water map and soil map are being correlated to a new livestock census to find out or assess the maximum livestock each area can support, so that it may also help in identifying regions with special varieties of breeds, number of cattle available and assessing the need of the region in respect of the same.

On the basis of collected data, different livestock development programmes can be undertaken. Depending upon the nature and importance of the individual programmes these can be sponsored either by the Government or Private bodies or jointly. These programmes may be added by way of grants or loans or be Government supported.

In the beginning, the Government would undertake a special breeding programme in selected areas purely

as departmental projects. As an adjunct to this programme, projects for the development of poultry, fisheries, piggery and dairy would be sponsored. The Tamil Nadu Government proposes to implement an experimental scheme called "White Revolution" in Thanjavur district in the current year. The scheme is visualised to produce enough eggs, milk and other products. The Departments of Agriculture and Animal Husbandry of the Government will implement such schemes as loan schemes for the benefit of interested small farmers.

The small farmers will be provided loans for establishing units for manufacturing poultry and cattle feeds. Programmes for manufacturing equipment for poultry and dairy development, would also be sponsored by the small farmers, who may be provided loans for the same. As a corollary, projects for bone meal manufacturing and leather tanning may also be considered. All these schemes it is expected will provide full time or part-time occupation to a number of small farmers, with non-viable farms.

Salient Features.

The salient features of the above schemes are to provide facilities to the poultry and other livestock breeders in the form of breeding stock, feed, equipment, technical know-how, disease control and marketing of the eggs, milk and other products. 'Producers' co-operatives are being started for poultry and dairy in different regions by enlisting small poultry and cattle breeders. The societies will be helped to start their own feed mixing units to supply well balanced mixed feeds at the lowest rates to their members, other private breeders and the Government units in the region.





OUR VANISHING ANIMALS AND BIRDS

For the past few decades pressure on wild areas and natural communities of plants and animals is increasing very rapidly throughout the country. This poses a growing threat to the survival of many wild species and ecosystems of great ecological scientific and economic value to the mankind. The disturbing situation and the need for urgent action are brought out in the report of the Working Group on Conservation, submitted to the National Committee on Environmental Planning and Co-ordination recently.)

The degeneration of the natural assets of any country is a matter of vital concern to it for its survival because a country may be lost not only through conquest and invasion but also by ecological aggression. For instance in most parts of India, the plains forests have disappeared owing to colonisation by humanity and thoughtless and wasteful exploitation for immediate profit, as a result of which this resource is no longer available to our country. It is realised that more space was needed for our growing population but the exploitation of the land has been so shortsighted and destructive that vast areas have been laid waste that need not have been. Good land-use practices could have made it possible for the burgeoning population to survive on the basis of our natural resources. Even to day most of our State Governments are giving away large areas of land even in reserved and protective forests to individuals.

forests during the period 1959-1969 as much as 1.69 million hectares have been deforested for various purposes. In a strongly worded note circulated to all the State Governments in August, 1971, Mr. C. Subramaniam, Minister for Planning, said "Forests are a powerful factor affecting environment in India as elsewhere in the world and are among the most important natural and renewable resources. Forests moderate extremes of temperature and slightly lower the mean temperature, effects which are particularly important on the main continental land mass in the tropics like Northern India. They tend to increase local precipitation at

least to the extent of increasing the number of rainy days regulate water-supplies, reduce the intensity of floods and arrest shifting sands".

India took a very imaginative step in 1952 when it formulated a National Forest Policy which laid down that 30 per cent of the total land area of India had to be put under forests for various reasons. Unfortunately this aim has not been achieved and today, as referred to above, barely 24 per cent of the land area is under forest in India, and in some States even less than 15 per cent.



While India today has only 24.7 per cent of the total area under

To illustrate the rapid dwindling of our wildlife, and the problems of conservation, some animal and plant species currently endangered in our country may be considered. All over the world it has now become clear that the way to save threatened species is by conserving their habitat, and not merely by legislation prohibiting their destruction. Habitat conservation does not merely imply the prohibition of shooting or otherwise killing these threatened species in the areas in which they are known to occur, it also implies the provision of adequate area and protection from human disturbance and other ecologically aggressive factors within that viable area.

Mammals

The Hispid Hare and the Pigmy Hog, inhabitants of Assam till recently thought to be extinct were re-discovered last year and plans for their conservation have been formulated by the Assam Valley Wildlife Association under the patronage of the Prime Minister. The Liontailed Macaque similarly is known only in the southern reaches of the Western Ghats and associated hills and is in an acutely precarious position. The Wild Ass one of the two or three authentically wild equine species now left in the world, is to be found in a limited population confined (within Indian limits) to the Rann of Kutch. The Hangul, the largest Indian deer, is confined only to Dachigam and Desu in Jammu and Kashmir.

These animals, which had a very limited distribution even at the beginning of this century need absolute guarantee of adequate territory free from all disturbance if they are to survive. It may be added that all these are uniquely Indian and are found nowhere else in the world. The Dougong famed for centuries as the animal behind the mermaid legend, is now to be found in highly depleted numbers in the coastal waters off the south-eastern tip of India, in spite of all attempts to protect it, it is still being hunted, and protection is difficult because it is a marine animal.

As against these animals which have now such a small range, the Asiatic Lion and the Tiger are examples of animals with a wide distribution which have dwindled



and become restricted to a particular area (the lion) or to small non-viable communities broadcast over a large area (the tiger).

The tiger and the lion are examples of animals famous for centuries and with dynamic dramatic appeal. The degenerate of the lesser cats, which lack this dramatic individuality exemplifies the decline of species owing to mere negligence in conservation. The Rusty Spotted Cat and the Fishing Cat are examples of such species.

Many animals well known and common in certain areas till comparatively recently have become locally extinct mainly due to the decline of their population to below the minimum necessary for survival by their being hunted. Examples are the Leopard, till recently thought to be so adaptable that it could survive in widely different habitats, and the South Bear which has given the place name to so many localities in the country but which is now extinct in them. The Wild Buffalo within peninsular India illustrates the decline of a species due to hunting and also to national planning that takes no note of harm to wildlife.

The Madhya Pradesh Barasingha (*Cervus Duvaceli branderi*) is now to be found only in Madhya Pradesh mainly in a small population of under 100 in the Kanha National Park (an area where it was once found in thousands). The Nilgiri Tahr, the only wild goat of peninsular India and uniquely Indian, was

considered on the brink of extinction many years ago, and a successful attempt to revive it by according it special protection was made. Shikar and unlicensed coaching have claimed paracital by every wild animal in our country but none has suffered depletion so directly as the consequence of hunting as the Blackbuck. The Chinkara is also an animal that has become locally extinct in many areas due to hunting. Both these animals particularly the Blackbuck, were amongst the common wild beats of the plains country but are now completely wiped out in most of their former homes. The disappearance of the Blackbuck from so many areas where it previously existed has been the principal factor in the complete extinction of the Cheetah which lived largely on this herbivore.

Birds

Of its 1,200 odd birds species India is fortunate in having lost only three species so far. But there are two others on the danger list, namely the Whitewinged Wood Duck and the Great Indian Bustard. These birds are endangered principally because of environmental deterioration. The White-pinged Wood Duck is a resident of the rain forests of Assam and the severe logging operations in that region are ruining its habitat. The Great Indian Bustard is a bird of dry open country and lays only a single egg at each nesting and increasing agricultural operations even in our marginal lands have driven the bird near extinction.

Many of our birds have become locally extinct because of urbanisation and a radical change in land use. It is important that local check-lists of these avians be continually made and monitored, because birds, as has been said above are good indicators of the ecological health of different regions and the fact that they can be easily seen makes them valuable signals of the state of the environment.

It is estimated that almost 5.5 million waterfowl birds migrate into India from the Siberian-Kazakhstan-Pakistan region. These birds are an international resource of great value and they can only be saved if we take steps

with regard to the conservation of Wetlands, and also conserve our lakes. Chilka and Tada lakes are sizeable backwaters which attract a great number of waterfowl. These are, however, systematically slaughtered by professionals with guns, nets and snares.

All the three species of crocodiles found in India have been severely depleted. Of the approximately 230 species of snakes in the country, 85 per cent control rats and mice, rodents which do incalculable damage to crops and grain in the country. There is an acute shortage of anti-venom especially of Krait due to the short supply of snake venom. Yet snake-skins at an average of 2.6 million a year have been exported during the past few years, and even for this year a quota of 1.3 million has been fixed. The python is protected and the export of its skins prohibited. But when tanned skins in such vast quantities are being exported, there is every likelihood that even the banned varieties go out unchecked.

Like the snakes the lizards to have suffered grievously due to the destruction of their habitat and in aerial spraying of crops, and anti-locust spraying. Yet the exploitation of their skins go on unabated and a quota of 1.2 million

skins has been allowed for this year. The role of the "Sandha" (Baromatin) in the control of locusts is well known. Besides certain lizards like the Southern Varanus Water monitor and the Agra lizard are endangered species.

Fish—

It is well known that fish already provide substantial amount of protein for the requirements of human beings and food from the seas is one of the main hopes of the increasing population of our planet. Unfortunately the poisonous effluents from industrial processes and the wide spread use of D.D.T. on the land have gravely affected this marine resource. Increasing reports are coming in about the death of fish in the rivers of India and pollution of the oceans is evidenced by reports such as those about the death of sardine in the Haji Ali Bay of Bombay recently.

Plants—

Till recently plants were not considered a part of wildlife although the value of vegetation to the land (as conservers of soil) and the economic value of plants and their role in providing food and shelter to the animals was fully recognised. It is only recently in our country that we have defined the term wildlife to include plants

(the Expert Committee's Report on Wildlife Conservation in India, 1979). It might be stressed here that plants need to be conserved as they provide the basis for supporting all forms of life, they build and diversify habitats for themselves as well as for animals and they provide the framework of ecosystems. Their floristic values are of special significance as indicators of habitat and of land use practices.

India is one of the richest floristic areas of the world and the number of plant species runs into thousands, nevertheless, only a fraction of these of economic value have been conserved by Forest Departments for over a century now. Large tracts of the country's wild vegetation have not even been surveyed by any competent authority such as the Botanical Survey of India.

Habitat Conservation—

The examples provided above briefly set out the need for habitat conservation for preserving threatened species. However, these represent only a minor fraction of the wildlife wealth of the country and the need to appropriate certain areas blessed by nature and accord them total or partial protection from ecologically aggressive factors will be obvious.

A NEW HIGH YIELDING SORGHUM HYBRID

Since the release of CSH. 1 as a high yielding sorghum hybrid, several new hybrids are being continuously tested at the Agricultural Research Station, Bhavanisagar of Tamil Nadu Agricultural University with the co-operation of Project Co-ordinator, Indian Agricultural Research Institute for grain and straw yield. The trials were conducted for two seasons monsoon and summer. The hybrids were compared with local sen-cholam in main season and Co.18 during summer.

A basal dose of 20 cartloads of compost manure was applied along with 420 kg. of superphosphate (67.26 kg. of P) per hectare. 560 kg. of Ammonium Sulphate (112.00 kg. N) per hectare in two equal split

doses, the first half at the sowing and the other half, one month after sowing. A spacing of 45 cm. between rows was adopted and 15 cm. between plants. At sowing, Thimet was applied at 1.5 gram per metre row. Fifteen days after sowing one spraying with endrin was given as prophylactic measure. 30 days after sowing, another spraying with endrin was given. On 40th day endrin granules were applied at 15 kg. per hectare. In the earhead stage BHC. 10 per cent and DDT. 5 per cent were dusted to control the earhead bugs.

The hybrid MS. 2219 × IS 3541 has recorded consistently higher yields over the released hybrids and the local, during both seasons (1968-69 to

1969-70). It has recorded a grain yield of 6,030 kg. 5,975 kg. per hectare during summer season. This hybrid also possesses dull midrib and consequently juiciness of straw.

Apart from grain yield, the hybrid MS. 2219 × IS 3541 grows taller than CSH. 1. The plant measures 216 cm. in height against 136 cm. of CSH. 1. The straw yield of this new hybrid consequently becomes double that of CSH. 1. The duration is same as that of C.S.H.1. The grain colour is a pleasing good pearly white and no lodging was noticed in this crop. This new hybrid MS. 2219 × IS 3541 with high yielding potentiality (both grain and straw) and suitability for both the main and summer seasons.

VEMANA — A REFORMER POET

[In the whole range of Telugu literature, there is perhaps no author whose writings have attracted so much notice among Europeans as Vemana, whose birth centenary falls in 1972—Ed.]

Vemana is a popular Andhra poet. In fact he is far more popular than the Telugu literary giants like Peddana, Pothana or Pingali Surana. Vemana's verses are known as Vemanasatakam.

The greatness of this poet can be judged from following comments of western scholars. G.A. Grierson, who made a deep study of Indian languages and literatures, said that Vemana "is to-day the most popular of all Telugu authors, and there is hardly a proverb of a pithy saying which is not attributed to him".

The French Abbe J.A. Dubois in his 'Hindu Manners, Customs and Ceremonies' while referring to Indian poets who have written in "a philosophical vein" says: "One of the most famous is Vemana His writings, from which I have seen several extracts, appear to me to be most interesting and are distinguished by much discernment and independence".

Dr. G.U. Pope has appreciated that "nothing can exceed the sweetness and rhythm of Vemana's versification".

Major R.M. Macdonald whose name is familiar in Indology says "in the whole range of Telugu literature there is perhaps no author whose writings have attracted so much notice among Europeans as those of Vemana".

William H. Campbell another western oriental scholar says "Vemana is emphatically a poet of the people".

Dr. C.R. Reddy was primarily responsible for the rediscovery of Vemana in recent years. In his epoch-making book published in 1914 he hailed Vemana as one of the best and original poets produced by Andhra. In another place, he called Vemana "a star of the first magnitude in our firmament".

But it is ironic that there are no reliable records to substantiate the period in which he lived and

the places where he spent his years. Conflicting theories have been advanced to fix his time anywhere between the twelfth and the seventeenth centuries. It is generally accepted that he lived in the latter parts of the seventeenth century and the opening years of the eighteenth. Likewise, there is no agreement on where he lived though a place called Kondavidu, is believed to be his birthplace. Vemana is said to have spent the best part of his life in Cuddappah and Kurnool districts. Though a claim has been made that the poet died in one Katarapalle and that some sort of a tomb exists there, it has not found acceptance in many quarters.

His parentage has not been established for certain but till this day many legends are in circulation. Perhaps a diligent research of the verses of Vemana would yield more details about his life. Even a casual browsing tells one that Vemana comes from a farming household. He respects his parents and in turn basks in the maternal love. His mother seems to have died suddenly and, according to Vemana, with unseemly haste his father remarries. He undergoes a lot of sufferings at the hands of his step-mother; his own marriage after the initial flush, founders on bad housekeeping. Vemana's life touches the nadir before he finds a preceptor who gives him solace. Evidence on these points in the life of Vemana can be found in the verses he composed with such simplicity without giving up brevity, pungency, wit and satire.

Vemana has been acclaimed as a poet of the people. His compassion and humanism urged him to comment upon the many social evils and shortcomings of an age when despair enveloped the massed and only empty forms of religious reforms and rituals remained. Vemana's concern is the human being. Dr. L.D. Barnett in his book "The Heart of India" says Vemana "is indifferent to nothing human". Barnett further says

"when the teachers and preachers of mankind are weighed in the balance by the Searcher of Hearts, many a lofty and glorious spirit will be found of less worth than this humble yeoman of Telingana".

Vemana's philosophy has three main divisions: social, ethical and religious. His advocacy of human equality is very strong. In one verse he says:

If we look through all the earth.

Men, we see, have equal birth.

Made in one great brotherhood,

Equal in the sight of God.

He is equally vehement in inveighing against the class system. He rightly recognises that the class system is even more pernicious than the caste evil. While speaking about the riches and poverty, which Vemana says has a more corrupting influence than wealth, he warns that "poverty is a wild fire. It consumes you; it consumes all those who are dear to you. Verily, poverty is a sin".

In his ethical philosophy, he is aware of the limitations of human nature. He says that since everyone cannot become an ascetic, a family man will be equally great if he is honest, considerate and loves other lives.

In his religious philosophy, he rejects the authority of the vedas and other scriptures and concentrates on the identity of the individual and the universal soul. He believes that God lying in the heart of every being, is not altogether different from man. He says "there is no necessity for a seeker to move even from his village. Why should he, unless he wants to count the foxes on his why"?

Vemana's verses have been variously counted between more than a thousand and more than four thousand. Since he himself never wrote down any of the verses, many more have been attributed to him.

After deleting many spurious verses and interpolations foisted on Vemana by both his admirers and detractors, the verses that can be reliably said to be composed by Vemana will number about two thousand. Brown has made five groups of the verses he edited, religious, moral, satirical, mystic and miscellaneous.

Though he is classified as a *sataka* poet, he is distinctly different from the other *sataka* poets who always conform to grammar and prosody. Vemana never worries himself on these aspects: his verses have a life force that scoffs at the hypocrisies, pokes fun at the foolishness of the people, admonishes them to behave with rectitude to enjoy this life and to let others partake in this joy.

A brief mention must be made of the metre used by the poet for his verses. It is called *ataveladi* which means "a dancing damsel". Vemana has exploited this form with all its case, simplicity, rhythm and cadence. His language is simple and direct and many of

his verse lines are living proverbs in every day speech of the Andhras.

Any reader of his verses will not fail to observe his robust and native humour. He attacked superstitions and beliefs not always with logic but with satire and wit, with more telling effect. For example, he says: "when you perform a vedic sacrifice or visit a pilgrim centre a barber sprinkles water on your head to shave it, and a priest to save your soul. None can say how effective is the water sprinkled by the priest, but you have, in a clean shaven head, clear proof of the effectiveness of the water sprinkled by the barber."

An apparent contradiction in Vemana is the esteem in which he holds motherhood and maternal love and the disregard he shows to the woman in general. He tends to believe she is the embodiment of evil and he cautions others not to repose faith in her. Campbell comes to Vemana's rescue saying "In India women are the most determined enemies of reform, and Vemana must have often found

his influence weakened and his efforts baffled by their innate conservatism and blind acquiescence in the traditional opinions and customs".

Vemana's place in Hindu positivism is, according to Professor Binoy Kumar Sarkar, "Of the same rank as that of Kabir, Chaitanya and others, if not even higher". Yet he is comparatively much less known than Tiruvalluvar or Kabir. One reason could be that those who counted in Telugu literature did not give the due place to Vemana till recently. Even though he has now taken his rightful position in the galaxy of Telugu poets, his universal vision merits for him a wider appreciation and audience. Even though Vemana has been translated first by Brown and then others, he is yet to be presented to people other than Telugus in all his grandeur, wit and wisdom.

That need is all the more now for this poet has a message that transcends time and is universal in outlook.

the living past

The imprint of Time left on impressive buildings like the Taj Mahal is more easily discerned in written records. In place of mute memorials, eloquent books speak to one and all. The past is preserved in documents and books for posterity to show how and where history is imperishable. The same can be a guide to the future also.

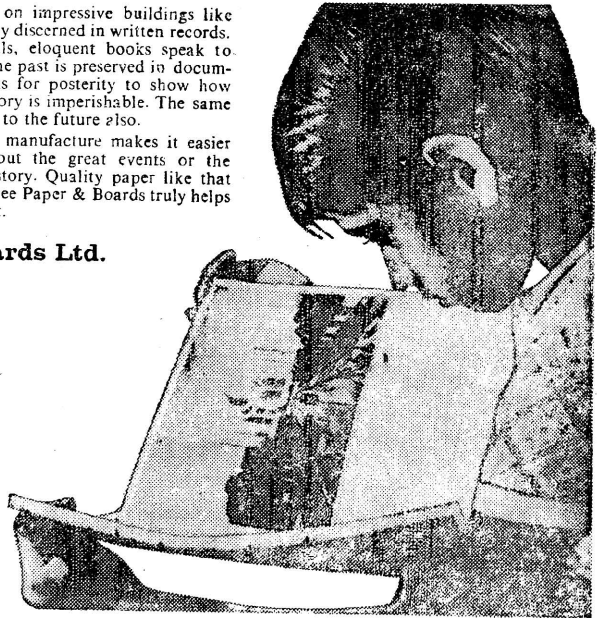
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GROWTH OF BANKING SINCE INDEPENDENCE

With institutions as with human beings, a 25-year span leads to a completely new generation. Commercial banking has been no exception. Over the last 25 years, it has undergone changes for most of which the term "revolutionary" will be not just a figure of speech but the most appropriate description. Whether one examines its metamorphosis in quantitative term or assesses it in terms of qualitative changes, one comes to the same conclusion : that the infant of 25 years ago has turned into a mature adult and has developed a distinct personality of its own. At the time of independence, the number of bank offices in India was a little over 4,000 ; today the country is dotted with more than 13,600 bank branches. From around Rs. 900 crores in 1947, bank deposits today amount to over Rs. 7,700 crores, an eight-fold increase. Total bank credit at that time was about Rs. 400 crores ; now it stands at over Rs. 5,300 crores. Resources made available by the commercial banks to the public sector in the form of investment in Government and semi-Government securities amounted to Rs. 450 crores; to-day they are over Rs. 2,000 crores. Less dramatic perhaps, but for more significant, have been the qualitative implications of the changes, particularly since a major portion of the banking sector was brought under public ownership in July 1969. Until then, commercial banks in India had a strong urban bias and were almost the exclusive preserve of the urban and metropolitan elite. Their favourite areas on operation were cities and towns with a developed commercial

and industrial structure. As a result of deliberate policy pursued vigorously during the last three years to take banking to rural and less developed areas, there is today a much better dispersal of banking facilities. Banks have moved into areas that were traditionally considered unattractive. This has, however, not been an easy job nor is the present position such as can be viewed with perfect equanimity.

An altogether new vista was opened by the nationalisation of 14 major banks on July 19, 1969. With this change roughly 4/5ths of the commercial banking system came under the public sector's fold. On the question of extension of banking facilities to rural and unbanked sectors, an areawise approach was evolved and incorporated in an action programme known as the 'Lead Bank' scheme. The bank assigned the 'lead role' in a particular district has a major developmental responsibility vis-à-vis that district.

SILVER JUBILEE OF OVERSEAS COMMUNI- CATION

The 25th Anniversary of our independence also marks the Silver Jubilee Year of the Overseas Communications Service. It was constituted in the year 1947, by the Government of India, to run the external telecommunication services taken over by the Government from a private organisation known as the Indian Radio and Cable Communication Company. At the time of nationalisation on January 1, 1947, the external

services were extremely limited. Wireless, telegraph connected India to U.K., Japan, Australia, China and U.S.A. while radio telephone connected only U.K. and the Submarine cable telegraph linked London and Penang. With the attainment of nationhood by India, it was found necessary to develop better and faster telecommunication contracts with the outside world to foster better understanding, goodwill and growth of industrial, economic and trade relations. During the Third Five-Year Plan the external telecommunication services were expanded and modernised to introduce currently available technological improvements. The expansion of the services in a balanced manner to reach all the regions in the country called for the establishment of regional centres along with the expansion of the main Bombay centre.

In 1943, a restricted radiophoto service was opened for military and war publicity purposes. Radiophoto services were subsequently inaugurated at other centres : at New Delhi in 1954, at Calcutta in 1958 and at Madras in 1966.

By the end of the Third Five-Year Plan, the number of direct circuits increased to 32 wireless telegraph circuits, 32 telephone circuits, 32 telex channels and 18 photo-telegraph circuits.

The increasing scale of the exploitation of the HF radio medium by all countries led to severe congestion in the restricted radio spectrum available. HF radio cannot also afford enough bandwidths to provide for the ever-increasing demand for more channels, thereby inhibiting the growth of telecommunication facilities. It had also serious drawbacks like fading and noise which stood in the way of utilisation for semi-automatic or automatic telephony and telex. It was, therefore, necessary to look for a reliable wideband communication medium to provide for future expansion. While submarine telephone cables were known to be reliable wideband medium which could provide the answer to the challenge of the growth of telecommunication requirements, India was not in a favourable position as it had no submarine cable even in its neighbourhood.

SPACE TECHNOLOGY IMPROVES TELE-COMMUNI- CATIONS

At this stage, space technology came up with an excellent solution to the problem by providing a wide-band medium in the form of communications through man-made satellite which would be orbiting the earth and providing the telecommunication relay between countries.

India joined the international Satellite Consortium known as INTELSAT in 1965. The satellite consortium was responsible for providing space segment which consisted of the construction, launch and subsequent maintenance of satellites in space. The earth station for communication through satellite is the responsibility of the member countries. Plan for the establishment of Indian earth station was drawn up in 1967 and the project was entrusted to the Department of Atomic Energy for execution in April 1968. The earth station was completed by DAE and tested and taken over

January 31, 1971. The first access to the space segment through Indian Ocean region satellites, INTELSAT III, to exchange signals with the earth station in Goonhilly, England, took place on February 13, 1971

marking India's debut into commercial space communication. The first telephonic service was cut over between India and Australia on February 26, 1971.

Since the commencement of the commercial operation of the earth station, the service through satellite has expanded to cover seven countries and through their earth stations to seven other countries. The satellite circuits achieved so far are Phone Channels 47, Telex Channels 46, Telegraph Channels 10 and Leased T.P. Channels 29.

Railways Carry More Passengers

The Railways have been carrying more passengers this year. The passenger traffic went up by 9.3 per cent in the five months ending August last, compared to the corresponding period of 1971-72. The originating revenue earning goods traffic during the same period registered a marginal increase of one per cent. On the North-Eastern Railway, the goods traffic dropped by 18.4 per cent. The fall was due to lesser production of sugarcane, sugar, molasses and alcohol this season. There was a marginal decrease in the originating revenue earning goods traffic on the South Eastern and Central Railways. The fall of one per cent on the South Eastern Railway was mainly because of lesser loading of iron ore, of cement on account of lesser production and because of breaches and cyclones on the East Coast. On the Central Railway

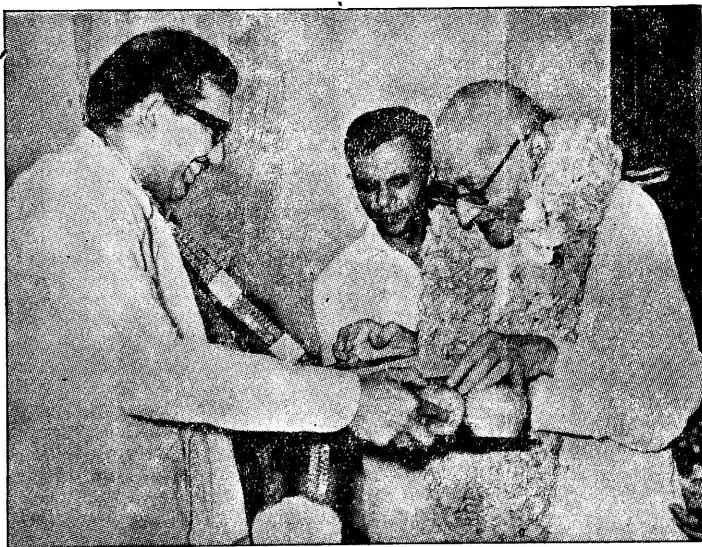
too, lesser loading of cement and coal and breaches on the Western Railway as well as heavy rains in coalfields areas contributed to the marginal drop of 1.6 per cent. Similarly, there was a marginal decrease in goods traffic due to breaches on Bombay-Delhi route.

DUAL PURPOSE TONG.

Two types of tongs, Chintia and 'Sansi', are commonly used in Indian kitchens. The Chintia is used for handling flat utensils like tawa (pan) and lid, while the Sansi is used for handling cooking utensils or vessels. A dual purpose tong developed by Shri S. G. Borlikar comprises the functional qualities of both the above implements.

The dual purpose tong, called, 'sevak' consists of a pair of suitably designed tongs with long handle and hinged at a point, a third tong without handle, is revetted at the point of intersection of the first two tongs. The tongs are so designed that they can hold vessels by gripping the wall vertically, while flat utensils can be held horizontally. For special applications, as in laboratories, hospitals and workshops, 'Sevak' can do both the jobs of lifting the lid and holding the vessel simultaneously.

For his invention Shir S. G. Borlikar of Shah Trbingy Company, Bombay has been awarded Rs. 500 by the Invention, Promotion board.



The Chief Minister of Tamil Nadu presenting the Tamara Pataram to Thiru C. Rajagopalachari at his home in Madras City.

THE APPLIED NUTRITION PROGRAMME

During a 3-day Regional Conference of Southern States on Applied Nutrition Programme held at Ootacamund early in July this year, the methods adopted in Tamil Nadu were singled out for praise and emulation by other States.

The broad objective of Applied Nutrition Programme is to educate the people on the need to take nutritive food and to make the community produce protective food in larger measure and make them available particularly to the vulnerable sections like children and expectant nursing mothers. This programme which was sponsored by the Government of India with the aid of UNICEF is being implemented in this State from 1963-64. The programme is worked for 5 years in each Block and thereafter the community is enabled to implement it on its own initiative. It now covers 10 blocks since the first series of 5 blocks have been weeded out from this programme. During the year 1971-72, about 8,500 kg. of vegetables, 2,983 litres of milk and 139,900 eggs were distributed under the feeding programme. The number of beneficiaries under this programme amounts to 2.6 lakh child-days and 724 woman days.

Senior Officers charged with the responsibility for implementing the Applied Nutrition Programme in the States of Tamil Nadu, Pondicherry, Kerala, Mysore and Andhra Pradesh participated in the conference. Dr. N. A. Agha, Joint Secretary, Ministry of Agriculture, Government of India, presided over the conference. Thiru Guhaprasadam the UNICEF Field Representative posted to the Southern Zone took a prominent part in the deliberations.

Thiru E. C. P. Prabhakar, Secretary, Rural Development and Local Administration Department, described at length the various methods by which the programme is implemented in Tamil Nadu and explained the co-ordination processes followed in Tamil Nadu and also emphasised that the Gramasevikas and Gramasevaks were made to function as the primary agents, at the field level.

In the course of his talk, the Rural Development and Local Administration, Secretary to Government of Tamil Nadu Stated :

"The district officials and the Panchayats were fully involved in this process. They were made responsible for indicating the places, where community gardens, school gardens and other items of works could be located. The programme was also being reviewed every year, as a part of an 'inbuilt system' of evaluation, which took into account, the past performances in the field".

During the discussion, Thiru S. Islam Khodjaer, Thiru Kreuger and Guhaprasadam, Representatives of UNICEF also participated and Thiru Kreuger commended, that the pattern of planning on a 5 yearly-basis but yearly plan, as followed by the Government of Tamil Nadu may be adopted by other State Governments.

The Conference agreed to promote the Nutrition Education and emphasised the need for publicising data on nutrition facts and information and suggested that a monthly news letter on Applied Nutrition Programme may be issued, either by the State Government or the Central Government.

An Exhibition-cum-display of literature and educative charts pertaining to Applied Nutrition Programme were specially got up by Dr. Rajammal Devadas, Director, Sri Avanasilingam Home Science College, was commended by the representatives of Government of India to other State representatives. This arrangement was the highlight of the three day conference and it underlined the need for the spread of Nutrition Education among the masses and the elite.

Concluding the proceedings, Dr. Agha, Joint Secretary, Government of India, thanked the organisers of the conference, especially

Thiru E. C. P. Prabhakar, I.A.S., Thiru Raghupathi, I.A.S., Director of Rural Development Department and the host State of Tamil Nadu for the arrangements made and for the successful conduct of the meeting.

In Tamil Nadu a sum of Rs. 10 lakhs has been provided for the scheme during 1972-73. The wages of Labour would be Rs. 7 lakhs and material component Rs. 3 lakhs. The objectives of the Applied Nutrition Programme are as follows:—

1. To demonstrate the production of more nutritionally valuable foods like vegetables, fruits, eggs, fish and milk.
2. To educate the people to become more nutrition-conscious.
3. To organize demonstration feeding programme for expectant and nursing mothers and pre-school children.
4. To improve the family diet with available food to raise the standard of health.
5. To train all the participants in the programme (officials and non-officials) in Nutrition education to produce more nutritive foods.
6. Developing the leadership and resources to make the programme self-generating in each village.

IMPLEMENTATION OF THE PROGRAMME.

(a) To improve the production of the nutritionally valuable foods the following have been set up in villages or selected blocks.

Community, school and home gardens to grow nutritionally rich vegetables and fruits. Backyard and Block units to produce more poultry and eggs. To educate the people demonstration feeding programmes have been arranged to distribute cheap balanced foods to expectant and nursing mothers and pre-school children.

Periodic evaluations are also done to measure the impact of the programme on the people and find out to what extent production and consumption of protective foods are taken up by the local people.

MANGANESE SULPHATE INCREASES GINGELLY YIELD

Gingelly is a very important oilseeds crop in Tamil Nadu. About 3 lakhs acres are being cultivated in Tamil Nadu. Due to the higher calcium content, gingelly oil is regarded as very good vegetable oil.

Gingelly was reported to have responded significantly to the application of manganese sulphate. Agricultural Extension Department of Tamil Nadu Agricultural University organised test demonstrations in the districts under the supervision of State Agriculture Department to verify the same.

4 kg. of Manganese sulphate were applied to the gingelly crop, apart from the regular dose of fertilisers. The test demonstrations were conducted in the fields of—

(1) Thiru C. Angappan, Nambi-yampalayam, Avanashi Block of Coimbatore district.

(2) Thiru M. Palaniappan, son of Marimuthu Gounder, Veppampalayam of Erode Block, Coimbatore district.

(3) Thiru R. Natarajan, Eda-yankodu, Pulipakkam (via) Chingleput district.

(4) Thiru G. Arumugam, Poosaripatti, Kadayampatti Block of Salem district.

The results have shown that gingelly crop has given 20 to 23.19 per cent increase yield due to the application of Manganese sulphate at the rate of 4 kg. per acre. The average increased yield because of the application of manganese sulphate was also 21.39 per cent.

Based on the result of the test demonstration it can be concluded that manganese sulphate is good source of nitrogen to increase the yield of gingelly crop. ☛

Land Development Loans.

New fillip to World Bank Scheme.

After months of dilly-dallying the government has at last taken notice of the miserable pace at which the various rural development projects financed with World Bank loans are being carried out. According to recently published official figures, nearly 94 per cent of the credit provided by the bank over the last three years remains unused.

The root of the problem is the bank's stipulation that no new wells should be constructed unless their location has been cleared by the technical cells in the newly established state ground water directorates. These manned largely by civil engineers who have little experience of field conditions, have laid down norms which are so rigid that they virtually rule out any large-scale programme.

With the setting up of a special task force in Krishi Bhavan, it should be easy to remove such obstacles, says *The Times of India*. Despite the bottle-neck, the Land Development Loans disbursed last year amounted to as much as Rs. 25 crores, in Tamil Nadu.

Loans disbursed by Co-operatives for agricultural production in Tamil Nadu during the past year totalled Rs. 57 crores, Rs. 12 crores more than in the previous year, according to the Registrar of Co-operative Societies, Thiru P. M. Belliappa. He said this was a creditable achievement, considering the fact that the amount disbursed had remained more or less static around Rs. 45 crores, during the previous three years. The recovery of loans had been "much better", the outstanding loans being 12 per cent in the past year as against 16.4 per cent in the previous year.

DISTRIBUTION OF WASTE LANDS

.....About 5.7 million hectares of wasteland has been distributed in different states. The bulk of this land has been distributed to landless agricultural labourers. In almost all States rules have now been framed for allotment of Government waste land to agricultural labourers and

small land-holders. A number of states have adopted measures for taking over land which becomes surplus as ceilings agricultural holdings are imposed and implemented. So far about one million hectare of land is reported to have been declared surplus. Nearly half of this land has already been distributed. The Fourth Five Year Plan lays emphasis on the need to distribute surplus land to landless farm workers on a systematic basis.

Agricultural Study

.....The number of students and agricultural institutions increased to 12,800 students (by March 1972) and 93 agricultural institutions (by September 1972) as compared to 1,400 students and 17 institutions in 1947. At present there are 18 agricultural Universities in the country. The number of post-graduate agricultural colleges increased from 5 in 1961 to 42 in 1971. There are 20 veterinary post-graduate colleges today as compared to only one in 1955. The first Agricultural University in India was opened in 1960 in Pant Nagar in Uttar Pradesh.

Agricultural needs

.....The value of agricultural requisites other than fertilizers, namely, improved seeds, agricultural implements, pesticides, etc., handled only by the co-operatives during 1969-70 and 1970-71 was around Rs. 50 crores each year, of which seeds accounted for Rs. 24 crores and pesticides and other accounted for Rs. 20 crores. The balance of Rs. 6 crores represented the value of agricultural implements distributed. The co-operatives in U.P. Maharashtra and Gujarat alone account for bulk of the turnover in these activities. The basic objective of the co-operative which is to help the small peasant, worker and artisan reflects the goal of socio-economic policy of the State which has been expressed succinctly as "growth with social justice".

Cancer Research

.....The Indian Council of Medical Research has established three units at Bombay, Hyderabad and Ahmedabad for testing environmental carcinogens to determine the causes of cancer. These units are carrying out research to determine the carcinogenicity of edible oils, beverages, tobacco, contraceptives, insecticides and pesticides.

REFORMATION IN THE SET-UP OF SMALL-SCALE INDUSTRIES

Small-scale industries is defined to include industrial units with Rs. 7-50 lakhs investment in plant and machinery. This definition excludes amount involved on land, buildings and working capital. In case of ancillary small-scale units, the limit of investment is up to Rs. 10 lakhs on plant and machinery alone. According to the data compiled by the Small-Scale Industries Development Organisation (SSIDO), the rate of production in this sector is 11 per cent per annum. SSIDO, has also estimated that the number of units is growing at a rate of 10 per cent per year. There are at present over 2.82 lakhs units registered in the country. From the data available, it also appears that there are 33.40 lakhs men employed in this sector. SSI units would have exported goods (non-traditional items) of a value of Rs. 32 crores in 1969-70.

LICENSING POLICY.

The licensing policy has favoured small-scale sector by reserving certain products for small-scale units. There are at present 128 products set aside for small-scale production. Eighty more items are

under consideration for reservation. There are some items which technically and economically can be manufactured in small-scale sector.

ENTREPRENEURS.

Most entrepreneurs in small-scale industries appear to have come from the commercial class or other group of advanced society rather than from the artisan or technically trained groups. Special efforts have now been initiated to attract entrepreneurs from amongst technicians.

SUPPLY OF RAW MATERIALS.

Special procedure for allocation of raw materials to this sector exist but these need to be improved. The present norm of basic distribution of imported raw materials on the value of machinery installed needs to be reconsidered.

Balachandran Committee has gone into the matter and has suggested that raw material allocations be made on the basis of capacity. Recommendations of this Committee need to be implemented which could improve the situation.

Constant efforts are also required to be made to ensure that larger allocations of indigenous raw materials are made available to small-scale industries. This will ensure increase in production and create larger employment opportunities.

It is proposed that a target for the creation of one and a half million new jobs and encouraging two lakhs new small-scale units may be set for of this sector. To meet this target, foreign exchange to the tune of Rs. 300 crores at the beginning stepped up to Rs. 450 crores towards the end of the Fifth Plan, would be required to provide imported raw materials, components, parts, machinery and equipment. Besides, scarce steel items would be needed to the tune of 15 lakh tonnes as against the current supply of 2 lakh tonnes to this sector. Institutional credit to the tune of Rs. 1930 crores would be needed. Besides, policy and organisational support would be required.

While present status of small-scale sector and its past performance may justify a much bolder programme for its development during the Fifth Plan period, targets have been suggested keeping in view the inputs that the economy would be in a position to provide in this sector.



Thirurathi Sathiyavanimuthu, Minister for Harijan Welfare, is seen presenting Gold Medal and Certificate to an inter-caste married couple on 2nd October 1972 at Perambur.

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UNITED NATIONS AND INDIA

As we celebrate the twenty-seventh anniversary of the United Nations, two heartening developments in an otherwise uncertain world require to be noted. The United Nations has made a giant step towards becoming truly universal in character by the active participation of the People's Republic of China in most of its forums. The absence of the most populous country in the world for long had made the deliberations of the UN somewhat unrealistic but no one can challenge the UN any more, purely on the basis of its representative character if it seeks to preserve international peace and security. India, with its some 560 million people, has been playing an active role in the UN since its inception and now as China's 800 million have joined it, expectations are naturally raised that the UN could become more effective than in the past.

Miracles should not, however, be anticipated as the United Nations is, after all, not a super-state or world Government and its success or failure will depend on the consensus it is in a position to mobilise among its small and big nation members on issues of peace and war. As member nations are sovereign and equal, there can be no intervention or interference in their affairs unless it is established that international peace is in peril. Once this basic limitation of the UN is kept in mind, its successes or failures in the past and prospects for the future can be assessed clearly.

GROWING DETENTE.

The second heartening development is the growing detente among super powers who constitute the permanent members of the UN Security Council. After years of confrontation, the United States and China are developing closer relations preceded by the understanding between the United States and the Soviet Union on some international issues. The end of confrontations between China and Japan is equally important as it is likely to contribute to the pacification in East Asia and the Far East. One of the main assumptions of the Charter-unanimity among the five permanent members of the Security Councils, the USA, the

Soviet Union, China, UK and France—has some chance of becoming a fact in no distant future as a result of the growing detente.

The new U.N. Secretary-General, Mr. Kurt Waldheim, has however, pointed out appropriately that even if the UN Security Council becomes somewhat effective, the idea of maintaining peace and security through the concert of great powers is no more valid as the process of technological advance and democratisation is producing a new form of world society. Says Mr. Waldheim: "The interest, the wisdom and the importance of the vast majority of medium and small powers cannot, at this point of history, be ignored in any durable system of world order." This is a hometruth as the majority of the membership of 132 of the UN belong to this category of nations who want to be heard and participate actively in decision making at all levels in all inter-national bodies.

Dr. John Mc Diarmid

Resident Representative of U.N.

Despite its shortcomings, the UN continues to be the only effective instrument to prevent a third world war. True it has not prevented the outbreak of small wars, but it has acted in many parts of the world to halt fighting or to aid in the settlement of political disputes as in West Asia, Cyprus, Kashmir, Lebanon, Yemen, Korea, the Congo and the West Irian. But the value of UN in the political sphere will be grasped from the fact that since the signing of the Charter in 1945, scores of nations have thrown off the colonial yoke and are enjoying the fruits of freedom. Most of 81 countries who have become members of the UN in the last 27 years owe their independence not only to the struggle and suffering their peoples have undergone, but also to the sustained agitation through UN bodies. Out of the 11 territories put under UN trusteeship system, only Papua and New Guinea administered by Australia and the Pacific Islands administered by the US remain. But millions of people in Southern Africa and elsewhere who seek human rights are

still far from their goal and the new UN Secretary General is making renewed efforts for human equality in this region.

INDIA IN FOREFRONT.

As one of the founding members of the United Nations, India has made substantial contribution to it in all spheres. The successive Presidents and Prime Ministers have affirmed and reaffirmed India's deep and continuing commitment to the principles of the UN Charter and Indian delegations have taken active part in the deliberations of committees and UN agencies. Believing that her freedom has no meaning if millions of others are not free, India has been carrying on a relentless crusade inside the UN for liquidation of colonialism, elimination of apartheid and grant of universal human rights. India has steadfastly advocated complete and total disarmament. The former Prime Minister, Mr. Nehru, urged that if a fraction of the money being spent in the arms race could be diverted to the economic and social needs of developing countries, it would be a better world to live in. For UN peace-keeping operations in Korea, UNEF, Congo and Cyprus, India had supplied men, money and material. In fact India's contribution of military contingents for UN peace-keeping operation has been the largest.

The United Nations, through its various agencies has mobilised international assistance efforts to developing countries on a scale unprecedented in history. In fact, while political wranglings in the UN Security Council hit the headlines newspapers, it is not known widely that 80 per cent of the UN resources and personnel are quietly engaged in the pursuit of long-term economic and social development of the two thirds of the world which is living in an unacceptable state of poverty and misery and lack opportunities for developing fully their human personality.

UNDP'S KEY ROLE.

On the front line of the struggle to quicken the tempo of social and economic progress in developing nations is the United Nations

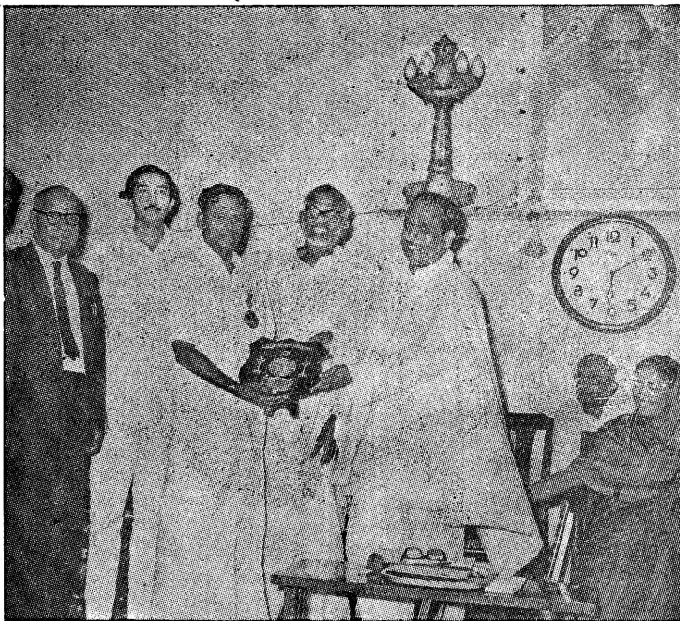
Development Programme. Its objective is to help low-income countries to realise more fully the potential wealth of their under-utilised human and national resources. UNDP is the world's largest single source of multinational pre-investment aid, carrying out projects which help the countries to attract capital investment needed for rapid progress. Some 125 Governments are now voluntarily contributing funds to UNDP to the tune of 270 million dollars annually. More than 500 major pre-investment projects have been undertaken for a total expenditure of 3,500 million dollars. More than a half of it is from the developing countries themselves. Several thousands of small technical missions have been sent to the field. Among the specifically measurable results are some 3,800 million dollars follow-up development investments directly or indirectly stimulated from public and private sources, the equipping of 600,000 men and women with

essential productive skills and the locating of 13,000 million dollars of untapped mineral resources. As UNDP Administrator, Mr. Rudolf Peterson has pointed out, UNDP spent in 1971 alone 249 million dollars on development projects providing 10,139 experts, 7,115 fellowships and 42 million dollars worth of equipment.

India is the largest recipient of UNDP aid, where UN agencies as a whole give aid to the tune of some 30 million dollars a year. India has also provided in the last two decades a good deal of expertise for UNDP-assisted projects in other parts of the world. It is thus a two-way traffic for partnership in peace and progress. As many as 3,532 expert posts have been filled by Indian Nationals. Over 2,030 of the fellowships awarded by UNDP have been for study in India. UNDP assistance to India over the last 12 years includes 64 large

projects which on completion are estimated to cost UNDP 61.5 million dollars.

The UNDP recently streamlined itself under what is known as country programming to improve the UN development machinery to handle more efficiently a greater volume of funds and programmes. For India, the UNDP Governing Council has approved its seven-year country programme and sanctioned 50 million dollars for the next five years. India's country programme, with its accent on scientific and technological development and a certain amount of sophistication, is utilising UNDP aid as catalyst for its goal of self-generating economy. It is not possible here to go into details, but UNDP is assisting many facets of India's agricultural, industrial, educational and scientific activities. This fruitful collaboration between India and UNDP is expected to develop wider in the coming years.



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