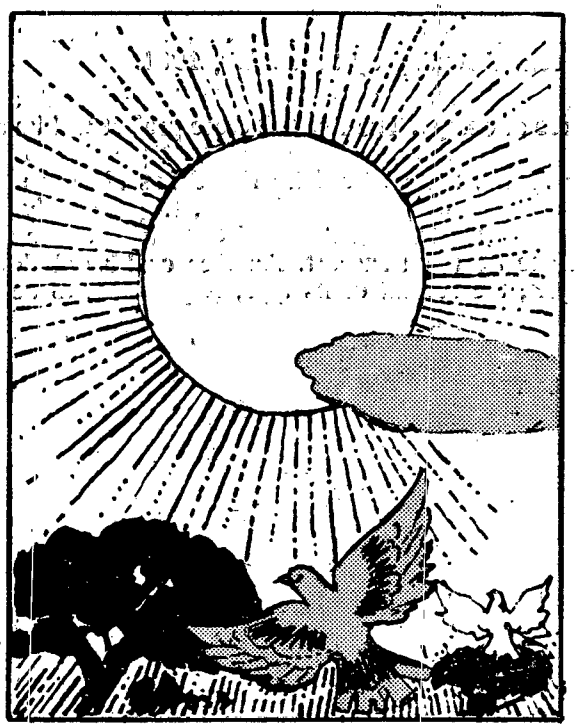
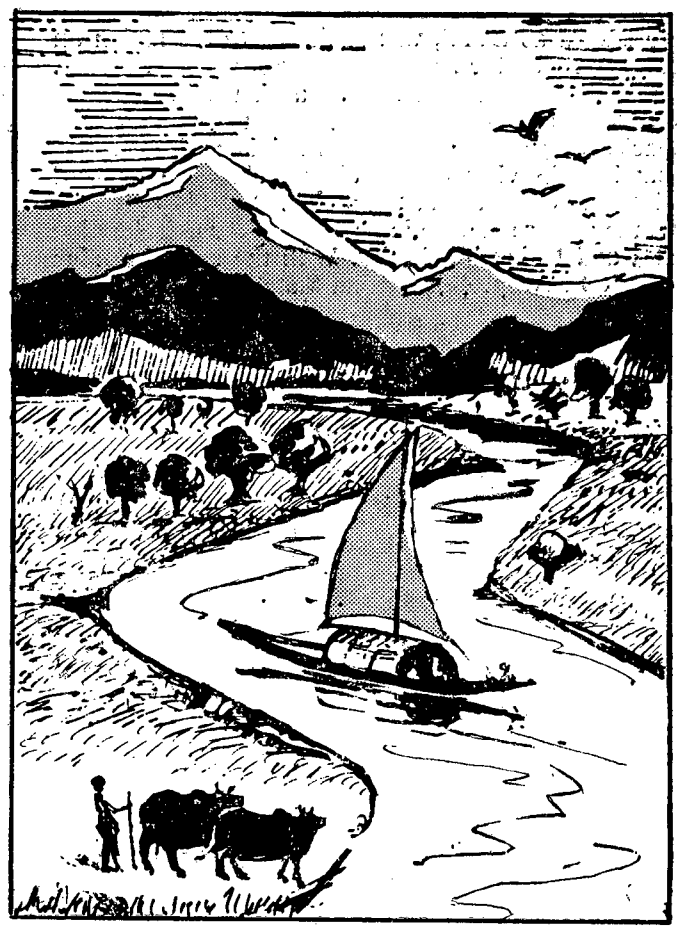
VOL XXV/10 1-15 JUNE 1981

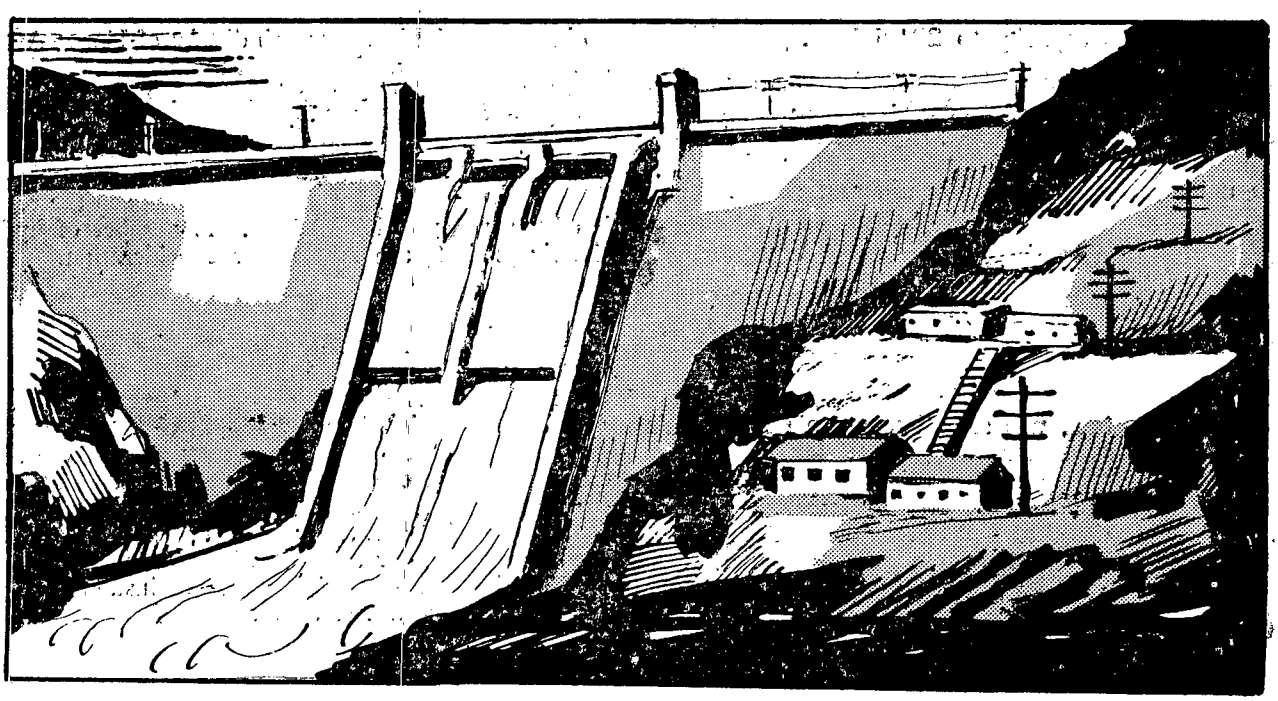
yojana

ONE RUPEE





ENVIRONMENT



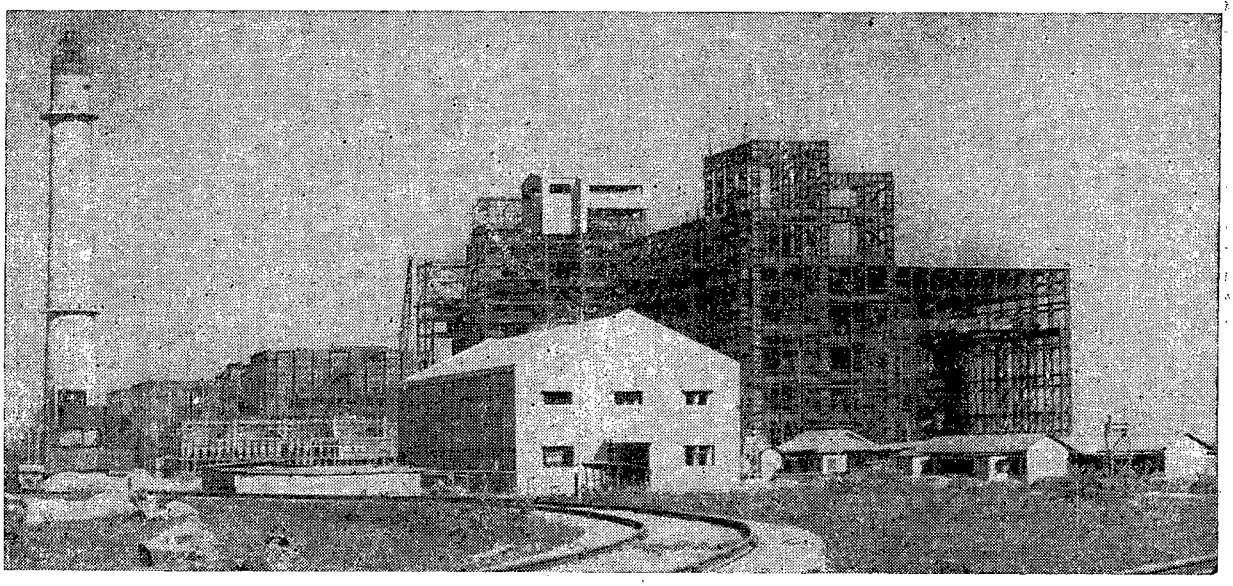
Bongaingaon Thermal Power Station

R. N. Bezbaruah*

BONGAINGAON Thermal Power Station, popularly known as BTPS, was dedicated to the nation on February 26 by the Assam Minister for Power, Shri K. C. Gogoi. Though stated to be a giant among power stations in the North Eastern region, this unit with capacity to generate only 60 MW is nothing to be proud of in view of the big gap between demand and supply of energy in the region. It would only help ease the power shortage in Assam and the neighbouring States and Union Territories. With the commissioning of this 60 MW project, Assam State Electricity Board can increase its capacity to 201.5 MW.

Bongaingaon Thermal Power Station was conceived with an installed capacity of 300 MW (5 x 60 MW) in 1975. The Station was therefore, designed for common facilities and infrastructres for installing five units of 60 MW each in different stages. While the first unit was completed and commissioned in February, the second unit is expected to be ready for commissioning by September, 1981.

The BTPS envisages the utilisation of coal as a source of energy. The Rs. 140 crore project will be implemented in a phased manner and completed by 1984. The Assam State Electricity Board has already made arrangement with Coal India Ltd., to get supply of coal from the Eastern Raniganj Coal-fields to the project site by rail transport. Another coal-based Power Project, the second of its type, is proposed to be set up in Margherita in Dibrugarh district of Upper Assam to be fed by coal available from the nearby Mergherita coal-fields and the scheme is now being examined by the Planning Commission.



A View of the Bongaingaon Thermal Power Station

The North Eastern States are endowed with rich resources of energy. The estimated hydro-electric power potential of 15 rivers flowing through the region is of the order of 12000 MW. A number of hydro-electric projects are now under consideration. □

*Our Correspondent & Senior Editor Yojana (Assamese)

Cable Car with Wood Fuel

AN AIRSHIP CAR, which runs on steam power with wood as fuel, will soon become a reality. This off-road transport system will have a hot air balloon which will fly three metres above the ground with 25 to 40 people in the fibre-glass cable car underneath it. It is being designed and developed by Sri A.M.M. Murugappa Chettiar Research Centre, Tharamani, Madras. The head of the photosynthesis and energy division at the Research Centre said that another revolutionary process successfully implemented by the centre is a unidirectional windmill, called "Anilar 1". Made of tree trunks with gunny bags as sails, the windmill, erected on causuarina poles in the coastal areas, will start operating when the wind speed reaches 25 kmph. At this speed, nearly 2,000 litres of water is pumped in an hour and the windmill functions for at least 12 hours a day. The cost of installing such a windmill is around Rs. 1,500.

YOJANA

Volume XXV Number 10
1—15 June 1981 11—25 Jyaistha 1903

Journal devoted to Planning and Development. Published Fortnightly in Assamese, Bengali, English, Gujarati, Hindi, Malayalam, Marathi, Tamil nd Telugu.

Yojana seeks to carry the message of the Plan but is not restricted to expressing the official point of view.

IN THIS ISSUE

Editorial Office :
Yojana Bhavan, Parliament Street, New Delhi-110001. **Telegraphic Address : Yojana**, New Delhi. **Telephones : 383655** 387910, 385481 (extension 420 and 373) **Circulation :** Business Manager, Publications Division, Patiala House, New Delhi-110001.

Subscription : Inland : One year Rs. 20, Two years Rs. 35 Three Years Rs. 50, Foreign : One Year $ 6 or £ 3 ; £ 7.50 Single copy $ 0.30 or 0.15.

Editorial

Wheat Procurement

THE SLOW RATE of procurement of wheat has caused much concern all around. It was reported in the press that the procurement in Punjab and Haryana was less than half their quotas till the third week of May when the harvesting season was nearing its end. The poor arrivals of stocks at the markets have been all the more worrying. In spite of the new crop the market price has been higher than the procurement price.

Due to the widespread drought of 1979 in the north, production in the next year was much less than expected, and only 5.8 million tonnes of wheat could be procured. Meanwhile the withdrawals from the buffer stock were at a higher rate, and the stock, as in April this year, was less by two million tonnes than the required minimum of 12 million tonnes. This year's severe drought in the south has further aggravated the position.

There are many reasons for the tardy procurement this summer. Firstly, because of the shortfall in production, private traders have sought to buy up all available stock for hoarding and profiteering. Secondly, some politicians have been advising the farmers to withhold stocks in order to force the government to increase the procurement price to sell it later at a higher price to private traders. The State governments have also been hesitant to offend the farmers' lobby. Further, the relaxation of the regulatory mechanism by the government after the previous bumper harvests, has led to large-scale movement of wheat from the producing States to other areas.

The Prime Minister herself has held discussions with Haryana and Punjab government leaders on May 20 on the procurement problem. Immediately after, the Punjab Government imposed restrictions on the stocks which could be held by the traders. Some other States have already imposed levies on private traders.

The government has to take firm action to foil the attempts of vested interests to create artificial scarcity and increase the price of wheat. Any such contingency will cause hardship to the poorer sections and also adversely affect planned development. Levies should be imposed both on traders and rich farmers by all States so as to procure the targeted 9.5 million tonnes. Inter-State movement of wheat should be controlled. The Government should also make it clear that it would not hesitate to take over the wholesale grain trade if necessary. (215.81) □

Science and Environment

Indira Gandhi

For us who live in underdeveloped countries and are grappling with the age-old problems of poverty, the conservation of the environment cannot be at the cost of development. War at one end and poverty at the other are the worst of all polluters of the human condition. We need balanced development and peace to rescue civilisation from this predicament. The ecology movement must proceed hand in hand with the movement for peace and the fight against economic backwardness.

At the time of our Independence and in the fifties, we all looked forward to a brave and bright new world. We had unbounded faith in science and the miracles it would work to eradicate the ills of society. Now we see the ancient wisdom that what really counts is the human spirit, the human approach, in sciences as in everything else. Let us not blame science which has unveiled for us some of the mysteries of our own minds and bodies no less than the miracles of outer space. Let us blame ourselves as governments and citizens for seizing these wondrous opportunities not to help fellow man but to destroy or maim him, not to make up whatever deficiency there might be in our earth but to deplete its treasures. For what ? For every temporary gain, or physical comfort, or goods of which we so soon tire, as does a child who has a surfeit of toys.

The rich out of greed and the poor out of need have been reckless in plundering earth's assets. There is now deep anxiety about the rapid diminishing of what have become essentials to our way of living indeed even to life.

In affluent nations, agriculture is based on high energy inputs which we simply cannot afford. Agriculture is a harvest of sunshine, a resource which we have in plenty. Whereas industry makes allowance for a certain depreciation of assets this is not feasible in agriculture. We have to use land and water so as to enhance their productivity. The indiscriminate use of fertilisers, pesticides and other agricultural inputs cause long-term damage to humans and animals, to crops and to the earth itself.

Industry, so necessary for employment and for providing indeed articles, can also be a nuisance. While vast numbers in the developing countries are in desperate need of basic necessities, the affluent countries are using up far more than their share of the world's resources, spending much money, material and talent in churning out luxuries thus inculcating wasteful habits although it is now known that resources are limited. Goods and weapons soon become obsolete. They clutter the landscape. Either we cannot or haven't yet made the effort to recycle them. Factories pollute the air and the water, spreading dirt and disease no less than that caused by poverty.

Development with Conservation

Development with conservation means that growth priorities do not sacrifice the needs of tomorrow for immediate compulsions. It requires closer association of scientists and technologists in the planning process. Planners must call for ecological impact statements to indiate the probable long-term effects of any technological innovation. We have just constituted a Department of Environment at the Centre and have suggested to the State Governments to do likewise. We hope that every major development ministry will have advisers to take care of environmental considerations.

Our recent legislation ensures that proposals to convert forestry areas to non-forestry uses are scrutinised by a Central team of experts. Public awakening about the ecological dimension of development has resulted in an indepth look at the Silent Valley and other projects. We except the State Governments to share our concern and do their utmost not only to preserve existing forests but to extend and enrich them and promote socially useful schemes like farm forestry and social forestry.

* From the address of the Prime Minister to the 68th annua session of the Indian Science Congress, at Varanasi, January 3, 1981.

Environment and River Valley

Development Projects

S. Maudgal*

ENVIRONMENTAL considerations should form a part and parcel of river valley development projects. This would result in short or long-term social and economic benefits.

Creation of large water bodies is known to have resulted in the introduction of water-borne diseases through such vectors as snails. Malaria, filaria and schistosomiasis epidemics have known to occur because of disregarding the introduction of parasites and vectors through the creation of large water bodies. The loss to the nation, in terms of man-hours lost and the consequent loss to the GNP and additional cost on medi-care etc., can be crippling especially in situations where the health delivery system is already in a rather precarious condition. The introduction of a development project, in such a situation can become a harbinger of disaster rather than ushering in an era of prosperity.

Destruction of areas of plant genetic resources that have been created by many centuries of evolution, for short term gain, would indeed be an unmitigated disaster.

The prosperity of mankind depends upon our capability to keep the foodgrains free from destruction by insects and pests. As more and more high-yielding varieties of Food grains and economic plants are released for general cultivation, the problem of heavy losses through diseases and pests which thrive under conditions of intensive agriculture, will become increasingly important and the plant breeders would have to turn to the genetic resources found in the primitive type varieties and their wild relatives. Preservation of the areas rich in plant genetic resources as biosphere reserves is thus imperative. Destruction of these resources that have been created by many centuries of evolution, for short-term gain, would indeed be an unmitigated disaster. Therefore, the need for a careful study before establishment of traditional development projects in such areas can hardly be over-emphasised.

Fish in most of the developing countries is a rich source of protein. The creation of a barrier across the migration path of the fish can considerably undermine the survival of the affected fish. Simple fish ladders, or quite elaborate mechanised lifts, can be provided to permit fish to reach their breeding spots. Adequate attention, however, needs to be paid to proper designs of the engineering structure so as to effectively help the fish to cross the hurdle. Otherwise, overlooking of a simple factor can be disastrous to the regional economy.

Inadequate attention to the provision of drainage works in irrigation projects is known to have caused more damage than bringing commensurate benefits. Reclamation of water-logged and saline soils is an expensive and time-consuming process which the growing economies can ill-afford. Even though the initial investments may seem forbidding, integrated planning of irrigation, drainage and soil conservation aspects is a must.

The development projects are accompanied by extensive road building activity, creation of new settlements, destruction of forest areas and introduction of new industries. All these factors cause irreparable damage to the soil cover resulting in increased sedimentation, flash floods, and loss of land fertility. Land slides that accompany the road construction activity, specially in the hilly tracts is a common, and unfortunately a generally accepted sight. The excessive blasting operations losen the whole slope which becomes susceptible to serious land and mud slides.

The factors listed here are by no means uncontrollable. Indeed, the detailed study of the problems involved can help to arrive at a judicious solution where the soil conservation and afforestation measures can be intermeshed with engineering solutions to provide long-term stability. Even a cursory analysis would reveal that the environmental planning is absolutely essential to achieve long-term sustainable economic development. Short-term gains, at the cost of natural environment, may be tempting but can end up only in disaster.

Ecological Considerations

Since, the natural environment can no more be considered a free and inexhaustible resource, all development activity impinging upon the natural environment needs to be carefully selected and controlled. Development of water resources is a major challenge

* Principal Scientific Officer & Member Secretary, Environment Appraisal Committee.

to be accomplished in an environmentally sound manner for achieving economic development. This calls for incorporation of ecological parameters in the planning and execution stages of these projects.

During the planning and feasibility assessment stages of River Valley Projects, the following aspects need to be seriously considered. The first one is site selection. Some of the major environmental components that need to be kept in view during the selection include short and long-term impact on population/human settlements in the inundated and watershed areas impact on flora and fauna (wildlife) in the vicinity, impact on wildlife (including birds) breeding area/feeding area/migratory route, impact on national parks and sanctuaries both existing and potential, impact on sites and monuments of historical, cultural and religious significance, impact on forests, agriculture, fishery and tourism etc.

Being a relatively new discipline, requisite data for impact assessment may not be readily available and may have to be generated through such field-surveys as pre-impoundment census of flora and fauna, particularly the rare and endangered species, in submergence areas ; census of animal population and available grazing areas; Land-use pattern in the area with details of extent and type of forest in catchment and submergence areas; pre-impoundment survey of fish habitat and available nutrients' levels; round water levels, water quality and existing water use pattern ; mineral resources in the impoundment; living conditions of affected tribals etc.

The impoundment creates altered surface water patterns that may have far-reaching impact on underground acquifers and their recharge. Major aspects to be considered include; siltation or sedimentation expected in the reservoir and adoption of watershed management practices to retard siltation process; potential ground water recharge, or other ground water changes, due to impoundment; expected water quality (salinity) changes over time and their effect in riverine eco- ystem both in impoundment as well as downstream; land use patterns and practices in the vicinity of waterspread that would affect acquatic vegetation growth patterns; potential impact on micro-climate due to creation of a large water body; potential seismic impact of reservoir loading etc.

Careful evaluation should be undertaken of the impact of factors like resource trade-off, such as, loss of optional land use due to impoundment, mineral deposit loss, forest reserve diminution, monuments inundated, recreational facilites lost, dislocation of existing settlements etc; compatibility of dams creation and operation with present or planned development of the region and effect on resident and migrating fish and other acquatic life and assessment of new fishing potential.

Since, relocation may strain/disrupt the social fabric of the affected population, efforts should be directed towards betterment of their quality of life and preserving, to the extent possible, the special characteristics of their life-style by adequate provision of population relocation requirements in inundated as well as watershed areas; identification of educational and vocational training programmes to be imparted to the affected population so that they can cope better with the new life style; resettlement area planning for housing and other amenities of community life (water supply, sanitation, schools, health services etc.) to be provided at resettlement sites.

Serious consideration must be given to new health problems or vector patterns that may arise due to changes in water velocities, temperature, quality or other physical change factors caused by water impoundment and adequate public health planning to create facilities for migrant construction workers and immigrant influx. Possibility of disease aggravation or new public health problems introduced due to changes in population density and distribution also need to be looked into. Measures to control contamination of surface and ground water due to pesticides and fertilizers need also to be drawn up in advance.

Rapid economic development on a sustained basis can be achieved only by safeguarding the air, water, land, flora and fauna.

The cost of proposed remedial and mitigative measures, if any, to protect the environment must be included in the project costs. Mitigative measures may include :

- Compensatory afforestation;
- restoration of land in construction areas by filling, grading etc to prevent further erosion;
- control of aquatic weeds in submerged areas to provide improved habitat for aquatic-life;
- measures to salvage/rehabilitate any rare or endangered species of flora and fauna found in the affected area;
- measures to salvage and relocate monuments from inundated zones;
- enforcement of anti-poaching laws;
- measures to prevent forest fires, over-grazing etc.;
- establishment of fuel depots to meet fuel requirements of labour force for preventing indiscriminate felling of trees;
- public health measures to control spread of water and soil-borne diseases.
- field surveys and studies to create the environmental data-base;
- technical and administrative measures to effectively monitor the observance of suggested safeguards and mitigative measures etc.

A judicious sequencing of construction operations and appropriate location of labour camp and project colony etc. can go a long way to reduce environmental damage. The following factors are worth considering. All road construction and blasting operations, specially upstream of the reservoir, should be completed before reservoir filling is commenced so as to reduce excessive sedimentation load. Exxcessive blasting resorted to by contractors should be controlled, specially in hilly terrain, so as to check the incidence of land-slides in the area.

(*Contd. on page* 26)

Import-Export Policies of 1981-82

—An Appraisal

Dr. V. R. Panchamukhi*

IN making an appraisal of a policy frame—current or past—three types of issues need to be looked into. Firstly, one should analyse the nature of basic changes in the policy frame that are introduced in relation to the policy structure of the past periods. Secondly, one should ask the question as to whether there are any rational criteria on the basis of which these changes are introduced. Thirdly, are the policy changes, as also the total policy frame, consistent with the objectives of these policies and also with the overall aspirations and goals of the planned economic development? In other words, what are the implications of the policies for the various aspects of the domestic economy, such as prices, resource allocation, production, trade and income distribution, and consequently, are these economic implications consistent with the overall objectives of planning? This three-pronged appraisal of policy frame could be categorised as, (i) Identification of structural changes, (ii) Determinants of structural changes and (iii) Problems of consistency and coordination. The purpose of this paper is to examine the import-export policy of 1981-82, on the basis of these three types of issues of appraisal.

The new Import-Export Policy is pragmatic and innovatives in several respects. This is a cogent and imaginative import-export policy book introduced at a time when the country is through a most difficult period in the balance of payments account.

Structure of Policy

At the outset, it is useful to make an observation that the conception of the structure of import and export policy frame as envisioned and practised by the Ministry of Commerce is a very partial one and it lacks comprehensive coverage of the various aspects of the import and export activities. Ideally, import policy frame should cover the following : (a) import licensing system in regard to goods, services and technology, (b) import tariff structure, (c) institutional aspects of the import activity, and (d) exchange rate policy. Similarly export policy frame should cover, (a) export control, (b) export promotion measures of fiscal nature, (c) export promotion services and related institutional measures and (d) exchange rate policies and related issues, such as exchange risk coverage, etc. In a wider conception, one should include in the import-export policy frame also such of the domestic policies which affect directly or indirectly the import and export activities. In any case, in the conception of the Commerce Ministry in so far as the policy statement is concerned, this frame does not include policies towards import of technology, tariff system, exchange rate policies some of the institutional aspects and export promotion schemes. Paradoxically export policy statement is essentially concerned with export control rather than export promotion measures. Compartmentalisation of the total policy frame according to the different Ministries of the Government has led to undesirable disintegration of the import-export policy frame, causing thereby, problems of consistency and coordination.

In the field of planning and policy making, it is necessary to make a distinction between total variables and parameters on the one hand and those at the margin on the other. For example, instead of considering total output of a sector in a period it is useful to consider separately and explicitly, the level of output (X) with the last year's plant and machinery and capacity utilisation, and the incremental output (DX) with the additions or changes in the latter. It is appropriate not only to consider the total tax rate (T) but also the past level of tax rate (T') and the change (DT) that is sought to be made in it. Similarly distinctions between the average and the margin should be made in respect of entities such as technology, input coefficient, import licensing system, tariff rate etc. It is these marginal variables, which generate new types of impulses and sequences of economic effects on the various other aspects of the economy.

*Institute of Economic Growth, New Delhi

Inspite of this importance of the margin, very little care is taken to incorporate this distinction in the exercises on planning and policy making. Import-Export Policy frame is no exception to this weakness.

Over-all Policy Frame

The broad frame of import policy of 1981-82, remains the same as that initiated for the first time in 1978-79 period as a result of the rationalisation process recommended in the Alexander Committee Report. As against the "Nil" policy frame of the pre-1978 periods, the new frame categorises the goods into OGL, Restricted and Banned categories and lists in the policy statement only the latter two categories and keeps the OGL as an open-ended list. The spirit of this rationalisation process was to gradually emancipate the economy from the grips of excessive import controls and "expose" the domestic industry to greater and greater international competition so as to induce greater efficiency and emphasise the importance of the developmental role of imports and thereby induct import management rather than import restrictions as the basic philosophy of the import policy frame. However, the policy frame of 1981-82, seems to imply a reversal of this rationalisation process in so far as there is a large scale removal of items from the OGL list and the banned list runs into 38-40 pages, of the import policy book. It is contended that removal of 165 items from the OGL list is done with due "regard to indigenous production and capabilities" and placing of 63 items of OGL is effected so as to "enable requirements without difficulty". These contentions seem to give to the domestic availability criterion a place of prime importance without regard to the aspects of efficiency or costs of domestic production in determining as to which items should be placed on OGL and which on restricted or banned lists. A suitable criterion in this regard should combine both the domestic production and price-advantage aspects. Suppose we classify the various items into a two-way table with share of domestic production in total supply as one variable and the price advantage of domestic output in relation to imports as another variable :

		Price Advantage of domestic output in relation to imports	
		High	Low
Share of domestic production in total supply	High	I	II
	Low	III	IV

Items falling in category I are normal products without any need for policy interventions. Further, the items in quadrant-IV deserve to be carefully nourished for domestic production on selective basis with supporting measures on technology, product development, financial support etc. Items falling in quadrant-II deserve to be gradually exposed to international competition because they have grown under excessive protection in the past. Gradual liberalisation of import regime is necessary for these items. Items falling in the third quadrant require special policies which facilitate domestic production—measures of technological advice information, preparation of project reports, assistance in product development, etc. A careful application of this size-price criterion* alone could make the modifications in the structure of policies rational and sensible. There is no evidence whether the CCI&E's office had done such elaborate, though, at times quite demanding exercises, before taking decisions on the OGL or banned lists.

Three points are pertinent here. Firstly, analysis of the import behaviour of the items put on OGL, shows that there is no consistent spurt in the import levels of these items after they are put on the OGL and, in fact, uncertainties in regard to continuation of OGL status for an item may induce spurious spurts in the imports. In any case, the initial spurt, if any, would eventually taper off as a result of supply-demand interactions. The second point is that it is a misnomer to attribute any sluggishness in domestic production or capacity utilisation of an item to the fact that it is put on the OGL, because there are a number of 'on-OGL" factors affecting domestic production activity. Hence a detailed analysis is called for. Thirdly, if domestic industry has to learn the "art" of surviving under competition, it should be given a fairly good "opportunity" to do so and further no tears need to be shed if inefficient lines of production die off when exposed to competition after a fairly long period of growth under "excessive" protection.

Based on these points, one could recommend strict stability for three years for the categorisation of items in the different categories.

Bias Towards Small Scale Sectors

The new policy has adopted a number of innovative measures to promote production and trade from the small scale sector. Provision of repeat licence up to Rs. one lakh, special facilities for consortia of small scale units and Small Industries Corporations of State Governments are welcome changes. However, distinction between Trading Houses and Export Houses and special advantages to the former, reduction in the value of additional licences to the Export Houses exporting products of small scale units do not seem to be based on very convincing arguments. However, one important point that is missing in this year's and also earlier policy pronouncements is that services of import management, advice on product adaption, and information do not receive adequate special recognition—advantages to the Trading Houses or consortia, should have been linked with the provision of services to the small scale sector rather than the simple criterion of volume of the exports from the small scale sector.

Growth Factor in Automatic Licences

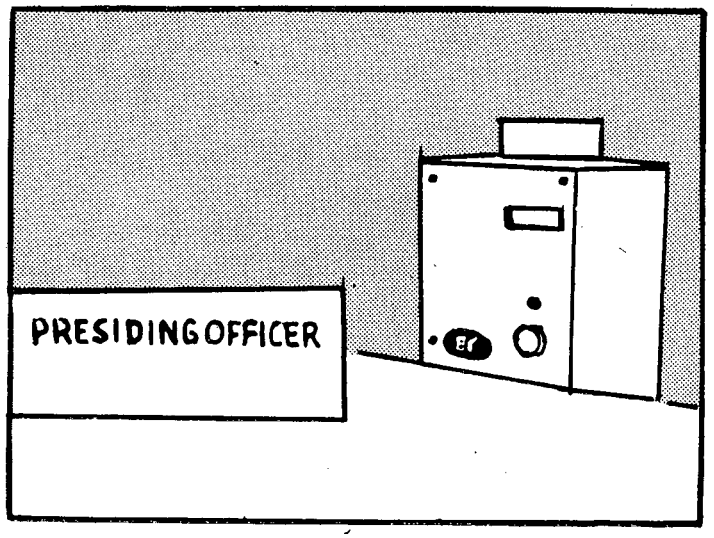
The ten per cent growth factor in the automatic licences has been confined to the export performance. This change introduced in the last year's policy has been continued. Even though this may imply a built-in advantage to the export activity, the purpose of the growth factor built into the 1978-79 policies was meant to provide ease in input supplies for the advantage of all the domestic producers. It is worthwhile considering the retention of a growth factor for all automatic licences and a special growth factor for export-oriented units.

* Further discussion of this size-price criterion may be found in V.R.Panchamukhi- "Trade policies in India : A quantitative Analysis". Appendix-2, Concept Publishing Co.1977.

(Contd. on page 23)

Can we have Electronic Voting Machine ?

I. K. K. Menon*



The Presiding Officer regulates voting with a small controlling electronic switching machine.

THE electronic voting machine (EVM), which is suggested to be introduced in India, will usher in a new era in her history of elections. This voting equipment, developed by the Electronic Corporation of India, is a simple device of the size of a tape-recorder. It hardly weighs two kilograms The machine is run by two simple cells which are easily available at Rs. 5. On a pair of cells the machine can be operated for 3 or 4 days continuously The machine has plastic buttons against which the names of the contesting candidates and their symbols are pasted. Bahart Electronics Ltd., Bagalore has also developed a similar machine for trial.

Like the present ballot box the EVM will be kept within a screened compartment. The Presiding Officer will regulate the voting with a small controlling electronics switching machine connected to the voting machine by a six metre long wire.

After verifying his identity, a voter is allowed to go behind the screen and press a button to cast his vote in favour of the candidate of his choice. Then the machine records his vote which is indicated by the glow of a small red bulb. Simultaneously the glowing red light of the controlling machine, will go off. By this method the Presiding Officer and the agents of the candidates can satisfy themselves that the voter has exercised his vote. The EVM does not function again till the presiding officer releases a lever and this prevents the voter pressing the button more than one time. Also to satisfy the agents of the candidates, before them are displayed, the controlling machine and an electronic sign board indicating the number of votes polled, each time a vote is recorded. At the close of poll, a button on the side of the voting machine and the button against the candidate will have to be pressed simultaneously when the number of votes secured by the candidate will be flashed on the window of the controlling machine, as in an electronic wrist watch.

*Former Secretary to Election Commission

The button to be used by the voter is so sensitive that a slight touch is sufficient to record the vote. The machine is provided with a system to satisfy the candidate's agents before the polling commences, that the EVM is set for casting the votes and that there is no defect or foul play. At the end of the poll the voting machine can either be sealed and taken to the counting centre, or the counting can be done at the polling booth itself wihin a few minutes and the results recorded in the result sheet.

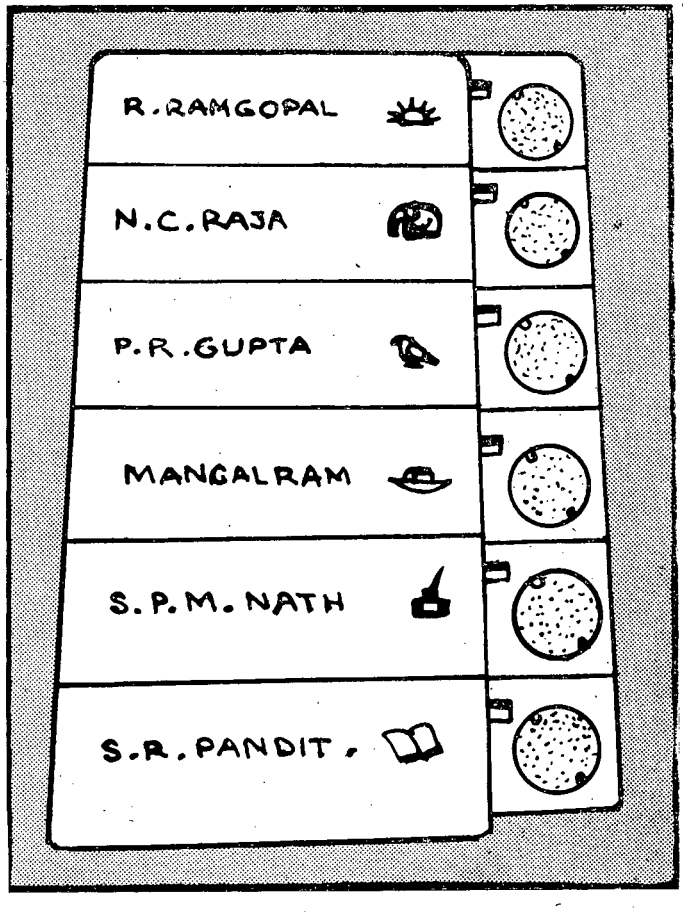
Disadvantages

But the main impediment in the way of introducing this system is the enormous cost involved. The cost of the machine, as at present, works out to about Rs. 6000 to Rs. 6500. In the event of mass scale production, the Electronic Corporation of India claims that the cost can be brought down to Rs. 1500 to Rs. 2,000 per machine. For the existing 4,50,000 polling boths all over the country 2,25,000 voting machines will be required. The total cost will work out to about Rs. 45 crores at the rate of Rs. 2,000 each. Further in far flung areas like Lahaul Spiti and so on, if the machine goes out of order, the polling will have to be suspended. However such a contingency is not likely to arise in the normal course, since the body of the machine is strong and can withstand any ordinary rough handling. The machine can be preserved for at least 15 years with proper care so that it may be used in a number of elections to the Parliament, Assemblies, Panchayats, Muncipalities and other local bodies.

Advantages

Its advantages, however, far outnumber the disadvantages. If the machine is intrduced, there is no need for ballot papers at elections. There will also be a reduction in polling personnel. As against three or four polling personnel besides a Presiding Officer, two

persons, one for checking the identity of a voter and another, a helper if need be, to put the indelible ink on finger are sufficient. If the photograph Identity Card is introduced, indelible ink marking can also be done away with, and consequently manpower can be further reduced. By such re-arrangements, an officer of higher status can be posted as a polling officer, who will instil more confidence in the voters.



The EVM has plastic buttons against which the names and symbols of the contesting candidates are pasted.

The use of the machine can accelerate the pace of polling and it may be possible to reduce the number of hours of polling; each polling party can take the poll in two polling booths on the same day as against one at present. The poll in one booth may be taken in the morning by assigning 4 hours, say from 7 a.m. to 11 a.m. and in another from 2 p.m. to 6 p.m. After poll in one polling station, the electronic voting machine, which is handy, can easily be transporated to the second polling booth. The vehicle carrying the polling party from one polling booth to another may itself serve as a mobile polling booth and cover the different areas now assigned to a single polling booth. Incidentally, this may not only reduce the distance to be covered by the voter but also prevent anti-social elements from preventing weaker sections of society reaching the polling station to exercise their franchine, as the poll will be taken almost at their door-step.

By introducing the Electronic Ballot Box the use of the ordinary ballot box can be completely done away with. At present, 3 ballot boxes are normally supplied to a polling booth, but if the number of contestants is large, resulting in increase in the size of the ballot paper, about 5 ballot boxes are necessary. Similarly procurement of large quantity of special type of paper printing binding and stitching of ballot papers bundles can be dispensed with. The distribution of ballot papers and opening of various distribution centres for the purpose, checking of each ballot paper thoroughly at the time of distribution, the innumerable varieties of stationery and forms used at a polling station, the large number of papers and keeping accounts can be avoided completely or reduced drastically. At present, after the poll the sealed ballot boxes are taken to the storage centre and preserved there under police guard until the counting is taken up. In the changed circumstances this may not be necessary.

There will be no need for the existing elaborate arrangements for counting, that is provision of a number of counting tables, shamianas, a huge counting staff, supervisory staff and police personnel, and the payment of TA|DA to them. The number of counting agents to be appointed by the candidate and the security staff can also be reduced.

With the use of electronics voting equipment, there will be no scope for rejection of votes. The overall time period for election can also be reduced considerably. At present there is an interim period of 20 days between the withdrawal of candidature and taking of poll. This period may be reduced to just 5 or 6 days, because ballot papers will no longer be required, and the time spent on their printing can be saved. It is the printing and distribution of ballot papers that delays the holding of poll after the last date for the withdrawal of candidature. Reduction of the electioneering period will also mean a saving for the the candidate. It will not be necessary for him to appoint a separate set of counting agents and there will be considerable saving on this count as also on transport. □

Education and Employment

L. K. Jha*

FOR centuries in Indian society the manual worker has been looked down upon. The man who reads and writes, who has studied much, has been given all the respect. Therefore, it is the ambition of all those who are engaged in manual work of one kind or another to educate their sons so that they no longer follow the kind of vocations in which their forefathers have been engaged. Tailors, carpenters, blacksmiths and farm workers would like their sons to get a desk job. It is with this motive that they send their children to school. Those who entertain no such dreams, or feel they cannot afford them because their children must work and help them in their family vocations, do not send their children to schools at all. In the schools the educational system only strengthens a preference for white-collared jobs, preferably government jobs. Depending on how well they fare in their studies, some aim to get into one of the administrative services, others hope for clerical jobs or, as a last resort, for class four or group 'D' employment.

Let the hours of schooling be such that children who have to help their parents in the farm or in any other way can continue to do so.

Among those who are able to see far enough ahead to assess the employment possibilities of education in different fields, there have been shifts in preferences for the kind of course which they try to take up. At one time, science subjects were more popular than arts subjects. Later technical courses in engineering and medical colleges began to be specially sought after. More recently business management seems to be the craze. Even engineers want to take it up.

In terms of actual earning, products of medical, technical and management institutions seem to fare rather well, largely because only the meritorious can succeed in getting admission and the number of available seats is very limited. Only a fraction of those who receive what is known as general education, get the kind of employment they are looking for; those who do often find that the course which they took for their degree has not much relevance or use in the kind of job which they are doing. A man may do well in a competitive examination by offering subjects which would have no utility in the work he would do.

In sum, we have a situation in which a good proportion of the population denies itself even primary education, because the children cannot be spared from family work to take time for schooling. Children who do go to school all too often begin to get a little alienated from their familes and surroundings-except for those whose parents come from the educated and better off families—as they begin to feel superior and look down on manual work. Later frustations begin to manifest themselves. Only a few can gete admission to the technical institutions they want to enter. The rest take up a general course but most of them fail to get the kind of jobs they were aspiring for. They either remain unemployed or eventually reconcile themselves to doing some thing for which their eduction has little relevance. What is worse, even among those who do get reasonably good jobs, the chances are that what they studied in the university is of little practical use to them in the careers which they pursue.

Without dilating at length on the many weaknesses of the educational system as an agency for providing the kind of manpower we need, let me within the time at my disposal put forward for discussion and debate some suggestions to make the educational system more responsive both to the problems of individual students and of the community as a whole.

I suggest that primary schools in rural areas should not follow the time schedule and programme of holidays which come down from the British days. Let the hours of schooling be such that children who have to help their parents in the farm or in any other way can continue to do so. Similarly instead of a summer vacation or Christmas vacation, the timing of holidays should be such as to leave the young free to help in agricultural operations at sowing and harvesting time.

Secondly, in all schools, as far as possible, the task of keeping the class-rooms clean and tidy and of otherwise looking after the physical needs of the student community should be entrusted to the students themselves. The practice of engaging non-teaching staff should be reduced to the minimum. Payments to students for work done would also be a worthwhile reinforcement of the work ethic.

*Chairman, Economic Administration Reforms Commission. Excerpts from his inaugural address at the Conference of Manpower Data Producers and Users—New Delhi, April 26.

Thirdly, in the school syllabus there should be a practical paper which covers training in a craft which can be locally practised. A certain amount of flexibility between area and area will have to be there but in general in rural areas something connected with agricultural operations would be suitable, while in urban areas even repairs to some mechanical equipment such as a bicycle or replacing a blown electric fuse could be a part of the craft curriculum. In short, schooling should bring the benefits of literacy and learning to the traditions of productive work which are there in every village and, in fact, in every family, rather than create barriers between the young and their environment.

College Education

Let me now turn to college education. Some of the brightest and the best students after leaving school try to secure entry into a variety of institutions imparting specialised training in some profession or other. A good proportion of really deserving candidates cannot get entry into the fields of specialised study which they want to undertake. I belive we should expand the facilities for such courses, especially as employment outlets for them extend beyond the shores of India.

Indeed this is true of technical training at all levels. Vast number of Indians are going abroad to work, and if they are well trained and have the necessary skills, they can enrich themselves and the country. Even from a purely economic point of view, the expansion of technical training facilities would pay us good dividends. If financial resources prove to be a major bottleneck, I see no reason why some of these institutions connot be run on a basis which entails no subsidisation. Further, we could also get some finance from countries which are interested either in getting trained personnel from India or in sending their own personel for training in India.

Not everyone could or should go in for technical training. A high proportion of those who want to study more after leaving school seek entry into degree colleges, most of them not because they have any genuine interest in higher studies but because they want to become eligible for jobs, mostly governmental jobs, for which a degree is regarded as a minimum qualification. I suggest we should do some rethinking about minimum qualifications.

I feel we should do away with the insistence on a degree for jobs the entry to which is through competitive examination. Since success on a competitive basis in the entry examination is what ultimately matters, why should we insist on a degree as a pre-condition for appearing in the test ? It is not as if the course of study undertaken at the degree stage is of much use in the jobs for which candidates are being recruited. In the administrative services, knowledge of mathematics or Sanskrit is of not much use, though it is relatively easy to secure high marks in these subjects. Those who have studied them tend to fare better.

Would it not be desirable, I wonder, to start recruiting for the IAS after the plus-two stage ? In so far as competitive examination is meant to evaluate the general ability of the candidate the purpose could be served equally well by holding the test at a younger age. Thereafter the successful candidates could be sent to an administrative college where the subjects which are taught are those which would help in the discharge of duties which they would be called upon to perform.

The vocational paper should have links with the subject which the candidate offers for his degree. This would pave the way for graduates to take advantage of self-employment schemes which we are promoting.

The objective I have in view is to create an atmosphere in which only those take up university courses who are interested in the subjects which they are studying and are not merely trying to make themselves technically eligible for certain jobs by sporting a degree. The attempt, in other words, should be to reduce the overcrowding and the frustration in the university campus which makes vice-chancellorship one of the most hazadous jobs in the country. But even in the college stage, I suggest a vocational paper should be introduced as a compulsory part of the syllabus. As regards subjects, I feel dairy development, poultry farming, bee keeping, soil levelling, repairs to equipments like pumpsets and automobiles, typing and shorthand and the like could be considered. Preferably the vocational paper should have links with the subject which the candidate offers for his degree. This would pave the way for graduates to take advantage of self-employment schemes which we are promoting.

In contrast to the approach for higher jobs, I would suggest that for what are known as Group 'D' services, we might raise the level of minimum educational qualifications. This would, on the one hand, reinforce the links between education and manual work and on the other result in a much better standard of service in various institutions. To support my point, I would refer to the fact that while our surgeons perform the most difficult operations with a skill and proficiency which is comparable to the best in the world, all too often because of the carelessness and ignorance of the staff responsible for maintaining sanitary conditions in hospitals, the mortality rate in India tends to be higher.

We have to create an atmosphere in which of their own volition more and more students and their parents begin to opt for courses of a specialised vocational character rather than go in for the kind of general education which in British days became so popular. To fulfil this objective, we cannot just reply on setting up new institutions of a technical kind. No doubt more such institutions are needed, but it would be more economical and advantages to transform the content of education, to make it more relevant to our needs. □

Planning and Development in Saudi Arabia

Dr. Mohammad Iqbal*

SAUDI ARABIA has emerged, during the last decade, as one of the large oil producing countries in the world. Most of her inhabitants are Arabs and Muslims of the Wahhabite sect. Half of the total population consists of Bedouin tribesmen One fourth of the people are urban dwellers and remaining 25 per cent are settled cultivators. The system of Government in Saudia Arabia is monarchy, with strong theocratic overtones. The Islamic revivalist movement, known as Wahhabism was headed by Muhammad Ibn Abdul Wahhab in the eighteenth century. In this oil rich nation, Government is highly centralised and all power vests with the royal house and in particular with the person of the king.

Founded by the late King Abdul Aziz in 1932, the Kingdom had been reeling under acute poverty till late 50s. The oil boom has now transformed the nation into one of the rich countries of West Asia. Her population now stands at 8.96 million with a density of four persons per square kilometer against the world average of 30. Hardly one fifth of them are literate. Most of her people are nomadic or semi-nomadic. Agriculture and animal husbandry are the major occupations of the people.

Saudi Arabia had been living in isolation until the end of the Second World War. The discovery and development of vast oil resources had put an end to her isolation and transformed the nation into one of the wealthy countries. Saudi Arabia now stands third in oil production next to the US and the USSR and has nearly one quarter of the world's proven oil reserves. Oil constitutes over 80 per cent of the GDP and 95 per cent of the Government revenues. In 1979-80 the country produced more than nine million barrels of oil a day. According to the latest assessment Saudi Arabia's oil will last well upto the next century. The Arabian American Oil Company (ARAMCO) at Rass Tanuara, the largest oil refinery in the country, produces about 96 per cent of the country's total output. Besides, there are two other refineries, Getty Oil Company of the U.S. operating onshore in Meena Sand and the Arabian Oil Company of Japan operating offshore at Alkhafji. Moreover the Government has set up the General Petroleum Organization (PETROMIN) to manage the new oil and mineral based industries and coordinate national interests in oil production. The main oilfield in the Kingdom is at Abqaiq with the operating centre at Dhahran.

1Centre of West Asian Studies, Aligarh Muslim University.

Economy

The nation's economy in 1979-80 achieved a growth rate of 7.6 per cent in real terms. Over the last few years it has been growing at an annual rate of 6.5 per cent. The real gross domestic product in 1978-79 increased at 9 per cent compared to 5.9 per cent in the preceding year. The spectacular increase in the overall GDP was mainly due to the improved performance of oil sector which realised a growth rate of 5.5 per cent against a decline of 0.5 per cent in 1977-78. The non-oil private sector in the same period, witnessed an impressive growth rate of 12.4 per cent, though somewhat lower than that in the preceding year, whereas that of the public sector was 13.5 per cent. A structural change in the economy has set in during the last 5 to 6 years. The share of the oil sector in total real GDP declined from 60 per cent in 1974-75 to 50 per cent in 1978-79, while that of the non-oil private sector rose considerably from one-fourth to one-third of total GDP. Capital formation, in gross domestic expenditure rose from 13.2 per cent in 1975-76 to 33.3 per cent in 1978-79. The unprecedented economic growth expanded the infrastructure, removed bottlenecks, improved public utilities, reduced the gulf between the growth of aggregate supply and demand and subdued domestic inflation.

Planning

At the root of rapid transformation of the economy lies well conceived and effectively implemented economic planning. The establishment of an Economic Development Committee heralded the era of development. In 1959 the Committee was expanded and re-

named as the Committed for Economic Development. In 1961 it was replaced by the Supreme Planning Board and later, by the Central Planning Organization (CPO). The CPO is charged with the duties of preparing periodic economic reports, formulating economic development plans, estimating the overall resources needed to implement the plan, assisting the various ministries and government agencies in their economic planning, establishment of planning units in each ministry and public agencies and providing the technical advice to the King. The president of the CPO reports directly to the King. The CPO in cooperation with the advisers of the Public Administration Project of the Ford Foundation, presented the first comprehensive document entitled "Planning for Growth". But as this document did not give precise guidelines for implementation, the Plan met with failure. In 1968, Shri Hisham Nazar an official of the Ministry of Petroleum and Minerals, was appointed as the President of the CPO. Shri Nazar transformed the CPO into an aggressive planning body.

Saudi Arabia now stands third in oil production next to the US and the USSR and has nearly one quarter of the world's proven oil reserves.

A five year plan, from 1970-71 to 1974-75 was chalked out in 1970. The plan envisaged rejuvenation of the entire economy, including the policies, programmes, and projects, to increase the rate of growth of GDP, develop human resources, and to achieve overall development. This plan also intended to diversify sources of national income and reduce dependence on oil by increasing the share of other productive sectors in GDP. Table I shows the average growth rates from 1965-66 to 1968-69 and the projections for the plan period 1970-71 to 1974-75.

Table 1

Average annual growth rates and plan projects

Sector	1965-66 to 1968-69	Plan Projections
Agriculture	1.7	4.6
Crude Oil and Natural Gas	8.2	9.1
Mining and Quarrying	6.4	23.3
Petroleum Refining	11.7	9.1
Manufacturing	12.1	14.0
Construction	4.2	10.4
Electricity, Gas, Water and Sanitation	12.1	13.2
Transportation, Communications and Storage	11.1	12.9
Wholesale and retail trade	10.3	12.8
Banking and Insurance	10.7	11.0
Ownership of dwellings	7.0	8.6
Public Administration and Defence	5.4	5.0
Education	7.2	19.0
Health	2.4	9.5
Other Services	8.1	10.0
GDP	7.9	9.8

Table II gives the expenditure incurred for the development of various sectors in the First Plan.

Table—II

Development Expenditure during the first Plan

(Million Riyals)

Sector	1970-71	1971-72	1972-73	1973-74	1974-75
Communication	523.6	1333.7	1244.1	2051.7	4212.1
Civil Aviation	79.9	127.3	223.9	466.8	1150.8
Agriculture and Water Resources	230.1	456.0	572.5	855.0	249.7
Petroleum and Mineral Resources	39.6	82.3	86.7	136.3	164.3
Commerce and Industry	9.2	28.9	29.9	46.0	114.4
Labour and Social Affairs	8.2	24.1	26.4	36.4	165.7
Education and Educational Institutions	24.9	125.9	255.1	565.5	1265.6
Health	10.9	29.9	45.4	84.2	435.1
Interior (Municipalities)	190.1	438.8	640.5	1575.3	3683.8
Hajj and Awqaf	9.4	28.2	45.7	57.5	103.8
Information	28.2	48.8	82.2	158.5	205.3
Others	1441.9	2312.5	3463.2	8229.8	14646.4
Total	2596.0	5035.7	6717.6	14263.0	26397.0

The first plan placed emphasis on agricultural development. The agricultural programme mainly consisted of four major projects : a 30,000 acre irrigation project at Al-Hasa in the Eastern Province, a major land reclamation and irrigation project to settle 10,000 Bedouins (The Faysal Model Settlement), a dam at Wadi Jizan (which on completion was to irrigate 20,000 acres), and another dam at Al-Abha in the Asir region.

In 1973 a major desalination project was started and by the end of 1974 the Saudi Government was operating five sea-water desalination plants. Besides these, the first economic development plan also undertook projects like the Petroleum Lubricating Oil Company in Jedda with an annual production of 75,000 barrels, a sulphuric acid plant in Dammam, expansion of the Jedda Oil refinery to 45,000 barrels per day capacity, construction of a 15,000 barrels per day refinery in Riyadh area, expansion of the Jeddha Steel Rolling Mill to 1,00,000 tons per year capacity and a long-term programme for the exploitation of mineral resources.

Second Plan

The first economic development Plan had hardly come to an end in 1975 when Saudi Arabia's new king, Khalid Ibn Abd al-Aziz al-Saud announced, the most ambitious development plan in the history of Saudi Arabia involving an expenditure of $ 100 billion during 1975-80 on all types of industrial and

agricultural projects. Later the outlay was enhanced to $ 141.1 billion as shown in Table III. The Plan brought about a change in the composition of the economy. The contribution of the non-oil private sector to the GDP rose from 26.8 per cent at the beginning of the Plan period to 34.3 per cent in 1978-79. The plan reduced the acute port congestion between mid 1977 and early 1979, improved labour shortages, contained the rate of inflation by 10 per cent and lowered the construction cost.

Table III

Outlay of Second National Plan (1975—1980)

($ billion)

Sector	Outlay	Per cent
Economic Resource Development .	26.1	18.5
Human Resource Development .	22.7	16.1
Social Development . . .	9.4	6.7
Physical Infrastructure Development	32.0.	22.7
Administration	10.8	7.7
Defence	22.1	15.7
External Assistance Emergency Funds, Food Subsidies and reserve	18.0	12.7
Total	141.1	100.0

The main objectives of the plan are, to achieve a high rate of economic growth, to exploit the mineral resources of Saudia Arabia, to achieve independence from oil as a source of national income, to develop the infrastructure and human resources. The effective implementation of the plan resulted in developing infrastructure and industries at a rapid rate. But the economy landed in high rate of inflation, port congestion and less efficient development process. However, Saudia Arabian Monetary Authority in its Annual Report of 1977, wrote ".....1976-77 ended with major bottlenecks removed.....port congestion eliminated..... inflation has begun to decelerate."

To have a diversified economy, their industrial development plan aimed at expanding and developing the existing manufacturing and industrial enterprises, such as cement production, the Jeddah Steel Mill and ancillary investments in desalination units. The Plan envisaged to develop the seven 'industrial sites' near major urban centres, which would accommodate light industry to meet the needs of the Saudi Market. The country thought of developing the industrial areas at Yonbo in the west, and Jubail near Dammam in the east, where a hydrocarbons industry was planned for processing gases associated with oil. It involved investment of $ 30 billion for infrastructural facilities. They envisaged an aluminium plant, steel mill, fertiliser plant and additional refineries and hydrocarbon plants.

Third Plan

The third development Plan, 1980-85, set the expenditure ceiling originally at 831.6 billion riyals ($ 249.7 billion), allowing for an inflation rate of 7 per cent a year. However it was pointed out that the expenditure would be 900 billion riyals ($ 270 billion). But due to the rise in oil price and the demands of individual ministries, expenditure is now likely to go up to $ 1,000 billion riyals ($ 300 buillion).

The third Plan gives top priority to the strengthening of the role of the Sharia (Holy Law), to the defence of the religion, and internal stability of the Kingdom. The Plan aims at, developing productive industries, notably the industrial zones of Yonbu and Jubail, improving the quality of life in the smaller and more distant towns and villages, developing the kingdom's manpower resources by imparting education and vocational training. It tries to steer the private sector to serve the nation rather than earn profit. Easy credits are provided and subsidies reduced.

The first development plan of Saudi Arabia aimed at diversifying sources of national income and reducing dependence on oil by increasing the share of other productive sectors in G. D. P.

The plan tries to take advantage of the fruits of the second plan and to direct the economy towards capital intensive development. Main emphasis will be on the creation of increased output capacities in the productive sectors, together with an expansion of critical development resources such as energy and water. In the plan the total expenditure on civilian development is 7,83,000 million riyals ($ 235,843 million) at current prices, which reflects a significant departure from the earlier strategy of creating physical infrastructure for the development of the productive sectors.

From 1962, Saudi Arabia has been showing marked economic progress. However their rapid modernization process is severely hindered by several constraints. One of them is the shortage of adequately trained manpower, because their system of education is fifty years old. Moreover Saudis do not evince any interest in education because many opportunities are open to them with minimum education on account of abundant oil revenues and subsidised social services. The pervading conservative influence of the Wahhabites in the country is a strong social bottleneck to development. Religious training in the educational curricula is strongly emphasised. They stand for the total exclusion of Saudi women from the work force. Moreover the opposition of the powerful religious leaders (Ulama) to many aspects of modernization has slowed down the entire

□

Eucalyptus Plantation in Bhavnagar

H. R. Sanghavi*

A gardener watering eucalyptus seedlings in a nursery

INDICATIONS are available that Bhavnagar District in Gujarat may earn the distinction of becoming the first Eucalyptus district in India. The farmers of the District seem to have grasped the economic viability of eucalyptus (Eucalyptus Hyrid) plantations.

Social Forestry

The programme of eucalyptus plantation is being carried out in the District as part of Social Forestry Programme. The programme is being implemented in close co-operation with the Agriculture Department of the District Panchayat and the Extension Division of the State Forest Department. If the Small and Marginal Farmers' Organisation could also extend its helping hand the programme could succeed still further.

The manner in which the farmers of Bhavnagar District have been attracted towards plantations of eucalyptus indicates that during 1981 Van Mahotsava, there will be a very substantial rise in the demand for seedings of eucalytus. The Extension Units of the Forest Department as well as the Forest Department of Bhavangar are preparing themselves to meet this expected demand and they are nursing one crore seedlings in different nurseries of the District.

The farmers of the District have been attracted towards eucalyptus plantation during the last three or four years. The eagerness of the farmers of the District for these plantations can be gauged from the fact that the farmers of Bhavnagar District alone have demanded nearly 1.57 crore seedlings. In the whole of Gujarat State about 6 crore eucalyptus seedlings are to be sown this year. Thus the demand for seelings from Bhavangar District alone is so large that it may assume the status of eucalyptus District not only in Gujarat but also in the country as a whole.

*Senior Correspondent, Cum-Editor, Yojana (Gujaroti), Ahmedabad.

The benefits that accrue from this plantation include availability of firewood, prevention of soil erosion, and the possibility of establishing paper mills etc. If the farmers plant eucalyptus trees on the peripheries of their fields, it not only prevents damages being done by animals but also protects the farmers' crops from strong winds and heavy rainfal. Moreover, eucalyptus trees are free from diseases or pests.

The farmers of Bhavnagar district are trying to develop various models of farm forestry involving various spacing, mixed cropping pattern, fertilisers and irrigation. Various models to raise eucalyptus plantations with different spacings have been tried in collaboration with the forest department. If the plantations are made at the spacing of 60 cms X 60 cms., it has been estimated that in one acre of land, about 10,000 seedlings could be sown. But no other crops could be taken from this land. However, if the plantations are done at the spacing of 60 cms-240 cms., another crop could be taken between the rows. Thus farmers are able to earn sufficient supplementary income for their maintenance.

If the planation of eucalyptus is done at a spacing of 60 cms X 60 cms., at the end of 3 years nearly 10,000 rafters could be prepared and if each rafter is priced on an average of Rs. 10 the farmers shall get about Rs. 1,00,000/-from one acre of land. Now if an amount of Rs. 15,000/- to Rs. 20,000/- is deducted towards the cost of water, fertilisers and other incidental expenses, the farmers would get a net profit of Rs. 80,000/-from one acre of land. This way the eucalyptus Plantation, gives the farmers an opportunity to increase their earnings.

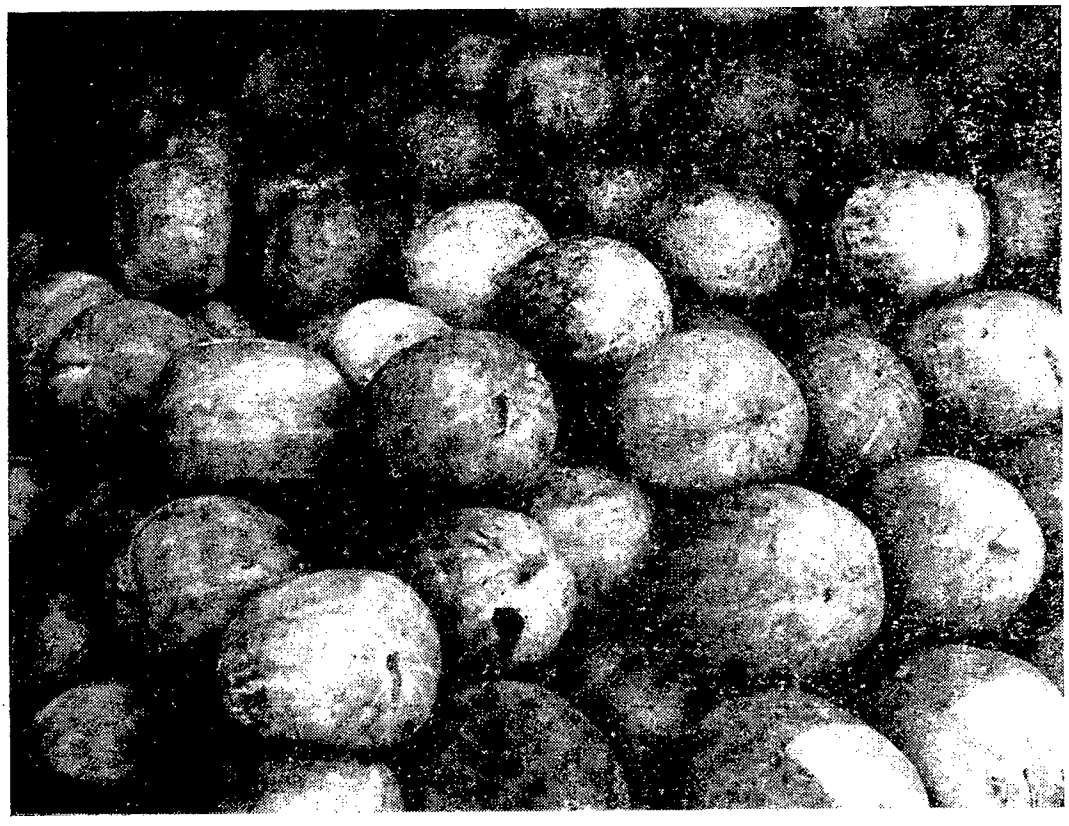
More Rain

Many parts of Gujarat experience drought conditions now and then and therefore the success of crops largely depend upon good monsoon. To attract rains, it is imperative that the forests are developed. The farmers love trees and therefore if they are given incentives to grow more trees, the forests could grow speedily. If the farmers are to be made to take interest in raising forests, they must be shown how they can profit by growing trees.

Three-year-old Eucalyptus plants at Surendrabag farm

In collaboration with the Forest Department, various models to raise eucalyptus plantations with the different spacings have been tried at Surendrabag farm in Bhavnagar District. Surendrabag is working towards developing a model which can be caled "Density Plantation of Eucalyptus for higher profits". The increase in the plant population can cause shortage of nutrition. This fact has been kept in mind in the models tried out at Surendrabag.

Also experiments were carried out to provide nutrition to the trees through fertilisers. To make this nutrition easily available, there must be enought moisture in the root zone. This condition can be created by increasing the number of waterings. Thus the Density of eucalyptus plantation can be increased by 3 to 6 times as compared to the conventional one. The density plantation involves more trees with heavy doze of fertilisers and more irrigation. This has given amazing result. The growth of eucalyptus, has been more in the second and third year compared to the first year, as against the conventional farm forestry, resulting in an increase in income three to six times.□



Kusmanda (Sveta)—Benincasa hispida

T

Healin

Ayu

Vidya Bh

AYURVEDA, the "Science of Life" has been sustaining the health of people of India and the neighbouring countries from time immemorial.

The art of healing was propounded in the Upangas or branches of the *Vedas*. The *Rik Veda*, the oldest repository of human knowledge, was replete with the *Srtras* or *Mantras* of the theories and practices of ayurveda. In the other *Vedas*, specially the *Atharva Veda*, remedies including surgical operations for several diseases were enshrined. The *Asvins* were the celebrated physicians of the vedic period, and they did miracles in the field of medicine and surgery. They revitalised lay individuals and saints, injected vigour and vitality in the sterile, cured serious diseases like tuberculosis and so on. Many surgical feats like transplantation of head, providing artificial limbs and probing of urethra were quite common in those days.

The *Upanisadic* period witnessed widening horizon of the philosophical background of the fundamental doctrines of Ayurveda. During this period, many ayurvedic classics were composed. Though most of these classics are unfortunately not available, works of Agnivesa, Sushruta and Kashyapa, belonging to the bygone era, have been preserved. During this period ayurvedic practice had eight specialised branches :

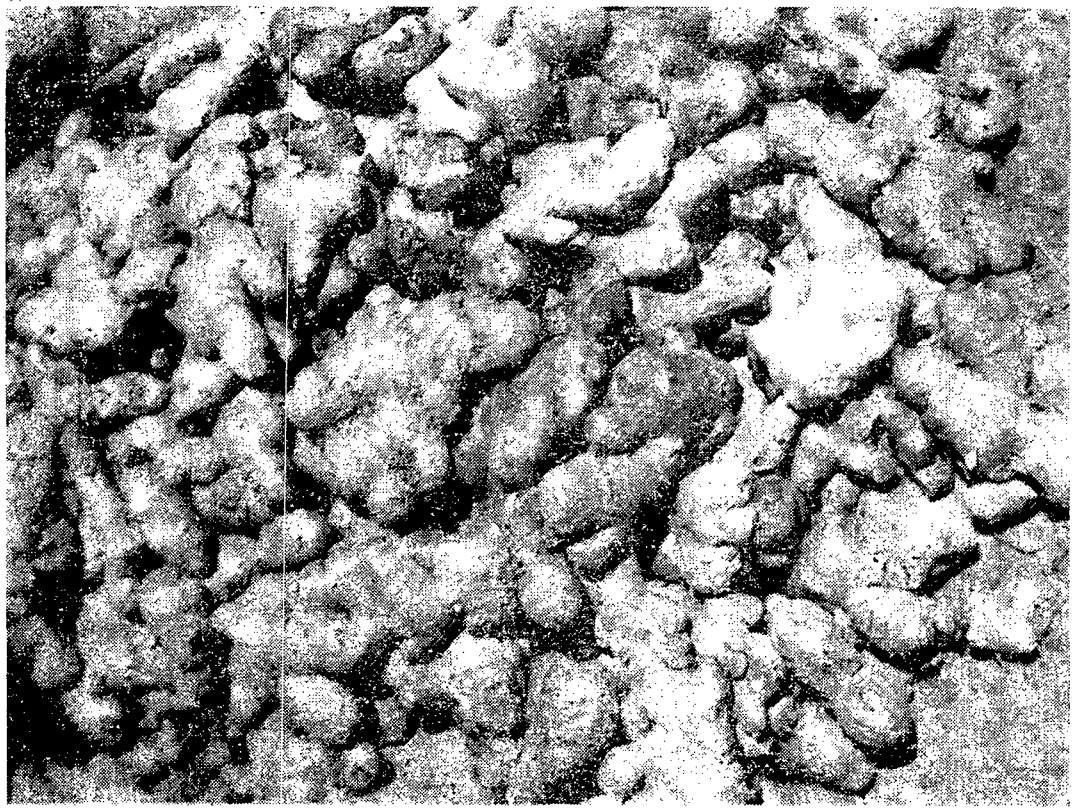
1. Kaya Chikitsa or Internal medicine
2. Shalya Tantra or Surgery
3. Shalakya tantra or treatment of diseases of eye, ear, nose, throat and other parts in head and neck.

*Deputy Adviser (Ayurveda) Ministry of Health and Family Welfare

Touch

eda

Dash*



A pile of Ardraka (Zingiber Officinale)

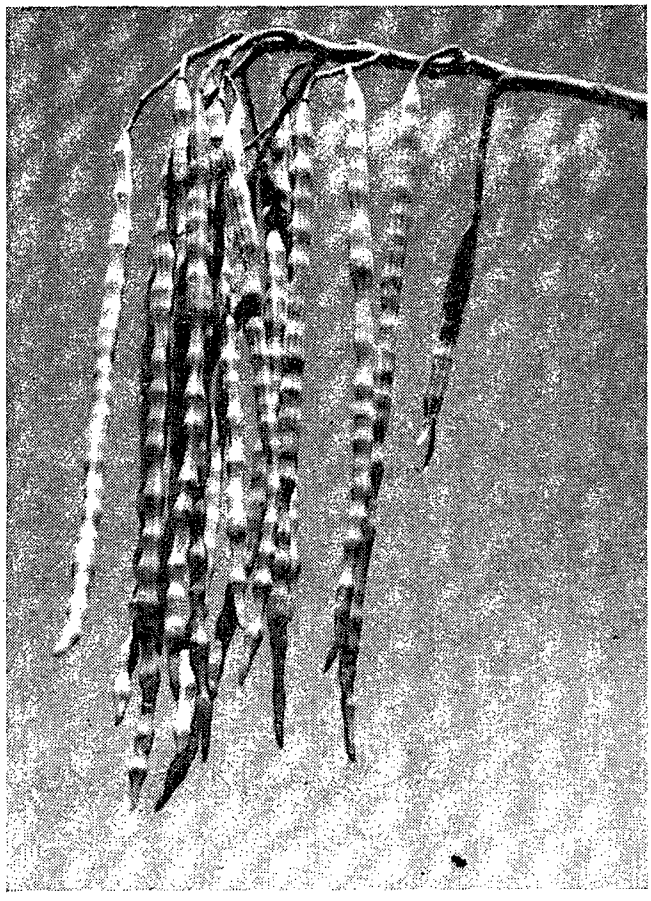
ura metal

4. Agada tantra or treatment of ailments caused by different types of poison.
5. Bhuta vidya or treatment of diseases cause by evil spirits, invisible germs and other psychic disorders.
6. Bala tantra or management of children and their diseases.
7. Rasayana tantra or geriatrics including rejuvenation therapies, and
8. Vaji karana tantra or treatment of impotency and sterility including the administration of aphrodisiacs.

Most of the works composed by several specialists on each of these branches, referred to by later commentators, have been lost.

In the Pauranika and Aitihasika age when original versions of the Ramayana and Mahabharat were composed, this science was at the apogee of its development. Works of this period are replete with references to war surgery and such emergency treatment.

Ayurveda enjoyed a unique position in the pre-Buddhist and Buddhist periods. The then Takshashila university attracted several students from far off countries. Jivaka, the physician of Lord Buddha received specialised training in surgery in this university, Atreya, at that time, was the head of the medical faculty and under his supervision Jivaka performed many major surgical operations including brain surgery which fact was recorded in Buddhist literature. For propagation of religion, monks of this time visited Nepal, China, Tibet, Mongolia, Burma, Indonesia, Sri-Lanka and many other neighbouring countries and alongwith religion, they used to teach ayurveda also. In fact



A branch of Sobhanjana
(*Moring oleifera*)

through ayurvedic teachings, they found the propagation of religion easier. Ashoka, one of the Buddhist monarchs had established many herb gardens with a vedic methods of treatment, and incorporation of poor patients. Post-Buddhist period witnessed the ban on Panchkarma, surgery and practice of classical ayurvedic methods of treatment, and incorporation of many metallic and mercurial preparations into the ayurvedic pharmacopoeia.

Frequent external invasions and internal conflicts resulted in the destruction of libraries discouraging scholars of intellectual pursuits. Mediocres, in the name of religion, were engaged in intellectual acrobatics. It lost royal patronage and for the most part went into the hands of quacks and charlatans. Feeble attempts were made to revive ayurveda and to restore its due position in the health development programmes, but with no success. The foreign rulers, in pre-independence era, viewed with contempt anything connected with Indian culture and tradition. The elites of this country were sufficiently indoctrinated to ignore ayurveda as a bundle of traditional superstitious practices. Ayurveda, a living science which guided the destiny of the health of our people for thousands of years was thus relegated to the back seat and almost became 'history of medicine' rather than a 'Science of Life'. It gradually went into the hands of people who had no other means of livelihood. As a result of the economic conditions, then prevailing, the neglect of ayurveda, the standard of health of our people came down and the country became the abode of epidemics and sufferings. In this situation, controversies and conflicts among ayurvedic physicians and patrons were the natural corolary. Therefore, after independence, our leaders faced a herculian task to revive this science by giving due weightage to different view points and by cleansing it of conturies of accretions.

When the system of traditional healing was being injured, the women folk of this country alongwith some ex-rulers and zamindars, saved the science from complete anihilation. However sophisticated or financially sound a family may be, the kitchen and young children of the house are left to the care of the mother. Ayurveda prescribes many dos and don'ts in diet for different seasons and different parts of the day as well as night. For different common ailments simple remedies are prescribed which are mostly available in the kitchen, kitchen gardens and in the fields surrounding the villages. Ladies of the house adopted them, of course, without knowing them to be ayurvedic prescriptions, in their day to day routine and thus the practice of ayurveda continued uninterruptedly in this region of the world.

Economics of Ayurveda

Most of the Ayurvedic medicines are drawn from the plants available in the forests of this country. Herbal plants for common ailments are available in the fields and forests near our villages. Traditionally, villagers, at least some senior members of the village, are capable of identifying them and using them. Most of these herbs are harmless and that makes their use very easy. For a physician or a pharmacy, these herbs are collected from the local forests, and therefore, the forest dwellers of poorer, sections of the village get wages during their period of unemployment. The pharmaceutical processes for preparing medicines out of these herbs do not involve any sophisticated techniques. Thus, semi-skilled persons handle them and get their employment. A pharmacy for the manufacturing ayurvedic drugs can be started in a small scale. Notwithstanding some of the big ayurvedic pharmacies, most of the ayurvedic manufacturers depend upon small capital. Out of this capital a significant portion goes to persons who collect herbs, pound, boil and make pills and powders out of them. Foreign exchange for the most part is not required for importing raw material for these medicines. Similarly, foreign trained experts and sophisticated equipment are not required for their manufacture. For the most part, these medicines are cheap except those containing gold and other precious metals and minerals. These costly medicines are required only for serious diseases and in comparison to the expenditure which would have been involved otherwise even these costly medicines, become less expensive.

Side benefits

Since these medicinees are in use for thousands of years, people know certain that they are non-toxic. Even toxic drugs are processed in such a way that they become non-toxic when administered to a patient. While curing a disease they build up the body resis-

tance against the diseases. Thus instead of side reactions all of them have side benefits. Ayurvedic drugs are meant for both the patients and healthy individuals. While they have the power to cure a disease, they rejuvenate the entire system.

Apart from drugs, ayurveda prescribes different types of diet and regimens for the prevention and cure of diseases. Most of these are known to our people in villages. They know traditionally what to eat and how to behave in a particular climatic condition. In fact some of these traditions have taken the shape of religious rites and people follow them automatically without knowing that these are meant for their health. Thus, ayurveda is more conducive to the tradition and culture of this country.

In Ayurveda, more emphasis is laid on the prevention rather than cure of a disease. The regimens are meant for different parts of the day and night, right from the early morning when a person leaves bed till he retires. These regimens are also precribed for different seasons with which our people are well acquainted. Therefore, people in villages are generally free from serious diseases. They remain healthy for the most part. For their common ailments they know the utility of herbs in their kitchen or fields surrounding the village. Only when the disease goes beyond one's control one consults the local vaidya and only in serious cases the patient is referred to a hospital. Thus, self-medication, both for prevention and cure of diseases, is a rule rather than exception in ayurveda. This is safe because the herbs are harmless and people have the knowledge of their utility traditionally.

No elaborate investigations

Diagnosis and treatment of diseases according to Ayurveda do not involve any elaborate laboratory investigation. The physician arrives at the diagnosis by physical examination of the patient including his pulse, stool, urine, tongue, eyes and skin. They generally do not need any electric and electronic equipment for their aid. Thus, ayurvedic physicians find it at home to work in remote villages.

Ayurveda has its own concept of drug composition, drug action, genesis of diseases, and line of treatment. A disease in a particular organ is never treated in isolation. Alongwith the effected organ or viscera, the whole body is kept in view while treating the patient. It is not only the body but also the mind, intellect and soul which are taken into consideration before initiating any treatment. In fact psychosomatic concept of the disease is an inbuilt character of Ayurveda.

Government's encouragement

After independence, both the Central and State governments have recognised ayurveda and other systems of traditional medicine for utilisatin in the health development programmes of the country. The plan allocations for development of ayurveda and other systems of traditional medicine have been as follows :—

First five year plan—Rs. 0.40 crores
Second five year plan—Rs. 4.00 crores
Third five year plan—Rs. 9.80 crores
Fourth five year plan—Rs. 15.83 crores
Fifth five year plan—Rs. 25.07 crores
Sixth five year plan—Rs. 60.00 crores (approx).

It will be seen from the above that the Government has been providing more and more funds in every successive plan for the development of these systems As a result of recognition of ayurveda by

A gardener tending plants of Haridra (Curcuma longa)

the Government, ayurvedic dispensaries and hospitals were opened under Central Government Health Scheme and the expenditure on ayurvedic treatment is reimbursed to Central Government employees under CS(MA) Rules.

Education, Practice, Development

At the time of independence, there were different types of courses for study in various ayurvedic colleges and there was no statutory control over the practice of ayurvedic physician. In 1971, by an Act of the Parliament Central Council for Indian Medicine was established. This Council has already prescribed the minimum standard of education which is introduced uniformly in all ayurvedic colleges of the country.

To implement various planned programmes for the development of ayurvedic system there is an Advisorate with an Adviser at the Centre. In most of the States there are independent Directors for the execution of various programmes for development of ayurveda.

For research into various aspects of ayurveda the Government of India has constituted a Central Council for Research in Ayurveda and Siddha. The main areas of their work are clinical research including fact finding, mobile clinical research, drug research, medico-botanical research and literary reserch. These programmes are being implemented by them through their several Central Research Institutes, Regional Research Institutes, and Research Units.

The Drugs and Cosmetics Act is now applicable to Ayurveda and ayurvedic pharmacies are being licenced to manufacture their products under hygienic conditions and supervision of experts.

Ayurvedic drugs are being used in this country since thousands of years. Therefore, there are regional variations in the manufacture of the same drug. To bring uniformity in the methods of manufacture, raw ingredients and finished products an Ayurvedic Formulary has been prepared by the Ayurvedic Pharmacopoeal Committee constituted by the Government of India. The Central Council for research in Ayurveda and Siddha has already laid down standards of some of these preparations and the work on the remaining medicines is in progress. Methods of testing the genuineness and standards of ayurvedic preparations are also being included for which a Pharmacopoeal Laboratory in Indian Medicine has been established at Ghaziabad. Financial assistance is lso being given to State Ayurvedic Pharmacies for increasing the quantum and standards of their production and for development of herb gardens. The Government of India has also registered a Corporation under Companies Act to manage a Central Pharmacy of Indian Medicine at Ranikhet with a view to making available potent and genuine ayurvedic drugs at a reasonable rate. At present, there are about 3000 ayurvedic pharmacies in the country.

The Government of India has established a National Institute for Ayurveda at Jaipur for providing undergraduate training, post-graduate training and research facilities. For similar purposes an Ayurvedic University has been estbalished at Jamnagar in Gujarat. At present, there are about 100 recognised ayurvedic colleges in the country where the syllabus prescribed by the Central Council of Indian Medicine is being implemented. About 3000 graduates are coming out from these colleges every year. In Banaras Hindu University, an Institute for Post-graduate training in various specialiaties of Ayurveda is functioning. Besides, there are 16 departments in different ayurvedic colleges of the countrv where post-graduate training facilities are available. At Banaras and Jamnagar, short term post-graduate courses for foreigners are also being arranged. There are 25 Boards and 37 University faculties for regulating education and practice of ayurvedic physicians.

Medical Aid in villages

Ayurvedic physicians in villages are providing medical aid to the villagers. Now a days, there is a greater demand for ayurvedic physicians in cities where patients who are not cured by other systems and who had also side effects of the earlier treatment, come to these physicians. Besides, there are about 250 hospitals and 1500 dispensaries of ayurveda in the country. For providing medical aid through ayurveda to Central Government employees, many dispensaries have been opened under Central Government Health Scheme. There are ayurvedic dispensaries under Employees State Insurance Scheme and Mine Labour uelfare Associations. Many Community health Volunteers have received ayurvedic training and ayurvedic physicans are also employed as third doctors in some Primary Health Centres in States.

Fruit bearing branches of Emblica officinalis Garten

At present there are about four lakh ayurvedic practitioners in our country. Out of them about 2.5 lakhs are regisered under various Boards and Faculties for their practice. Of them, about 1.2 lakhs are institutionally qualified. About 60,000 ayurvedic practitioners have undergone training in clinical and para-clinical subjects of modern medicine.

Economic Condition of Practitioners

Most of the ayurvedic practitioners, are financially backward. Their training and ethics do not permit them to amass wealth at the cost of suffering humnity. They teach people to adopt different measures for the prevention of diseases. This obviously reduces the number of their clients. They, for the most part prescribe home remedies available in the kitchens and gardens as well as fileds surrounding the village. This deprives them from getting fabulous commission as a result of drug-sale. These prescripptions are very simple, well known and harmless for which the patient himself starts administering and propogating them. This further reduces the clinetele of the ayurvedic physicans. If the patient comes with a serious disease then after treatment, the relapse of the ailment is very rare. In fact all ayurvedic medicines being tonics, they promote the body's immunity against diseases. Thus, even an obliged patient does not return to pay fees again but only to express his sincere gratitude. Ayurvedic physicians and students are mostly drawn from poor sections of the society. They, therefore, do not grudge their poverty. But, in this sophisticated and materialistic world, because of the economic backwardness of the physician the science of ayurveda is often misconstrued as ineffective or less effective.

Ayurveda goes abroad

Day by day, ayurveda is becoming more and more popular in foreign countries. In the past, delegations from foreign countries like Srilanka, Nepal, Burma, Japan, Indonesia, Mongolia, China, West Germany and America have visited this country to study ayurveda. Some of these delegations have come under Government sponsored cultural programmes. Ayurvedic Physicians of India have also been invited to many foreign countries to teach ayurveda there. Many foreign students are now in India to study ayurveda in our colleges. For foreign doctors, short term courses in ayurveda have been instituted by Banaras Hindu University at Varanasi and Gujarat Ayurvedic University at Jamnagar. The World Health Organisation have appreciated the need for the utilisation of ayurveda and other systems of traditional medicine in the health development programmes of member countries. During the days of Takshashila and Nalanda Universities, our country was the leading light in the field of arts and sciences. Indian doctors then were very much in demand outside the country. But later we became eternal students in as much as our scholars went to foreign countries generally for learning and foreign scholars came here mosly for teaching. The trend is being reversed now through Yoga and Ayurveda. □

Import Export Policies of 1981-82—An Appraisal

(*Contd. from page 8*)

"Ghost of Actual User" Condition

After a good deal of discussions, the Alexander Committee Report had recommended that the "Actual User" condition for the OGL items should be retained for the first one or two years and it should be gradually relaxed so that competitive open trading in imported items could reduce the premia operating in the parallel economy. Inspite of this clearly logical recommendation, the import policies year after year, are remaining haunted by the ghost of "Actual User" condition. It is useful that fresh thought is given to this in regard to the entire policy frame. It is commendable however that the new policy has taken a bold step—though a small step—in the right direction, in removing the AU condition for duty-free REP scheme against exports from the decentralised sector.

Missing Elements

The new policy, like the earlier ones, has a few missing elements. In India licensing system should gradually give place to tariff system. There is no evidence of the trade policy frame moving in this direction. Further, as stated earlier, pronouncements on tariff policy and those on import licensing policy are made by separate Ministries without any explicit recognition of the need for an integrated approach. Import and export services should receive greater attention than the import-restrictive or export control policies. The policy statement is silent on the important question of the establishment of National Trade Information Center, which is hanging fire for the last several years. Another important issue which is not receiving adequate attention is that of coordination between the imperatives of the international economic relations induced by the considerations of New International Economic Order and the domestic import-export policy frame. Obviously, if greater cooperation among developing countries is, for example, an NIEO objective, then at least some specific import-export policies need to be initiated so as to foster this coperation in an effective manner. Here again, perhaps, lack of coordination between the Commerce Ministry and the External Affairs Ministry could be a constraint, or could be a cause for a narrower conception of the import-export policy frame.

Economic Implications

The new policy has set for itself the right type of objectives in terms of, (i) providing essential inputs for strengthening domestic production base, (ii) further reducing dependence on imports, (iii) providing greater impetus to exports and (iv) to further simplify and streamline procedures. It is difficult to envisage all these objectives in the course of one year itself. In fact institutional response lags, which are often ignored in the discussion on policies, may necessitate stability of a policy frame for 2-3 years in order to realise the cherished objectives, particularly in regard to production and export activities. The new policy may succeed in restricting import but it is incorrect to conceive that it will have any significant favourable effect on the balance of payments situation of the country during 1981-82 period. While more than 60 per cent of the import bill is due to Fuel and Fertiliser (and food) (F^3) categories, there is very little manoevarability regarding the imports of the non-F^3 categories without adversely affecting the domestic production activities. The uncertainties regarding the composition of OGL, restricted and banned categories and frequent notifications for policy changes, would continue the tendencies of excessive importation and cornering by a few, thereby generating large premia on import licences. The new policy could provide some anti-inflationary effects to the extent that domestic production activity would boost up. However, this would be only marginal.

The new Import-Export Policy of 1981-82, is pragmatic and innovative in several respects. However, it has in it some degree of reversal of the rationalisation process which was initiated with effect from 1978-79 policies as a sequel to the Alaxander Committe Report. A number of innovative schemes for encouraging the small scale sector are bound to disburse the export-oriented small entrepreneurship in different parts of the country. The effect on the total import bill of the country could be marginal whereas the export effort is likely to receive a boost with product diversification. Lack of coordination between licensing system and tariff policies, trade policies and NIEO objectives, inadequate recognition of import management services as against import-restricting policies and export promotion services as against export incentives, are some of the weaknesses not necessarily peculiar to this year's policy-frame only. In any case, Commerce Ministry and in particular CCI&E's office, deserve to be congratulated for producing a cogent and imaginative import-export policy book at a time when the country is passing through a most difficult period on the balance of payments account. □

Significance of Space Research for India

Tapan Das*

FROM the day the Soviet cosmonaut Yuri Gagarin zoomed into the space 20 years ago, vast stretches of scientific knowledge have been laid bare before the mankind. Baikonour is the place from where the Soviet Union launches its spaceships. It is also the place from where India entered into the space age through the launching of Aryabhata and Bhaskara earth satellites with the help of Soviet rocket carrier.

India has no doubt gained considerable experience in space research. Indo-Soviet cooperation has played a significant part in it during the last few years. The proposed joint space flight by an Indian cosmonaunt along with a Soviet spaceman therefore assumes added significance in this context. What benefit can a developing country like India get from space probes ?

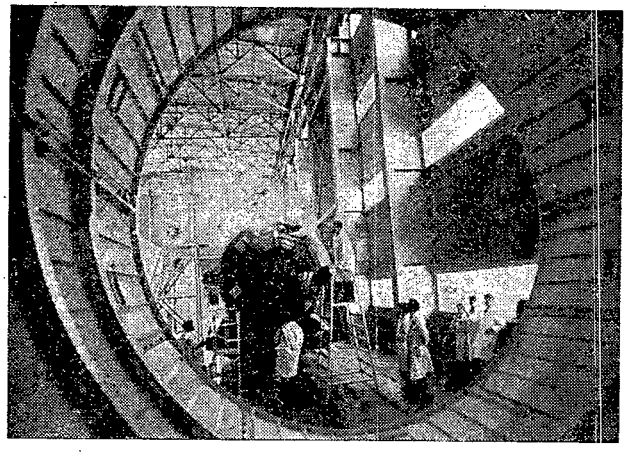
India with its vast area and large population, nearly 80 per cent of it being essentially agriculture-based stands to gain immensely from space research if results achieved by others in this field are any guide. As the leading scientist and pioneer of space research in India, Dr. Vikram Sarabhai said long ago that space research was essential for social progress. India can get accurate data on natural wealth and mineral resources of the country through space probes. Cosmic survey is also not alien to India's cultural heritage.

Space photography offers immense benefits and helps economy of country in diverse ways. Photos obtained by the spaceships and other experiments can help meteorologists to predict the origin of cyclones, floods and storms and take remedial measures in advance. Spaceships help to photograph vast areas in 4-5 minutes while conventional surveying methods take years involving huge expenditure. Photographs taken from spacecrafts have enabled the scientists to acquire valuable information, which could not be provided by standard photographs.

The cost of geological survey has now been considerably reduced, thanks to space photographs. Difficult mountainous areas which, for instance, were beyond the comprehension of ground-based geologists and equipment, can now be surveyed by multispectral photography from spaceships. This survey is essential from the point of view that tectonic processes often occur in mountainous areas.

Geological mapping with the help of multispectral space photography can enable geologists discover mineral, oil and gas bearing structures. The Soviets have made good use of space photography for designing some major hydro-technical and hydro-power complexes, railways including the Baikal-Amur Railway, canals and for studying the shifting river flows.

Hydrologists on the other hand can use the data for surveying water resources. Hydrologists can get from spacecrafts information about water reservoirs, humidity of soil, distribution of ice cover, glaciers and snow reserves in the mountains. This information will enable them to forecast the outflow of rivers and plan for power engineering and irrigated farming.



Indian Satellite Bhaskara being linked to the Soviet carrier rocket

Closely connected with natural resource survey and hydrological engineering are the problems of agriculture and cattle breeding. In a country like India where agriculture is still largely dependent on the vagaries of nature and both famine and floods are a recurring phenomena, space research offers various remedies. The problems of fodder, pasture and irrigation are also acute in India. One can, however, confidently look forward to the solution of these problems in future, provided the experiences gained by other countries are applied. Prof. U. R. Rao, a noted Indian space scientist says that India can benefit in the spheres of meteorology, remote sensing of earth and communication through joint space research with the USSR.

* Journalist and Author.

President Brezhnev decorating Yuri Gagarin with a Pilot Cosmonaunt of the USSR

In the USSR, desert areas in several Republics have been turned into green pastures following forecasts made by earth satellites helped detect lentils of fresh and poorly mineralised water to the surface of Kyzylkum desert. Reconnaissance drilling corroborated the forecast and the water deposit has been developed for the needs of cattle breeding there.

Spectral studies of the atmosphere and natural formations conducted by Soviet specialists have opened up prospects for controlling the environment on a global scale and have shown the possibility of the automatic identification of such objects as flora, soils and mineral composition of soils from their spectra. It is now possible to even differentiate between the healthy flora and the flora affected by diseases. This is very important for agricultural scientists and forecasters as well.

Terrestrial observation from space can be used for the elaboration of effective methods of weather and climatic changes, forecasting for long periods ahead. There is no denying the fact that weather and climatic changes and their correct prediction are closely linked with a country's economy. As has been shown by experience, space data can provide defiinite clues to the formation of hurricanes, cyclones and dust-storms.

Data about the formation of dust-storms have also led the scientists to understand the role played by the dust-storms on the earth as a mighty factor of air pollution. Air pollution in turn has a serious effect on the weather and climate. Scientists have found that the contrasts of the temperature of the clean and polluted surfaces of water and also differences in the degree of the polarisation of solar light, reflected by water, can serve as reliable indicators of pollution.

These studies are also of great value in following sea and ocean currents, for reconnoitering phytoplankton and zooplankton contents in the water. Along with the data about the temperature of the surface of water, these studies can be of valuable guide to the search of the most probable areas of fish accumulation, and thus scientific methods of fish breeding can be undertaken. Study of ocean, its currents and its inter-relationship with atmosphere leads to easier and correct forecasting of weather.

In the modern times of scientific and technological revolution space research can play a very important role in communication. Promising results have already been obtained in this respect in countries like the USSR. In a country like India, space satellites can effectively contribute to the solution of communication gap problems at a much lower cost. Such problems as illiteracy and family planning can benefit a lot from space technology in India.

In fact, space technology has progressed so much that today scientists are talking of creating in the near future a global communication system with telephone subscribers in any part of the globe at any hour of the day. There are also plans of creating satellites with big multi-beam aerials, powerful transmitters and miniature transmitter-receivers resembling a wrist watch.

According to Soviet cosmonaut Gherman Titov, one can make a call from Moscow to Vladivostok, which is several thousand kilometres away. For this one has to switch on miniature transmitter-receiver and tell the city's code. The order is then processed by a computer carried by a satellite on a stationary orbit and the caller waits until the channel through which the call is to be put, is free. Space apparatus on a stationary orbit can maintain communication between an unlimited number of callers, he says.

Advancement achieved in communication through space science can also be utilised for spreading information through television. India with its meagre resources will take decades to build a communication network for spreading information to its 5,60,000 villages. A system based on the geo-stationary relay satellites is now able to relay television programmes to many remote areas in the Soviet Union.

Communications and radio-relay satellites in Soviet Union have replaced the expensive terrestrial installation. Many remote areas in the North Pole and Kamchatka in the Soviet Union now receive television programmes from Moscow. These satellites also guarantee reliable colour TV reception with the help of ordinary antennae.

In the present days of shortage of raw materials and minerals, space research holds great promise. Scientists have acquired valuable knowledge from

technological experiments in space. It has been found that certain raw materials and minerals which cannot be produced in the conditions of our Earth's gravitation can be obtained from experiments in conditions of weightlessness and deep vacuum.

Experiments carried out by the Salyut-6 spacecraft have resulted in the production of foam-metal which is stronger than even high quality steel and is as light as wood. Research in zero gravity has also proved very valuable for growing special semi-conductor monocrystals. The need for artificial crystals is becoming greater day by day. They are used in semi-conductors, transistors, electro-accoustics, high-frequency technology, optics, support stones and high quality materials. Space research in this context offers unlimited opportunities.

Optics specialists have also been thrilled by the prospects of producing high quality glass and special lenses badly needed by the fibre optical instruments.

What can indeed be more fascinating than the use of space technology for solving the problem of energy which has plagued almost every country today ? Soviet scientists have already come forward with projects for creating high-altitude orbital power stations which will convert solar energy into electric power and relay it back to Earth. □

Environmental and River Valley Development

(*Continued from page* 6)

Temporary labour camps must be located, to the extent possible, in areas which will later be submerged so as to reduce the loss of forest cover. Even though the sites for resettlement and project colonies are selected well in advance, there should be no need to cut all the trees on these sites. Only those trees should be cut which stand on the residential plots or on the proposed roads and paths. Cutting of these trees should be taken up only when construction operations are imminent. The extent of clearance under the transmission lines should be related to the height of the standing trees, and the clearance restricted to minimum necessary width. Vegetation on island-formations in the rservoir above FRL should not be removed so that they may be developed as bird sancturies at a later stage.

Only when the incorporation of environmental aspects in the planning and execution is made a part and parcel of all River Valley and other Development projects, there would be hope to protect and preserve our natural environment and to fulfil the objective of rapid economic development on a sustained basis while safeguarding the natural resources including the air, water, land, flora and fauna for the benefit of present and future generations. □

Environmental Studies in India

C.S. Pillai*

AN All India Seminar on Status of Environmental Studies in India was organised and sponsored in The three-day Seminar was opened on the 26th Trivandrum by the Centre for Earth Science Studies. March by the Kerala Industries Minister, Shri P. C. Chacko, and nearly 200 scientists from different parts of the country participated, presented their papers and took part in the discussions.

The Co-sponsors of the Seminar included among others, Department of Environment, Government of India, Geological Survey of India and Geo-science & Technology Association of Kerala.

Dr. N.L. Ramanathan, Director of the Department of Environment, Government of India stressed the need for public participation in all environmental issues. He also underscored the importance of Environmental Information System. The scientists who participated in the seminar unanimously decided to institute a new society titled "Indian Society of Environmental Science".

All activities that adversely affect the quality of air, water, soil or biological resources should be controlled and monitored. All activities fostering and promoting harmony between man and nature should be cultivated and encouraged.

Ecosystems should be studied and understood in their total perspective by including interacting living and non-living resource components. These resources must be used judiciously so that drastic imbalances that are often irreversible do not occur in the environment.

Environmental impact analysis should be made for all types of development projects in the country. Trained environmental managers should be employed for ensuring environmental protection.

Environmental training should be initiated at school level to bring about environmental consciousness in the generation to come. Non-formal education system need also be implemented. In professional training centres environmental training should be initiated to create experts who will advise on environmental implications of all developmental activities in the country.

In matters of natural resources exploitation and conservation of environment, the purpose and objective of such activities should be properly understood, and measures taken accordingly for the well being of the people of the country, not only for the present day, but also for the posterity.

A scientific body may be instituted to deal with and suggest guide-lines for total development of the environment. This body will also provide opportunity for interactions between environmentalists of different disciplines by organising national conventions. □

*Our Senior Correspondent at Trivandrum.

Fourth All-India Educational Survey

GIRL students accounted for 36.33 per cent (35 million) of the total enrolment in schools throughout the country. In all 95.4 million students were enrolled in recognised schools. Of these 70.28 per cent were enrolled in schools in rural areas. Girls constituted 33.92 per cent of the enrolment in rural schools.

This was revealed in the Fourth Educational Survey carried out by the National Council of Educational Research and Training (NCRT), to collect information on schools, teachers and enrolment in schools. The survey was confined to recognised educational institutions catering to school education, in all the States and Union Territories. The findings of the Survey were utilised in the formulation of the Sixth Five Year Plan with regard to education.

For the country as a whole the gross enrolment ratio for the age-group 6 to 10 years was 81.65 in 1978 as against 80.30 in 1973. The gross enrolment ratio for the country for the age-group 11 to 13 years was 37.94 in 1978 as against 33.15 in 1973. Age-specific enrolment ratio for the age-group 6 to 10 years is the percentage ratio of number of the students belonging to the age-group 6 to 10 years (irrespective of the class in which they are studying) to the child population in the age-group; the age-specific enrolment ratio for the age group 11 to 13 years can also be similarly defined. The overall age-specific enrolment ratio for the age-group 6 to 10 years for the country was 64.13 and for boys and girls respectively 76.27 and 51.28.

The survey figures show a marked decline in the school enrolment from classes I to IX and onwards. Total enrolment in classes I to V was 69 million (38.27 per cent girls). In the rural areas the enrolment was 75.70 per cent (36.18 per cent girls) of the total enrolment in classes I to V. In classes VI to VIII 18 million children were enrolled altogether, of which 32.70 per cent were girls and the corresponding enrolment for the rural areas was 11 million (27.83 per cent, girls). Enrolment in rural areas was 61.03 per cent of the total enrolment in classes VI to VIII. At the secondary stage of education the enrolment was 88.7 lakhs (28.69 per cent girls). The enrolment in rural areas was 47.12 per cent of the total enrolment at the time of Fourth Survey.

Children belonging to Schedule Castes constituted 14.73 per cent of the total enrolment in classes I-V and correspondingly Scheduled Tribes children accounted for 6.28 per cent the total enrolment in these classes. In classes VI-VIII the enrolment of Scheduled Caste students was 11.21 per cent of the total enrolment. Schedule Tribes students constituted 3.39 per cent of the enrolment in these classes. In the secondary classes (Class IX and onwards) again, their enrolment figure was 9.77 per cent (SCs) and 2.84 per cent (STs) of the enrolment.

Scheduled Tribes girls enrolled in classes IX and onwards accounted for 26.70 per cent of the total ST enrolment in these classes whereas there were only 21.53 per cent of girls in the Scheduled Caste category. However, from Class I to VIII there was only a marginal difference in the enrolment of girls belonging to the two reserved categories.

Out of the total number of 4,74,636 primary schools in the country, 34.75 per cent were single-teacher schools and only 8.85 per cent schools had more than five teachers.

The Survey indicated increase of 7.60 per cent in the number of recognised educational institutions over the period 1973-78. Of the total number of 6,34,144 institutions 5,56,873 were located in rural areas.

The pupil-teacher ratio at the national level was 41 at the primary stage, 25 at the middle-stage and 18 at the secondary and higher secondary stages of education in the country.

Primary schools|sections were available in 4,51,455 rural habitations covering 78.53 per cent rural population within the habitation itself. The corresponding percentages in the Third All-India Educational Survey (1973) were 44.33 and 76.12. About 92.82 per cent of the rural population has been revealed to be served by primary sections located either in the habitations or up to a walking distance of 1 km as against 90.34 per cent in 1973. In the country as a whole 77.31 per cent and 93.05 per cent of the habitations with a population of 300 or more were served by primary schools|sections within the habitation or up to a distance of 1 km respectively. About 66.94 per cent and 90.65 per cent habitations with population 300 or more and predominantly populated by Scheduled Sastes, were served within the habitation of residence or up to a distance of 1 km respectively. For the habitations predominantly populated by Scheduled Tribes the corresponding percentages are 77.78 and 90.48. In the year 1978 middle schools|sections were available in 1,03,601 rural habitations thereby serving 33.47 per cent of the rural population within the habitation. 6,44,971 (66.86 per cent) habitations covering 78.83 per cent of the rural population were served up to a distance of 3 km. At the time of the Third All-India Educational Survey (1973), 28.86 per cent and 71.97 per cent of the rural population were served by middle schools|sections within the habitation of residence and up to a distance of 3 km. □

TRENDS

Audio-visual Teaching Aids

DR. S. N. SARAF, Educational Advisor, Planning Commission, recently inaugurated a four-week training course for educators on the 'Application of Educational Technology for Preparing Audio-visual Materials'. More than 30 participants, mostly teachers from training colleges, participated in the course which was jointly organised by the National Council of Educational Research and Training (NCERT), New Delhi and UNESCO Office for Education in Asia and Oceania, Bangkok.

The programme seeks to develop a cadre of teacher educators who would appreciate that educational technolgy has to play a vital role in bringing about improvement in education. Necessary skill will be imparted to teachers so that they could use them in making learning more meaningful and productive by preparing and using audio-visual materials for classroom instruction. Speaking on the occasion Dr. Saraf said that teachers in non-formal centres should be oriented to prepare their own teaching aids to make education more attractive. □

Haryana Exports Cotton

HARYANA State Cooperative Supply and Marketing Federation has been serving the farmers of the State by providing them the facility of processing and marketing their agricultural produce. Recently it has also set up a ginning factory and a cotton seed processing complex at Ding near Sirsa at a cost of Rs. 2.60 crore. The daily capacity of the factory and the complex is about 300 bales and 1000 quintal cotton seeds, respectively. HAFED proposes to set up a similar factory at Ratia in Hissar district soon. 55,000 farmers and 350 villages will be benefied. A cotton ginning factory and a spinning mill with a capacity of 25,000 spindles is also proposed to be set up at Bhattu Kalan at a cost of Rs. 6 crore. The State Agriculture Department has introduced an integrated cotton Development Project with the financial assistance of World Bank. HAFED is earning foreign exchange by exporting cotton and cotton seed soil cake. □

Fuel from forest and Farm Waste

FROM Agricultural and forest wastes, smokeless, and inexpensive solid pelletised fuel has been developed by the centre for Rural Developmenet & Appropriate Technology and Bio-Chemical Engineering Research Centre of the Indian Institute of Technology, Delhi. They used zoond glass, and other waste matter like coconut and rice husk, tree leaves, sawdust and so on, which are in plenty in our country-side, can be used to produce the fuel. One kilogram of waste can give fuel of the same weight which generates heat equivalent to that of one kilogram of coal.

Prototype plant to manufacture the fuel is being set up. Such plants in the villages and hill areas will go a long way in solving the fuel problem and also in discouraging indiscriminate felling of trees for fuel. □

Research to improve Goat and Sheep

AT the first national seminar on sheep and goat production and utilization held in Jaipur recently a number of important recommendations were made. They are :

1. The Union Ministry for Agriculture should constitute a committee of experts to lay down a policy for improving the breed of goat for milk, meat and hair.

2. Steps should be taken for conservation of important sheep and goat breeds.

3. A Central disease investigation unit with sub-units in important agro-ecological regions should be set up.

4. Intensive programmes for development of feed resources on common grazing lands, land earmarked for forest and private land not suitable for crop production be taken up.

5. The rearing of the sheep and goat species should be taken up in mixed farming system.

6. The Government should not allow import of carpet wool liberally so as not to adversely affect the prices of indigenous carpet wool. Instead, emphasis should be on improving the carpet wool quality within the country.

7. The marketing of live animals and wool be properly organized so that the sheep and goat breeders are saved from the middle men and receive remunerative prices.

8. To achieve this, corporations might be set up in each State with a National Sheep and Goat Development Board to coordinate the activities of the State organizations. □

Pension for the Handicapped in Tripura

IN Tripura, 3550 physically handicapped persons are being brought under the pension scheme. For this this purpose a sum of Rs. 3,18,600 has been earmarked in the current financial year. This information was given by Tripura's Education Minister, Shri Dasarath Deb in the State Assembly while replying to a question by Shri Khagen Das recently. □

Hudco Exceeds Loan Target

HOUSING and Urban Development Corporation (HUDCO), a Government of India Enterprise, released during 1980-81 Rs. 90 crores to different borrowing agencies spread over 16 States and 2 Union Territories. This is 17 per cent more than the amount released during 1979-80 and exceeds the target set for it for the year 1980-81. The major beneficiary agencies to which the amount released exceeds Rs. 8 crores are in the States of Andhra Pradesh, Gujarat, Karnataka, Rajasthan, Tamil Nadu and Uttar Pradesh. Kerala, Maharashtra, Madhya Pradesh, Punjab, Haryna, West Bengal and the Union Territory of Chandigarh received loans ranging from Rs. 2 crore to Rs. 5.4 crores.

Since its inception 11 years ago, HUDCO has released Rs. 405 crores to different housing agencies in the country against Rs. 706 crores loan sanctioned by it. □

BOOKS

Social-Economic Change

Economic & Social Change in India by S. L. N. Simha; Publishers : Vohra and Co., Bombay; pp. 115; Second Edition 1980; Price Rs. 25.

SIMHA has written a good number of articles and books on Economics, Finances and socio-cultural values. In the title under review he has succinctly and perspicaciously described the substantial economic and social changes which India has undergone since the dawn of independence. A traditional society is in the process of transformation towards modernities. The socio-cultural perspective, though clouded now and then, is nonetheless not bleak. Much has been achieved and yet much remains to be achieved.

The path ahead is doubtless beset with considerable difficulties and onward march is quite an uphill task. Despite an impressive build-up of Industrial base, entrepreneurial potentialities and managerial skill the country is not speeding fast towards the objective of social justice. There are evidences of feudalistic and communal overtones ; caste, creed, community, and languages are exploited by vested interests, and chauvinistic self-seekers. All in all, solution to the problems is quite possible. While Government should initiatively and actively work for economic growth and social justice, the intelligentsia comprising writers, educationists, artists, sociologists, politicians and such others should campaign for national integration and regeneration of moral values. The book is worth-reading and modestly priced.

T. C. Rastogi

A Comprehensive Book on Khasis

Local Government in Khasi Hills by Umasaday Bhatacharjya; Vivek Publishing Company, Delhi; 1980; pp. 263 ; Price Rs. 70.

THE institution of local government has been one of the pillars of Indian administration, more so in the case of north-eastern region. For Khasis, this practice of self-governance is age-old. They managed all their affairs through *Syiems* or Kings on the basis of popular will and consent freely expressed.

The book under review seeks to study in the historical perspective and in depth the unique features of organised system of self-government and democratic traditions in the Khasi Hills States.

A few interesting points observed in the book are that the initiation of Syiemship (kingship) is peculiar to Khasi Hill States, that the Khasi electors have the power to disqualify the next heir for good reasons according to their customs and that the Khasi women inherit and hold property but have no right to vote in the elections of chiefs. The Khasi Hills has the highest rainfall in the world. Cherrapunji with 485 inches used to be described as the wettest place on earth. But that pride of place has been taken over by another village Mawsynram, situated about 10 kms. towards east of Cherrapunji. The average rainfall at Mawsynram is 577 inches per annum.

The book under review, which is vastly comprehensive and informative, will be of inestimable value to general readers, researchers and those engaged in the task of running local government institutions in the country in general and north-eastern region in particular.

S.R.S.

Financial Management

Social Cost-Benefit Analysis by D. Aruna, Institute for Financial Management and Research, Madras, 1980 ; pp. 124 ; Price Rs. 25.

THE BOOK under review, within about a hundred pages, attempts to deal with the basic principles of Social Cost Benefit Analysis (CBA), in the development—planning context, and to summarise the main developments in the literature during the last ten years, relating these whatever possible, to the Indian scene.

The basic principle of Cost-Benefit Analysis is both simple and conceptually attractive. It is based on the logical proposition that any proposed activity can be considered socially profitable, only if it promises to yield *social* benefits more than the *social* costs it will entail. However, the translation of this simple proposition into a methodology fit for application in developing countries introduces several complications, the most important of which are the problems raised by the unsuitably of the market pricing system for a valuation of social costs/benefits, and the consequent need to devise a new pricing system. The alternative pricing systems formulated by the OECD on the one hand and the UNIDO on the other have been generally accepted as suitable methodology for project appraisal, though the relative merits/demerits of the two systems are still a matter of controversy. Regardless of whatever both at the national and the project level, are fully aware of the limitations of the tool that they are handling.

The book is divided into five sections and the aim of the thought contest is two-fold : first, to introduce the reader to the essentials of CBA in general or non-technical and subsequently in technical terms, second to place before him a brief but critical survey of the three approaches in current use namely, those of the Organisation for Economic Co-operation and Development (OECD), the U.N. Industrial Development Organisation (UNIDO) and the World Bank (IBRD), so that the reader may judge for himself the theoretical acceptability and practical utility of each approach. It also briefly surveys the Indian scene and thus an attempt has been made to keep certain theoretical controversies out of the exposition and to relate it, whenever possible to Indian context. The book concludes with a survey of the horizons opening out to the C-B Analyst.

S. K. Dhawan

Rajasthan in a Capsule

Folklore of Rajasthan—By D. R. Ahuja—National Book Trust, India, A-5, Green Park, New Delhi-110016—Pp 176—Rs. 11.75.

THE TITLE is a misnomer because the book is not confined to 'folklore' but deals with many other things such as the geography, history, traditions, customs etc., of Rajasthan. All these are presented in a capsule form since a life-size portrayal would require, as the author says in the preface, several "tonnes" (tomes?). Some selections from oral literature are given in the appendix, which is described in the blurb as "a spend section" (?). As it is, the book can be useful as an introduction of Rajasthan to the people in other parts of the country and thereby serve the cause of national integration. However this cause could have been served better if the book had also dealt with Rajasthan's role in the freedom struggle and its subsequent progress under the Five Year Plans. The "States of the Union Series" of the Publications Division is better in this respect.

P. S.

Public Cement Vs Private Cement

Cement Industry—An Inter-Sectoral Appraisal. Published by the Birla Institute of Scientific Research, Economic Research Division, New Delhi. Pages 50. Price Rs. 15.

CEMENT is one of the important ingredients of construction activity. The book tries to find out the relative performance of private and public companies in the cement industry. For this purpose, six public sector companies out of the ten and 33 out of 47 private companies have been selected. The study concerns itself with the five year period 1973-74 to 1977-78. The entire study is presented in five chapters and seven annexures. Great care has been shown while comparing the performance because of variations in many aspects from company to company with regard to accounting years, completely different capital structures, etc.

Some of the conclusions arrived at make interesting reading. Private sector employed Rs. 130 per tonne of installed capacity and it went down to Rs. 122 in 1977-78. But there was only marginal growth in the sector during the period. The public sector employed Rs. 313 per tonne of installed capacity and the figure went upto Rs. 446 by 1977-78. Considerable addition to public sector installed capacity in the period has been observed. Salary and wages per tonne of production was Rs. 25.45 in the private sector in 1973-74 and Rs. 30.55 in 1977-78 whereas the corresponding figures for the public sector were Rs. 32.52 and Rs. 37.65 respectively. In other words public sector cement companies employ more people than necessary and rate of utilisation of capacity is poor.

Some such interesting facts have emerged from this study which is quite useful to those involved in the management of the industry.

R. R. RAO

Human Behaviour in Agricultural Sector

Psycho-social Dimensions of Agricultural Development by B. C. Muthayya and S. Vijayakumar. Published by National Institute of Rural Development, Rajendranagar, Hyderabad 500 030. First published 1980, Pages 103. Price Rs. 18.00.

THIS research study brings forward useful conclusions on the interesting issue of human and social dimensions of human behaviour in the agricultural sector of the country. The authors conducted the survey sometime in 1973 through collecting empirical data in districts where Intensive Agricultural Development Programme (IADP) was implemented in the States of Karnataka and Tamil Nadu. Comparison has been made with the position as it obtained in non-IADP districts.

It is true that no attempt had been made earlier to study systematically the impact of green revolution *vis-a-vis* agricultural development on psycho-social dimensions of one's behaviour. It was believed that economic changes would bring about changes in the social levels and attitudes of the people automatically from traditional to modern ways of living. It was not recognised that economic changes need not necessarily be accompained by social changes to the same extent in terms of improvements in the cognitive, affective and behavioural aspects. In fact, reports on agrarian tension in rural areas, particularly in the IADP districts of Kerala and Tamil Nadu, had revealed that the increasing economic disparities between the landowners and the labourers had led to social discontent of a magnitude which threatened the continuity and sustenance of agricultural growth itself.

In this study it has been found that while economic betterment did not have any influence on one's fatalistic attitude, it did bring increasing aspirations, though the variation in the IADP and non-IADP districts was not much in this respect. No significant variations have been found between the respondents in IADP and non-IADP districts revealing thereby that the traditional sttructures, the type of feelings and attitudes maintained by people cannot be changed or automatically taken to have changed due to an economic input. The implication of this finding is that along with economic development, it is necessary to conceive the type of social development that should follow so that each one will supplement the other and serve as a driving force for sustaining the benefits of economic development.

There is a feeling the benefits of green revolution did not percolate down the level of poor farmers. This is amply borne out in this study which says that whatever, socio-psychological changes were observed, they were more in the higher land-owning classes. Also, when irrigation is equalised as a major input for agricultural development, the variations resulting from other factors get reduced to a great extent. Thus the study makes useful observations for being taken note of by our economic planners.

Navin Chandra Joshi

Government of India
Department of Publication
Civil Lines, Delhi-110054

LIST OF NEW ARRIVALS - MARCH 1981

S. No.	Title	Price
1.	Public Enterprises Survey 1979-80 Vol. 3 (Print-1980) PFD. 257	Rs. 22.00
2.	Annual Survey of Industries-1971 (Census Sector) in 10 volumes) Vol. IV (Print 1980) PDIS. 75.71.V	Rs. 68.00
3	Vol. V (Print 1980) PDIS. 75-71-V	Rs. 101.00
4.	A Guide to Resettlement of Ex-Servicemen (Print 1980) PDGR. 2.	Rs. 7.75
5.	Physical and Mechanical Properties of Some Assam Timbers (Print 1980) PFRI. 178.4.1	Rs. 9.75
6.	Silvometrics (Studying the Growth Dynamics of a Stand of Trees) (Print 1980) PFRI. 108.II.1	Rs. 50.00
7.	Statistics of Factories 1973-74 (Print 1980) PDLB. 5.73 & 74	Rs. 198.00
8. (*)	Eightieth Report on the Method of Appointment of Judges (Print-1980) PLD.92.LXXX	Rs. 11.00
9.	Official Directory. As on Ist October 1980 (Print 1981) PHD. 278.10.80	Rs. 12.50
10.	The Scheduled Castes and Scheduled Tribes Orders (Amendment) Act, 1976 (Print 1980) Act 108 of 1976.	Rs. 3.10
11.	Motor Transport Statistics 1975-76 (Print 1980) PMT. 138.75.76	Rs. 30.00
12.	मानक विनिर्देश (Print 1980) PNBO 33)	Rs. 150.05
13. (*)	Accessibility of the Poor to the Rural Water Supply-A quick Evalution Study (Print 1980)-PPC. 232	Rs. 7.25
14.	Vital Statistics of India 1974-75 (Print 1981) PRG. 50.74.75 (N)	Rs. 35.00
15.	भारतीय संसद राज्य सभा सदस्यों की सूची जिसमें स्थायी पते तथा दिल्ली के पते और टेलीफोन नम्बर दिए गए हैं I (1981) PRS. 51. (N)	Rs. 2.00
16.	Parliament of India, Rajya Sabha-List of Members showing Permanent and Delhi addresses and Telephone Numbers, 2nd Feb. 1981 (Print 1981) PRS. 51	Rs. 2.00

(*) These publications are not yet released for sale for want of instructions from the sponsoring Departments.

For all your requirements of Government Publications released by various ministries/Departments of the Government of India, the Periodicals and Gazette of India (all Parts) please contact any of our sales Depot/counters or book your orders and address enquiries to the undersigned.

i)	Kitab Mahal, Baba Kharak Singh Marg, State Emporia Unit No. 21 N. Delhi	Tel. No. 343708
ii)	Book Depot, 8 K.S. Roy Road, Calcutta	Tel. No. 238813
iii)	Sale Counter Udyog Bhawan, Gate No. 13 New Delhi.	Tel. No. 372082
iv)	Sale Counter, U.P.S.C. Dholpur House, N. Delhi.	Tel. No. 383991
v)	Sale Counter Headquarters, Civil Lines, Delhi-110054.	Tel. No. 227821-25 227800

These Publications can also be had from our authorised agents and sale & Return Agents (including state Govts.) all over the country and abroad.

AMRIK SINGH
Controller of Publications

davp 81/15

Breast Milk Best for Babies

R. R. Rao*

MOTHER'S MILK is the cheapest, best and the most nutritious food for the baby. Don't be carried away by the pedagogic, subtly cast in all superlatives, claims of the baby food manufacturers. Breast milk immunises the baby against diseases, tunes the chords of love and affection between the mother and the child and builds up physical and mental faculties of the offspring.

The Consumer Guidance Society of Indian (CGSI), International Organisation of Consumers Union and Indian Federation of Consumer organisations, took pains, at a press conference arranged in New Delhi recently, to substantiate the superiority of breast milk over bottle milk, with the help of medical provings, clinical observations and field studies.

In India also, most of the urban mothers, says Dr. R. K. Anand, Chairman of the CGSI medical panel, have switched on to the bottle feeding and the baby food has crept into the countryside to some extent.

Breast feeding has many advantages. A baby fed on mother's milk does not require any multi-vitamin drops. The milk enables the baby withstand intestinal infection, allergies, asthma, and eczma which are known among bottle fed babies. Even if we take the economic aspect into consideration, a mother needs extra nourishment worth Rs. 21 a month on an average whereas for artificial milk she has to spend every month about Rs. 80 on milk powder, Rs. 108 on Amulspray, Rs. 120 on Lactogen, or Rs. 138 on Lactodex.

*Our Correspondent.

Every mother can secrete enough milk to feed the baby. Breast feeding trims the body of the mother, sheds the extra fat in the form of milk and improves the figure of the lady. Above all the immense joy the mother and baby get is something to be felt and is beyond words. No problem even for working women. Before going out, collect the breast milk in a bottle and later somebody else can feed the baby, with the milk after slightly warming it up.

Breast feeding postpones the ovulation and results in automatic spacing of children. If they want, the mothers may use any other contraceptive but not the pill which suppresses milk secretion. The infant mortality rate in Kerala is half that of the nation because of many reasons, one of them being breast feeding.

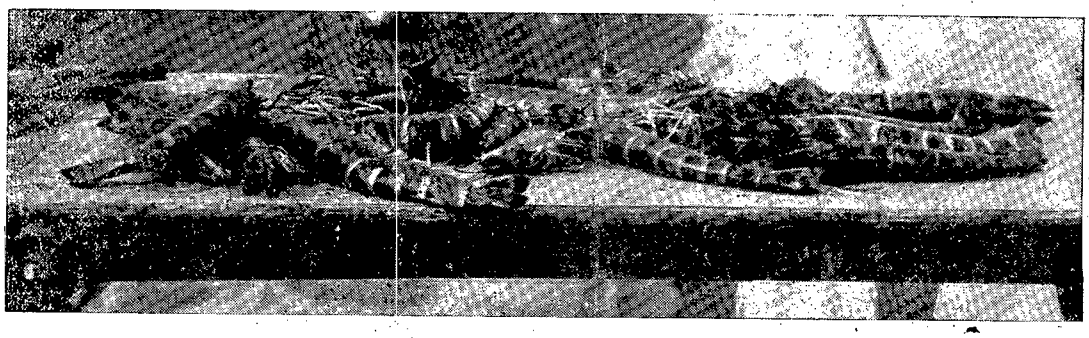
In a study conducted last year, about 200 babies attended the OPD at the Nair Charitable Hospital Bombay. About half of them were being given artificial milk. About 80 per cent of the families had an income less than Rs. 150, and about 100 mothers were illiterate. Of them 13 per cent had continuous water supply. Further it was found out that most of the mothers were not aware of proper sterilisation of the bottle and proper dilution of the artificial milk. Out of the above 200, 13 children died and they were fed on bottle milk. In 1976, out of 100 diarrhoea cases, 12 children died and they were not breast fed. Between 1971 and 1976, 1690 children died of diarrhoea caused by artificial feeding.

About one million infant deaths can be averted by promoting breast feeding all over the world. About 10 million babies suffer from diseases caused by bottle feeding in the world, claim paediatricians.

The attempt of the WHO, with the help of health experts, governmental and non-governmental organisations, to evolve an international code of marketing for breast milk substitutes, is being vehemently opposed by the International Council of Infant Food Industries (ICIFI) formed by 15 companies controlling 85 per cent $ 2 billion baby food market. □

Pisciculture in Machilipatnam

P. Ramalingaiah



Tiger prawns of Machilipatnam

IN Andhra Pradesh a large number of fish tanks spread over an area of 120 acres have been dug around Machilipatnam to breed fish and prawns. Fed partly by the tidal backwaters and partly by fresh waters of irrigation channels, these tanks provide suitable conditions for composite culture of tiger prawns and fish. The per acre yield of fish is 1,000 Kg. and that of prawns 60-70 Kg. with the total income of Rs. 10,000. Financial help, seed and technical know-how for pisciculture are being provided by the Fisheries Department. Andhra Bank also extends financial help to those engaged in fish farming. □

Printed by the Manager, Govt. of India Press, Ring Road, New Delhi-110064 and
Published by the Director, Publications Division, Patiala House, New Delhi-110001.

Regd. No. RN 949/57
P & T Regd. D. (DN)/152.

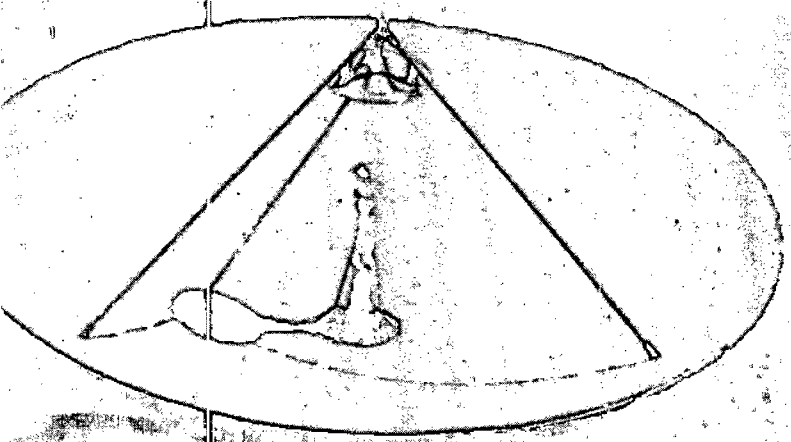
Licensed U (D)-52
to post without pre-payment at
Civil Lines Post Office, Delhi

VOL. XXV/11 16-30 JUNE, 1981

yojana

ONE RUPEE.

NEW TRENDS IN TELECOMMUNICATIONS



Coconut Development Corporation

C. S. Pillai*

IN Kerala three lakh tonnes of copra (dried coconut kernel) is produced annually. About half of this is sent to monopoly mills in Bombay where coconut oil and other product are manufactured. In October 1975 the Kerala State Coconut Development Corporation was formed to free the coconut farmers from the clutches of these monopoly mills and other middlemen. Some concrete steps have already been taken by the Corporation for the development of the copra industry. The Chairman of the Corporation Shri K. P. Aravindakshan revealed that some package programmes are also being taken up.

The first Coconut Oil Processing Unit under the Corporation was opened in Mamom near Attingal in Trivandrum District in April 1980. The Unit has a crushing capacity of 60 tonnes of copra (4.5 lakh coconuts) per day. There are 100 workers in the unit which has a capital investment of Rs. 1.60 lakhs. Its capacity has not yet been fully utilised.

The second coconut oil processing unit with the same production capacity is being established in Quilandy Taluk of Kozhikode District.

The feasibility of establishing farmers' co-operative societies and buying copra through them is also being considered by the Corporation. Government-level discussions on this line are going on. Copra required by Mamom Unit is now purchased through the local depot and a depot at Chunkom in Alleppey District. Copra is purchased through Kerala State Marketing Federation also.

Activities of the Corporation are also being expanded to fields other than oil production. Coconut cakes expelled from ordinary mills contain a minimum of seven per cent oil. One of the programmes of the Corporation is to instal a Solvent Extract Plant which can extract maximum oil from copra. The other project is to remove moisture from the scraped kermel and export it to various consumer countries. Nutritious coconut water is not utilized now. There is a project under consideration to market coconut water in bottles. Activated carbon fuel can be made from coconut shell. A project report prepared by the National Chemical Laboratory at Poona is also being studied by the Corporation to see the feasibility of producing sugar from coconut shell.

King Coconut of Andaman and Nicobar Islands

The two units at Mamom and Quilandy utilising their capacity fully, can process 36,000 tonnes of copra only. There is possibility of starting more oil processing units under the Corporation in Kerala.

The oil processed in the units of the Corporation is sold in the markets of Bombay and Calcutta. Last year Corporation had opened an oil sales counter in Trivandrum to which consumers responded well. Due to some unforeseen reasons, the counter has been closed after some time. Now the Corporation has a plan to market oil in plastic containers. □

*Our correspondent and Editor, Yojana (Malayalam), Trivandrum.

Poultry for Prosperity

P.R. Chaudhury

UNDER the Special Animal Husbandry Programme, 50 poultry units, each consisting of 100 layers under Deep Litters system, have been set up at Gopalpur village of Nadia district, West Bengal, for the benefit of agricultural labourers, marginal farmers and small farmers. All the 50 farmers have been brought into the fold of a cooperative society.

All the chicks have been vaccinated by the veterinary staff and kept in pucca sheds. Poultry feed produced at Kalyani Feed Mixing Plant and supplied by West Bengal Dairy & Poultry Development Corporation Ltd. is given to the birds.

Before the units were started the concerned farmers were given a short training course in poultry keeping by the Animal Husbandry Department of the State. The capital cost per 100-layer unit is Rs. 3,400 and running cost upto 26 weeks comes to Rs. 2,195.

Till November 1980, there were 4,569 poultry units, each consisting of 50-100 layers under the Deep Litter System in the district of 24-Parganas, Hooghly and Nadia in West Bengal.

The Scheme is subsidised by the State Government upto Rs. 1898 and the rest of the amount has come from the Allahabad Bank, as loan. The loan is repayable in five years. The bank loan has been utilised for the construction of poultry sheds, purchase of day-old chicks, equipment and feed. The villagers who were once poverty stricken are now well off earning about Rs. 250 a month each, more than their usual income.

YOJANA

Volume XXV Number 11

16—30 June 1981 26 Jyaistha—9 Ashadha 1903

Journal devoted to Planning and Development. Published Fortnightly in Assamese, Bengali, English, Gujarati, Hindi, Malayalam, Marathi, Tamil and Telugu . Also published as monthly in Urdu.

Yojana seeks to carry the message of the Plan but is not restricted to expressing the official point of view.

IN THIS ISSUE

Editorial Office :

Yojana Bhavan, Parliament Street, New Delhi-110001, **Telegraphic Address : Yojana**, New Delhi, **Telephones : 383655** 387910, 385481 (extension 420 and 373) **Circulation :** Business Manager, Publications Division, Patiala House, New Delhi-110001.

Subscription : Inland : One year Rs. 20, Two years Rs. 35 Three Years Rs. 50, Foreign : One Year $ 6 or £ 3 : £ 7.50 Single copy $ 0.30 or 0.15.

Editorial

Plan Outlays and Resources

THE NATIONAL ECONOMY which started recovering during the first year of the sixth Plan has entered the path of growth during the second year. Even though the present rabi harvest has been somewhat lower than what was expected, the timely onset of monsoons assures good kharif production. The progress in the industrial field is even more spectacular—the growth rate this year is likely to be more than double that of last year. There has been considerable improvement in the production of infrastructure items which has enabled higher growth in other fields of the economy.

Doubt has, however, arisen about the ability of the economy to improve or even maintain this growth trend. The present improvement is mainly due to the better utilisation of the existing capacities and only new investments for increasing the capacities can ensure sustained growth. Further, the continuing inflation and price rise are adversely affecting all branches of the economy besides eroding the real value of the Plan outlays and necessitating more allocations for non-developmental expenditure like additional dearness allowance. From January 1980 to May 1981 the wholesale prices have risen by about 24 per cent. If this trend continues all the calculations about planning will be offset. Apart from shortage of goods, the main cause for the rising prices is the increase in money supply. The Plan provided for a deficit financing of Rs. 5000 crores for the entire five-year period, but it is estimated that in the very first two years the deficit financing might be of the order of Rs. 3500 crores. The country is eagerly awaiting the promised measures of the Finance Minister to curb black money and price rise.

Regarding mobilisation of additional resources for the Plan, the Centre has by and large done its part well while the States are lagging behind. The expected contribution of surplus from the public sector has also not materialised so far. While foreign aid prospects are good, the preparation of suitable projects for utilisation of that aid has not been prompt. The unexpected increase in population, as revealed by the latest Census, poses another big problem to the planners and the Government.

There is one major factor of consolation amidst these uncertainties, that is, both the Planning Commission and the Government are conscious of the problems and they initiate remedial measures without any delay. The improvement in the performance of the infrastructure was due to such watchful action of the Government. Similarly, the Minister for Planning sent a circular letter to the Chief Ministers last month requesting them to conduct periodic reviews so as to avoid deviation from the planned outlays and targets. A full meeting of the Planning Commission is to be held later this month to consider sectoral readjustments in the plan outlays and other problems. Given the political will it will not be impossibe to solve the problems affecting the planned development of the country. □

Need for Health Revolution in Developing Countries

Indira Gandhi*

LIFE is not mere living but living in health. The health of the individual as of nations is of primary concern to us all. Health is not the absence of illness but a glowing vitality, a feeling of wholeness with a capacity for continuous intellectual and spiritual growth. What is our ultimate goal? Is it the mere accretion of medical and other knowledge, the building of better machines and even hospitals, or are all these meant for a higher purpose, to make man better and more capable of handling the emotional and other stresses posed by material progress, increasing pace, and the lack of privacy in contemporary living? In India even in very ancient times it was believed that physical, mental and spiritual health are intrinsically interwoven. This is the basis of the science of yoga. The medical system perfected in India, Ayurveda, or the Knowledge of the Span of Life, in many ways foreshadowed W.H.O.'s own definition of health as "a state of complete physical, mental and social well being".

Dr. Mahler and his colleagues deserve congratulations and encouragement on their vision of "Health for All by the Year 2000". This envisages strengthening of public health programmes of developing countries, where most diseases are concomitants of economic backwardness.

Exit Old Diseases, Enter New Ones

Yet it should not be imagined that affluent countries have no health problems. They already experience the tensions, mental and physical, to which the dwellers of densely populated cities succumb. So that while the old diseases are being wiped out, new ailments are making themselves felt. New industrial processes must share the blame for this. Also, men and women seem willing to risk illness by over-indulgence in eating, smoking or drinking rather than practising the self-restraint so essential to health. In affluent countries medical treatment has become so exceedingly costly that they too need health insurance and assistance. Pychiatric treatment is prohibitive.

*Address to the Thirty-Fourth World Health Assembly, Geneva, 6th May, 1981.

It is pertinent to recall that until a century and a half ago, the death rates and the general prevalence of disease were roughly the same in all countries. The scientific discoveries of the nineteenth century enabled Europe to cut down the death rate. This period also coincided with rapid economic growth in those lands. In Africa and Asia, however, the death rate is declining because of new miracle drugs and campaigns against epidemics. Once it is recognised that better health is not a mere offshoot of overall economic development, and that major improvements in health are possible in the absence of industrialisation, it follows that the patterns of public health and health administration of advanced countries are not necessarily appropriate for developing ones. The vast increases in population in developing countries are the outcome of successful public health programmes, but they constitute a further challenge to science, to governments and to mankind.

The vast increases in population in developing countries are the outcome of successful public health programmes, but they constitute a further challenge to science, to governments and to mankind.

Vulnerability to Epidemics

Long before modern communications, and economic forces proclaimed the interdependence of the world, epidemics had demonstrated that humanity is one in its vulnerability. Smallpox has been the latest of the epidemics to be eradicated, and an estimated billion dollars have been saved by giving up compulsory vaccination. But is it being used to assist other developmental work on health? In fact the story of international assistance tells that development does not command the enthusiasm that defence does. In India, 94 per cent of resources for development are mobilised domestically. Only six per cent comes as aid, but it is much needed as a catalyst of change.

We are told that we are on the threshold of a new age of biology. Major discoveries are promised in cell biology, genetics and immunology. Developing countries hope that these will enable them to overcome many of the old tropical diseases—particularly those connected with malnutrition, diarrhoeal disorders and

communicable diseases. W.H.O. has a commendable programme of tropical medicine. Leaders of medicine all over the world should evolve a special project in this field as part of the "Health For All" schemes.

Priorities of Medical Research

May I say a few words about the priorities of medical research? Affluent societies are spending vast sums of money understandably on the search for new products and processes to alleviate suffering and to prolong life. In the process, drug manufacture has become a powerful industry, subject to the same driving considerations of other big industries, that is, concentration on profit, fierce competition and recourse to hard-sell advertising. Medicines which may be of the utmost value to poorer countries can be bought by us only at exorbitant prices, since we are unable to have adequate independent bases of research and production. This apart, sometimes dangerous new dugs are tried out on populations of weaker countries although their use is prohibited within the countries of manufacture. It also happens that publicity makes us victims of habits and practices which are economically wasteful or wholly contrary to good health. You are all familiar with the controversy over the export of baby foods to developing countries.

My idea of a better ordered world is one in which medical discoveries would be free of patents and there would be no profiteering from life or death.

We do need excellent modern hospitals. But the desire for ever larger hospitals, more often than not oriented towards high cost modern technological medicine, has to be resisted. Primary health care must be within reach, in terms of distance as well as money, of all people. The world has found to its dismay that resources are not unlimited. Hence waste of any kind and in any form, particularly in health and hospital care, should be strongly discouraged; and the countries' resources must be more equitably distributed. If this is true of the national scene it is even more so internationally.

Health Services at Door Steps

In India we should like health to go to homes instead of larger numbers gravitating towards centralised hospitals. Services must begin where people are and where problems arise. We have acquired the capability of placing satellites in orbit which give useful information, but we have not yet been able to reach out to all our rural people. However, we are engaged in reorganising our medical administration. Our outlook has been admirably expressed in one of the documents prepared by our doctors, which says, "Health is neither a commodity to be purchased nor a service to be given; it is a process of knowing, living, participating and being."

The disparities in levels of medical research and administration also affect us in another way. At great expense and effort we give our brightest young men and women medical education. But a large proportion of them are lured by the high salaries and tempting opportunities for further work which affluent countries offer. Thus we lose the skilled manpower so desperately needed to save our own people. Brain drain has been called the technical aid that developing countries give to the rich.

My idea of a better ordered world is one in which medical discoveries would be free of patents and there would be no profiteering from life or death. The world community should also work out some form of recompense for the loss suffered by developing countries because of this migration of trained doctors and nurses.

Health Revolution

A country's progress is generally judged in terms of its GNP. But surely the health of the people is also a significant yardstick. That is why we must stress the need for a health revolution in developing countries, not only to wipe out diseases and to make available specialised treatment, but what is equally essential, to provide basic health care and to take preventive measures. Education from the earliest stages must include certain elementary information about health, sanitation, cleanliness, the avoidance of contagious diseases and the preservation of the environment which is closely linked to these.

The world, and we in the developing countries, are beset with many health problems. But at this point I should like to take up three specific items. My country has participated successfully in the malaria and smallpox eradication programmes. But the cunning and urge for survival of the ubiquitous mosquito has outwitted us, and has proved stronger than we had realised, and he or rather she, for I am told that the female is far more deadly, has returned to disturb our sleep. Such focusing on special diseases and making all-out efforts to end them is a rewarding exercise.

I wish we could do the same for leprosy which is such a dread disease but now well within the powers of contemporary medicine to control. I pay tribute to the dedicated persons who, in my country and elsewhere, have devoted their entire lives to this demanding work. Obviously, such voluntary work can have only limited reach. Leprosy is prevalent in some 53 countries. If this problem is not scientifically and vigorously attacked right now, it will spread and be with us for long. The time has come to utilise better health education, better health technology and immunological advances to launch a global campaign to eradicate leprosy from the earth within the next twenty years. A major obstacle is the general public's ignorance and superstition regarding leprosy. People tend to evade investigation and hesitate to admit to the disease at the early stages when a cure could be complete and easier. This sense of shame is outdated and dangerous.

The second is blindness. It is said that at least 15 per cent is preventable by the addition of greens in early childhood diet and by simple treatment. W.H.O. could devise a special international programme with emphasis on safeguarding children from blindess, just as this year it has drawn attention to the problems of the disabled.

Population Control

The third, though by no means less important, is the question of population control. India is among the very few developing countries, if not the only one, in which the increase in the production of grain is larger than the increase in people. But the hard, cold fact remains that today men and women need a more varied diet and want much more besides food. At the rate at which we are growing, it will be increasingly difficult to

match the demand for consumer and other goods and even for living space.

The Government of India was one of the first to take up family planning as a part of its official policy. Our aim is not merely to curb the growth of population but to have happier and healthier families which, in our circumstances, means smaller families. We are disturbed that our recent census shows an alarming increase. It is small satisfaction to know that some of this is due to people living longer and not to a higher birth rate. In fact our family planning programmes are estimated to have prevented 29 million births in the last decade.

Baseless Propaganda Causes Harm

Because there has been such wrong reporting and an entirely erroneous picture given of our policy, I should like to clarify that we neither believe in nor have we practised forcible sterilization as a matter of policy. We did emphasize what was called "motivation', that is persuading people to participate in this programme ; operations were conducted by competent and authorised medical personnel. In this, due to mistaken over-zealousness or other mischief, there were some cases, but the margin was no larger than in other cases of medical or other error. What did incalculable harm was the baseless propaganda which some interested parties and individuals unleashed about our family planning schemes, and the political use that was made of it by gross exaggeration and even falsehood.

I shall give two instances to illustrate my point. At that time, some groups started an insidious and mischievous whispering campaign that we planned to sterilise the entire population. In the wake of a flash flood in Patna where the drinking water had become contaminated, people resisted the team of doctors who had gone to inoculate them against cholera. Some months later, our desire to give protection against diphtheria, tetanus and whooping cough to children who went to municipal school was thwarted because the parents were misled into thinking that the children were being sterilised.

Breakthrough in FP Programmes

By and large, women even in rural areas do want family planning. Our people are beginning to understand that children have certain needs and are not merely hands to help the family. However, controlled families are possible only if parents are reasonably assured of good health facilities for the survival of their children. As yet no inexpensive and effective remedy is available. Our scientists are working on this and claim that they are on the brink of major discoveries.

I should like to take advantage of my presence at W.H.O. to stress the need for a new dynamic and better coordinated programme of research in contraception. Family planning programmes are awaiting a big breakthrough. Without a safe, preferably oral, drug which women and men can take, no amount of government commitment and political determination will avail.

Life is and perhaps always will be a struggle, although the nature of it keeps changing. To meet it we need vision, faith, courage and dogged perseverance. These are the qualities I admire in individuals and in organisations. These are the characteristics of the role of the W.H.O. That is why I have come all this way to express our appreciation of its work, and to assure it of my Government's support. □

Latest Trends in Leather Technology

Dr. S. Santhappa*

INDIAN Leather industry has to face many a challenge in the 1980s. The leather scientists, technologists and tanners are probing into alternative technologies, to avoid the use of chemicals which pollute the environment and to save energy. In the tanners' get-together "Challenges of the 1980's for the Leather and Allied Industries" held recently at Central Leather Research Institute, Madras, all aspects of research on leather industry were discussed. The Research Programme of the CLRI is formulated on the basis of the discussions. The scientists and technologists of the institute and its Regional Centres at Jullundur, Bombay, Rajkot, Kanpur and Calcutta have been striving to achieve the goals of the research programme.

In the field of tannery, pollution control measures like the conservation of water, avoiding or reducing the use of polluting chemicals, employing alternate non-polluting chemicals and elimination of common salt in the preservation of raw hides and skins are being adopted. The CIRI has succeeded in effecting economy of water upto 50 per cent and thereby reduction of pollutants in the tannery effluents. Consequently considerable amounts of processing chiemicals have been saved. Partial substitution of chrome with aluminium, gluteraldehyde and acrylic syntans has diminished the content of chrome by 90 per cent in the effluents. In one or two processes chrome has been completely eliminated.

In the beam-house processes, liming operation results in a large amount of sludge. Effluent from lime yard contains a high degree of alkalinity and toxicity. Pollution of the environment has been reduced to a great extent by adopting the new process developed in the CLRI. The new process envisages the treatment of re-hydrated hides and skins with ammonium salts, urea and caustic soda followed by dehairing system. The hair is removed the very next day and the hides and skins are treated with alkali to get the required plumping. The chemicals used in this process do not produce sludge nor are they harmful for the workers in the beam-house. Vegetable tannins and aluminium salts do not pollute so much as chrome salts, and even in re-chroming of E.I., it is proved that aluminium salts are giving very good results. Bag tanned leather can be retanned with alum and finished into marketable upholstery leather. The split is made into upper leather. In the leather finishing, transfer film has been used in the place of pigments and resin binders, with the advantage of freedom from pollution. Shanthiniketan type leathers have been made by spraying vegetable tanned goat skin with suitable binder followed by screen printing of designs and fixing with HCHO. Purses made of this leather are attractive.

In the field of tannery, pollution control measures like the conservation of water, avoiding or reducing the use of polluting chemicals, employing alternate non-polluting chemicals and elimination of common salt, are being adopted.

Use of enzymes for unhairing has helped to eliminate sodium sulphide which is highly toxic to aquatic flora and fauna. Likewise development of water-based finishes, instead of solvent systems has helped in cutting down atmospheric pollution. Among all the chemicals used in the industry, common salt is the major culprit causing ground water pollution. Technologies have been developed in the CLRI with a view to minimise its use and even to completely avoid, if possible. The CLRI has undertaken a programme to utilise solar energy for heating water for tannery use and also drying of leathers.

Bag tanned leather

In Jullundur (Punjab) a co-operative system for helping the rural bag tanners was suggested by the CLRI. Under this, it was proposed to create a central agency or an industrial co-operative which will provide for the inputs and purchases of leathers produced by the tanners at fair prices. The agency will provide facilities for retaining and finishing as well as fabricating the leathers into consumer articles, such as sportsgoods, ladies bags etc. An experimental trial was made in a local tannery by the Regional Extension Centre of the CLRI at Jullundur and the practicability of the scheme had been verified. The leather goods were fabricated at the local units as

*Director, Central Leather Research Institute, Madras.

Leathers having many grain defects are printed or embossed with suitable designs.

also sports good like rugby ball and wicket-keeper's gloves by the respective manufactures; the splits obtained were sold to the country shoe manufacturers and the trimmings to village cobblers for repaid work.

Usually the low grade hides and skins having grain and other defects, are converted either into grain or suede lining. Leathers having too many grain defects are printed or embossed with suitable designs like those of crocodile, elephant, porcine and similar grain patterns. Other techniques include screen|block printing and tie and dye methods for producing various patterns both on the grain and suede sides.

But the "Novotone Technique", developed by the CLRI, involves printing of various designs and patterns on the grain side of the leather using half-tone blocks. The main advantage of this technique is that no elaborate equipment or machinery is required and the pattern can be printed on cut panels or components by the leather goods maker himself; the investment on equipments is very little and therefore, this technique is ideally suited for cottage and rural leather goods manufacturing units. This technique has been award Rs. 3,000 by the National Research Development Corporation, Government of India recently.

Processes for the manufacture of chrome/zirconium combination tanned and zirconium tanned cricket and hockey ball leathers have been developed in the CLRI. The leathers thus obtained have greater scuff resistance, better dyeing characteristics, longer life, better shape retention and also are more resistant to water.

The export oriented Indian Football Leather Industry demands a leather without any residual stretch. It is found that most of the leathers. being used presently, go out of shape either during their manufacture or after their use in one or two games. Bag tanned leather which is supposed to have the least amount of stretch has quite a few serious drawbacks associated with its crude methods of production being adopted in rural conditions. Keeping this point in view and especially the stretch, a process has been developed wherein the middle portion of the leather is left untanned. This portion is expected to absorb the impact from the kick given to the ball and retain its shape. It has been found that by retanning the central untanned portion of the vegetable tanned leathers with chrome or slum in low percentages, satisfactory leathers for football could be manufactured.

Fundamental Aspects of Leather Research

Many antiseptic formulations for use in curing and preservation have been tried with goat skins. By using (i) bronidiol + sodium pentachlorophenate, (ii) $ZnSo_4$ + salt (less than conventional amount) the skins were preserved for more than 35 days without hair slip. Bronidiol 0.5 per cent+Benzalkonium Chloride 2.5 per cent has been found useful to preserve for one month without addition of salt.

Certain indigenous tanning materials of our country were studied for their nature of tannins as well as non-tannins. Such studies on Kahua (Terminalia arjuna) indicated that the bark tannins belong to condensed type and are based on (+)-catechin, (—)-epi catechin, (+)-gallocatechine, (—)-epi gallocatechin, whereas the fruit tannins belong to hydrolysable type from which puniculagin was identified. Loranthus, longiflorus, a parasite plant growing on mango was found to contain tannins to the extent of 10 per cent which are based on (+)-catechin and leucocyanidins.

A synthetic tannin was prepared using the tannins from de-oiled sal seeds. The syntan gave good results as a retanning agent for the manufacture of chrome retanned upper leathers. Preliminary studies on the improvement of Ghat-bor tannins by addition of syntans and chemical modification, where they are used as the raw material for the manufacture of syntans, gave encouraging results in improving the colour and rectifying other defects.

The "Novotone Technique" of finishing, developed by the CLRI, involves printing of various designs and patterns on the grain side of leather using half tone blocks.

It is well known that raw hide/skin is used for making musical instruments. Research has been undertaken in the CLRI to study the sound characteristics of animal hides and skins in relation to their structure, for use in musical instruments. Normal modes of vibration were studied with sun dried buff calf, cow calf, goat and sheep skin membranes in correlation with histological features of the skin. Though there is no significant variation in the fundamental frequency, the stiffness of the membranes which influences damping characteristics varies significantly. The stiffness increases as the compactness and the length of the fibre bundle increases. Effect of processing on the fundamental frequency and stiffness of the goat skin membranes subjected to (i) sun drying or (ii) liming, deliming and acetone dehydration ; and (iii) vegetable tanning were studied. The vegetable tanned skin has very low frequency and stiffness. Though the sun dried and limed, delimed and acetone dehydrated skins have the same frequency the sun dried skin has much higher stiffness.

Novel processes for bating and unhairing of hides and skins using immobilized pancreatic enzyme products were developed on the basis of our study on immobilization of proteolytic enzymes like trypsin and pepsin on sand by different methods.

Applied Research

Small quantities of fibrin prepared (in CLRI) were supplied to Madras Veterinary College and they were found to be acceptable in veterinary surgery for arresting bleeding. Hide fleshings were hydrolysed under different conditions and the hydrolysates were found to be useful as fillers for improving the properties of leathers and also as sizing agents in textile industry. Studies on the hydrolysis of hide trimmings have yielded good results for their suitability in preparation of detergent formulations. Large quantities of processed goat hair were supplied to the Jute Technological Research Laboratories, Calcutta for making non-woven bonded fabrics using a blend of goat hair, wool and jute. The fabric is useful as insulating material in high altitude shoes. Tannery hair and chrome shavings are digested separately and are being tried as nitrogenous manure for vegetative crops like cluster beans, ladies' finger etc. The uptake of chromium and its toxic effect in plants are also being investigated. Dog biscuits were prepared in the CLRI using nonhuman grade meat and other animal offals ; samples of the same have been sent to the CFTRI Mysore for their evaluation. Dog chews and other formulations of dog treats could be obtained from hide splits, hide trimmings and tripes.

An FAO/UNDP assisted project (for four years) was initiated in 1979 (April) in CLRI on "Processing of animal by-products for various end-uses". The immediate objectives of this project are—to develop processes and products through latest techniques making use of the largely available animal by-products in our country. It long rangs objectives are (i) modernisation of slaughter-houses in our country for setting up by-products processing units ; (ii) formulating and arranging training programmes for people in different categories ; (iii) demonstrations of some of the processes. The staff members under this project are being trained abroad and experts from other countries are assisting in this project. The following are some of the activities initiated in CLRI recently under this project : a) preparation of fire extinguishing foam compounds from hooves, horns and feathers of animals ; (b) preparation of protein—feed supplement for poultry from feathers, hooves, horn of animals and also from chrome shavings; c) cosmetics—small peptides from purified skin collagen for shampoo making; soluble collagen, monomers and dimers for skin cream lotions; from calf or fetal pig skin invertebrates and lower vertebrates; soluble deamidated collagen from hides and skins; kertin hydrolysates for hair shampoo, naid polish etc., from horns, hooves, etc. (d) Prosthetic materials—collagen sheet for wound dressing from coliagenous tissues of animals; collagen tube in vessel prosthesis for the prevention of adhesion, perimural from collagenous tissues of animals; e) protein for human consumption —from frog carcass, shark waste, fish offals etc.

Water resistant sole leathers have been prepared by myrob and Al tannage and Iron-Al-Veg tannages and also by treatment with aluminium stearate followed by basic aluminium sulphate. Incorporation of tallow and oil also improves water resistance. Use of the five per cent solution of sodium sulphide has been found to give quick unhairing in sole leather making. Nappa and chamois splits were made from buff hide with a view to increase the value realised as finished leather.

Syntans

Improved syntans based on lignosulphonic acid and phenol for retanning purposes, Lignosulphonates as such and hydrolysed ligno-sulphonates, were reacted with polyphenols of myrobalan. It has been found that the hydrolysed material gave a better product for use as a self-tanning agent. Commercial myrobalan extracts containing excessive bisulphite have not been found to be satisfactory.

Tannery trials with syntan "RS" since developed in the CLRI have been found to give good results with certain modifications. Urese in "AH" another syntan, developed in CLRI has been found to be useful for retanning of chrome leather.

The mono and di-glycerides obtained from the marine and vegetable sources on reaction with mono-poly-carboxylic acids have shown promising results for both tanning and fatliquoring purposes. During preparation of fatliquor styled as CENFAT, obtainable from vegetable/marine/animal amine based and chrome, it has been found that substituting chrome powder with chrome alum gives better results. A collaborative project between the CLRI and a public undertaking firm of Calcutta has been initiated recently for preparation of synthetic fatliquors using the CLRI technology.

A number of pigment dispersions have been screened for properties like heat and migration resistance, light fastness etc. Various organic and inorganic pigments were blended as pigment dispersion formulations and their properties namely hiding power, particles size, colour value and also dispersibility were studied. These blends are being compared with commercial ones existing in the market.

A fabric, made of goat hair, wool, and jute is found quite useful as insulating material in high altitude shoes.

Recent research investigations in polymer area are concerned with development of tanning aids, finishes and various leather auxiliaries based on polymers. Acrylic copolymers based on MA-MMA-ACN (CLRI brands) were prepared in emulsion form for use as base coat for leather acrylic binder (RS). The process was perfected and the know-how has been released to a number of chemical firms for commercial exploitation. Polyurethane lacquer based on TDI castor oil was also released to chemical firms in Bombay and Delhi. A know-how for the preparation of modified case in finishes, developed in CLRI, has been handed over to the NRDC for release for commercial exploitation. A series of adhesives based on VC-VAC-copolymers (CLRI) and polyurethanes have been made and are being assessed for their use in footwear manufacture. With a view to investigate and also explore out-lets for utilisation of industrial polymeric materials, based on agricultural and industrial by-products, for incorporation into hides and skins and others, Mica-Vinyl graft copolymers, and lignosulphonate-vinyl graft copolymers have been made and used in leather manufacture. The leather treated with these grafted products showed improved properties like fullness, softness and nap as compared to the untreated product. Preliminary investigations for preparation of antithrombogenic surfaces based on collagen for use in biomedical field have been completed. An inter-institutional project sponsored by the Department of Science and Technology (DST) has beene undertaken for the preparation of phenolic resins based on non-petroleum products. Good progress has been made in the preparation of resin from the hydrolysate of myrobalan tannin extract. An International Symposium on Polymers was held during January 1980, at Madras, by CLRI, in which experts from all over the world participated.

A number of new designs for handbags with and without frames, pouch bags, leather album and light weight softy brief cases have been developed. Leather goods like wallets, handbags, writing cases etc. have been made with 'Novotone' leather. Novel and useful designs for wall hangers have been made out of inferior or rejection quality leathers. Newer uses have been found for bag tanned leathers from rural areas for making travel bags, conductor bags etc. Certain accessories for straight edge folding machine and universal press have been developed. A plywood bending machine for suit cases has been fabricated.

Studies on biophysical aspects of normal and abnormal feet and its relationship with footwear have been studied. In electromyographic studies conducted during surveys to evaluate the behaviour of the leg and foot both in static and moving phases, it has been found that while the foot is flexed at the ankle and also when extending the toes at the metatarsophalangeal joint, both in standing and sitting postures, muscles are more active during flexion in weight-bearing posture than in sitting. Similar results have been obtained in the case of calfmuscles as well.

Kinematic analysis of locomotion of children while walking barefoot was conducted using cinematographic technique. Eight normal persons, a flat-footed person, a person with knock-knee were chosen for this study. The displacement patterns for various leg markers affixed at different joints of leg, knee, ankle and metatarsophalangeal joints were traced. The displacement information thus obtained was fed to the computer for the computation of velocity and acceleration data for further analysis. Studies are in progress on the structure and properties of footwear materials with the object of making improvements in footwear.

A 1800 mm splitting machine has been fabricated for leather industrial organisation in Vijayawada. This was demonstrated to the public in the TGT-1981. Strap cutting machine, skiving machine, hydraulic clicking press and vacuum dryer are in the process of fabrication. Design drawings for 400 mm, splitting machine have been completed. In co-ordination with CMERI, Durgapur-Madras Unit (MERADO), CEERI, Pilani-Madras Unit, the CLRI has taken up development of a rotary spraying and drying machine. A pneumatic blade fixing device for cylinders of fleshing shaving, sammying and setting machines is being developed in CLRI.

An International Seminar on Transfer of Technology in Leather and Allied Industries sponsored by the ESCAP was organised by the CLRI during Jan.-Feb. 1980 at Madras, in which delegates from the ESCAP countries, UNIDO, FAO, ILO etc. as well as from all over India participated. □

Telecommunication Services in India :

A Review and Perspective

Vijay Naval Patil*

UNDER the Sixth Five Year Plan the Ministry of Communications is aiming at a substantial overall expansion and improvement of public telecommunication services.

As is well known, telecommunication is a vital link among people of different strata for the economic development of a nation. In the words of our beloved Prime Minister Shrimati Indira Gandhi "Communication in today's world plays an important role. Without it neither democracy can function nor can progress be made."

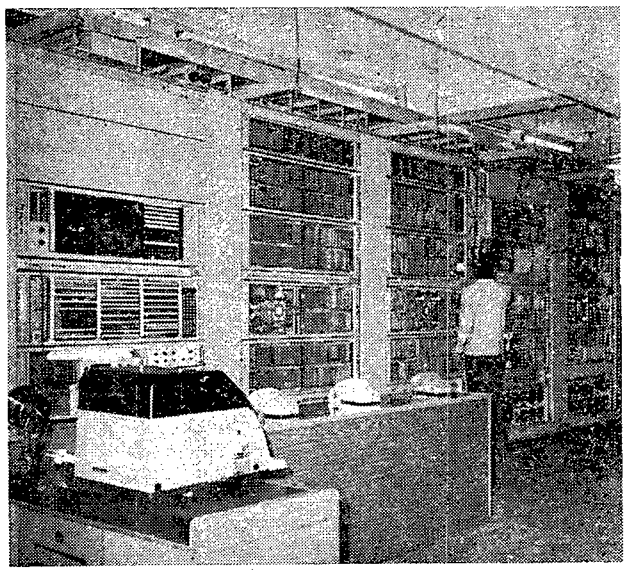
Substitute for Transport

Telecommunication is in several respects a substitute for transport. Most other means of communication involve movement through public or private transportation and therefore require use of considerable amount of resources more so in recent years in view of escalating energy costs. Telecommunication services offer a significant low-cost alternative to the user as well as permit saving on energy consumption. This is of particular importance for a large and energy starved country like India.

Owing to various constraints the investments in the telecommunication sector in the past have not been adequate with the result that the level of telecommunication services has fallen short of the needs of the economy. A higher priority to this sector is justified considering its infrastructural character and potential contribution which can be made to economic growth.

Objectives

It has been our main objective to overcome the chronic conditions of shortage and congestion in our telecommunications network since world war II. In the assessment of the telecommunication administration the following targets are capable of achievement by the end of the current decade (1980--90).



Electronic Telephone Exchange.

(i) Provision of telephone and telex connections practically on demand;

(ii) Full automation of the local telephone exchange networks;

(iii) Replacement of all old exchanges and other equipment ;

(iv) Provision of subscriber dialling facilities on an integrated STD Trunk network among all cities and towns with a population of 50,000 or more.

(v) Provision of subscriber's dialling facilities between all telephone exchanges within a secondary switching area with boundaries of one or two revenue districts;

(vi) For calls outside the secondary area not covered by (iv) above provision of no delay manual trunk service; and

(vii) Extension of telephone service either through a telephone exchange or long distance public telephone to within 5 kms. of most inhabited locations in the country.

While developing the telecommunication network to meet the above objectives it will also be neces-

*Deputy Minister for Communications.

sary to take into account facilities for such main users as AIR, Doordarshan, Defence, Irrigation, State Electricity Boards, ISRO, NTPC, IAC, Air India, Civil Aviation, IOC, ONGC and State Police Deparments.

Rudimentary System

At the time of Independence, India had a rudimentary telecommunication system. A review of position obtaining on 1-4-1948 has revealed that the country had a total of only 321 telephone exchanges with a capacity of about one lakh lines, 82,000 working connections (DELS) served by a total of 426 long distance (inter-city) speech channels. There were only 338 long distance public call offices and 3324 public telegraph offices.

Growth of Telecommunication

After independence, the Parliament under the able leadership of late Panditji gave high priority to the revitalization of the economy. It discussed and framed many schemes for creating the necessary infrastructure for development of industry and improvement of agriculture. As these schemes got into swing and economic activities picked up, need for rapid and effective communcation facilities began to be felt. These needs were reflected in the increase of telegraph and telephone traffic.

The Government's schemes for socio-economic resurgence were given the shape of comprehensive National Plans with the formation of Planning Commission in 1950. The first five year Indian was launched in 1951 and has been followed by successive Plans. Based on demands for telecommunication services and the total availability of investable resources both in money and materials, considerable expansion and development, both quantitative and qualitive has been made in the field of telecommunication in the successive plans. The table given below summarises the development in this regard.

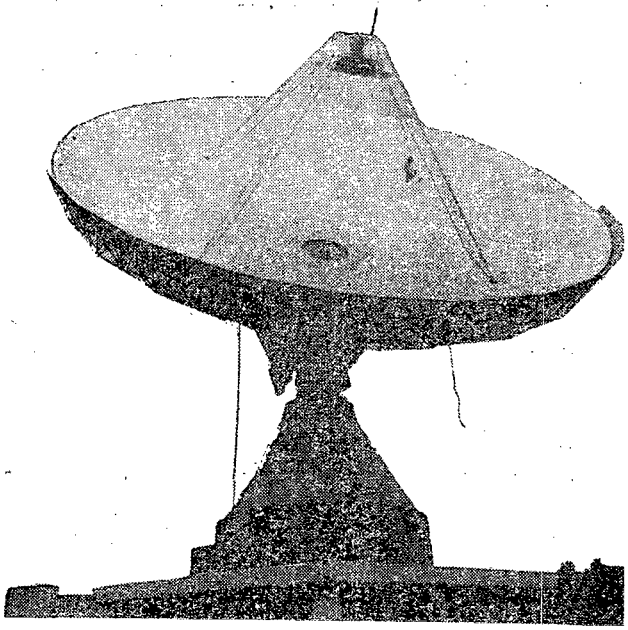
Qualitative Improvements

The basic telephone services have grown almost 24 times during the last 32 years—a remarkable achievement. Side by side there have been considerable qualitative and technological improvements. A few of these may be mentioned.

The local telephone service has been made automatic to a large extent. As on 31-3-80 only about 14.53 per cent of total exchange capacity was manual. This has hastened considerably the putting through of calls and eliminated the complaints of inattention by operators. The step by step system (Strowger) was a fore-runner of automatic switching in the country. The common control switching system was introduced in mid-sixties primarily to meet the demands of nationwide subscriber trunk dialling service. By eliminating the intervention of manual operators and enabling the subscriber to switch directly their long distance calls, the trunk service has been completely transformed. The subscribers have received the new service with great enthusiasm and we notice tremendous increases in trunk traffic revenue. In the last decade "Electronic switching system" has been developed the world over and accepted as the system of the future. The Indian P & T joined this breakthrough in October 1974 along with eleven other countries of the world and had its prototype in the TRC (Telecommunications Research Centre) at New Delhi. Another field trial of this type is being evaluated in the Rajouri Garden area of Delhi Telephone network. The P & T is also taking steps towards introduction of electronic switching for local trunk and telex exchanges in the current plan period.

Growth in Telecommunication Service

S.No.	Facility	Unit	Position on 1-4-1948	Position on 1-4-1980	No. of times growth since 1-4-1948 (b/a)
1.	Telephone Exchanges	Number	321	7430	23.15
2.	Local Exch. Capacity	Lakhs lines	1.00	23.36	23.36
3.	Working connection (DELS)	—do—	0.82	20.14	24.56
4.	Telephone sets	Lakhs	1.68	26.15	15.57
5.	L.D. PCO	Number	338	13830	40.92
6.	Manual Trunk boards	-do-	250	7106	28.42
7.	Trunk Automatic Exch.	-do-	Nil	18	infinite
8.	TAX Capacity	-do-	Nil	40300	—do—
9.	STD routes (pt to pt)	-do-	Nil	137	—do—
10.	L.D. Speech channels	-do-	1426	59741	140.24
11.	Co-axial Cable system	Route km.	Nil	16641	infinite
12.	M/Wave system	—do—	Nil	16545	—do—
13.	Public Telegraph offices	Number	3324	24457	7.36
14.	Telex Exchange	-do-	Nil	136	infinite
15.	Telex Capacity	-do-	Nil	22015	—do—
16.	Telex subscribers connections	-do-	Nil	17983	—do—
17.	Voice Frequency Telegraph channels	-do-	450	17777	39.50
18.	Teleprinters	-do-	615	36982	60.13



Antenna of the Earth Station at Dehra Dun.

There has been a continuous technological evolution in transmission techniques. In the earlier days open wire physical circuits were common modes of transmission of telegraph and telephone messages. The open wire circuits were replaced progressively by three channel, eight channel and 12 channel open wire carrier systems and 18 to 24 channel VFT systems. Till mid-1950's the trunk network in the country consisted almost entirely of open wire routes.

Telecommunication is in several ways a substitute for transport. It offers a significant low-cost alternative to transport and helps reduce energy consumption.

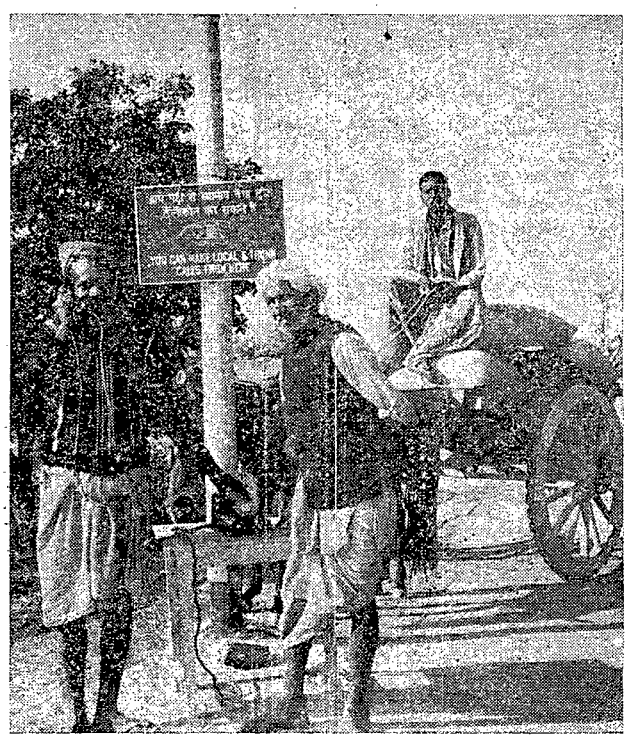
By the end of 1950's the coaxial cable system was introduced in the country and it has ultimately provided the main back-bone routes between four metropolitan cities of the country. Initially capacity of the coaxial cable system was of 960 channels which was subsequently increased to 2700 channels per pair of tubes (copper) by the installation of 12 MHZ coaxial line equipment. 60 MHZ coaxial cables system catering to 10800 simultaneous telephone conversations has been introduced on an experimental basis between Bombay and Thana. Thus, the technological change has brought about change from Morse code transmission method for telegrams to teleprinter mode of transmission of messages and the improved quality speech in the carrier phone channels and ushering in the subscriber trunk dialing. The latest facilities provided through the VFT systems to the business houses has become more and more popular.

Rural Telecommunications

Trade and commerce, which has for long been concentrated in and around large cities, has of late begun to diversify and extend to rural areas. This diversification is regarded essential for generating new employment opportunities and there is greater realisation today about the need to render institutional and economic support to the small town and rural based communities. There is, therefore, need to penetrate deeper so as to bring villages closer atleast to district town centres through faster communication medium.

The rural telecom development would be a part of rural programmes as provision of a quick and efficient means of communication could provide the basic infrastructural support in monitoring the information and mobilisation of services for the massive employment oriented and other socio-economic development programmes. The developments in the field of electronics and digital communication that have taken place during the 1970's offer us the possibility of improving the rural networks by the application of this new technology. It is proposed to plan telecommunication networks taking advantages of this new technology for the 18 selected districts. These development plans are designed specifically to improve telecommunication facilities in rural, backward, hilly, tribal and scheduled areas which would definitely facilitate economic development of scheduled caste and scheduled tribes who constitute bulk of the population in these areas.

Development of telecommunication in rural areas could be a great boon to the farmer.



Providing long-distance public telephones through multi-access rural radio systems offers great advantages since the cost of providing long-distance public telephones is indepenedent of line lenth upto 50 kms. from the exchange base station and for the low traffic. Remote area communication is also planned through the satellite. The department also proposes to install 10 line electronic exchanges in villages. These will enable smaller villages to avail of efficient telecommunication facilities, where at present 25 line SAX could not be justified because of small number of subscribers. This is how the P & T Department proposes to give a rural orientation to the telecommunication network to stop the flow of rural population into urban areas and cities by helping to grow industries simultaneously in urban and rural areas giving opportunities of employment to village population in the fields of cottage industries, small scale industries and facilitate farmers to concentrate more on grow more food compaign.

New Services

As the economy of the country is getting transformed, modernized demands for new services are coming up. Thus, the Doordashan needs TV bearer channels, business houses and government agencies like Civil Aviation need data transmission facilities, newspapers and meteorological department telemetry facilities and so on. The department is making provision for these services and meeting the requirements in its successive Plans.

The basic telephone services have grown almost 24 times during the last 32 years—a remarkable achievement.

The Telecommunications Research Centre of the P & T Board is well set to meet the new challenge that is ahead of us. Technological changes at an ever-growing rate are forecast in the future. Integrated time division transmission and switching techniques are on the horizon. So are the optical fibre transmission techniques. Further thus holds out prospects of revolutionary and exciting adventures and challenges in the telecommunication technology in the service of the nation. □

Physical Planning in Tourism Development

C. S. Pillai*

A balance should be struck between conservation of cultural values and environmental aspects on the one hand and development of tourism on the other. It is necessary to make special efforts to involve, and educate, as well as provide for maximum possible economic benefits to the local community so that the adverse attitudes and tensions which are developed at a later stage would be avoided. Identification of the particular form of tourism or tourist product and image that any country desires to promote is essential. Otherwise the marketing and promotional efforts for tourism are not likely to be concerted and successful. Also the respective Governments should give much priority to the tourism industry in their National Plans.

These are some of the recommendations made at the five-day workshop on "physical Planning" conducted by the World Tourism Organisation at Kovalam in Kerala recently. While inaugurating the workshop, the Union Minister of Tourism and Civil Aviation, Shri A. P. Sharma, said that physical planning of tourism facilities was an important aspect of tourism development which needed serious examination and consideration. Tourism is a multifaceted discipline. If given full hope, it holds unlimited potential for making substantial contribution to the country's cultural, social and economic fields. Besides, it can foster better international understanding, forge national integration and correct regional imbalances, Shri Sharma added.

While creating the necessary infrastructure and facilities for tourists, the minister said we must ensure that there is no adverse impact on the local community. While undertaking the physical planning of a particular area—whether an archeological centre or a wild life sanctuary or a beach or mountain resort—we need to take particular care of the impact of tourism on the local community and on the environment of that area. Shri Sharma suggested that master plans should be prepared to determine and suitably locate the various facilities required. Suitable legislation, if necessary, should also be made part of physical planning of a centre, so that the master plan prepared and guidelines formulated were adhered to. The Minister announced that the Central Department of Tourism had prepared master plans or land use plans of about 18 tourist centres of national beauty and archeological interest.

Earlier, speaking to newsmen, the Union Minister said that India expected to receive 1.75 million tourists by the end of 1985 and double that figure by the end of 1990. He said that the country earned foreign exchange worth Rs. 500 crores from tourism in 1980. The amount may be Rs. 1,000 crores in 1981. Now that chartered air service had been permitted, a large influx of tourist could be expected, the Minister added. To begin with 30,000 youths will be coming from Germany and 20,000 from France.

The Workshop was attended, among others, by the Regional Secretary of the World Tourism Organisation, Shri J. M. Handi and the W.T.O. Consultant, Shri John Hawkes under the Chairmanship of Smt. A. Mehta, Additional Director General of Tourism, Government of India, New Delh □

*Our Senior Correspondent and Editor of Yojana (Malayalam) Trivandrum.

Economic Development of Nigeria

Navin Chandra Joshi*

AFTER remaining a colony under Britain the Federal Republic of Nigeria was granted internal self-government in 1951 when Nigerians took up all but a few of the ministerial portfolios. Complete independence was obtained on October 1, 1960 when it became sovereign and independent and a member of the Commonwealth. On January 15, 1966 the parliamentary government of the country was ended by a military coup and a second coup followed on July 29 the same year. In mid 1967 civil war erupted finally culminating in a yet another coup on July 29,1975 and yet another on February 13, 1976.

Nigerians gave to themselves a new Constitution on October 1, 1979 providing for an executive president. This marked the end of almost 14 years of military rule. General elections in the country were held in July/August 1979 and the present President Alhaji Shehu Shagari was elected. The second Republic brought with it the presidential form of government and the only constitution designed to hold in balance the tremendous tensions generated in the rapidly growing and changing Nigerian society of over 80 million people and over 250 ethnic groups. Today Nigeria is a federal republic comprising 19 states and a federal capital territory.

Nigeria is the second largest producer of cocoa in the word.

The country lies at the coast of West Africa. It has total land area of 923,768 square kilometres. It is the most populous country of the African continent. Nigeria's name is derived from the Niger river which enters the country from Western Africa.

While the population increase is at the rate of 1.5 cent, the per capita income is around $25 per annum. About 10 per cent of the total area of the country is under cultivation. The forests cover about 32 per cent of the total area. In the extreme north the country is almost desert with sparse population. There are a few mountains, and on the northern plateau there are peaks of over 5000ft. The Niger, Benue and Cross are the main rivers. The climate varies in different parts of the country though Nigeria lies within the tropics and temperatures are quite high. The country is bordered by Dahomey on the West, Niger on he north, Chad and Cameroon on the east and the Gulf of Guinea on the south. The Country's currency is Naira introduced since January 1, 1973 and prior to that it was the pound.

Economic Recovery

There is a general lack of major economic data on Nigeria. In the period imediately following the end of the civil war in January 1971, Nigeria made a remarkably rapid economic recovery. Assisted by a large and fast growing flow of financial resources from the petroleum sector, the Government accelerated reconstruction, removed economic distortions, and redressed the country's overall financial situation.

The real GDP at factor cost expanded on the average by about 18 per cent over the two years 1970-71 and 1971-72. The surge in the growth rate was, however, accompanied by a substantial increase in domestic prices and balance of payments pressures. While relative price stability was in 1972-73, the early post-war growth momentum was not sustained. The rate of increase of real GDP was 9.6 per cent in 1972-73 which fell to 7.0 per cent in 1973-74.

Predominance of Agriculture

Nigeria is an agricultural country where 80 per cent of its total working population is engaged in producing yams, cassava, plantains, rice, beans, sugar-cace and citrus fruits, cocoa, oil palm produce, groundnuts, rubber and cotton. There is a fairly high degree of specialisation in agricultural production. The bulk of Nigeria's cocoa is produced at the western end of the high forest region while palm is produced at the eastern end. The Nigerian system of agriculture is based on numerous small farms. About 55 per cent of all farms are smaller than 2.5 acres. Even for plan-

*Senior Lecturer, Motilal Nehru College, Delhi University.

tations, small holdings are the rule in Nigeria. Only 37 per cent of Nigeria's total land area is reasonably well developed for agriculture. With modern technology and inputs it is being raised to 79 per cent. Population pressures have now become serious in the rainforest belt as well as in the groundnut and cotton areas of the north. The middle savannah regions represent the largest under-populated and under-farmed area in Nigeria.

Agricultural operations are primarily oriented towards the domestic market. Recently the Government has launched a programme of Green Revolution. At present, food imports consist of wheat, sugar and milk to meet comestic demand. Nigeriais the second largest producer of cocoa in the world and the world's largest exporter of groundnuts. Climatic conditions are favourable in most of the areas and water resources are ample.

Land constitutes a major asset in Nigeria. All lands in the northern states are vested in the public authorities (usually local governments) but this is not the case in the southern states where customary land tenure system still operates. Under the latter, the land belongs to the corporate bodies in their capacities as property owning groups. The rights of the groups are considered far superior to those of individuals. Alienation of interests in land, particularly in return for cash payment, is prohibited under the customary land tenure system.

Population Density

Population density varies in the country from the sparsely or virtually uninhabited areas in the north and the middle belt to the densely populated parts of the eastern states. As against the country's average density of 156 persons per square mile, Lagos (the capital) has about 1,000 persons and density of 700 persons is common in Imo and Anambra states. One serious problem is to make available part of the 'surplus' land in the north to the other citizens from land-scarce areas of the country. The increasing rate of urbanisation entails the conversion of rural land to an urban use and with it an inevitable rise in the price of that land. Therefore, it is almost impossible to achieve effective planning without adequate control on the use and ownership of land. The regulation of land use is very inneffective in Nigeria. There is now a universal consensus that the overriding social function of land usage justifies the imposition of limitations on private rights.

Manufacturing Sector

Nigeriaa's manufacturing sector is characterised by a limited range of textiles, apparels, soft drinks, tobacco, simple metal products and some assembling, a fairly high dependence on protection, substantial geographical concentration, mainly in Lagos and three other large cities and a relativelv high degree of private ownership, largely foreign. The ratio of manufacturing to GDP is around 8 per cent. Import substitution, spurred by fairly high market protection, has been an important factor in the expansion of the manufacturing sector in Nigeria. Nevertheless, the country's dependence on imports is still high, particularly for machinery, transport equipment and chemicals. Within the industrial sector larger enterprises have been growing fast while handicrafts have been expanding slowly although they provide good employment. The public sector has made substantial investments in the manufacturing industry but inadequate planning and administration have hampered the operation of many public enterprises.

It may be recalled that during the pre-independence era, industrial development in Nigeria was very slow. Over the last decade, however, industrial growth became a crucial factor in Nigeria's general economic development. The new burst of activities both in the petroleum and manufacturing sectors have come to constitute the major driving force in the development process. Today industry has moved from the periphery of the country's growth mechanism to a potentially dominant position as an important engine of economic transformation. Emphasis has shiftted from import substitution to the establishment of basic and intermediate industries. The Nigerian economy is now faced with the challenge and opportunity of creating an industrial base that can guarantee self-sustaining growth in the future. The country is well endowed with both mineral and human resources necessary for rapid industrial growth. There is a large and expanding domestic market which can provide the leverage for competition in the export market.

In order to harness the tremendous potential of the manufacturing sector and to realise the particular advantages which a dynamic private sector has in this area of economic activity, government has decided to further open the doors to both indigenous and foreign private investors in most sectors of manufacturing. Efforts are being directed towards the promotion and expansion of the intermediate and capital goods industries in order to raise the contribution of value added in the manufacturing sector. The private sector is banned only from investing in defence industries and from security printing. The Federal Government must have majority interest in basic petroleum industry such as crude mining, gas gathering, liquefaction, but not necessarily in downstream petrochemical industries. In other areas of manufacturing industry the Government, the private sector, and others are free to invest either in collaboration or exclusively, without prejudice to the Nigerian Enterprises Promotion Decree of 1972.

Foreign investment is encouraged in the areas of major earnings where 40 per cent or more of the output is meant for export, in engineering industries, basic industrial chemicals and agro-based industries. The government has promulgated the 'Nigerian Enterprises Promotion Decree in order to initiate practical participation by Nigerians in the industrial development of the country and to encourage foreign investors to move to those sectors which require more advanced technology. Under a decree of indigenization, Nigerians must have a minimum of 30 per cent shareholding in all foreign enterprises.

Industrial output does not yet account for a significant part of the GDP. In the basic resources for industrial development, Nigeria is more fortunate than many other developing countries. It has a good labour supply, numerous raw materials, fuel, water,

home market of people whose incomes are gradually rising, and investment capital. The plateau area of Nigeria produces large quantities of tin and nearly all the world's output of columbite, a metal used increasingly in the manufocture of alloys capable of resisting high temperature. Nigeria is the world's sixth largest producer of tin producing about 10,000 tons per year. There are coal fields, deposits of lignite lead and zinc. Hopes of Nigeria becoming a petroleum producer were bright in 1953 when oil was found in the eastern region. Today, petroleum has changed the whole face of Nigerian economy.

Discovery of Oil

The establishment of OPEC in 1960 was a turning point in the history of the oil industry. Nigeria, like other members of the 13-nation organisation, depends on revenue from oil for financing her development projects. Crude oil today forms the backbone of Nigeria's buoyant economy. Today the earnings from oil alone contribute over 80 per cent of the annual revenue of the country and are responsible for over 75 per cent of Nigeria's foreign exchange resources. With a daily output of 2.3 million barrels of crude oil, Nigeria is the ninth on the world oil rating and second to Algeria in Africa. Without oil, it would have been difficult for Nigeria to play the increasingly important role she now plays in Africa and the world. The rapid recovery from the civil war losses was made possible by the huge revenue from oil.

Over the years the Nigerian oil industry has almost exclusively been the preserve of foreign private companies. Recently, the Government decided to involve itself in the oil industry. Nigeria is also guided in its relationship with the multinational companies by the conditions that obtain in the other producer countries, especially OPEC member-countries. The Government established in 1971 Nigerian National oil Corporation, now called the Nigerjan National Petroleum company (NNPC) for establishing some control over the oil industry. The country has benefited from higher prices, taxes and royalties from crude oil. Nigeria's share in the refining capacity of its crude oil is still small with onlv two refineries existing at present

Exports

Nigerian exports are over £150 million annually. Almost half of these are represented by vegetable oil products - principally palm oil, palm kernels and groundnuts. Cocoa, the other major product, accounts for nearly one-fourth of total exports. Tin and columbite provide the largest share of the remainder. The bulk of agricultural export items are produced by small landholders. Textiles are the major items for imports. Transport equipment and machinery are the other items.

Development Planning

As regards development planning, the first attempt was made in 1946 when the Ten-year Plan of Development and Welfare was introduced. But real planning commenced when in 1962 the First National Development Plan (1962-68) was launched. Its objective was a growth in GPD of 4 per cent, increase in private per capita consumption by about 1 per cent per annum and the government consumption increase by about 15 per cent. Gross fixed investment was estimated at 15 per cent of GDP or N. 2366 million over the plan period, of which N 1586 million was to be spent in public sector. Most of these targets were actually exceeded in implementation.

The Second National Development Plan (1970 71/1973-74) strived for an equitable distribution of income both among people and among areas, full employment of resources and an increase in the employment of labour force. The Third Plan (1975-76/ 1979-80) emphasised on utilising oil resources for promoting rapid development in the overall economy. Extension services were provided to improve the quality of life and to alleviate the existing bottlenecks in infrastructure. The current Fourth Plan is upto 1985.

Control of Inflation

It is heartening to note that on the whole inflationary pressures are under control through schemes of price conrols and their effective implementation. Wage rates for the private sector are normally fixed by collective baraining without government intervention. Open unemployment is mostly an urban phenomenon and is heavily concentrated among the younger age groups and among school leavers. In the rural areas, disguised unemployment is a serious problem. There is a continuing migration from the rural to urban areas from agrcultural to non-agrcultural employment.

Since 1972 exchange liberalisation and trade system have been introduced. Tariff policy has been adjusted in a flexible manner for improving the competitiveness of Nigerian industry and for checking the increase in import prices. The evolution of Nigeria's balance of payments has been dominated increasingly by developments in the petroleum sector. In 1973 the contribution of the petroleum sector was of such a magnitude that it yielded a surplus in the current account of the balance of payments for the first time since independence. Capital inflow on account of the petroleum sector comprises direct investment in the form of reinvestment of undistributed income and other investment in the form of capital equipment. The mem ber states of the Economic Community of West African-States (ECOWAS) were to eleminate their tariff barriers to their industrial products with effect from May 28, 1981 as per the latest decision of ECOWAS. By May 28, 1989 the elimination process is expected to be completed throughout the Community. At the first economic summit of the Organisation of African Unity (OAU) held in Lagos in April, 1980 President Shagar of Nigeria stressed on political cooperation in a sustained manner with a view to forge continental unity in the realisation that it is a pre-condition for, and foreunner to, economic independence. Surely, one can hope that the country is now well-poised for a breakthrough in its economic development. □

Ecc

Nag

Dr. Atu

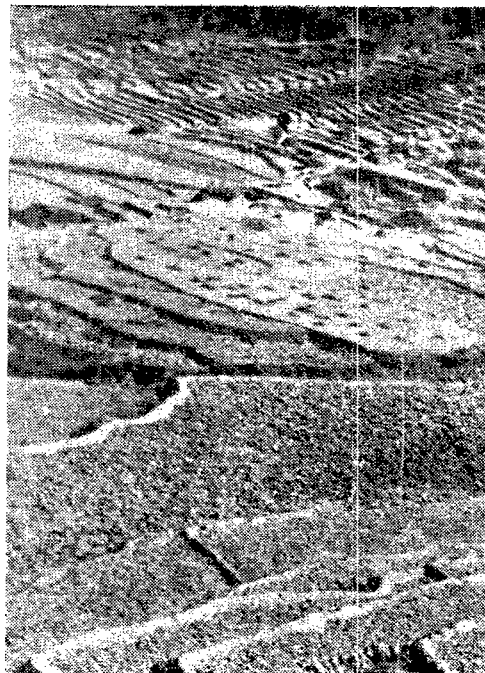
NAGALAND was formed on December 1, 1963 as a full fledged State. The State has an area of 16527 sq. kms. with seven districts, three sub divisions and three towns. The State has three distinct geographical regions, namely high hills areas, medium hill ranges and foothills. It does not have any big rivers. The western half is economically more advanced than the eastern half. Soils of Nagaland are by and large fertile and responsive to fertiliser applications. They are acidic, rich in organic carbon but very poor in potash and phosphate content.

According to 1971 Census Nagaland had a total Population of 515561. About 88 per cent of the population belongs to Scheduled Tribes. The literacy rate of Nagaland of 27.3 per cent, although lower than the all-India average of 29.4 per cent, comparers favourably with that of some other States. But the percentage of literates without any educational level is very high. The vast majority of the literates have attained formal literacy only, as is evident from the very low percentage of primary or matriculates and above, in the total number of literates. Even among those who have received formal education, the overwhelming majority have received only general educationn; the number receiving technical education is exceedingly small. This shows that the manpower resources of the State continue to be unsatisfactory for industrial development, despite very rapid rate of increase in the literacy rate in the post-independence period.

Nagaland has a very high participation rate of 50.8 per cent compared with the national rate of 32.91. It is due to the primitive technology used in agriculture and cottage industries which compels almost every able-bodied person above the age of 10-12 years to work for a livelihood.

The low percentage of sown area in Nagaland is on account of wide prevalence of jhuunuming.

The answer to Nagaland's stagna which is possible only i



Resources

The State is not favourably endowed with natural resources. An area of 30673 hectares (1.9 per cent of the geographical area of the State) is under reserved forests. With 51799 hectares under protected forests, (3.1 per cent of the total area), about 2,07,000 hectares (12.6 per cent of the total area) are under village or community forests over which the Government have very little control. Because of the shifting cultivation practised by the inhabitants, virgin forests are confined to inaccessible and high mountainous regions only. The current fallow area is covered by secondary vegetation consisting of grasses and reeds because of repeated jhumming. There are large patches of bamboo forests in Mokokchung and Kohima districts. Based on bamboo and reeds, an integrated paper and pulp mill with a capacity of 100 tonnes per day involving an investment of Rs. 65 crores has been set up at Tuli in the district of Mokokchung jointly by the State Government and the Hindustan Paper Corporation. The other forest areas which offer some scope for economic exploitation are Namza-Tijit in Mokokchung district and Rang Pahar in Kohima district. The State Government have also started rubber plantation in the entire foothills because of the favourable climatic conditions.

Reader in Economics, Dibrugarh University

omy

and

swamy*

A Naga in his poultry farm.

culture is technological improvement
ase of terrace cultivation.

Other forest resources are citronella grass and various specimens of discorea, digitalis, lanta and mentha. There is a great scope for an effective utilisation of these medicinal plants. The State Government have very rightly encouraged the cultivation of these plants in waste lands. Arrangements have also been made for their processing.

The known mineral resources of Nagaland are not significant. Mention may be made of Borjan coalfield (estimated reserves are 55 million tonnes) in Mon district and a 10 million tonnes deposit of magnetite with associated minerals at Kriphrey subdivision of Tuensang district. Occurrence of oil has also been reported at Borhola and Merpani areas of Wokha district. Exploration of more minerals is likely with detailed geological mapping.

The financial resources of the State are slender. The tax base is very small. But a large sum of money flows out to the rest of the country. This amount can initiate a moderate progress of agricultural and industrial development, if properly harnessed. The commercial banks have started operation in the State and deposits have been increasing substantially year after year.

Human resources are similarly very limited. There is acute dearth for skilled labour. Technical skill formation among the local people has hardly started. Even fly shuttle looms are yet to replace the loin looms. The Inner Line Regulation is preventing the inflow of technical skill from the rest of the country.

Infrastructural Facilities

Nagaland, like other constituents of the north eastern region, is deficient in transport infrastructure. The State has 8.1 kms. long railway. The railway connecting Gauhati with Dibrugarh runs parallel to the western boundary of the State. Dimapur is the only railway station within the State on this section. Naginimara in Tuensang district is another minor railway station on the Branch line in the Jorhat-Dibrugarh section. The severe tophography of the State is partly responsible for the poor railway coverage of the State.

Roads form the most important means of transport in the State. Fortunately, the road system is not bad, although much more remains to be done. National Highway 39 passes through the southern part of Nagaland linking Dimapur with Kohima and Imphal in Manipur. Because of its links with railway and national highway, Dimapur has grown into an important commercial centre which handles the entire export and import trade of western Nagaland and Manipur. The State's total road length in 1976 stood at 4049 kms. There is 1 km. of road for every 4.08 sq. kms. of the State's area. In view of the difficult topography, this cannot be regarded as very unsatisfactory. The length of surfaced road stood at 1085 kms. and that of unsurfaced 2964 kms. in 1976. It has to be noted that compared with the western part, the eastern part is more backward in road communication because of sparse population and difficult terrain. There is now regular air service connecting Dimapur with Gauhati and Calcutta.

There were 14 branches of commercial banks in the State at the end of June 1976. The State does not have a State Financial Corporation. However,

Nagaland Industrial Development Corporation meets the needs of industries in the State. Nagaland State Raw Material Supply Corporation also helps the industrial units in getting supplies of scarce raw materials.

Agriculture

Nagaland's agriculture is yet to make a breakthrough. The State is deficit in foodgrains and imports rice from Manipur. However, there is scope for increasing food production through such devices as replacement of shifting by terrace cultivation, increased use of high yielding varieties of seeds, chemical fertilisers, pesticides etc., the introduction of double cropping in place of single cropping practised so far and the expansion of the area under irrigation. Soils of Dimapur area being suitable for sugarcane cultivation, there is scope for increasing the production of this cash crop by bringing more area under its cultivation. A public sector sugar plant with a crushing capacity of 1250 tonnes per day and an investment of Rs. 370 lakhs has been set up at Dimapur on the basis of this crop. The climate and soil of the State are also favourable for horticulture, especially for the tropical and sub-tropical varieties of fruits like pineapples and oranges.

According to the report of the Agricultural Census of Nagaland 1970-71, 41.9 per cent of the total land was set apart for cultivation. This included area under, shifting cultivation, permanent cultivation and plantation. Reserved forests constituted 2 per cent while protected forests claimed 3.1 per cent of total land. 2.4 per cent of the land was for 'civil use'. The remaining 50.6 per cent land included forests belonging to the villages' wastelands etc.

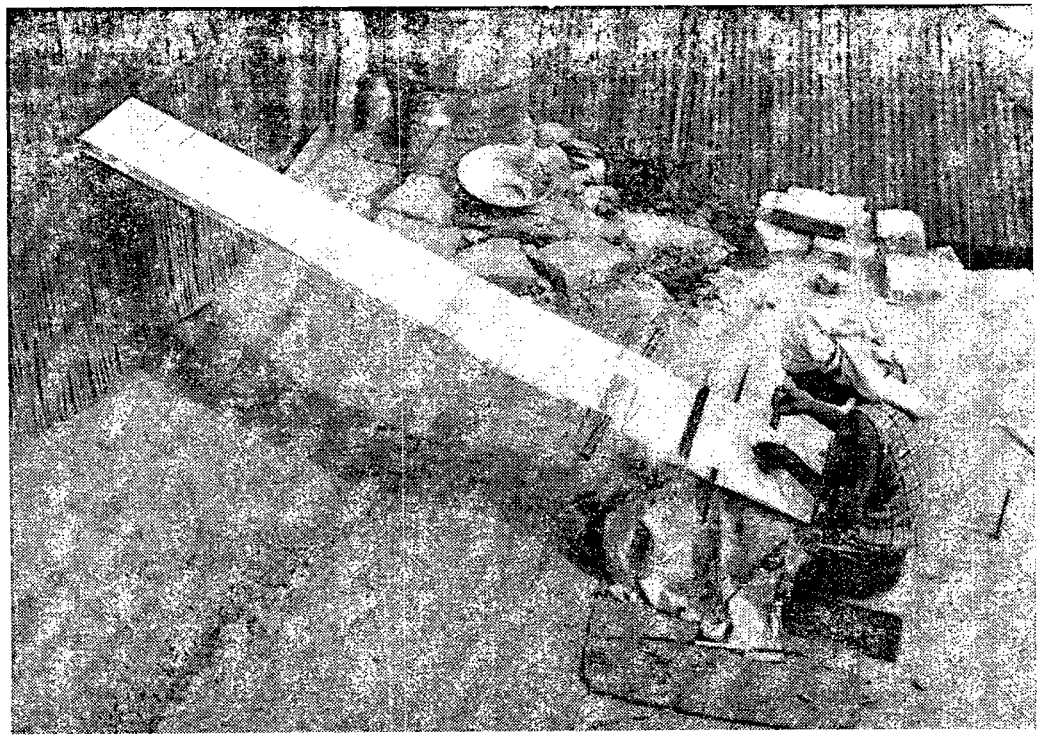
About 90 per cent of the cultivated area is under rice. Pulses, oilseeds and fibres account for less than six per cent, while miscellaneous crops account for six per cent of the cultivated land. Because of the wide pervalence of shifting cultivation, Nagaland continues to be deficit in foodgrain despite acreage of land under foodgrains (94,400 hectares in 1973-74). Fortunately, there has been a steady decline in the acreage of land under autumn rice (which includes jhum rice) and a crorresponding increase in the area under winter (RTC) rice and other cereals and small millets. The area under winter rice went up from 15,362 hectares in 1961-62 to 29,510 hectares in 1975-76, owing largely to the efforts of the Government. It is to be noted that the answer to Nagaland's stagnant agriclutude is technological improvement which is possible only in the case of terrace cultivation.

Signs of technological breakthrough in Nagaland's agriculture are perceptible in some pockets. Steps not only to replace jhumming by terrace cultivation but also to bring more areas under irrigation have been continuing. Irrigated area stood at only 26,171 hectares in 1970-71. This has increased to 33,437 hectares in 1973-74 and further to 33,854 hectares in 1975-76. Similarly, attempts to bring more area under high yielding varieties are continuing. The area under high yielding varieties of rice, maize, wheat and mustard stood at 2508, 1543, 342 and 283 hectares respectively in 1975-76. Unfortunately, the increase in agricultural production has not been commensurate with efforts for transformation of primitive agriculture into a modern one. Despite the none-too-insignificant increase in the area under terrace cultivation and irrigation, Nagaland's agricultural production has remained more or less unaltered.

According to the World Agrcultural Census, 1970-71, the number of operational holding in Nagaland stood at 93,262 while operated area was 5,03,763 hectares giving the average size of operational holding of 5.4 hactares. It was revealed that only 33.76 per cent of the total operated area was sown with crops. This low percentage of sown area to the total area operated was because of the wide prevalence of jhumming with the jhum cycle varying from 5 to 8 years.

As Roy Barman in his "Demographic and Socio-Economic Profiles of the Hill Areas of North-East India" has pointed out, one finds three classes of farmers in Nagaland. The first group consisting of progressive farmers located over the villages on foothills has taken over permanent cultivation and has adopted improved methods of cultivation. This group has some surplus production. These farmers are likely to respond very promptly in favour of any rational scheme of agricultural development. The strategy should therefore be giving more incentives in the form of loans and subsidies available to this group. The second group of farmers is in the transitional stage from shifting to permanent cultivation. This group forms the bulk of the farming population. These farmers live in difficult conditions of the hills and hardly produce sufficient food to feed themselves. They also need various inputs at subsidised prices. But more important, they need subsidy for land development, land reclamation and for creating irrigation facilities. The last category of farmers who live in interior and inaccessible areas are chronically deficit in food production. They are still practising the ancient system of cultivation. Measures like improvement in communication, opening of demonstration farms etc. may be of some help for this group.

Among the tribes the Angamis have been practising terrace cultivation from a long time. The State Government have very rightly emphasised the need for switching over from jhumming to settled cultivation among other tribes. Subsidies are given at the rate of Rs. 740 per hectare for constructing terraces as against the average estimated cost of Rs. 3,000. In addition, inputs like chemical fertilisers, seeds, pesticides, tools etc are supplied at 50 per cent subsidised prices. Permanent cultivation is likely to bring immense benefits to the people of Nagaland by increasing the productivity of agriculture and releasing substantial mandays for ancillary occupations like horticulture, poultry rearing, handicrafts etc.



A Naga lady weaving a shawl.

Industry

Organised industry had a late start in Nagaland. Even now the number of organised industries is very small. Lack of infra-structural facilities, and entrepreneurial talents, limited physical resources, difficult terrain, limited population and restriction on the entry of outsiders to the State act as constraints to industrial development. Dimapur, a rail head adjacent to the Assam plains, is the only centre with some industrial activity. In the rest of Nagaland, handicrafts are the only industry. The villagers meet their own requirements of cloth baskets, furniture, implements etc. using traditional techniques and tools.

Among the organised industries special mention may be made of the Sugar Mill at Dimapur, Paper and Pulp Mill at Tuli and the Plywood Factory at Nimaza-Tijit-Tedang.

The entire State is declared as industrially backward and qualifies for concessions including Central Government's outright subsidy. In many cases, however, loans were not utilised for the purpose they were granted. Only the sons of the soil are entitled to licenses for setting up of an industrial unit, for running a shop or for constructing roads and buildings. As observed by the study team on the industrial potential survey of the State sponsored by the Industrial Development Bank of India that, on many occasions the tribal concerned transfers the benefit of the licence to an outsider and thus becomes an absentee owner. This Policy has created a new tribal renter class which is not helpful for the industrial development of the State. It would be much better to provide management assistance to the tribal for running their own business.

Nagaland's economy is marked by low utilisation of resources and limited knowledge of resource potential. The State Government have very rightly taken the role of promoter entrepreneur. It has not only to take the initiative in building up the necessary infrastructure for industrial and agricultural development, it has also to foster the growth of a class of elites who can assimilate the information, perceive the advantages of taking follow-up action and bear the consequences thereof. The elements of subsidy, grants and low rate of interest have created an atmosphere of soft loan in the minds of the local people. For removing this feeling, there is an urgent necessity for formulating a clear industrial policy of the State Government. In the field of agriculture the present strategy of replacing jhumming by terrace cultivation should continue because this alone can release a substantial number of mandays for utilisation in subsidiary occupations. In the industrial sphere major emphasis should be put on the creation of industrial skill, entrepreneurial ability and managerial talent. Because of the small population base of the State, it will not be practicable to plan for large demand-based industries. Future industrial development should be thought of on the basis of available resources. Above all the industrial development of Nagaland cannot probably be thought of in isolation. A well-integrated industrial development plan for the entire north-eastern region comprising Assam, Meghalaya, Manipur, Tripura, Mizoram, Arunachal Pradesh and Nagaland offers the best solution to the problem of industrial development of the region, many components of which in isolation are not viable for large-scale industries. This calls for discovering the complementaries among the various units. □

Tribal Labour Force

L. C. Sharma*

INDIA has second largest concentration of tribal population which can be divided into three main groups (1) Tribal pockets of Southern India, Andaman & Nicobar Islands. (2) tribes of north east India and (3) the tribes living in the belt which runs from Orissa to Gujarat.

The Working Force

The working force in tribal population as per 1971 census comprises 14.62 million. Most of the workers earn their living as cultivators, agricultural labourers, and by activities like, forestry, fishing, hunting, plantation etc. Tribals usually practice shifting cultivation. They lack basic knowedge of weights and measures including the wholesale prices. They are cheated by traders. They borrow from the traders on personal security and repay the debt in kind i.e. either in agricultural produce or in forest produce or both. The tribals have to accept the agreed price for their produce which is much below the market price.

The size of the land holdings is small and the terms on which land is cultivated by the scheduled tribes is relatively low, along with the lower number of cultivation among this class. They do not earn enough to meet their daily requirements, besides they are liquor addicts. They borrow to celebrate marriages and death anniversaries. Rate of interest ranges from generation to generation. The tribes repay the loans honestly. They honour all the entries wihch the traders make in their books. The traders usually induce the tribals to borrow for their own benefit. A government or cooperative agency should replace this system to end their exploitation by money-lenders. Such an agency should take up the marketing of the entire produce of the tribals and provide them with the necessities of life at reasonable price and offer them credit facilities on easy terms and conditions.

Forest Regulations

The tribals inhabited the forests freely before the Britishers came to power in India. They used to earn their living by exploiting the forest wealth. However their freedom to exploit forest wealth was curtailed when the government started controlling the forests. The forest Department employs a good number of them. Scheduled Tribes Commission has rightly pointed out that the concept of regulating the rights and restricting the privileges of the tribes has effected their lives deeply. The Forest Policy Resolution of 1952, however, envisaged that intermediaries who exploit both the forests and the local labour for their own benefits may be replace by forest labour cooperative societies which may be formed to suit the local conditions. It is true that many restrictions which are imposed on tribals are in public interest but the interest of the illiterate tribals should also feel safeguard. Care should be taken that they don't feel that they are being driven out of their homes.

The government of Gujarat took a policy decision to replace all intermediaries who exploit the forest labour. All the high level commissions and committees have recommended the replacement of contractor system by cooperative societies. Adequate development funds are required to make this policy a success.

The Forest Department requires labour force on permanent basis for carrying out different operations in the forests i.e. survey, demarcation, felling, extraction, construction of roads, laying out plantations etc. as these opertions involve constant work in the interior of forests, the forest department organizes labour camps to ensure regular flow of manpower. There is a large number of forest villages in the country for this purpose. It is estimated that Madhya Pradesh alone has nearly 1,000 forest villages in which about 100,000 persons live.

Recognition of tribals' right to draw upon forest resources for their domestic consumption and as raw material for agriculture and other economic persuits is very essential.

Generally, tribals living in forest villages live on hunting, bird trapping and fishing, collecting and selling forest produce like honey, fuel and cane. Some tribals are cultivators also.

On the promulgation of the policy to develop forests on scientific lines, the forest department has imposed many restrictions on hunting, fishing and cutting trees and shifting cultivation on forest, lands. The tribals are being compensated by concessions like cultivation of forest lands permanently and cutting tress for domestic use

Occupations

Some tribals like Banjaras and Marathas follow settled cultivation. Once Banjaras were good traders also. The Kadugowdalus are good arisans and manufacture of attractive grass mats. The Medas prepare bamboo, reed and cane articles. Some Killekyatabs make leather dolls and also cloth dolls. They make fishing nets also. They also specialize in preparing a dye called (pachcha) which is used for tatooling. The Kurubs and Kudiyas are shepherds who weave good quality blankets. Some tribals particularly Bhills work as quacks, religious mendicants, snake charmers and acrobats. A good number still make a living by capturing birds, small animals, reptiles. Some tribal women work as palmists and fortune tellers. Some others like the Kapalis are fond of collecting and selling wild roots and herbs.

*Planning Commission.

The tribals have to face many kinds of social sanctions on account of which they are unable to take to more remunerative occupations. They are still treated as untouchables which effects their mobility in the society. Since India is predominantly an agricultural country, the relative position of a community is judged by its share of cultivable land. Tribals have little land to cultivate and they are economically backward. They have a higher rate of growth than the rest of population, they are less urbanised and have a lower rate of literacy. Consequently, they have a lower standard of living.

Tribals lack basic knowledge of weights and measures including the wholesale prices. They are cheated by traders. They borrow from the traders on personal security on the understanding to repay the debt in kind

The investment for tribal areas' development in 1977-78 was Rs. 2,000 million which included Rs. 1,500 million from state plans. According to the Minister of State for Home Affairs. Rs. 15,00 milion were provided during the Fifth Five Year Plan for tribal development. A new accounting system has been devised to prevent diversion of resources meant for tribal development to other areas. This system allows every functional head to have a separate sub-head for tribal sub-plan areas. This arrangement has been done to ensure proper development of tribal areas with proper utilisation of development funds. There are some laws for protecting tribals land, yet the land continues to be alienated. So the administration should see that the tribals get the optimum benefit.

Of the total tribal working population 93 per cent are engaged in agricultural pursuits, agriculture being their mainstay. Therefore, it should be given high priority in any programme of tribal development.

Concessions should be granted on uniform basis to all the tribals in a state irrespective of the region. The existing friction between the forest department and the tribals can be reduced if they are recruited by the Department to man the positions of guards, watchers, peons, mahouts etc. and wherever possible to higher posts. The tribals should be provided employment opportunities in forest, agriculture, animal husbandry and industries at least for 300 days in a year.

Application of Minimum Wages Act to forest labour should be considered. Recognition of tribals' natural rights to draw upon forest resources for their domestic consumption and as raw material for agriculture and other economic persuits without commercialisation of raw materials is another important factor. It is necessary that the Minimum wages Act should be implemented in every state to benefit the tribal forest labour.

The various plantation schemes which are suggested in the Plan should not make the tribals merely wage earners but active partners of the scheme. It can be done by assigning them a part of the income derived from it by organizing cooperatives. They should be given right to free grazing, lifting of timber for domestic and occupationsal use and collection and sale of minor forest produce.

Sericulture Industry in Cachar District of Assam

Hiraprasad Nath*

SERICULTURE in Cachar district of Assam is playing a very important role in rural economy. Though it is a traditional industry of the Barman Kachari community (plain tribal), sericulture industry is becoming popular among other communities of the district.

An eri seed grainage at Darmikhal and Mulberry seed farm at Paliapool are being established tor supplying disease free seeds to the village rearers. Besides meeting the requirement of the district of Cachar, these two farms supply seeds to adjoining Mizoram, N. C. Hills, Karbi Anglong District and other places in Assam. The seed is distributed among the village rearers at a small price through the Sericulture Demonstrators appointed in different parts of the district. These demonstrators also help the villagers in other matter related to silkworm rearing like plantation and maintainance of silkworm food plants, silk reeling, spinning etc.

*Manager, Government Eri Seed Grainage Darmikhal, Cachar, Assam.

In different parts of the district 11 eri concentration centres, eight Collective Mulberry Gardens and four som Plantation Centres have been established. Muga Rearing, a monopoly business of Assam was not practised previously in Cachar district but presently Muga rearing has also been introduced here through these som plantation centres.

Arrangements have been made for granting aid and subsidy from annual plan and tribal sub-plan scheme to the rearers for construction of their own rearing houses and to provide loans from nationalised banks at low rate of interest. Three silk reeling units under a reeling expert have been established in different part of the district.

Eri silkworm rearing and subsequently spinning and weaving of eri silk is a profitable business of the Barman (Kachari) community of the district. The sericulture products of the non-weavers are being sent to Assam Spun Mills Ltd. Jagiroad through the departmental co-operative societies.

A few Khadi and Gramudyog samittees are established for the sericultural products. Two more Eri seed Grainages are under construction. □

Export Potential of Tobacco

Dr. Badar Alam Iqbal*

INDIA is the third largest producer of tobacco in the world. Accounting for nearly 8 per cent of the total world crop it comes next to USA and China. At present it has 4.9 lakh hectares under this crop with an annual production of 4.5 lakh tonnes. The chief tobacco growing states are Andhra Pradesh, Gujarat, Karnataka, Tamil Nadu, Orissa, Bihar, West Bengal and Maharashtra. Out of these states, Andhra Pradesh ranks first. Gujarat comes next, while Karnataka holds the third position. This is because of the availability of black porous soil in these states which is considered as most favourable for the cultivation of quality grades of tobacco.

Exports

India is the third biggest exporter of tobacco in the world coming next to the USA and Turkey. Our export earnings from tobacco went up to Rs. 111 crores in 1978-79 from a mere Rs. 14 crorer in 1950-51—an increase of more than 692 per cent. The exports during 1979-80 are expected to be around 70,000 tonnes valued at Rs. 110 crores against 68,770 tonnes worth Rs. 111 crores in 1978-79, showing a marginal fall.

India is the third largest producer and exporter of tobacco in the world.

The growth in earnings has been mainly due to higher unit value realisation which has gone up from Rs. 14.67 per Kg in 1977-78 to Rs. 15.65 per kg. in 1978-79 and to Rs. 17.89 per kg. in 1979-80. This all indicates that the tobacco has bright future in international markets.

Since there is increasing demand for tobacco, it is necessary to retain export growth between 10 and 30 per cent taking the total export much higher than the target of Rs. 200 million. In view of the current rising international demand for tobbacco and the current growth rate of tobacco, it is essential for the country not only to achieve the target by the end of 1983-84, but also to reach a much higher ambitious export level of Rs. 300 crores by then.

India exports tobacco to nearly 40 countries. The principal buyers of our PCV tobacco are UK, USSR and Bangladesh. In Western Europe the UK is the principal buyer of Indian tobacco. Exports to France also have registered a sharp rise. Exports to Italy and the Netherlands of course have declined, while those to Belgium have shown no change.

Grading of tobacco in progress.

In Eastern Europe, exports to the USSR have gone up appreciably. Czechslovakia and the German Democratic Republic have maintained their usual intake. Bulgaria has also been importing considerable quantity of India tobacco. Exports to Middle East Region have declined considerably, while in the east Japan is the leading importer of Indian tobacco. Exports to Bangladesh have registered a steep fall.

Quality Improvement

Although India has a potential for producing good quality tabocco, it would take some more time for its tobacco to command reputation and a higher unit value in the world market, as it is yet to attain high standards required by importers. We have to compete with other countries such as the USA, Italy and China in the interntional markets. The Central Government should make studies both of national and international situation of tobacco from time to time and come to rescue at the time of need.

In the world markets there has been an increasing demand for India's FCV tobacco. If India organises regular and satisfactory supplies and launches an aggressive publicity campaign, it is possible to take tobacoo exports much beyond the target The areas in which improvements are required include quality as well as reasonable prices. The performance in the export horizon would depend largely on effeective solution of these problems.

* Lecturer, Faculty of Commerce, Aligarh Muslim University, Aligarh.

It is proposed to bring additional 12,000 hectares in new areas under FCV tobacco in the states of Andhra Pradesh, Karnataka, Uttar Pradesh, Gujarat and Tamil Nadu. While the productivity per hectare has gone up considerably, it is essential to make concerted efforts to tackle the problem of plant diseases such as tobacco mosaic virus root knot nematode etc. The research programme being carried out by ICAR on various aspects is aimed at enabling the country to produce more and more of better tobacco especially the exportable type. The Central Tobacco Research Institute in Andhra Pradesh is mainly devotted to the investigation of fundamental problems related to various aspects of tobacco. It also coordinates the work of other tobacco experimental farms and research stations spread all over the country, which are carrying out research on different types of tobacco grown in the concerned regions. Similarly, the Indian Tobacco Development Council formulates the tobacco development plans reviews the progress and considers the problems of marketing, trade and price policy. Likewise, Directorate of Tobacco Development, Ministry of Agriculture, implements the developmental schemes. Government finances and renders technical advice and guidance.

The Government of India has announced the minimum export prices for tobacco. The new prices have been fixed for the crop years 1978-79 and 1979-80 because State Trading Corporation has been carrying unsold stock. These prices are effective w.e.f. 15th February, 1980. Similarly the minimum f.o.b. unit value for higher grade of tobacco has been increased, while the same for lower grades reduced. However, there is no change in the unit values of medium grades. The crops and grades for which minimum export prices had not been fixed are free from these restrictions. □

Silken Chittoor

N. S. Kuppu Raju*

SHIMMERING silk sarees sing many a scintillating song of the dextrous hands employed in the industry. For some it is a part time avocation and for many, particularly in Chittoor district of Andhra Pradesh it is a round the year profession. Palamaneru, Punanuru, Kuppam, Madanapally and Vayalpadu Taluqs of the District have relatively cool and soothing climate even in summer, essential for the rearing of silk worms. Of late, mulburry plantations have been established in the adjoining taluqs like Chittoor, Chandragiri, Putturu, Satyavedu and Kalahasty. Therefore, it can be said that entire district of Chittoor is now nurturing this delicate home and farm industry.

In 1974-75, when the State was reeling under famine, special efforts were made to encourage mulberry plantations in Chittoor District and to provide employment opportunities to the farmers and labour. Under the six point development programme, this industry received further impetus and assistance. About 2,566.85 acres of land was under mulberry plantations in the District, during 1974-75. On account of incentives offered, the area has gone up to 8000 acres now. Subsidies are offered to small and marginal farmers for digging up new irrigation wells, construction of rearing rooms, purchase of implements etc.

Until 1974-75 Palamaneru was the only centre for rearing of silk worm in Andhra Pradesh. Under the State Famine relief programmes, two more such production units were commissioned-one at Madanapally during 1976-77 and the other at Kuppam during 1977-78. The production of silk rearing worms in 1979-80, at these two centres, was estimated around 12 lakhs. In the year 1979-80 two more centres were started at Pungnoor and Peeleru. These two centres

*Taluq Information officer.Chitoor district A.P.

The government silk farm at Palamaneru offers training facilities to farmers engaged and interested in rearing of silk worms and mulberry plantations. They provide training for 135 farmers in a batch. The three month training course covers production and rearing of silk worms, mulberry plantations etc. Stipend is provided to all the trainees. Similarly the Centre also supplies free of cost, all the required rearing implements to SC/STs, engaged in this work.

Most of these farmers are poor and economically backward. They rear the silk worms in their houses. Since the rooms for rearing are to be specially built, most of the small farmers find it difficult to carry on the trade in the houses. Therefore, Government has constructed 13 rearing rooms and converted four of them as *chakee* rearing units. Here in these *chakee* units the departmental personnel and technical staff supervise the programme and rear the silk worm upto the second stage. Then the seed is supplied to the farmers for further rearing at their gardens and homes. Such arrangement eliminates the fear of loss, under growth, or infection, which commonly effect the silk seed at the early stages. Encouraged by this experience, government has decided to open two more silk worm rearing units, one at Molakalacheruvu and the other at Chittoor during the current financial year. In addition, plans are afoot to bring an additional area of 4000 acres under mulberry plantations.

It is also planned to open a new (pure race) silk worm egg production unit at Horsely Hills. The climatic conditions around Horsely Hills is said to be most suitable for such a centre. With the commissioning of this pure race silk worm egg centre, the farmers of Rayalaseema will have a better opportunity of procuring pure race silk eggs for their silk farm units.

During 1980-81 under the programme of self-employment scheme, the Government has sanctioned Rs. 1,06,200 to encourage entrepreneurs take up the silk worm rearing programme. Under the scheme, unemployed farmers of Chittoor, Nellore and Prakasam districts can receive all benefits. It is expected that about 200 persons can find employment opportunities under the schesme in this field.

Biogas Plants : Time for a Pragmatic Approach

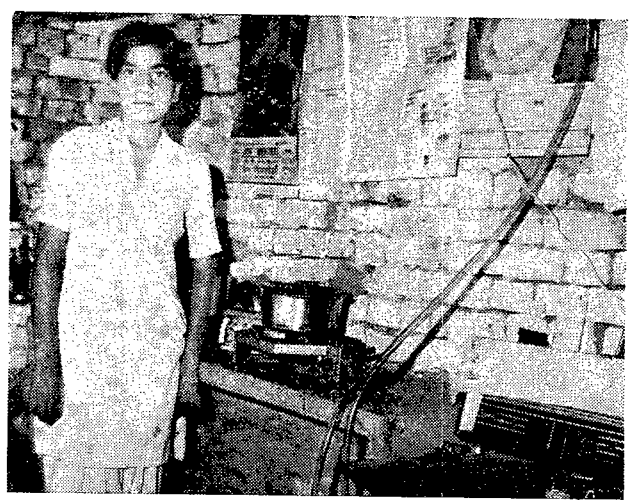
J. B. Singh*

THE relevance and importance of biogas in the context of energy economics and organic manure production are far too well known to require elaboration. However, the question arises as to why, despite so vast a potential, adoption of biogas plants is so poor. Even though India has been a pioneer in the research and development of biogas technology, why is it lagging behind other countries, particularly China, in the assimilation of this technology on a large scale ? It is in this context that the present policy needs to be reviewed before the future course of action can be decided upon.

Technological Constraints

The biogas plant designed by the Khadi and Village Industries Commission (KVIC) has been extensively propagated in India. The KVIC model is the steel-gas holder biogas plant commonly observed in the countryside. Over 85,000 of these plants are reported to have been set-up although unfortunately many are not in working order. Considering the difficulties and failures and the fact that not many plants of any design other than the KVIC model have been constructed, poor response can largely be traced to the draw-backs of the KVIC plant itself.

The primary reason for the failure of this design arises from the fact that biogas contains small quantities of Hydrogen Sulphid, Amonia, etc. which corrode the metallic gas holder causing gas leakage. This is all the more pronounced if proper maintenance is lacking. It is also well known that the digestion process is extremely sensitive to sudden temperature changes and bacterial activity is negligible below 10°C. Thus, the KVIC model, which is exposed to fluctuations of atmospheric temperature, often runs into difficulties specially in areas where day and night temperatures vary considerably. In such areas gas production is very low and at times ceases completely during winter. The high cost of the KVIC plant, scarcity of cement and steel, difficulties in transporting the prefabricated metal gas holder to inaccessible rural areas and lack of adequate afterconstruction service facilities, are some of the other constraints in its adoption.

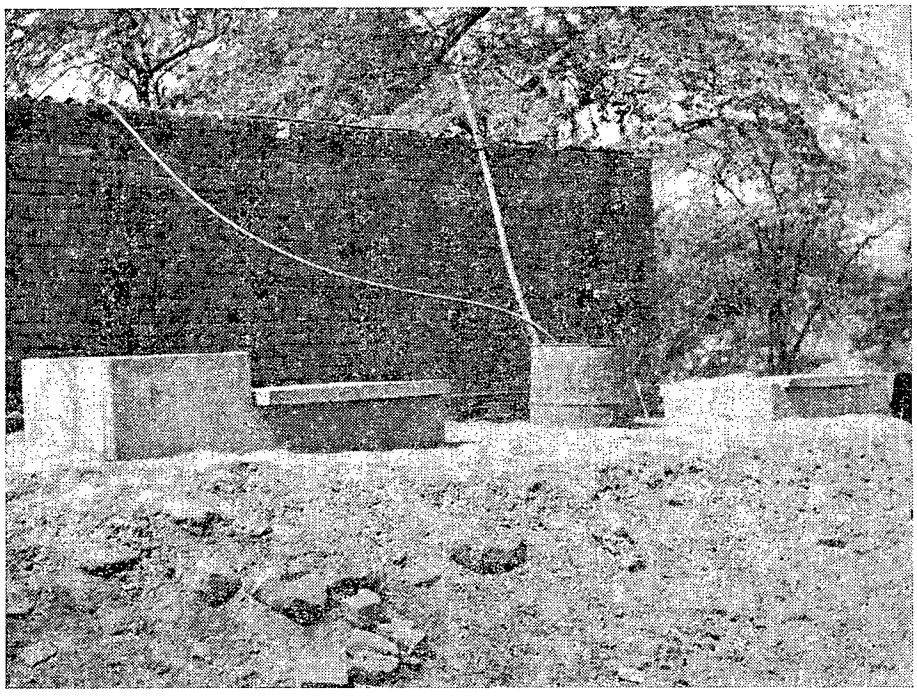


Cooking is pleasure on biogas stove

Design Choices

In spite of the above constraints, the fact remains that the KVIC plants continue to receive vigorous support and publicity, even though a more appropriate design is now available. The alternative is a hybrid model combining the good features of the KVIC and Chinese designs. It is known as the Janata biogas plant and has been developed by the Gobar Gas Research Station (GGRS) Ajitmal, Etawah. Like the Chinese model, it is a cement and brick structure and completely eliminates the need for steel—an expensive and scarce commodity. It also has a continuous feeding

*Executive Director, Action for Food Production, New Delhi.



Janata type biogas plant is a boon to the rural poor.

system as in the KVIC model. Spatial constraints observed in many villages where huts are clustered closely together are also partially overcome as the plant is constructed below ground. Being underground the Janata plant is somewhat insulated against temperature changes. In fact Janata plants constructed by Action For Food Production (AFPRO) in Delhi, Rajasthan, Maharashtra and Andhra Pradesh are known to be functioning well and even in Punjab and Uttar Pradesh they have done exceedingly well during the past few cold winter months. The Janata plant costs about 30 per cent less than the KVIC plant of comparable size and requires practically nothing for maintenance and repair.

Considering the above factors it is indeed surprising that as recently as 1979 the Janata model was known only in U.P. where roughly 50 plants were reported to have been constructed and were in operation. Even now perhaps of the multitude of organisations interested in the Janata model, AFPRO alone is working throughout the country for the systematic assimilation of this technology.

Problems in Extension

Some people fear that the propagation of the Janata model will result in the closure of the small private sector units manufacturing the KVIC gas holders. But can one foster the interests of a few businessmen in preference to the larger interests of the nation? Where is the justification for propagating only one model in preference to others? Would it not be better to leave the choice of model upto the man who actually pays for it rather than to the promotional agency?

The problems of technology dispersion are magnified because the KVIC and many State Governments subsidise only one model. In these states absence of subsidies for the Janata plant deters many villagers from constructing it even when they are convinced of its advantages. It is in this context that the whole question of subsidies on bio-gas plants needs to be reviewed.

Although the Janata plant is cheaper, it is still fairly expensive and well beyond the means of many poor farmers. It stands to reason that only farmers who have the means can install them. Moreover, considering that at present biogas plants are primarily run on dung, the villager must be in a position to maintain atleast three heads of cattle for the economic running of biogas plant. Obviously a farmer who can afford all this does not necessarily need any subsidy. Then why not abolish subsidies altogether? In any, case, judging from the numerous requests AFPRO receives for technical "know-how" it can be safely said that there are many farmers who are willing to foot the bill for construction, irrespective of whether they get a subsidy or not. All that they ask for is "know-how" for construction and cement and accessories at reasonable prices.

Implicit in the above reasoning is that a very large number of the poorer villagers are not in a position to enjoy the benefits of this technology. Community bio-gas plants may be the only feasible answer for this class of the rural population. However, to convince poor farmers to pay for a community plant will not only be a Herculean task but in many instances they may not even have the resources to pay for the cost. It is for these plants, serving the poorer classes of the peasantry, that subsidies have a relevance. What is, therefore, suggested is that subsides for the family-sized plants be withdrawn while 100 per cent one time capital investment be made for the community sized plant provided the community undertakes to run and manage plants on a cooperative basis.

Considering the various constraints, such as unfamiliarity of rural masons with construction techniques difficulties of procuring cement, the fairly significant cost of the biogas plants, etc., it may be argued that research to develop a cheaper plant should be intensified.

At present most researchers are engaged in experimentation and designing new models to achieve recognition and plaudits in the scientific community. Nobody will question the desirability of developing better and more efficient and appropriate models, but technology already available should be given greater importance and be transerred to the villages as fast as possible. Also extension and propagation of biogas should be unbiased with equal publicity and infrastructural support facilities for all models. For this a national biogas extension organisation needs to be setup which would not only collect information on scientific developments but provide logistic, infrastructural, financial and technical support for the assimilation of all the available models. The choice of model should rest squarely with the people who are going to use the plant rather than the propagating agency. Extension education should be intensified as various studies indicate lack of awareness to be one of the constraints. The national biogas extension organisation should be entrusted the task of launching a massive training programme for teaching rural masons and artisans the art of constructing these plants as a measure for creating the infrastructural capability for a decentralised construction programme. □

A case study

Makhana Production and Marketing in Bihar

Dr. A. N. Jha *

MAKHANA (Euryola Eerox Sali SB) is an annual acquatic widely cultivated in north Bihar. It is a subsidiary occupation of people of the area.

There are over 60 thousand tanks and ponds in the entire State covering local water area of about 80 thousand hectares. Besides tanks and ponds there are big lakes also in the district of Champaran, Muzaffarpur and Darbhanga, having total water spread in the area of over 40 thousand hectarts.

About 60 lakh fishermen in Bihar belonging to Mallah, Kewat, Machua, Chaudhary communities and many tribals thrive on boat plying, fishing, makhana and trappa cultivation and other subsidiary occupation. These fishermen work as an organisation. But they are exploited by the middlemen. Their economic condition and standard of living are poor. They still live in abject poverty as major portion of the benefit goes to middlemen and other people. This study covers Darbhanga and Madhubani districts in Bihar. Makhana can, no doubt, help rise the economy of Bihar. to some extent. It has its social religious and economic value. It is an important edible nut and is also used for extraction of starch in textile mills. The fruit has also good amount of nutritive and medicinal value. In Ayurvedic book "Bhawa Prakash Nighantu" its usefulness in curing different diseases has been discussed. Makhana seeds are sprayed on water surface during the month of October-November when water is stagnant and a minimum depth of water around 4 ft. is maintained.

Harvesting of Makhana starts from the month of August-September and is completed by the end of October. The method of harvesting is a very cumbersome operation in which generally fishermen are engaged. It requires much more labour than other crops. It is a cash crop. There is another variety of Makhana which is called Tal Makhana (Hygrophila spinosa).

The total production of Makhana in Darbhanga and Madhubani districts is about 15,000 quintals per year. The gross return of 15,000 quintals Makhana at Rs. 2,000 per quintal (minimum prevailing market rate) fetch Rs. 3 crores approximately. But the growers get only Rs. 6 per kg. from the middlemen who sell it at Rs. 20 per kg.

At present, private traders who have the monopoly of purchase are exploiting the growers by way of advancing loan and thereafter making outright purchage at low prices. The sale price of Makhana ranges from Rs. 6 to Rs. 30 per kg.

Recently the State Bank of India has chalked out a scheme for financing the Makhana producers. But most of the producers are unable to get loan from the Bank due to lack of extension services. Co-operatives should be established among the fishermen. These cooperatives can reduce the exploitation by middlemen and improve the storage and marketing facilities and help the fishermen in getting loans from bank. Medicinal value of Makhana should also be publicised.

The village cooperative society may help in collecting the produce from growers on behalf of Vyapar Mandal Sahayog Simiti and Biscomann of NAFED can arrange for proper packing, transport, marketing etc. In order to create proper market the NAFED may also arrange for proper publicity about this product. This item can be exported also

If the State government in collaboration with Central government pays adequate attention to makhana, employment opportunities to the farmers and fishermen enhance immensely. □

*Co-operative Training College, Dehradun

STEP BY STEP

Small Scale Sector Makes Steady Progress

Small Scale Industries have made steady progress during the last few years. The small scale sector accounts for nearly 62 per cent of the total production of the village and small industries sector in terms of value added. According to the Annual Report of the Small Industries Development Organisation for the year 1980-81, the production of this sector increased from Rs. 7,200 crores to Rs. 19,060 crores between 1973-74 and 1979-80, accounting for about 28 per cent of the total industrial production. During the same period, employment in this sector rose from 30.6 lakhs to 64.6 lakhs. Exports from the sector amounted to Rs. 1,050 crores, representing about 16 per cent of the total exports during 1979-80. It is estimated that the production in the small scale sector rose to the level of Rs. 28,080 crores (at current prices) during 1980-81. As many as 2,35,300 small industrial units received technical, economic and managerial assistance from the Small Industries Development Organisation during 1980-81.

The annual growth of production of small scale sector during the Sixth Plan is aimed at 8.7 per cent. It is expected that by the end of 1984-85, production level of Rs. 32,873 crores would be achieved. Similarly, the value of exports is also expected to go up to Rs. 1,850 crores. The employment is likely to go up from 67 lakhs in 1979-80 to 89 lakhs in 1984-85. Besides producing consumer goods, the sector now produces many sophisticated and precision products like electronic systems, micro-wave components, electromedical equipment and TV sets. □

BHEL Bags FP Award

THE Tiruchirapalli Unit of the State-owned Bharat Heavy Electricals Limited has been given the 1980 All India Award sponsored by the Federation of Indian Chambers of Commerce and Industry, for significant contribution in the field of family planning and child immunisation in the country through its cafeteria approach. The integrated approach to family welfare planning with adequate aute-natal and post-natal, maternity and child health services has been successful in creating consciousness about the small family norm. Its efforts in the field of child immunisation as also providing anti-anaemic and vitamin A drugs to mothers and children are also commendable. □

Profit of BHEL

BHARAT Heavy Electricals Ltd., a public sector undertaking, made turnover of Rs. 776 crores in 1980-81 representing an increase of 10 per cent over the previous year's output. The company earned a profit of Rs. 35 crores. □

Organic Chemicals and Products from Coal

THE Central Fuel Research Institute, Dhanbad has successfully developed a technique to convert the macro-molecular organic complex of coal into simpler organic chemicals and products. A breakthrough in the oxidation technique which has been found very costly, is now achieved in CFRI in converting coal essentially with air and a small proportion of nitric acid into water soluble polycarboxylic acids which largely consists of mixture of aliphatic and aromatic acids and which, in turn, may be a good source of a host of aromatic and aliphatic chemicals and a base and intermediate for the synthesis of ion-exchangers, plasticizers, resins, fertilizers and the like. The new technique has now, for the first time, made the conversion possible with hardly one tonne of coal against 6-8 tonnes if oxidants required in all other processes. □

Mehsana tops in Milk Yield competition

IN the All India Milk Yield Competition, Mehsana District of Gujarat, bagged two 1st, and three 2nd and 224 consolation prizes. This is a new achievement for the district. A Mehsana buffalo, belonging to Shri Ambalal Maganlal Patel won the first prize of Rs. 2,000 by yielding 22.03 kg. of milk per day. The 2nd prize of Rs. 1,000/- has been won by Mehsani buffalo of Shri Hargovindbhai Joitabhai Patel. She yielded over 19.5 Kgs. of milk per day. The first prize of Rs. 2,200 in the Kankrej Cow category has been won by Kankrejcow "Kamdhenu" of Seth Shri Vitthaldas Hakamchand Gaushala by yielding 26.3 Kgs. of milk per day. Kankrej Cow "Malavi" belonging to Shri Fecharbhai Revabhai Chowdhary won the 2nd prize of Rs. 1,000 by yielding 18.28 Kgs. of milk per day. In the Cross Breed category of cows, the 2nd prize of Rs. 1,000/- has been won by the Cross Breed cow 'Krishna' belonging to Shrimati Menaben Revabhai Chowdhari. She yielded 29 Kgs. of milk per day. □

TRENDS

Domestic Planning Endeavour

THE Minister for Planning and Labour, Shri N. D. Tiwari has said that the Government has decided to pay full quantum of wages to the disabled employees instead of 70 per cent of wages being paid at present. Presiding over a meeting of the Consultative Committee attached to his Ministry in New Delhi recently he said it had also been decided to raise minimum wages in the mining industry by 16 per cent in view of the rise in the cost of living index.

Shri Tiwari said the Government was considering the question of evolving the basic principles which should determine a national wage policy. A Committee of officials had been appointed to draw the standard list of employments for which minimum wages were required to be fixed. The proposals for constitution of wage boards for sugar and construction industries and wage committee to revise the wage structure in the mica mines were being examined. Every possible measure was being taken to secure effective implementation of the existing schemes for workers' participation in management. Proposals for liberalisation of family pension and employees' deposit link insurance schemes were also under consideration. One of the essential objectives of the Government's labour policy, Shri Tiwari added, was to create an atmosphere of industrial peace and harmony essential for improving the industrial performance and production. □

Afforestation in Ravine Areas of MP

THE Madhya Pradesh State Forest Department's afforestation work includes improving the 503 hectare area adjacent to Piprai and Naikpura villages on the southern bank of rive Chambal besides the aerial seed casting operations which would be carried over more than 2000 hectares in the ravines of Chambal to arrest soil erosion. □

Panel on Employment

A high evel committee has been set up by the Planning Commission to advise the Central Government on employment planning issues and to oversee the functioning of district manpower planning and employment generation councils.

The committee will suggest ways and means for encouraging self-employment in all the sectors of the economy to advise on matters relating to restructuring of employment exchanges to enable them to offer guidance to persons desirous of starting self-employment ventures, and advise on suitable steps to be taken at the district level for integrating the district credit plans, training infrastructure marketing facilities and guidance services.

Besides Dr. Swaminathan, who is the Chairman, the committee comprises 19 members officials and non-officials. □

Vishakhapatnam Steel Project

THE main construction work of Vishakapatnam Steel Projejct will start in October this year. About 16,000 acres of land out of the total estimated requirement of 27,000 acres have been acquired for the plant, township and other facilities. This information was given by the Minister for Commerce, Steel and Mines, Shri Pranab Kumar Mukherjee, to the Parliamentary Consultative Committee attached to the Ministry of Steel and Mines in New Delhi recently. He said negotiations about the Pradeep Steel Plant had been held between an inter-ministerial committee and foreign parties to firm up the prices and other terms and conditions. Final decision for the setting up of the plant would be taken after receipt of the recommendations of the committee.

The integrated steel plants under SAIL at Bhilai, Bokaro, Burnpur, Durgapur and Rourkela, Shri Mukherjee said, had produced 4,746 million tonnes of saleable steel during 1980-81, exceeding the previous year's production of 4,592 by 1. 54 lakh tonnes. Shri Mukherjee said that the production plan for the current year envisages, 5.73 million tonnes of saleable steel, 1,424 million tonnes of saleable pig iron and 7.21 million tonnes of ingots.

Elaborating the steps taken by the Ministry in the last few months with a view to making iron and steel materials more freely available to the industry and the general consumers, the Minister said that after the price rise for pig iron and steel materials allowed in the beginning of February 1981, items like semis, bars and rods were taken out of JPC control. As a result, the prices of these items were fixed according to the market conditions. With the same objective in view there had been substantial liberalisation in the new import policy whereby a number of steel items had been put under open general licence and would now be more freely available to the consumers. □

Air Force Scheme of Disabled Children

To mark the International Year of the Disabled, the Air Force Benevolent Association has introduced a new scheme to grant a sum of Rs. 1000 a year for three years for the purchase of medical aids for physically handicapped or mentally retarded children of serving Air Force personnel. They will also receive a monthly grant of Rs. 100 each for three years to meet expenses on specialised education to mitigate their disability. The Managing Council of the Association which met in New Delhi recently also decided to give an increased exgratia grant to daughters of service personnel who die in service. The amount of ex-gratia will be Rs. 2000 in case of daughters of officers and Rs. 1000 in the case of those of airmen. The Rehabilitation Grant given by the Association to airmen discarged on medical grounds has been increased from Rs. 1,200 to Rs. 2,400. □

BOOKS

Organising the Rnral Women

Role of Women in Rural Development—A study of Mahila Mandals, by S. P. Jain and V. Krishnamurthy Reddy, National Institute of Rural Developmeent, Hyderabad : Pages 93, price Rs. 16.

AS most of the rural life in India centres around women folk, it is legitimate to expect that women's organisations in these areas would be of considerable significance. Guided by this objective, the Department of Rural Development, Ministry of Agriculture and Irrigation sponsored the present study to collect field date and gather public reaction on the organisation and to suggest ways and means for making them more effective. The present publication is the result of this sponsored study.

Presently, the Mahila Mandals have been engaged in many diverse activities. In the beginning, the main emphasis was on child care, health and nutrition, promotion of home crafts and subsequently family welfare, adult education, cooperative sanitation were added to their activities. Now they are also expected to make an impact as far as kitchen, gardening, family welfare and such other activities are concerned. In order to evaluate the impact of the various Mandals in diffeffernt states in such activities, the project collected data from 15 Mandals in the states of Gujarat, Jammu and Kashmir, Orissa, Punjab and Tamil Nadu. The coverage was confined to aspects such as administrative structure and functioning, social composition, finances and activities. The information was elicited both by questionaire as well as interview methods. The administrative relationship between the various wings of the government working in this area does not seem to be very effective. In some of the states there is little coordination between agencies/departments concerned and the Mahila Mandals. The survey revealed that most of the Mahila Mandals have no constitution or rules and regulations for the conduct of their business. Even in those Mandals where there is a constitution, procedures were seldom observed. The membership during the last few years has not shown any appreciable increase. In some of the Mandals, Scheduled Caste and Scheduled Tribes showed significant representation. The income pattern of these Mahila Mandals indicated that 6 out of 15 Mandals mobilised their own resources while the rest relied solely on the grant received from the government for the implementation of different programmes, and most of the expenditure was incurred on construction and payment of office-bearers. An interesting finding of the report has been that "At times, it was surprising to find these women discussing freely the family planning methods with an outsider and that too a male. Needless to say, the Mandals had played a significant role in bringing about this awareness."

The study may be useful to the government for reorienting and making the programme effective and for directing their financial resources to the productive activities of these Mandals.

Ganga Madhava Rao

Investment Climate

Convertibility Clause & Investment Climate : by S. Jayapandian an IFMR Survey : Madras 1980; Pages 68; Price Rs. 15.

THIS booklet is a factual survey by Prof. Jayapandian of the conditions prevailing in the Indian investment market and how the convertibility of loans granted to industrial units by public financial institutions into equity has influenced the capital market. The survey was done on behalf of the Institute for Financial Management and Research, Madras.

Although it can be argued in favour of the convertibility clause from a narrow socio-economic point of view, in actual practice however, the clause appears to have done more harm than good to industrial development let alone investment climate. No doubt, the conditions have been relaxed now making it obligatory on seekers of loans of Rs. 1 crore or more as against the original limit of Rs. 50 lakhs to have the convertibility clause written in the loan agreement. Even so, the capital market has remained shy; and the learned author does not probe into the actual reasons why.

There is something to be said in favour of the argument put forth by the private sector that the convertibility clause in loan agreements is a subtle way of nationalising on-going schemes through the back-door. The author has not countered this view at all. He might have been handicapped in more than one way. But in a serious paper coming from him who has considerable experience of development finance, one would have reasonably expected him to have developed a little deeper into the whole dynamics of such lending instead of looking at the problem purely as a chronicle of events.

Practically speaking, it is abundantly clear that in the ultimate analysis the convertibility clause has definitely damaged the enthusiasm and initiative of the private entrepreneur. Since at present 90 per cent or more of the loanable funds are controlled by the 20 nationalised banks under government ownership and control, the private entrepreneur has no other alternative but to swallow the bitter pill. Whether such management of the investible money has served any meaningful or beneficial socio-economic purpose by generating a healthy investment climate remains a debatable point. On this the author unfortunately has not thrown any light although one would justifiably have expected him to give some original throught to this aspect of the problem.

—E.P. Radhakrishnan

Public Expenditure

Economics of Public Expenditure in Karnataka by M. C. Shanta Murty; published by the Department of Economics, Sri Jagadguru Renukacharya College of Science & Arts,, Bangalore—560009; Pages 28; Price Rs. 5.

THIS slender volume attempts to cover the pattern of public expenditure in Karnataka from 1957-58 to 1978-79. The author has examined the causes responsible for the rapid growth of public expenditure and has suggested the appointment of an Expenditure Committee to evolve guidelines for formulating a suitable public expenditure programme in the State.

According to the author, the non-development expenditure has been registering a remarkable increase in the last two decades. While it is true that the non-development expenditure has been at the cost of development expenditure, I am afraid how far the suggestions made by the author for slashing down the wasteful, unproductive expenditure on non-development account could be implemented.

Care should have been taken to eliminate the large number of printing mistakes in the book.

S. S. Rao

Our National Bird

Peacock—Our National Bird—by Ajit Kumar Mukherjee; Published by the Director, Publications Division, Patiala House, New Delhi; Pages 49 : Price Rs. 6.

PEACOCK, our National Bird, is the most colourful of all the birds and attractive too. Children and common men keep its feathers to decorate the house and do not have any idea of the bird beyond this. Of course, Hindus know that Lord Krishna adorned his crown with its plumes. But most of them are ignorant of the habits, history and economics of the bird and its place in art and literature. Exactly these are the aspects vividly, though not exhaustively described in this small book.

Ancient Sanskrit and other literature abounds in copious references to the enchanting bird and its intimacy with the human beings. It had been a messenger of love and had given its company to the lover and the beloved. Throughout the Indian history peacock has been adorned by the people. For Mughals, it was a family bird. Emperor Shahjehan was so much enchanted by the bird that he used to sit in a splendid throne in the form of a pair of peacocks studded with precious stones. This is the famous "Peacock Throne" for the possession of which many a ruler fought bitter battles.

The book, describing the magnificant creation of God Almighty, that is peacock, is printed on a beautiful art paper, narrated in lucid style with some attractive photographs studded at various places.

R. R. Rao.

Investment Management

Investment Management : Introduction to Security Analysis : S. L. Simha, D. Hemalatha and S. Radhakrishnan. Institute of Financial Management and Research, Publication No. 25, Madras, December, 1979, Page XV+810, Bibliography, Index, Price Rs. 100.

THIS is a highly instructive book on Indian stock market, written by a well-known economist of our country in collaboration with his two colleagues. Books on Indian stock market, which are few and far between, have been written as elementary textbooks. The present one is still a textbook but written in far more competent style and orientation. It has serveral distinguishing features which must be pointed out. It is far more comprehensive. Functioning of stock market is immensely complex and at the same time much less is known about it than about other markets. Prof. Simha and his colleagues have taken cognizance of this fact and analysed the technical features of the market to the fullest extent. Unlike the existing books it avoids repetitive description of the official institutions. Instead, it analyses the economies of the various forms of the financial instruments other than securities. Chapter Fourteen not only educates the general public regarding efficient use of their savings but also highlights the comparative profitabilities of those instruments. This helps in assessing investment and/or speculative character of the market. It is the first book in India which discusses Portfolio Theory (Chapter Sixteen) and Portfolio Management (Chapter Seventeen). In fact these two chapters alone elevate the book above the level of a text book. Investment management presupposes expertise in interpreting yield and cost of a security and knowledge about determinants of return. The latter is particularly essential for forecasting stock prices and stock yields. These form the foundation of optimum portfolio which may be defined as assortment of assets carrying maximum return and minimum cost. In other words, an optimum combination is possible only if forecasts are accurate; forecasting is accurate when determinants are identified correctly; determinants are identified with reference to yield, return and cost parameters. Prof. Simha has explained precisely these facts. Therefore, the book will optimally serve financial managers, graduate-level students of financial economics and the informed public.

The following two suggestions, may enhance the academic content and practical utility of this book.

The book deserved a chapter on New Issue Market. The public is generally more eager to know about the economics, functioning, rules and methods regarding floatation of new securities. It has an impression that they are more easily accessible while in fact they are not. Published data on volume of new issues, extent of subscription, premium and discount buying/selling are available. They could be put to examination for demonstrating the functioning of this market. There could have been another chapter on Share Price Movements in India which would examine fundamentalist, technical and random walk mechanisms even if cursorily. Particularly the current craze for random walk testing is too strong to be resisted. Passing reference is made to it on pages 667. Elementary testing, say in terms Runs analysis would be welcome feature of the book. The authors themselves very correctly enlisted factors which a priori weaken random walk possibility in Indian stock markets. This reviewer has a number of results to support this thesis (especially auto-and cross spectral results). As part of the second suggestion it may be mentioned that there is need for a section; reviewing the existing (some 20) studies on Indian share prices.

Suresh N. Kulkarni

Correction

In our issue dated 1—15 April 1981, the name of the reviewer of the book 'Inventory Management' has been inadvertently given as S. N. Kulkarni instead of Qamaruddin Khan. The error is regretted.

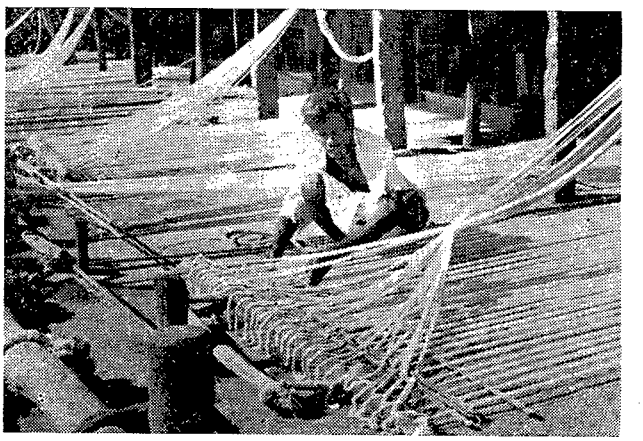
Editor

Shimmering silk carpets for sale.

Carpets for Foreign Markets

TRADITIONAL carpet weavers who adorn Bhavani Taluk, in periyar district of Tamil Nadu are manufactures of high class cotton and silk carpets, towels, lungis and bed sheets. These weavers of Bhavani are called Pandarams. One of the firms of Bhavani, run by Shri Mallaiyaraju of Kuppuswamy Pandaram & Sons, and has been exporting their products to African and Gulf countries and also to USA. Most of their products are sent through All India Handloom Fabrics Marketing Society Limited, Bombay. Being a member of All India Handloom Export Promotion Council this firm has enough work for 20,000 employees covering ten villages. Their daily wages range from Rs. 3.50 to Rs. 10 depending upon the quantum and size of work. □

A traditional weaver at work.



Regd. No. RN 949/57
P & T Regd. No. D (DN)/152
Licensed U (D)-52 to post without pre-payment at Civil Lines Post Office, Delhi

Minimum Needs Programme in Maharashtra

THE Minimum needs programme for bettering the lot of the poor is making a good headway in Maharashtra. The provision of direct and free services such as elementary education, housing assistance, better nutrition, rural health, rural roads, rural water supply, slum improvement and rural electrification are envisaged under this programme. The State's Sixth Five Year Plan outlay for this sector is Rs. 5800 crores-12 per cent more than the outlay in the previous plan. Reinforced by other rural development programmes M.N.P. is designed to eradicate poverty in the State where a little less than 50 per cent of the population lives below the poverty line. This in turn would help improve the consumption level of the poorest and increase their productive capacity. The implementation of this programme is also aimed at reversing the migration of people from the rural to the urban areas.

A large number of people from backward areas are benefiting from this programme. The case of a young man, Haribhau Jadhav of Bhiwandi taluka, bears testimony to this. His father died when Haribhau was very young. The family of five left behin could hardly make two ends meet. But Haribhau kept pursuing studies in a nearby school. Meanwhile, facilities like road, health centre, and supply of potable water were extended to the village. He utilised his spare time in running a tea stall or fetching wood and other forest products. Later on Jadhav was allotted two acres of land. This along with other schemes for helping the poor raised his hopes. He availed of all the chances and purchased a pair of bullocks with a loan granted by a nationalised bank. The land, the bullocks and the tea stall on the road side have brought a new ray of hope and pride in the life of Jadhav and his family.

Similarly there is resplendent charm and glitter of joy on the face of another young man, Keshav. Coming from a backward area of Thana district and possessing over three acres of land he never let despondency divert him from the path of progress. Soon after the village had a link road he took advantage of a government scheme to get himself a bullock cart. Besides the income from the land, he now earns upto Rs. 25 a day by carting bricks at the nearby kiln. He talks with pride about the future and looks forward to the time when his children will go in for higher education and bring more joy and fulfilment to his life. □

Haribhau Jadhav with his bullocks.

A village dispensary.

Printed by the Manager, Govt. of India Press, Ring Road, New Delhi-110064 and
Published by the Director, Publications Division, Patiala House, New Delhi-110001.