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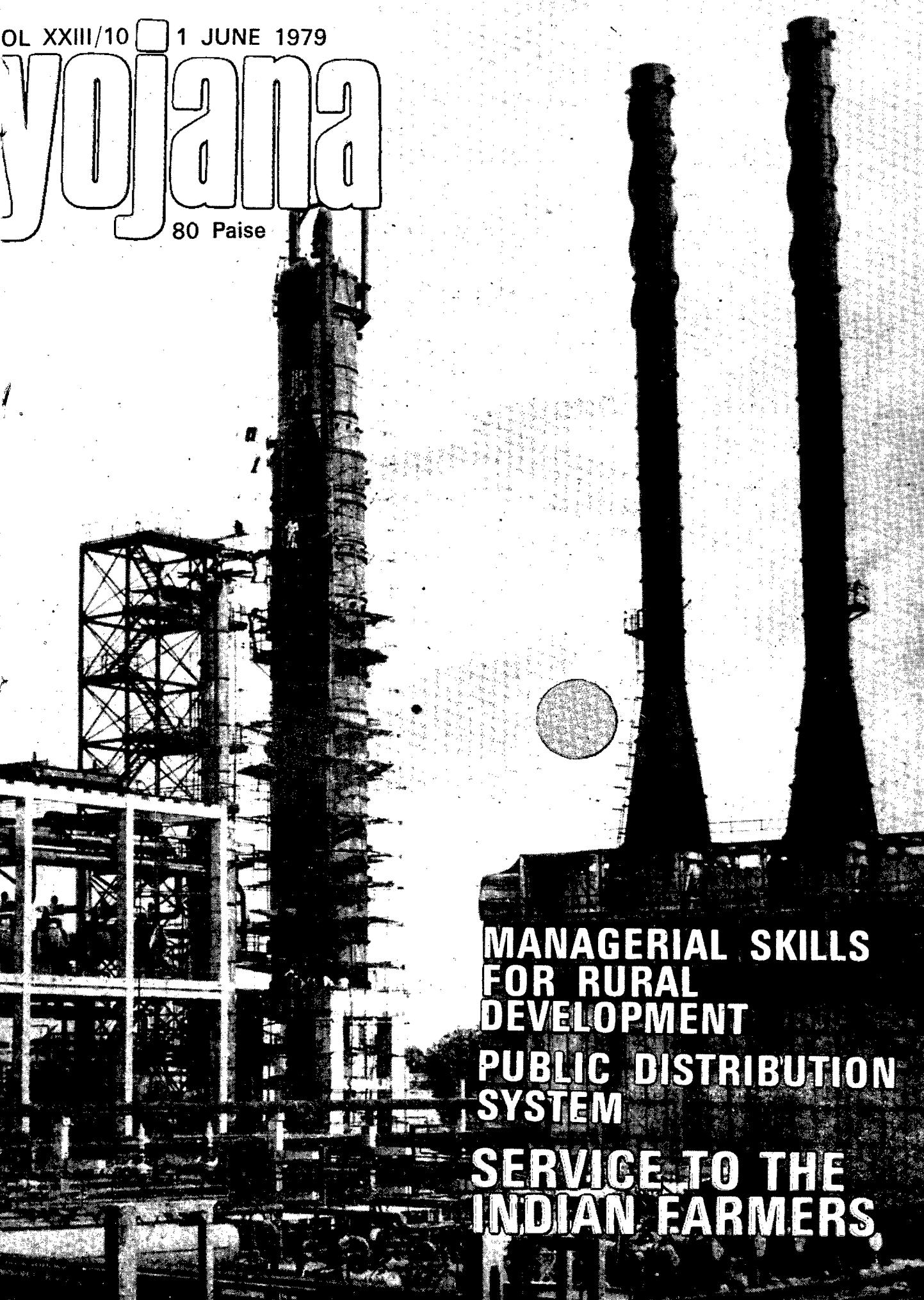

MANAGERIAL SKILLS FOR RURAL DEVELOPMENT

PUBLIC DISTRIBUTION SYSTEM

SERVICE TO THE INDIAN FARMERS

Our Achievements

First Indian Built Airport in Libya

THE FIRST Indian built Airport abroad was constructed by the International Airports Authority of India (IAAI) in the desert town of Ghat in South West Libya at a cost of Rs. 430 million. The construction included 3600 metres long main runway, a secondary runway of 15,000 metres, a parallel taxi-track and main apron.

In addition to the completed airfield pavement works, the Authority is also constructing a terminal building for the airport.

In the midest desert area, against very heavy odds like acute water scarcity and dust-storm 200 technicians completed the project within the time frame utilising highly sophisicated machinery.

Another Rs. 220 million airport construction project was given to the Authority in Libya at Brak, north of Sebha, the third largest city in the country. The National Building Construction Corporation (NBCC) associates with IAAI's construction in Libya.

Apart from the works in Libya, IAAI has a contract of building the Hulule airport at a cost of Rs. 86 million and a consultancy project for the Mafia airport in Tanzania. The Authority has at present Rs. 1,000 million workload in India and abroad.

Increase in Traffic at International Airports

INDIA'S four International Airport at Delhi, Bombay, Calcutta and Madras recorded an increase of 16 per cent in passenger traffic during 1977-78 over the previous year. During this year 86.5 lakhs passengers were handled as compared to 74.7 lakhs during 1976-77. The cargo handled for the year 1977-78 at the four airports was 1.48 lakh tonne registering an increase of 16 per cent over the previous year.

The Airport Authority earned Rs. 9.57 crore in foreign exchange from landing and parking charges from foreign airlines during 1977-78 as compared to Rs. 6.25 crore last year.

The capital expenditure of the Authority for the four airports was Rs. 10.42 crore during 1977-78, as compared to Rs. 6 crore during last year. The Airport Authority had invested over Rs. 34 crore on airport works and equipment during the past six years. During the year 1977-78 the Authority generated internal resources worth Rs. 6.24 crore.

The revenue of the Authority increased to Rs. 21.4 crore as against Rs. 13.95 crore in the previous year. It earned a net profit of Rs. 2.9 crore as against Rs. 91 lakh last year.

All-Time Record Production of Locomotives

THE DIESEL Locomotive Works (DLW) of the Indian Railways has achieved an all-time record by turning out 150 engins during 1978-79, bettering the earlier record of 140 engines. The turn-out of 130 complete locomotives during the year is also a new record exceeding the earlier record of 120 locomotives.

In money terms, the production at the DLW during 1978-79 was of the value of Rs. 54.7 crore.

The Diesel Locomotive Works is producing locomotives not only for the Indian Railways, but also for the Steel Plants in the country. The DLW has enough orders to fully utilise its capacity for the next three years. Plans are being drawn up to expand its annual capacity from 150 to 200 engines.

Nomadic Tribe Settles 'Amul Way'

NO LONGER are lambadis of Kolipalya village near Mysore nomadic now. Three members of this wandering tribe formed into a Milk Producers' Cooperative Society under the aegis of the Karnataka Dairy Development Corporation. In the beginning they started supplying five litres of milk every day to the Corporation. Within a few months the membership has gone up to 120 and the milk supply has crossed 300 litres.

Kolipalya and nearby villages of Veerenpura and Mukanpalva have a large population of Lambads. The coming up of the milk society has changed the life style of some of their families.

This is one of the 750 milk producers societies set up by the Corporation on the pattern of Amul milk producers cooperative societies. The society is managed by the members and a package of services including marketing is rendered by it to the members. The dairy corporation buys the milk from the soceity at a fair price. The profits earned by the society are shared as 'bonus' among its members.

Houses for Workers in Public Sector

A SPECIAL housing scheme for workers employed in public sector undertakings, has been promoted by the Housing and Urban Development Corporation (HUDCO).

Under this scheme, public sector undertakings can avail of loan assistance for construction of houses for their employees of all income categories for allotment on Hire Purchase basis. The rate of interest charged by HUDCO varies as per income category of the employees. For low paid workers with monthly income not exceeding Rs. 350 the net rate of interest is as low as 5 per cent with repayment period of 20 years.

HUDCO has recently sanctioned loans of over Rs. 5 crore to help Steel Authority of India (SAIL) and Bharat Heavy Plates and Vessels (BHPV) to construct 2466 houses of various categories for their employees. The houses will be constructed at Rourkela (Orissa) and Vishakapatnam (Andhra Pradesh) and allotted on hire purchase basis to workers of these public sector undertakings.

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Editorial

Thoughts On Energy Planning

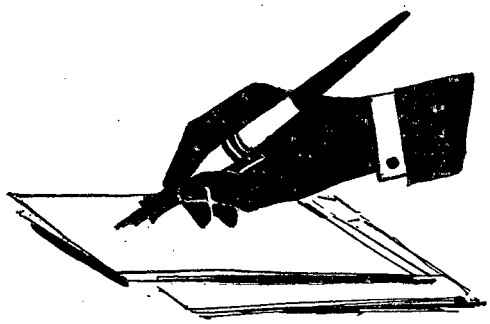
OUR SCIENTISTS did not share the conviction of Dr. Rajendra Prasad, then President of India, when he asked them to manufacture solar cookers. He thought it was eminently suited to tropical conditions with plentiful energy emanating from the sun for nine months in a year. Although he was fortified in his belief by his own cooking experiments with a solar cooker during his prison days, the scientists made a mess of it. Their tailism to the advanced countries of the West who had at that time plenty of oil as the principal form of energy, bred a sense of complacency and they did not take any initiative to evolve an appropriate technology for their developing country. Following the western model they lost no time to switch over their faith from oil technology to nuclear energy.

By a curious irony of fate, the world is now running out of oil. The advanced industrial countries have already started a crash programme for energy transition, which is, however a question of time. The wealth industrial world's energy problems dwindle into insignificance when compared to the crisis facing India. The possibility of our oil reserves going almost dry by the end of this century and the alarming prospect of continuous increase in international oil prices are forcing our planners and administrators to look for other sources of energy to keep the wheels of industry and economy moving. Coal is at best a temporary saviour. Our reserves are estimated to be 1,10,000 million tonnes, capable of meeting our requirements for about 75 years at a modest growth rate of five to six per cent. Water resources, which have not yet been fully exploited so far, cannot be the answer to the energy crisis. Hydel projects are costly, highly capital intensive and require long gestation periods. Even when fully exploited, it can at best contribute an equivalent of 135 million tonnes of coal by the end of this century.

The option naturally narrows down to nuclear power or known sources like solar energy, biogas and other biomass conversion techniques. The original belief that nuclear fission can provide clean, safe and cheap source of power has not stood the test of time. The risk of a reactor shutdown or other accidents and environmental pollution cannot be ruled out even though no major disaster has occurred so far.

The best choice appears to be solar energy, which is abundant, non-polluting and potentially cheap. Financial pressures are already pushing us along this way. It does not mean that we are making a choice for an antiquated, un economic and regressive system. The time is not far off when both the industrial and agrarian economies will turn to solar resources for their commercial energy. In countries like USA, many solar technologies already exist to provide energy in the form of heat, liquid or gaseous fuel and electricity. The photovoltaic or solar cell is at present the principal power source of orbiting satellites that carry much of the world's international telecommunication traffic. By early 1977 about 2 million solar water heaters had been sold in Japan. In Israel, Australia and USA these are also being marketed in large number. Through solar thermal power plants solar energy is being harnessed to produce electricity.

For a rural small scale decentralised industry which we consider essential for integrated rural development, solar energy-based small local power stations will be both economic and useful. Time is running out. If our scientists and others concerned make a sincere effort, India may even usher in the solar era before the industrially advanced world does.



Managerial Skills for Rural Development

V. G. Rajadhyaksha,
Member, Planning Commission

A GROWING and efficient corporate sector is a vital input into any national economy. There is no doubt it needs good men who will look ahead for the exciting and challenging opportunity of helping the economic development of this country. This developmental effort will create a new kind of managerial needs.

The Draft Sixth Plan provides new opportunities and presents the perspective of the future. It is perhaps necessary to dispel at this stage the illusion that seems to have been created in the minds of some people, including the business community, that this Plan is merely the result of the Gandhian bias of the present Government and that its rational is essentially ideological rather than economic. It is then argued that the Plan will change if the Government were to change and hence long-term forecasts of any kind based on the present objectives would be unjustified. This is simply not true. It is worth noting that State Governments run by almost every major political party have at no time raised any significant objection to either the objectives or the strategy of the Plan despite the numerous meetings of the National Development Council or its Committees and Working Groups that have been held since the Draft Plan was formulated. No Government or planner today can possibly overlook the massive problems of unemployment and poverty, primary education and illiteracy, basic health care and drinking water, housing and roads and their ominous impact on our population growth and income distribution. Given the resource constraints of a poor country there is no alternative to a strategy which, while minimising the capital output ratio, maximises productive employment opportunities and meets the demand for minimum needs. There is no doubt that the medium and large corporate sector has in the last 25 years made impressive contributions to creating technological capability and reducing our reliance on imports. On the other hand, it has made very little impact on reducing unemployment and has absorbed vast amounts of capital. While therefore I repeat that the corporate sector must continue to grow, the investment priorities must necessarily undergo a significant shift towards agriculture and allied activities and village and small industries.

From the convocation address at the Indian Institute of Management, Ahmedabad.

Our Strategy

Besides resources, our strategy must take careful note of three other constraints to which in the past we have as a country devoted little attention. These are the limits to our energy resources, the growing threat to the environment and the problems of metropolitan congestion. Happily, the rural development programmes with their emphasis on afforestation, reclamation, ability to use renewable pollution-free energy devices combined with the minimum needs programme suggest a way of dealing with these constraints also.

The only criticism of the Plan which however I do find somewhat difficult to answer with confidence is its implementability. To a very large extent the technical solutions to the three major problems of rural development, energy and the environment are known or within reach. The real doubts arise out of our capacity to apply them effectively. It is the implementation of the many programmes in these areas that is going to present the most formidable managerial challenge that the country has ever faced despite the fact that

financial and material inputs will not be serious constraints. But these challenges must be faced and overcome because this is the bed-rock on which all other economic development can take place. If we fail, I am afraid, the edifice of the entire corporate sector especially organised industry and many other institutions, will be seriously threatened. I would urge therefore that it is as much in the interests of the corporate sector as any one to see that the strategy succeeds.

Problems of Rural development

The problems of rural development, the bulk of the burden of this will fall on the existing district administration supplemented by established organisations like the KVIC, Handlooms and Handicrafts Boards and new bodies like the District Industries Centres which have been devised to bring about a degree of integration into the various specialised agencies, numerous other State level promotional agencies and the rural cooperative and banking infrastructure. Many of these agencies have done excellent work and have produced commendable results but it would be idle to pretend that, taken together, they have anything like the level of managerial expertise necessary to see through programmes of the magnitude and diversity that the rural development plan envisages.

My own view is that there is more than enough talent in the country for us to put through these programmes and an institution like the Indian Institute of Management could set an example as it did some 17 years ago when the major managerial gap was rightly considered to be the scarcity of trained managers for the private and public corporate sector. Today many other institutions, business schools and universities have developed some capabilities in this field. The larger and better managed corporations are running their own management development programmes taking in raw graduates. While it will still be necessary for institutions such as the IIM to continue to set new standards of excellence in the corporate management field, its real challenges to my mind lie elsewhere. One of these is to help overcome the managerial deficiencies in the agencies which are involved in rural development in which I include those in the smaller towns who form the hub of this activity.

It will no doubt be argued with some force that the IIM has trained its graduates with a sharp focus on professionalised corporate management and its ability to contribute to the task of development in the highly disaggregated, unorganised, widely dispersed and illiterate environment of the rural and semi-urban areas will be minimal. In fact it will be said that you will be taking a potential first-rate corporate manager and make him into a complete misfit. There are those who also argue that this activity requires a very different type of human raw material and different training inputs and it would be a mistake to mix these two types

Rational Thinking

I do not share this view. First of all our educational system has taught us is at least to think logically and rationally and to analyse problems in terms of their commercial, financial, technical and above all human content. It is difficult to accept that, given the right attitudes and motivations, many of these disciplines cannot be applied to rural developmental problems. Indeed, there are so many cases today where it has been done with resounding success such as the Kaira Cooperative, the Bhartiya Agro Industries Foundation and a large number of voluntary agencies who have recruited professional managers, that the issue cannot be seriously contested any longer. Your first Director himself has demonstrated by his personal example what can be achieved if the motivation exists. One could argue that the course work in management institutes ought to devote some more attention to the economic, social and technical problems of rural revelopment and would certainly commend this thought for the consideration of your Board. There is however an equally important reason why products of institutions like the IIM should get involved in the problems of our rural areas and that is the growing rural-urban gap not merely in terms of incomes, but in attitudes, language, value systems, and social and religious customs which must be bridged if we are not to have one day a major confrontation. The recent and unprecedently large rally of kisans in Delhi and the landless labourers are not to be dismissed as mere attempts at political lobbying and must be taken as symptomatic of a malaise which needs attention. It is only if the urban intellectual elite typified by the IIMs were to blaze the trail that others will follow. The creation of institutions specialising in rural development may perhaps be eventually necessary but their ability to keep the communication channels between the corporate sector with its urban bias and the rural areas open and wide would be more limited.

Is there any practicable way in which the talent emerging from such institutions can be involved in rural problems ? It would be hopelessly unrealistic to assume that all of you could afford to make the monetary and other sacrifices which such a step means, however idealistic you may be. It will also be some time before we begin to recognise where our major problems as a country lie and adjust our income and other policies to ensure that they allow the best talent to be devoted to solving them. I therefore offer a suggestion for what it is worth.

Managerial Trainees in Rural Programme

Would it not be possible for all these companies which you are joining to ask their managerial trainees to spend the first three years of their service, before they acquire the responsibilities that go with marriage and a family, in one of the blocks or districts of the country, especially one which has been chosen for the integrated rural development programme. They may need a short three-month orientation course which could be organised by the State Government and the Institute on specific subjects such as block and district level planning, organising village and cottage industries, helping to man the District Industries Centres and contributing to the efficient implementation of the minimum needs programmes especially in areas such as health, education, housing and water supply. It is not the functional expertise which by and large is lacking in cases such as the minimum needs programme. It is much more a question of providing a coordinating link and seeing that the organisational, procedural and logistical problems are tackled in a methodical way, that the concerned executive authorities are gently prodded into action and care is taken to see that the benefits reach the specified target group. None of these are simple tasks but they are the kind which an MBA, with their links to people who can collectively influence public opinion are well suited to take on.

Would all this be resented by the existing staff of the Government right upto to assistant collector or collector as an unjustified intrusion into their areas of responsibility? Perhaps if they felt that their jobs or promotional opportunities were at stake they might, but this is not what is proposed. On the contrary, the availability of a group of young men who are basically highly trained but do not wield direct authority is something they should welcome. Much will depend on the humility and tact the individuals bring to bear on their task, especially in terms of avoiding claiming credit and the speed with which they adjust to the village environment. One of the advantages they will have over their colleagues in the regular administration is that they are not beholden in any way to the power structure of the village and the district and their problems of politics, caste and religion are not likely to influence their actions. May I say that this is not mere speculation—I am aware of one or two companies who have tried this experiment and found that it works.

All I can say is if I were the Chairman of a company I would jump at the opportunity. Not merely, I may say, out of purely altruistic motives. I would do so also because I would get back into the company a basically better manager with his ego back into position, with many of his corners rounded, exposed to the realities of India, more mature, tolerant and humble and far readier to accept, by comparison, the life he will come back to if urban amenities is what he values. It would be preferable not to make such an assignment compulsory but let it be known that the so-called fast tract will largely be served for those who volunteer and do well again not as a bribe, but simply because the company will get a better trained man who deserves special consideration.

Perhaps not all will come back. Indeed, I would expect a few truly involved people not to come back, but this would be the least a company could do for what is in fact the long-term salvation of the country. In the longer term however, I find it difficult to see an income distribution pattern, at present so heavily weighted in favour of the less critical urban corporate sector, surviving a situation where the demand for managerial inputs is going to remain consistently biased in favour of the rural sector.

Corporate Sector's Role

The only other thought that I would like to share with you is self-employment on which we are relying heavily for solving our problems of employment. Entrepreneurship qualities are not evenly dispersed throughout the country. Gujarat happens to be a particularly fortunate State. If we are however to achieve nationally the employment and production targets set for the small scale sector, it has to be far more widespread. Again, we run into the problem of the lack of financial-staying power amongst those who are trained and willing to take some risks. Moreover at the risk of being accused of suggesting that the corporate sector should be seen as a kind of panacea for all our ills, they have also a part to play in this task. The best suited for this task are those who have had perhaps two or three years of operational experience backed by an exposure to all the major corporate activities during their probationary period. Is it not possible for companies to give them a couple of years of leave to try and see whether they cannot be set up in their own business and provide them with the necessary guidance in formulating and implementing small projects? Activities connected with their own business, so that marketing is not a problem, are obvious areas. With the kind of financial assistance banks give these days, the capital contribution that the individual has to provide is not so large as to be beyond his capacity. At the moment, such entrepreneural stimulus is confined to family-owned companies helping their sons and relatives to set up ancillaries and this slightly incenstuous business activity has rightly come in for criticism. If however it gets expanded to true professional managers in the corporate sector, it would be providing a much needed stimulus to the achievement of the self-employment targets. □

Worker Turns Owner

D. Som

F. P. O. Portblair.

SRI S. C. ARUNACHALAM of Nayashar village of South Andaman block, engaged himself in all sorts of small jobs. During the Japanese occupation he was employed as an agricultural labourer and later as a plantation worker. He was in Government service for a long time. Whatever line he took to, he was not able to make his both ends meet.

Finally he decided to stand on his own legs. He resigned the Government job and took to agriculture by acquiring six hectares of land. To his rescue came a local bank which tendered a loan assistance of Rs. 13,000 under a scheme of total outlay of Rs. 25,000. In two hectares he started growing vine archard, vegetables, pineapple, arecanut and cocoanut. The rest of the land, being hilly could not be utlised. In addition, Malaysian variety of pan leaves, which were in great demand in the area, were grown in a portion of the cultivable land. About 150 metre long pipeline fetches water to irrigate the land.

Soon his efforts have started paying him rich dividends. The fruits, vegetables and the pan leaves have gained popularity both in the local and the Madras market. Now his annual income is about Rs. 40,000. Not only that, Sri Arunachalam, once a labourer earning a few chips, has now employed about 15 workers on his farm. Encouraged by the success, and equipped with finances, he now proposes to cultivate rubber and spices in the hilly land most of which still remains unutilised. □

Brahmakumar Bhatt

Chairman Indian Farmers Fertiliser Cooperative Limited

THE INDIAN FARMERS Fertiliser Cooperative Limited (IFFCO) is the Federation of more than 26,000 farmer-cooperatives from village to the national level, spread over sixteen States and three Union Territories. It is the single largest fertiliser producer in the country and biggest cooperative of Asia with an authorised capital of Rs. 200 crore. Indian cooperatives had been distributing above 60 per cent of the total fertiliser consumed in the country for serveral years. Yet, till the birth of IFFCO, they did not own any production units of their own. In a competitive situation, with parallel channels of distribution, cooperatives suffered from lack of supplies to match the requirements of agricultural seasons. This caused disruption to the system. Access to sources of production, of which cooperatives themselves were the owners, could alone ease the problems of distribution. The Indian Farmers Fertiliser Cooperative was born to meet this felt need of the farming community.

Share Holding

The membership of IFFCO consists of Agricultural Cooperative Societies at all levels, namely, National Federations, State Apex Institutions, District Societies and Village Cooperatives. The State Cooperative Banks have also contributed to the Society's share capital. It is a tribute to the Indian farmers that through their cooperative structure in ten States they contributed more than Rs. 10 crore to the share capital of IFFCO for the plants at Kalol and Kandla. The Government of India has also contributed Rs. 18 crore (Redeemable) towards the equity capital of the Society. The cooperative share holding of the society has come from ten participating States, namely, Gujarat, Harvana, Madhya Pradesh, Maharashtra, Rajasthan, Punjab, Uttar Pradesh, Karnataka, Tamil Nadu and Andhra Pradesh. For IFFCO's third fertiliser plant, being set up at Phulpur (U.P.) cooperatives are expected to raise additional equity capital of about Rs. 250 million. States of Bihar, West Bengal, Orissa, Himachal Pradesh, Jammu & Kashmir and Kerala, which did not participate in the capital of the Society earlier, have also joined in the common endeavour this time. The paid up share capital of the Society has risen from Rs. 5.5 lakh in 1968 to Rs. 760 crore at the end of December, 1977. The contribution of farmers cooperatives—about Rs. 270 crore—is gradually and steadily increasing which reflects the faith of farming community in IFFCO.

3 DPD/79—2

The total capital cost of the Society's Plants at Kalol and Kandla as completed, has come to about Rs. 97.6 crore that of Phulpur Plant is estimated at Rs. 171.75 crore. To meet the capital cost, IFFCO raised funds in the form of share capital and loans from Indian and Foreign sources which included Indian Co-operatives, Government of India, Industrial Development Bank of India, Life Insurance Corporation of India, Industrial Finance Corporation of India, Unit Trust of India, U.S. A.I.D., Dutch and U.K. Government etc.

Kalol Plant

The Kalol Fertiliser Project is located near Ahmedabad. An important characteristic of the site is that it is in the Centre of the Kalol Oil and Gas fields and the project is based on Natural Gas.

The 910 tonnes per day Ammonia Plant, designed and constructed with the cooperation of U.S.A. is the first of its kind in India and is based on latest technology on account of which the electricity consumption has been cut to the barest minimum when compared to other fertiliser factories of equivalent capacity. This plant has produced about 7.59 lakh tonnes of Ammonia upto June, 1978. The plant has been working at 90 per cent of its licensed capacity. The capacity of Ammonia Plant is proposed to be increased by providing some balancing equipment at an estimated cost of Rs. 9.25 crore with the help of the World Bank.

The Urea Plant of 1,200 tonnes capacity per day, was constructed in collaboration with the U.K. It utilises the latest Stamicarbon Stripping Process technology, which has many operational advantages, and is presently the most widely accepted process in the world for urea production. The total urea production upto June 1978 had been of the order of 9,14,514 tonnes.

Kandla Plant

The NPK plant located at Kandla, has a capacity of 1,200 to 1,800 tonnes/day of NP/NPK fertilisers, depending on the grade being manufactured. Raw materials used are Ammonia, Phosphoric Acid, Mono-Ammonium Phosphate and Muriate of Potash. The last three items are imported raw materials and this largely explains for the location of this plant at Kandla Port. The location is eminently suited for the eventual manufacture within the country itself of Phosphoric Acid which is presently imported. Detailed plans have already been drawn up for the purpose.

The plant is manufacturing two grades 12:32:16 and 10:26:26. The production at this plant has sharply increased from 60,000 tonnes in 1974-75 to 5,17,000 tonnes in 1977-78. Utilisation capacity of the plant exceeds its licensed capacity and now it is working at the rate of 140 per cent. It is proposed to double the production capacity of this plant at an estimated cost of Rs. 23 crore which will be met from the Society's own resources. After the expansion Kandla Unit will be one of the largest phosphatic plant in the world.

Ice-plant

To utilise the surplus Carbon-dioxide, a Dry Ice Plant was also installed at Kalol, which went into production in March, 1978. The dry ice produced at this plant has been well accepted by the Food Processing Industry and efforts are being made to stimulate the demand for this convenient refrigerant and it is planned to produce 1,000 tonnes of Dry ice during 1978-79.

Landmark

A significant and memorable event of the year 1977-78 was that in April, 1978 IFFCO's NPK Plant crossed one million tonnes of production. This performance was repeated by Kalol Plant by crossing one million tonne production of Urea during September, 1978. During the year ending June 30, 1978, the Society emerged as the largest single producer of fertiliser in the country. While the production in terms of nitrogen was about 10 per cent of the national production, the phosphate production by the Society accounted for 23 per cent.

The net profit earned by the Society during the year 1977-78 was Rs. 36.620 crore as against Rs. 24.585 crore during the preceding year. Such remarkable achievements are rare in the fertiliser industry and IFFCO's prestige has gone up considerably for such splendid performance.

Marketing

The main objectives of IFFCO's Marketing Programmes are : (i) to organise an efficient and effective system of distribution for IFFCO fertilisers, (ii) to promote brand-identity of IFFCO fertilisers among cultivators, (iii) to supply quality fertilisers to cultivators (iv) to develop a farmer-education programme designed to improve agricultural practices, (v) to help the 'Cooperative Distribution System' to develop on sound lines, (vi) to train sales-point personnel in salesmanship, service, and sound management practices, (vii) to provide Management and Consultancy Service to the Cooperative System.

As a result of aggressive sales policy coupled with effective promotional and educational services being undertaken by IFFCO, the sales have been rising according to the availability from plants and were of an order of Rs. 146.570 crore in 1977-78.

Extension Services

IFFCO has about 300 highly-trained and extention programme through field demonstrations, field days, farmers' meetings, adoption of villages for integrated rural development, participation in exhibitions and fairs and publication participation in exhibitions and fairs and publication of promotional literature. To make a complete package of inputs and information on the various practices aivailable under one roof, IFFCO has undertaken a programme opening of a number of Farmers Service Centres. Forty-three such centres have already been opened. The Society has also a programme on hand to set up a Farmers' Training Institute at the site of its fertiliser factor at Phulpur. At this training centre the farmers will be drawn from different states and will be taught by practical involvement the modern methods of crop production, dairy, poultry farming and fishery. A dry land demonstration farm is also planned in the arid zone of Kutch and the Gujarat Government has already allotted a suitable piece of dry land to the Society for this purpose. In the village adoption programme, besides working on extension technique, an all round socio-economic development of the area is sought. IFFCO has, so far, adopted 210 villages. These villages have the focus of IFFCO's attention of effectively bringing about positive emancipation of the rural masses

Role of Cooperatives in Dairy Development

B. S. Vishwanathan,
President,
National Cooperative Union of India

LIKE MANY other sectors of national economy, dairy also presents a paradoxical situation. It is reported that India has the largest population of milch cattle. But most of the Indian people are not in a position to get sufficient milk, which is so vital for the health of their off-springs. We are unfortunanately a country where per capita milk consumption is the lowest. The dearth of milk is further aggrevated by the manipulations of unscrupulous traders. The milk vended by private people is adulterated almost without exception in various ways. In order to escape from the hands of the law and the testing machines adultration of milk is now reported to be done with certain injurious components, what to speak of adding water irrespective of its purity. This position accompanied with the exploitation of the milk producers by the middleman creates a peculiar situation in the country for the dairy industry.

These apart, we find that availability of good quality cattle, good cattle feed, vaterinary services, processing and marketing infra-structure is very weak. It cannot be denied that without a minimum amount of per capita consumption of pure milk, the growth of the future generation will be badly hampered. It is equally true that the economy of the milk producers cannot be dragged out of the morass of vicious activities of middleman unless they are provided with a scheme to give them an economic price for milk produced. This scheme should also ensure that the milk procured from the producers is not adulterated and proper facilities of transportation, processing, marketing, storage etc. are provided to the milk. It is necessary that consumers also get good quality of unadulterated milk and milk products at reasonable price. After looking at various alternatives available including nationalisation of milk industry, one finds that within the frame work of democracy to which our country is wedded the only alternative is to create economic democracy for the producers of milk. Cooperatives are the only institutions which can provide the required infrastructure to the producers who will have a definite say in the management of their own cooperatives and the supply of quality milk and milk products at reasonable rates to the consumers.

Integrated Development for the milk production

The production of milk in the country is much less than its demand and this gap is bound to increase further over a period of time due to continuous increase in population. On the other hand the production of milk in the country has increased at a much slower pace. It has risen from 20 million tonnes during 1966-67 to the present level of 24 million tonnes. As a consequence, the per capita availablity of milk has gone down to around 110 gms. per head per day from 140 grams of milk during 1956-61. The problem assumes enormous size if viewed against the requirement of 210 grams of milk per head per day as recommended by the Nutrition Expert Group of the Indian Council of Medical Research. To get out of this situation, it is absolutely necessary to accelerate the pace of milk production, which evidently can be brought about by enhancing the value of production of milk per animal as well as productive animal population.

The enhancement of milk production is inevitably linked with the issue of scientific breeding, feeding and management of cattle; establishment, expansion and modernisation of milk processing facilities to cope with the consequent increase in milk production; establishment of additional chilling centres and milk plants, cattle feed factories etc. Above all remunerative payment of price to the milk producers is to be ensured. The dairy activity undertaken in the integrated form particularly by the small and marginal farmers can provide them a cover against the vagaries of the nature and also enable them to generate recurring income which shall augment their repaying capacity and in its timeliness.

Dairy cooperatives have a long history in the country. It starts from the year 1913 when the first diary cooperative was organised at Allahabad in U.P. But the growth of the dairy cooperatives has not been even and steady throughout the country. It was only in the 1950's that Tamil Nadu, Gujarat, and U.P. had made some headway in organising dairy cooperatives. Otherwise no organised attempts had been made for development of dairy cooperatives before the advent of Five Year Plan era. It was during the Plan Period that the importance of dairy cooperatives, being an institutional framework to provide supplementary incomes to the farmers particularly those belonging to weaker sections of the community, was recognised; and emphasis was laid on development of dairy cooperatives. Inspite of this realisation much progress could not be made and no sizeable expansion of dairy cooperative activity took place. 'Amul' the most prestigious venture in the cooperative sector particularly in the field of dairy industry did provide incentive in formation of milk producers cooperatives in Gujarat and other States also. These milk producers cooperatives are playing an important role in raising milk production as well as economic status of their members. There are at present about 20,000 functioning primary milk societies with a membership of 20 lakhs in the country. Their total sales are estimated to be of an order Rs. 175 crore. State level federations of dairy cooperatives have already been formed in five State and a Federation at the national level has also come into existence.

The progress in the co-operative activity has however so far touched only a fringe of the problem. It has yet to make a dent. This is largely because of the immense size of milch cattle and millions of milk producers that are either outside the fold of cooperative activity or are not participating actively. No doubt much more needs to be done in this regard, for which sustained efforts at all levels are required to be made.

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Solution

The Working Group appointed by the Government of India in 1962 to study the prospects of development of dairying, animal husbandry, stressed the important role of cooperatives in dairy development programmes. The project, "Operation Flood" has also laid emphasis on setting up of rural milk producers cooperative organisations to procure, process and market milk on the one hand and to cater technical inputs for milk production on the other. Keeping the integrated character of dairy development and the need for an infrastructure for providing alround assistance in its entire gambit, the importance of the cooperatives as the only instituion for upliftment of this weaker section of the community, has further increased.

In addition to SFDA and MFAL which have a special task of providing incentives to the lending agencies for greater coverage of weaker sections, the cooperative credit structure has made arrangements for provision of medium-term loans to weaker sections of the community for purchase of milch cattle. National Cooperative Development Corporation of late, has also started playing a very significant part in the development of dairy industry through cooperatives. The National Cooperative Development Corporation has devised the schemes for financing dairy cooperatives for the purpose of organisation of medium and small sized dairy processing plants and milk chilling centres. In addition it has also been providing technical assistance to the cooperatives for undertaking techno-economic feasibility survey. The State Governments too have improved their veterinary services in the rural areas, which are mostly available through the agency of cooperatives.

The National Cooperative Development Corporation have devised the schemes for financing dairy cooperatives for the purpose of organisation of medium and small sized dairy processing plants and milk drilling centres.

Efficiency of any organisation, particularly of the cooperaive organisation depends upon the enlightenment of its members and operational efficiency of its employees. Education and training are essential ingradients of any business activity more so of cooperative activity which has social content also in addition to economic object. A sound infrastructure for imparting education to the members of cooperatives and training to their employees is available. This only needs to be taken advantage of by the dairy cooperatives through formulation of specific proposals for the training of managerial personnel and education of members.

The views expressed in National Conference on Dairy Cooperatives held at Jaipur in November, 1978 have further strengthened the conviction in the capacity and the potentiality of the cooperative structure in delivering the goods and realising the desired objectives of dairy development. It is heartening to note that the Government of Haryana has been quick to recognise the utility of this solution and is planning to take up integrated milk production programme on a massive scale. It is reported that the Indian Dairy Corporation and the Dairy Development Board have allocated funds for dairy development in Haryana on cooperative lines. It is a matter of time only when other State Governments also will realise the significance of the cooperative structure for implementing programmes of dairy development in their States. □

Indian Engineers Build a Refinery

Raman Patel
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SALUTE TO THE technical skill and talent of Indian Engineers and technicians, for they have been able to complete the construction of a 3 million tonne-capacity refinery from A to Z—working, drawings, detailed engineering, fabrication and procurement of equipments and construction including. This achievement is related to the expansion project, estimated to cost Rs. 55 crore of the present 4.2 million tonne capacity Gujarat Refinery near Koyali, District Baroda. The units was commissioned in October 1978.

Notable Achievement

The story of talent, skill, sense of devotion and hard work put in by our engineers and technicians, is quite interesting. The original proposal was to construct a refinery, only with a 2 million tonne capacity at an estimated budget of Rs. 30 crore. Before the construction of the Gujarat Refinery was taken on hand, Indian engineers and technicians had some practical experience from the construction of refineries at Gauhati and Barauni. Gainfully utilising their experience of the construction of these two refineries they prepared some of the working, drawings and also procured some of the equipments from within the country, thus effecting a saving of more than Rs. 4 crore. The refinery was commissioned in 1965.

Feather in the Cap

In the meantime crude oil was struck in North Gujarat and the need to increase the refining capacity of the Gujarat Refinery was keenly felt. It was decided quite appropriately, to add another one million tonne refining capacity and this task was accomplished mostly from the savings made during the construction of the Gujarat Refinery, in 1967. Further experience gained during the working of the refinery inspired our engineers to effect some changes and modifications at marginal cost. They were carried out successfully, with the result the capacity of the refinery was raised from 3 million tonnes to 4.3 million tonnes. Now, by completing the task of constructing a 3 million tonne capacity unit, they have added one more feather in their cap because this means construction of a refinery, 3 million tonne in size all on their own.

A notable feature of the Gujarat Refinery Expansion project is that unlike the original Gujarat Refinery, it is a compact and well integrated unit, along with seven other processing units. In the Gujarat Refinery, there are three distillation columns, each with one million tonne capacity. Against this, in the expansion project, there is only one distillation column with three million tonne distilling capacity. All these units are operated from a single Control Room. This ingenuity in designing has saved the construction cost of a large number of storage tanks and laying of long pipe lines of various sizes. The processing units, integrated with the expansion project are given below.

Name of the Unit	Unit/Capacity in million Tonnes Per Year
Visbreaker	1.00
Vaccum	0.80
Bitumen	0.25
Naptha Merox	0.10
Kerosene Merox	0.60
L.P.G. Gaustic Wash	0.05
Naptha Caustic Wash	0.60

Another notable feature of the project is the construction of four huge storage tanks—so far the largest built in Gujarat. With 56 metre diametre and 14-4 metres height, each has a capacity of 30,000 KL. About 850/900 tonnes of steel has been used in the construction of each tank costing Rs. 50 lakh each.

Indigenous Know-how

The engineering process for the Expansion Project has been primarily done from the indigenous know-how, except for two small areas where the processess were protected by foreign patent rights and had therefore, to be imported. This constituted only a small fraction of foreign exchange outgo. Almost all the equipment, used in the project, are indigenous. Only

some raw materials such as carbon steel, alloyed Steel, and some special types of pipes and tubings, not available in the country, were imported, at the cost of about Rs. 6 crore, which is just about 10 per cent of the total construction cost.

Pipelines

The design of the Expansion Project is based on 50 : 50 mix Rumaila (Iraq) and Light Arabina Crude. The crude available from Bombay High field is also processed in this unit. The crude from the Middle East areas and Bombay High Oil field, taken to Salaya, the oil port on the gulf of Kutch and from there, to project site through a pipeline. Large size tankers have been ordered by the Shipping Corporation of India, to bring the Middle East and Bombay High crude to Salaya. In keeping with the modern trend of oil transport logistics and economy, single buoy moorings are connected to the Salaya shore installations by submarine pipelines. Crude oil is pumped from the shore installations, through a 28-inch pipeline which is common for the Mathura Refinery as well as Gujarat Refinery upto Viramgam. From Viramgam to the Gujarat Refinery, there is a 45 cms. pipeline with all necessary intermediate repeater stations, communications systems etc., complete in all respects.

F.C.C. Plant

The Refinery authorities are planning to take on hand the construction of another plant called the Fluid Catalytic Cracking Unit (FCC) at an estimated cost of Rs. 40 crore. This project of great economic interest to farmers, small industrial units and housewives is likely to be completed in 1980-81. The package process for this FCC unit has been purchased from the United States, but all the designing and working, drawings, detailed engineering works, fabrication and procurement of equipment, construction and commissioning of the unit will be done by Engineers India Limited, another Public Sector Undertaking.

The need for this project arises out of the fact that the imported as well as the Bombay High Crude is of "SHS" (Low Sulphur, Heavy Stock) type. This process upgrades SHS into (i) Naptha (ii) LDO (Light Diesel Oil) (iii) HSD (High Speed Diesel Oil) (iv) LPG (liquid Petroleum Gas) popularly known as cooking gas, and will result in considerable amount of fuel exchange savings.

The LDO is in great demand particularly from farmers in Punjab, Haryana and Gujarat who for their engines, pumps and tractors use at present HSD which is costlier. The economic benefit from the low cost of LDO will flow to the farmers and small and middle group industrial units.

At present the production of LPG in the Gujarat Refinery is to the tune of 95,000 tonnes per annum. With the commissioning of the proposed plant, the production of LPG would go up to 2.20 lakh tonnes annually. This will ease the supply position of cooking gas so much that the house-wives will get their cylinder of cooking gas, at asking.

Some Salient Features of the Expansion Project.

Pipeline length of various sizes	**150 Kms.**
Cable Used	**170 Kms.**
Additional Railway Lines	**10 Kms.**
Railway Wagon filling capacity	**650 Wagon per day.**
Additional Employment	**300**

Gujarat State Small Savings Investments up

Gujarat secured an investment of Rs. 33.07 crore in small savings against its target of Rs. 25 crore for the year 1978-79. It is due to the exclusive performance of twelve districts in the state.

Among them Ahmedabad tops the list by mobilising, an investment of Rs. 6.16 crore, whereas Baroda secured Rs. 5.85 crore. The other districts in the list are, Surat Rs. 4.35 crore; Kutch Rs. 4.23 crore; Bulsar Rs. 3.23 crore; Rajkot Rs. 1.78 crore; Broach Rs. 1.04 crore; Surendranagar Rs. 92.54 lakh; Gandhinagar Rs. 36.82 lakh; and Dangs Rs. 5.83 lakh.

Communication and Rural Development

P. R. Dubhashi
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DEVELOPMENT is above all a human process and not just a mechanical or technological change. Development does not mean the construction of physical structures however imposing, installation of machines however complicated or adoption of latest technology however sophisticated. In the ultimate analysis, it is the develoment of people. Indeed, structures, machines and technology would not serve their purpose if the human beings are underdeveloped and hence are handicapped in utilising these as means of development.

Development of the people implies generating in them of the awareness of their surroundings, understanding of their problems, identification by them of opportunities available for a better life, a capacity to work out what needs to be done and formulate programmes to solve problems and fulfil their needs, goals and aspirations. If development of the people has to be accomplished in the manner indicated above, what is required is education of an entire people for a better living. This is considered of paramount importance not only in so-called developing countries but also in the developed countries.

Communication in Rural Development

Now where is the need for this is more imperative than in the field of rural development. That is why when the programme of community development was initiated in 1953, high priority was given to social education amongst men, women and youth and to extension as a basis of community action in the field of not only agriculture but all other aspects of rural life. Taking into account the importance of agricultural extension and social education, all development workers in the community development blocks including village level extension officers were educated in the techniques of extension and community work. Extension was a part of the two years course for village level workers, as well as shorter duration courses for other extension officers. Extension education institutions and social education training centres were specially established for the purpose. The underlying idea was that development programmes must go hand-in-hand with community education if the development office had an Information Centre where through charts, models and graphs the rural people visting the Block Office were educated in new techniques and ways of living.

In more recent years in the field of rural development more emphasis has come to be placed on the hardware of physical programmes and financial expenditure as compared with social education. Indeed, in many States it was felt that the programme of social education and the social education workers are redundant and could as well be done away with. Viewed in a long-term perspective, this must be considered to be retrograde step.

When the first flush of the enthusiasm for social education was over after about a decade of community development in the country, we seem to return to it in the form of radio and television. Radio Rural Forum or Charcha Mandals were established in rural areas to listen to the special rural broadcasts started at all the stations of the All India Radio throughout the country. It was expected that through these broadcasts new techniques and programmes would be communicated to the rural people and their discussions on the same would be fed back to the stations for further clarifications or elucidations. The Radio Rural Forum evoked some enthusiasm for a while, but it seem to have died out in recent years.

An outstanding experiment in the use of television as a medium of mass communication was attempted through the Instructional Television Experiment. It was an innovation of great significance for India's countryside. However, after the withdrawal of Satellite facility by the USA, the programme has come to an end. The rural TV sets are idle and their antenae are not lifting any programmes and have to await till we are able to set up our own Satellite. An evaluation of this experiment has been carried out and would be of use when the programme is renewed.

Integrated Rural Development

Integrated rural development implies development of all sectors of the rural economy and all sections of the rural society.

The rationale of development of all sectors of the rural economy is that they are inextricably interlinked with each other. Thus, agriculture is linked with allied activities like dairy, poultry, fishery and piggery, sericulture, sheep-farming, forestry etc. and with rural industry. Agriculture itself covers a vast field and has various aspects. Development of irrigation, rural electrification, plant protection, distribution of improved seeds, fertilizers and pesticides, agricultural extension, agricultural credit and investment, agricultural storage, marketing and processing, transport for movement of agricultural commodities, health, education and sanitation in rural areas, are so many aspects which are inter-linked with each other. Integrated rural development connotes suitable programmes in all these fields.

The rationale for development covering all sections of the rural society is that if modernisation of agriculture and increasing agricultural productivity and prosperity is confined to the larger land-holders, then small and marginal farmers and agricultural labourers will not be the beneficiaries of the green revolution and would provide a potential for a red revolution. It would lead to social tension and conflict. That is why special programmes like small farmers development agency (SFDA), marginal farmers and agricultural labour agencies (MFAL), drought-prone areas programmes (DPAP), rural works programme (RWP) and Antodaya programmes have been designed to deal with the less privileged sections of the rural society.

Need for Comprehensive Programme

A comprehensive programme of rural communication is required to deal with rural programmes covering all sectors of the rural economy and all sections of the rural society. The content, means, methods techniques and agencies of such rural communication programmes need to be discussed.

The rural development programmes in India have been going on since 1952 when the National Extension Service and Community Development pro-

grammes were initiated. They were followed by various specialised programmes of rural development like I.A.D.P., DPAP, SFDA, MFAL, IRD, etc. For reaching these programmes to the remotest corners of this vast country, a number of techniques were employed with different degrees of success. They could be listed as followed :—

(1) Visits to villages, organisation of demonstrations on farms, village meetings and seminars.

(2) Distribution of publicity material like posters and leaflets.

(3) Use of mass media of communication like film, radio and television; special mention may be made of the radio rural forum as also Instructional Television Experiment.

(4) Training programmes for farmers and rural leaders including village women and youth at the training centres.

(5) Exhibitions in the villages, at rural training institutions and agricultural universities.

(6) Mobilisation of rural institutions like Mahila Mandals, Yuvak Mandals, Cooperative Institutions and Panchayati Raj Institutions.

These different methods and techniques of rural communication can be employed singly or together. Thus, at the village meetings, demonstration, posters and exhibitions could be organised. Leaflets can be used as training material at the training courses given by the training institutions. The youth organisation can provide radio rural forum or a listening group.

The techniques also may be used in a sequence of communication. Thus, a village meeting or a demonstration could be used to pick up potential leaders. They can then be brought together for a training programme and then may be followed up in the villages through village visits, counselling and organisation of radio listening groups or television viewers groups.

Agents of communication

In the beginning, the communication with the rural people has to be made by the village workers. They may be either multi-purpose workers or single purpose workers like the agricultural demonstrators or the health or family planning workers. They have to be supported and supervised by the supervisory personnel at the Block and District level. The effectiveness and impact of communication, however, depends ultimately on the quality of the field or village personnel. They are the agents of change and hence also the agents of communication. They have, therefore, to be trained in the art and techniques of communication. The extension training in the country has been mainly organised with a view to impart skills in communication.

It has to be remembered that the radio, television or the printed word may reach the better-off farmers but not the small farmers, marginal farmers and agricultural labourers. Programmes of the SFDA, MFAL, IDP or Works Programme have to reach the illiterate people and people without access to the mass media. Financial institutions like commercial banks and the regional rural banks have introduced special assistance tor these havenots under the Differential Interest Scheme. If these new programmes have to reach the havenots, reliance cannot simply be placed on the radio, television or distribution of printed literature. Village visits and even door-to-door visits are required by the rural workers. Hence the importance of intensive work in rural areas by the field workers; mass media of communication or libraries are still not a substitute for intensive rural development work in the developing countries.

Thus while opportunities of communication through radio and television would have to be exploited to the maximum in the years to come, the more traditional media of communication should not be given up.

Communication and Rural Development

For communication to be effective, whether through radio television or otherwise, the communicator must work hand-in-hand with the development worker. The development worker knows what needs to be communicated, but perhaps not how. The technology and programmes to be communicated form part of what is called the stock in trade of the development work. What is, therefore, required is a communication between the communicator and the development worker before both could be effective. The communicator must look upon himself not as an independent entity but a member of the team of development workers.

Development is a micro-process whereas mass media of communication involve certain amount of centralisation. What is required, therefore, is decentralisation and localisation of the media of mass communication, whether radio or television or press. So varied are the socio-economic and agro-climatic conditions that centrally conceived and designed programmes are bound to be irrelevant unless they are completely transformed to meet the local situation.

We have to look upon communication policy as an integral part of the development policy. For every development programme there has to be a communication component. It is only when communication and development come near to each other then both have a chance of success. □

The effectiveness and impact of communication, however, depends ultimately on the quality of the field or village personnel. They are the agents of change and hence also the agents of communication.

Creating Mother and Child Institutions

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THE INTEGRATED CHILD Development Services (ICDS) programme was introduced in the Fifth Five Year Plan to make a concerted and coordinated effort to deliver a basic minimum package of health, nutrition and educational services in an integrated manner to the vulnerable mother (expectant and nursing) and the young child (0—5 plus years). In the Draft Plan 1978-83 the programme is stepped up so as to cover a much larger area and in particular the tribal groups of populations whose nutritional levels are proverbially low.

The pivot of the programme is the anganwadi, meaning a court-yard of a house where children and mothers assemble to receive supplementary nutrition and non-formal education. Anganwadis thus form the basic institutions for mother and child. These are the focal points of nutrition care and may be seen as 'growth centres', that is, the designated places which radiate their influences to the dependent populations in the hinterland villages around.

Thirtythree experimental ICDC projects were started in India in 1975-76 and continued in 1978-79. Of these, 12 were located in tribal areas and 14 in other rural areas. Four projects were located in groups of slums in Bombay, Delhi, Madras and Calcutta. Slums are known to prevail in almost all the nine Metropolitan areas in the country. May be, there is need to cover the remaining five cities, where more than 25 per cent of populations live in slums and hutments.

Programme Objectives

The main objectives of the Integrated Child Development Services programmes are :

(i) To improve the nutritional and health status of children in the age group 0 to 6 years ;

(ii) To lay foundations for the proper psychological, physical and social development of the child ;

(iii) To reduce the incidence of mortality, morbidity, malnutrition and school drop-out ;

(iv) To achieve effectively coordination of policy and implementation among the various departments to promote child development ; and

(v) To enhance the capability of the mothers to look after the normal health and nutrition needs of the child through proper nutrition and health education.

In sum, the programme seeks to create mother and child institutions for the delivery of a package of services. It seeks to lay foundations of such institutions which can be repleted in other parts of the country. In conception it is similar to IADP (Intensive Agricultural District Programme) which was introduced in the country a decade ago to increase food production or development of agriculture based on a 'package of services' of seed-fertilizer-irrigation inputs. Under the ICDS, the package of services are the health inputs-immunisation, supplementary nutrition, food and medicines, iron and folic acid and non-formal education aimed at the development of the child. It is basically an experiment to develop human resources and concentrates on 'mother and child' for creating happy homes. The beneficiaries are children of 6 months to 6 years age group and expectant and nursing mothers. The success of the programme depends upon whether it has reached the target population in specified manner and whether local institutions have been created to continue the activity as their programme. By September 1978, supplementary nutrition benefits were received by 218789 children 5 months to 6 years of age, and 46103 expectant and nursing mothers. Non-formal education was given to 107571 children and 43164 women attended functional literacy classes. In the ultimate end, the programme should be run by local agencies, the panchayats, Mahila Mandals and District Project Level Committees.

Progress in Implementation

On the whole, the stage has been well set in terms of equipping the centres with necessary health and non-health personnel required to assist the programme. As per reports flowing in, by September 1978, 28 out of 33 Medical Officers and 48 out of 62 Lady Health Visitors and 208 out of 228 Auxiliary Nurse Midwives were in position to man the 33 ICDS Projects. In 32 out of 33 Projects, Child Development Project Officers were appointed. Each project area has a number of anganwadis established at village level. Of the 3285 anganwadi workers sanctioned, 3247 were in position, 140 out of 159 Mukhya-sevikas were at work. On the whole, 87.9 per cent of additional health staff and 98.3 per cent of the non-health staff was in position in September, 1978. Allowing for the transitory staff, the position may be deemed to be satisfactory.

It is essential that the health staff trained in medical colleges in cities are given an exposure to the needs and style of working in the rural, tribal and slum areas. Training, hence, is part and parcel of the reorientation required to bring to bear the necessary dedication and zeal to further the programme objectives. All the staff, including the anganwadi workers and mukhya-sevikas were given training. They are similar to people on the lowest rung of the ladder nearer to the grass roots but at the same time need to be oriented to looking after children of various age groups, attract the beneficiaries to the anganwadis and sustain their interest throughout the year. Of the 3247 anganwadi workers, 2915 were already imparted training. Of the 140 mukhya-sevikas, 123 were trained. Besides, the additional health staff and the regular PHC staff were given training. As many as 73 Medical Officers, 81 lady health visitors and 338 auxiliary nurse midwives were trained. Paradoxically, more non-health than health personnel received training. Training of the re-

3 DPD/79—4

mainder of health staff, needs to be stepped up for 'bunching effect'.

Twentytwo primary health centres through which ICDS Programme is carried out are electrified. Sixteen PHCs are upgraded or selected to serve as 30 bedded rural hospitals. The health set up of 25 ICDS Projects have one or more independent vehicle in working order-27 projects have refrigerators in good conditions, 28 projects reported sufficient stock of medicines, 27 have sufficient stock of vaccines and 28 projects have adequate stock of iron and folic acid.

People's participation is satisfactory. Of the 3185 anganwadis functioning in 32 project areas, 2456 anganwadi centres are run in buildings provided by local bodies or by village and other communities free of rent. These, however, have to be of accepted norms or standards for healthy running in terms of space, ventilation and clean environment. Some anganwadis are run in temple premises. Anganwadi buildings need to be upgraded to satisfy the required norms.

Evaluation of the Programme

At the instance of the Planning Commission, the Programme Evaluation Organisation was called upon to take a countrywide general evaluation of the ICDS Programme. Base-line survey was carried out in July—September, 1975 and a repeat round a year later. Investigation was carried out by staff trained in evaluation work and located in its 30 field offices in various States. The baseline survey assessed the 'stage of preparedness' to mount the programme. The PEO prepared the Evaluation Report in June, 1977 and results were discussed by all those concerned with the implementation of the programme. Certain inadequacies, teething troubles, were then brought out. The inter se priorities among the different components of the programme were not well understood or not well recognised by the project authorities, means of effective coordination between various functionaries—BDOs, CDPOs, MOs—were not satisfactory. Survey and enumeration of households and beneficiary groups were not undertaken systematically but done hurriedly, supply of critical equipment like weighing machines was not satisfactory, supply of medicines and nutrition packets (food) was interrupted. The programme was at initial stages and certain 'out of control' points were not sized up. The Mahila Mandals were formed but remained non-working. Involvement of local women workers was thus lacking.

The outstanding success of the programme was in respect of children of age group of 3 to 5 years. Mothers were still shy to come over to anganwadis. Gradually programme has moved forward. The repeat round evaluation results are flowing in. It is too early to have final results of the investigation. But based on qualitative project level notes prepared by the evaluation officers the following preliminary observations may be made. Firm conclusions will await the final Evaluation Report expected to be available in early 1979.

It has been observed that during 1977-78, the percentage of children in 0 to 5 years age group participating in the programme at anganwadis has increased particularly in the case of rural projects—Dhakuakhana, Tarapur, T. Narasipur, Ukhrul, Thalli, Neelakottai, Choumanu, Shankargarh ; Tribal Projects located in Utnoor, Garhi and the urban project of Bombay. Coverage of children in 0 to 1 and 1 to 2 years of age has also shown good increase in number, both in rural and tribal projects. In the baseline PEO study, this target group was almost found neglected. There is definite improvement in respect of coverage of children in 0 to 5 years age group with respect to the programme of immunisation against various types.

In the feeding programme, the number of pregnant women and lactating mothers has also increased. Of particular significance is the fact that the food donated by the CARE and WFP have been replaced by local recipes/foods. Lack of proper storage facility, irregular supply of the food items and incomplete identification of severe malnutrition cases are yet positive limitations in the conduct of the programme. Records in regard to health check up are not properly maintained to assess the growth of the child. Here greater involvement and supervision of the health staff is called for.

On the community side, anganwadi level coordination committees have not been constituted in many cases and wherever these are constituted, these have not been effective. No regular meetings are held. Coordination at local level is very essential.

Suggestions

Certain suggestions to improve the Programme may now be offered. The training imparted for the various categories of personnel, particularly regarding health components and functional literacy is insufficient and should, therefore, be improved. The programme content may be given a tilt in the direction of health and nutrition rather than non-formal education.

Certain basic infrastructure facilities, especially those for health components, drinking water supply etc. should be ensured at the initial stages for the successful implementation of the programme. Supplies should be arranged in time and at regular intervals.

Project headquarters should be located within the ICDS Project area, particularly in the case of the urban projects. Supervisory staff should stay in the project area, if possible in the villages under their jurisdiction, to ensure effective supervision and impart necessary guidance to the workers at village level and to enlist the ready cooperation of local people. Local people and local organisations like Mahila Mandals should be fully involved in the implementation of the programme. Effective coordination with all departments concerned in the area, particularly with health authorities, is essential.

The Child Development Project Officer is the leader of the programme and much of the success of the programme will depend upon his own initiative, understanding, motivation and zeal. He must personally study the performances of all anganwadis in the area, identify factors of success and failure to take mid-course correction. He must monitor and continuously evaluate the programme by greater field supervision.

Tourism Prospects

S. K. Bose
Journalist

WITH THE phenomenal transportation breakthrough the world has become a global village where men and women leap the gaps of countries and continents in a trice. No wonder, tourism has become a flourishing industry all over the world, a major foreign exchange earner for many countries and a highly profitable economic proposition elsewhere. It is supposed to rank next only to the armanent and the petroleum industries.

Tourism in India is the sixth biggest foreign exchange earner. Statistically speaking India has reasons to be happy over the progress being made in this field. According to the annual report of Ministry of Tourism and Civil Aviation for 1977-78 India's gross foreign exchange earning from tourism was Rs. 283 crore when the country received 19.9 per cent more tourists than in the previous year. India shares still only about one per cent of the world's total tourist trade. Though India is nature's paradise and has an architectuaral, sculptural and artistic wealth, unless we are able to harness the world's almost unlimited wanderlust in sizeable proportions, these have no value. In its broad outline the Government policy on tourism seeks to strike a fine balance between foreign and domestic tourism. It may be summed up thus : while emphasis on developing foreign tourism would contiue, domestic tourism would also be given due importance. There is nothing wrong with the policy as such, but much depends on how it is implemented and what priority is given to it.

In Europe tourism is a highly organised industry working almost to photo-finish perfection. Europe's tourism success lies primarily in its sound domestic infrastructure which helps it sustain foreign tourist traffic of big dimensions. Its chain of hotels from the most posh to the most modest suit all kinds of pockets. Even its humble rural hotels do not by any means lack in respect of cleanliness, amenities and hygienic conditions of food and drink.

Some of India's metropolitan hotels in the public as well as in the private sector are luxurious to match the world standard. In India there are about 25 hotels which have been converted from the old princely palaces. Understandably these are meant only for the affluent Indians or foreigners. Whereas approved hotel accommodation is pitifully scanty. For 6.4 lakh foreign tourists in 1977 the number of approved hotel rooms available were only 17,362. The domestic travellers whose number is legion have to find for themselves just a roof over their head.

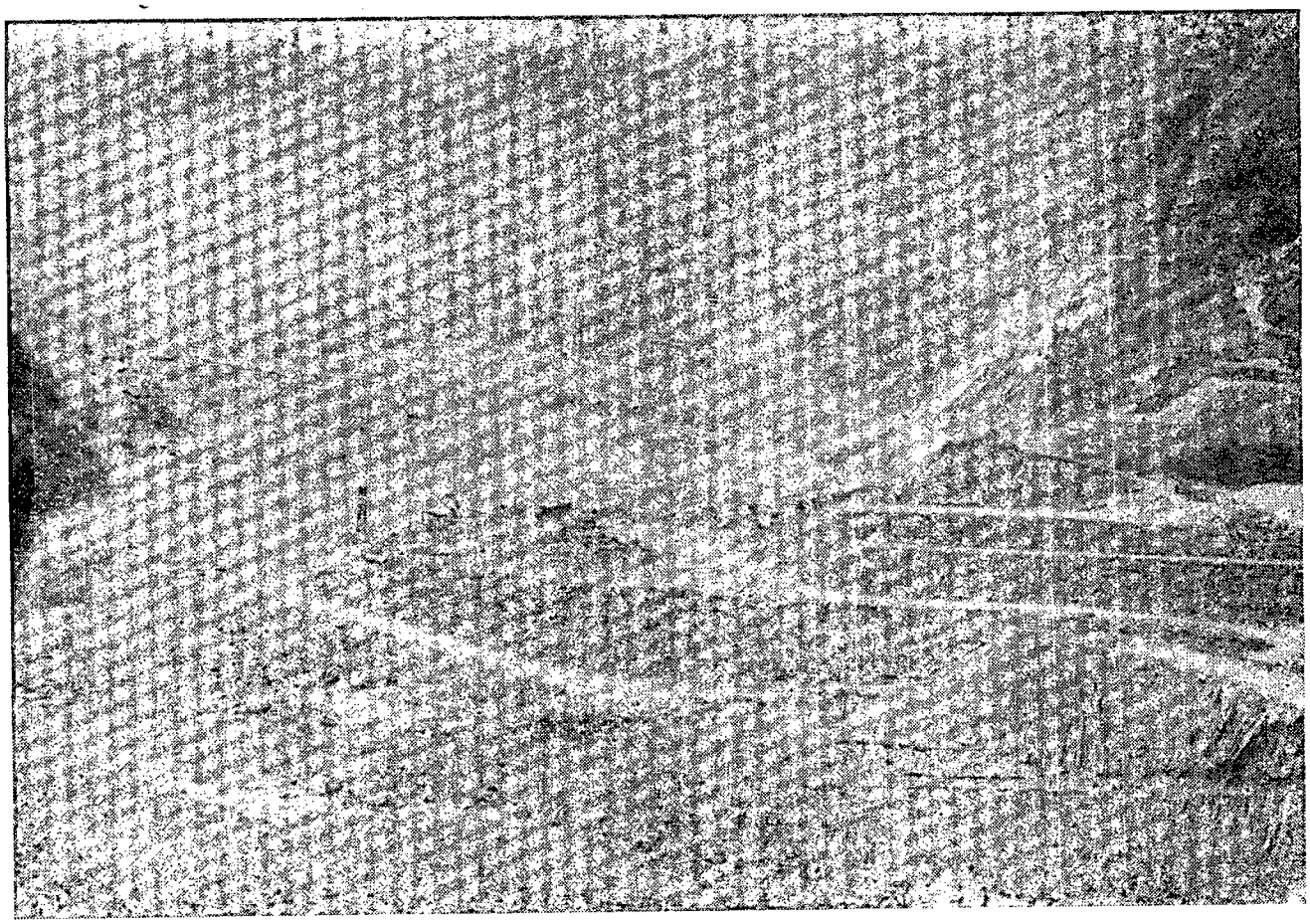
The success of India's effort to attract foreign tourists would almost wholly depend on the development of an infrastructure of domestic tourism whose horizons are virtually unlimited. Known as an invisible trade tourism brings about a silent but sure transformation in a country's development. If one compares the Khajuraho of today with what it was just five years ago one would not fail to notice the rapid transformation the sleepy village has undergone during this short span of time.

Transport and stay are the two primary problems of tourism, and in both these matters India has to make up much leeway. It would be a tall order to suggest that the country's transport systems which are far from satisfactory from the tourist point of view should be streamlined all at once. Till then however group tours of which some beginnings have been made may be organised on a big enough scale and on a regular basis. But since the Government agencies cannot do it alone the private agencies should be encouraged to undertake them. As regards, accommodation the Government's emphasis on developing Janata hotels and youth hostels is rightly placed. Road-side facilities which are now being provided in a rudimentary form by certain States like Himachal Pradesh, have to be vastly expanded. There are places of tourist interest which are not in the main focus at the moment. But given micro-level planning of facilities they can become popular resorts and draw a large number of tourists.

Admittedly the main crux of the problem is finance. The recent conference of the State Tourism Ministers which was also addressed by the Union Minister of Tourism and Civil Aviation brought out that in the central sector tourism has been allotted Rs. 63 crore only in the sixth plan as against the demand for Rs. 191.1 crore. This is apart from the State sector allotment of Rs. 46 crore, by no means a very big amount. In these days of escalating costs tourism would call for a big spending like any other sphere of development. In Rajasthan seven Janata hotels would be built at the cost of Rs. 82 lakh, as was given out by the State's Tourism Minister the other day. Even this may not be too big an amount considering the current price level.

It may reasonably be argued that in a country primarily of an agricultural and village-level production model, tourism is a rather wasteful exercise. But on a broader view this may not be supposed to be so. Tourism offers a double benefit, externally as well as internally. Its immense foreign exchange earnings potential calls for vigorous exploitation. In 1977, Britain earned as much a 3,000 million from tourism, although as a highly industrial nation it has many other sources of earning. Why can't India ? The impact of tourism, both external and internal, on the domestic economy is equally important. Its toning effect is all round. Even the rural areas stand benefied. It helps open up villages, set up ancillary occupations and give a boost to our neglected cottage and handicraft sectors. That way, it is quite in line with the Government policy of a rapid rural uplift.

What our tourism needs today is larger investment and an imaginative planning. Such an investment may not prove spectacularly remunerative in the short run but would prove highly profitable in the long run. Priority to tourism should be treated as a part of perspective planning. As regards handling, tourism, is highly sophisticated matter and should be dealt with expertise and imagination. □



Salal Power Project Reaches Take Off Stage

S. Narendra

ON THE EMARALD waters of the Chenab river, embracing Dhyangarh, a small hill amidst the imposing Shivalak ranges Salal hydro-electric project is being shaped.

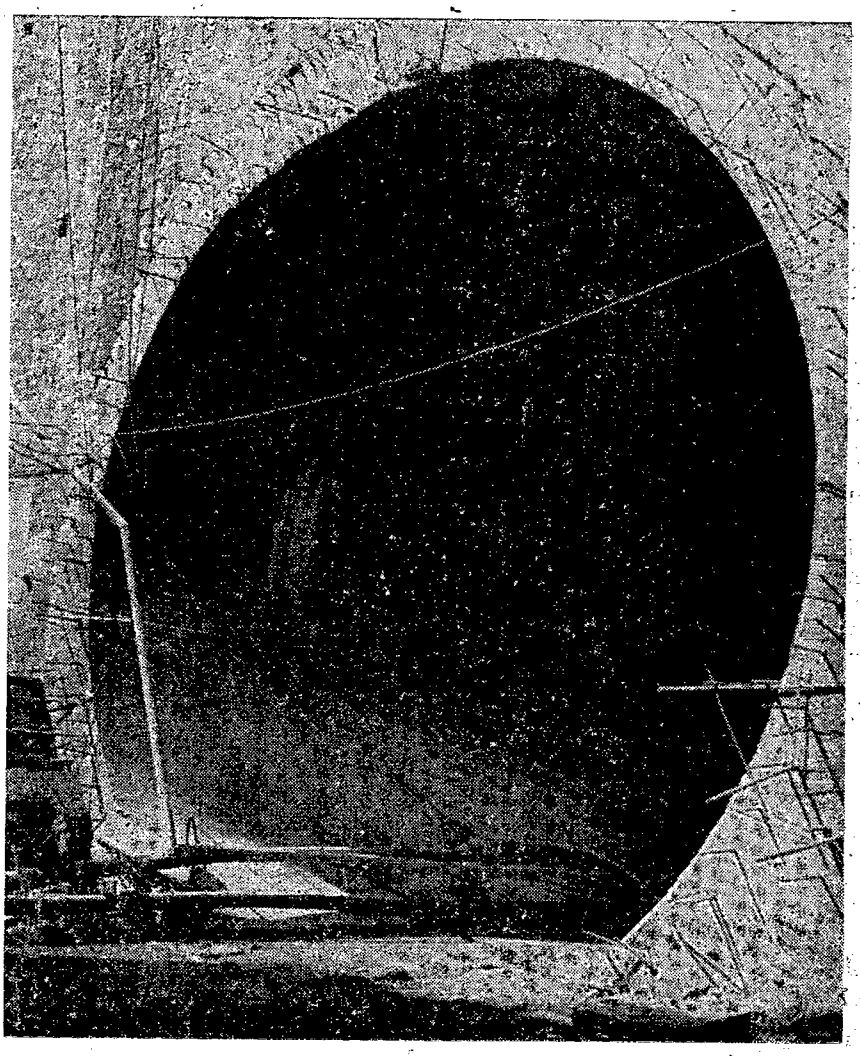
About 10,000 persons are working here to complete the ground work for the two dams, a diversion tunnel and the power house. Despite political and technical hurdles, the preparatory work done so far is impressive. It would save substantial labour and time in getting the project ready by 1985.

The project is a run of the river (without live storage of water) scheme meant to produce only power. The Chenab Waters will be impounded by a rockfill dam of 115 metres tall and about 600 metres long. On its left flank, a concrete power dam and spillway (coffer dam) of 110 metres high and 450 metres long, will be built. On the opposite bank the power house will come up 26 metres below the river bed. There will be three units of 115 MW capacity in the first stage. Three more similar units will be installed in the second stage. The waters from the turbines will be let out through 2.4 Km. long (tail race tunnels) twin tunnels burried under the hills.

To facilitate construction work, the river is diverted through a tunnel of 185 metres long, and 9.14 metre diameter, having capacity of about 50,000 cusecs.

The project is estimated to cost Rs. 220 crore and is the largest work in the Central sector in the field of power. Early this year the execution work has been entrusted to the National Hydro-electric Power Corporation, a public sector unit for development of hydropower. When the first stage is completed by 1985, it will generate 345 MW of power. In a year 2000 million units of power will be fed into the northern power grid bringing an annual revenue of Rs. 31 crore. So far, Rs. 70 crore, or one-third of the estimated cost, have been spent, mostly on creation of logistics and purchase of machinery and equipment.

To facilitate Construction work the river is diverted through a tunnel of 185 meters long, and 9.14 metre diameters having a capacity of about 50,000 cusecs.



The hockey-stick shaped diversion tunnel which is almost ready is proposed to be opened by February 1980. Soon after the monsoons in 1980, a diversion dyke will be thrown across the river. This will signal the start of construction of the coffer (concrete) dam and the main rock-fill dam. By 1984 beginning, the count down for completing the other stages of the project will earnestly begin, so that within a year power is generated.

For the rock-fill dam, one of the highest of its kind in India, the core trench has been dug and rock-fill material has been placed in some sections. About a million cubic metres of earth work has been done on this.

Over a million cubic metres of excavation work in connection with the power house has been completed. This power house work is being done by the National Projects Construction Corporation, a public sector unit.

The township at three different sites built earlier has now been found to be inadequate. It is being expanded. Same of the transmission lines, which will take Salal power to the grid, are ready and others are under construction. Some lines, built by Jammu and Kashmir Government when the project was under it, are already being used.

Hurdles

Every project has its quota of problems. At Salal. India and Pakistan came to an understanding on the project in May 1978. The technical aspects had to be cleared by both, after crossing the political hurdle.

The winding hill roads from Jammu, a distance of about 100 kms, obstruct the passage of heavy and lengthy machinery. The bridge across Tawi near Jammu can bear only 20 tons weight, whereas equipment as heavy as 70 tons have to cross it. The Nandini tunnel on the way has low head room. Now its bed is being depressed to gain head way.

The project has a School, a good hospital and other amenities for the workers who have come there from all parts of India

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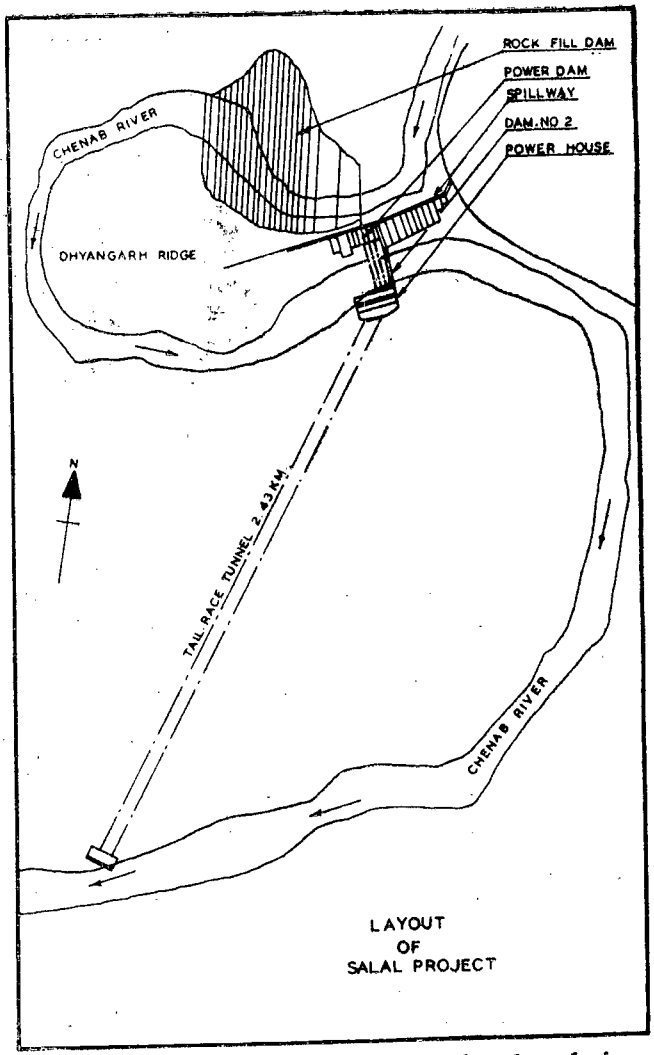
On the engineering side, Chenab refuses to be tamed. Its flow fluctuates between 4,000 to 400,000 cusecs. Winter rains cause floods; melting snows in summer encourage heavier floods; besides, there are flash floods. There are about 180 dry days for actual work but Chenab's anger claims many of them.

The soil around is loose and cause landslides. Rockfalls have claimed four casualties in 1978. Over 50 inches of rainfall aggravtes the communication problem.

Thirty feet below the planned foundation, the engineers have encountered tricky geology. As many as 12 week zones (shear zones), which cannot be strengthened by ordinary grouting, had to be specially treated. An elaborate test laboratory has been set up right on the site to check the quality of grouting of these at each stage. Evolving the appropriate treatment has taken some time. Even then, the work has reached the final stage. Elaborate instrumentation is being done to monitor the behaviour of the foundation after the dam is built. The weak zone treatment evolved is expected to be of great value in the execution of other dams on Chenab, where the geology would be almost similar.

At Dhyangarh fort, which is the project site, there are bull-dozers clearing up the land-slides, trucks hauling up construction materials over culverts, every where people are busy constructing the project.



A dam is a glutton for cement, steel and explosives and Salal needs 3,60,333 MT of cement, 25,333 MT of steel and 1,200 MT of explosives. Non-availability of these and other crucial construction material can throw work out of gear. □

Quantities of Key Materials Needed by Salal project

1. Cement	3,60,333 MT
2. Iron (MS plates, girders, MS rounds, etc.)	25,333 MT
3. Explosives	1,200 MT

LOAD OF WORK

1. Earth work	14.50 mil.cu.m.
2. Concreting	2.03 mil.cu.m.
3. Drilling and Grouting	0.50 million R. Metres

FIRST CLAIMED BY SALAL

1. Largest of the Central power projects under execution at present.
2. The first 'Pedestal' dam in the country.
3. The 'Rock-fill' dam of 115 metres is one of the highest structures of its kind.

DIAMOND INDUSTRY IN INDIA —An Export Outlook

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INDIA WAS FIRST to mine and cut diamonds and supply them to the world. It has also the unique distinction of being the first country where many important diamonds were discovered. The ancient field of Golconda in Hyderabad was the first bed of diamonds in the world, discovered about 2000 years ago. The famous Koh-i-Noor, Orioff, Great Mughal, Sancy, Hope, Shah, Florentine, Nassak, Regent etc. were some of the historic diamonds of India. Even in the by gone days, diamonds set in gold were the favourite ornaments. History testifies the fact that handcrafted jewellary from India was known the world over and adorned the proudest beauties and the crowns of many a monarch. Even today, some of the priceless gems from India glitter majestically in museums around the world.

Though India today may not figure prominently as a producer of rough gems, the art of cutting and polishing of diamonds is still known for its originality, antiquity and quality through out the world.

The diamond industry secures employment on a largest scale as well as earns large sums of foreign exchange. The industry employs over 2 lakh artisans at present as compared to only about 3,000 persons a decade ago. About fifty per cent of the exchange earnings represent value added element by way of the labour of artisans and craftsmen. Indian diamonds industry is virtually exporting labour, for, 'roughs' are imported from other countries for processing in India.

The diamonds cutting in India originally started at Panna and Banaras. Today it extends to almost the whole of Gujarat, Maharashtra (Bombay) Uttar Pradesh (Varanasi) Tamil Nadu (Madras), Rajasthan (Jaipur) and Delhi but 80 per cent of diamond cutting is done in Gujarat particularly at Surat, Navsari, Ahmedabad, Palanpur, Bhavnagar, Visnagar, Morvi and Rajkot. The artisans work in small units for the contractors who trade through jewellers in Bombay.

Export Trends in Gem Diamonds

Although India was considered a home of gem diamonds, it was only in 1962 that organised efforts were made to export gems and jewellery on a large scale when exports earned a revenue of Rs. 5 crore. During the period 1962—66 these went up to Rs. 10 crore. With the settig up of the Gem and Jewellery Export Promotion Council in 1966, the exports of gem diamonds increased sharply. Today India can claim to have occupied third place among the major diamond exporting countries of the world, having crossed the target (Rs. 350 crore) set for 1977-78.

The major markets of India's gem diamonds are the United States, Belgium, Hong Kong, Japan, Singapore, Netherlands, Switzerland, France etc. The US alone accounts for 20 per cent of the total export of diamonds. An interesting feature of diamond export in 1977-78 was that Belgium emerged at number one position in the export market of Indian diamonds pushing US to the second position. Still more interesting is the fact that Belgium and Israel two exporters of gem diamonds also import from India and export to other parts of the world as their 'own product', so as to own the credit for quality cutting.

Import of Rough Diamonds

The industry depends heavily on foreign countries for the import of raw material. Diamond Trading Company in London supplies us about 60 per cent of our requirements. Other sources of limited supply of roughs are the open markets of Antwerp, Zaire and Tanzania. The total import of roughs in 1976-77 was of the order of Rs. 184.30 crore which increased sharply in 1977-78 to Rs. 297.16 crore.

The Diamond Trading Co. (DTC) also known as Syndicate or Central Selling Organisation, is the world monopoly organisation formed to avoid competition which is considered harmful for such a trade. It being a monopoly organisation regulates supply to keep the prices high. Most of the countries mining diamonds have made agreements with DTC for the sale of their roughs. Unfortunately DTC supplies only smallsized rough diamonds to the Indian industry.

Eliminating Constraints

India is facing stiff competetion in the international market with Israel and Belgium whose workman cut and polish diamonds in a more scientific manner. Un-

like our exports of 'makable' stuff (not so popular in the US and other countries) these countries export 'sawable' diamonds which are more popular in the United States. Of the several factors hindering the export trade in gem diamonds, a few are: 1) inadequate supply of roughs 2) lack of finance and export credit facility 3) insufficient pubicity abroad 4) inefficiency of workmen due to poor working conditions and the like. Since the indegenous supply of roughs is negligible, as has been pointed out earlier, we have to depend on the supply made by the DTC and a few open markets. It is therefore necessary to augment the supply of raw material through liberalization of the imports of raw material and exploring new sources for mining in the country. Of the total requirements of roughs 50 to 60 per cent is met by the DTC and they can be persuaded for its increase. Further, there is need to lower the duty on the import of raw diamonds (which is being considered by the Government) or completely abolish it keeping in view the nature and usefulness of the trade. It is significant to note that rough diamonds are being smuggled into the country to the extent of Rs. 50 crore in an attempt to dodge the 5 per cent import duty which is considered a heavy burden on the trade. Another reason of the large scale smuggling is believed to be an obligation on exporters to buy 20 per cent of the roughs from the Minerals and Metals Trading Corporation which is reported to supply on prices about 15 to 20 per cent higher because of their commission, insurance, handling and service charges. As far as augmenting of local resources is concerned, the experts are of the view that the mines in Panna, Kollur and the exhausted mines of Golconda will yield more and better quality diamonds, if serious efforts are made in this direction. The attitude so far has been indifferent to diamond mining. According to experts, rough gem diamonds can also be mined in certain areas in Kashmir, Rajasthan and Madhya Pradesh as is evident from the available indications. It is, therefore, necessary to undertake geological surveys. It must be sufficiently clear that if the DTC monopoly has to be broken it would be necessary to develop our own resources.

The problem of finances and lack of export credit facility for the importers of Indian products are two important factors encumbering our export trade in diamonds. The credit squeeze policy of RBI has been deterrent on the way of getting liberalised supplies from the DTC. The foreign buyers are required to extend a minimum of 90 days credit to their customers who manufacture jewellery whereas our rivals like Israel offer long term credit facilities with a view to attracting more foreign trade business. As a result they depend on suppliers to augment their resources.

Advertising and publicity is necessary for augmenting the export of items like gem diamonds. Despite having occupied pedestral position in this trade in the past and maintaing a third place in the export of gem diamonds, India somehow has not emerged as a country that produces quality diamonds. The popular image of Indian gem cutting is that of a traditional industry using old-fashioned tools while fact is that the country's lapidarists have the best machinery. The low publicity budget is one of the reasons of this image, which is limited to a bare Rs. 20,000. Today, India has a reputation in 'makables' which is an insult to a country that has produced Koh-i-Noor, the Great Moghul, the Orloff and other well-known gems. There is much to publicise the fact that India cuts world's best diamonds and can process, bleach and drill pearls, that 'minakari' (enamel) jewellery is an Indian speciality and that only Indian craftsmen know, how to set jewellery in jade.

The poor working conditions in any trade whatsoever, affect efficiency of the artisans. Of the total of 10,000 units where around 10,000 cutters and polishers work, Surat alone shares 8,000 units where 90 per cent of cutting and polishing is done. But the place where the artisans work is hardly suitable from health and hygiene point of view. This requires to be improved in order to boost the efficiency of the workmen.

Needless to say, diamond industry of India is one of the most important exporting industry which has tremendous potential of labour employment. While in other industries an investment of Rs. 18,000 is required to create one job, the gem and jewellery industry requiries an investment of as little as Rs. 1,000 to provide employment for one person, with a worker earning, on the average about Rs. 300 to Rs. 400 per month. The industry is entirely indegenous and there is no foreign collaboration either by way of know-how or equity participation. This highly important industry has vast potential for development provided efforts are made to solve the problems. The setting up of the India Diamond institute by the Gem and Jewellery Export Promotion Council at Surat is an important development which will help training personnel in modern techniques of diamond processing and marketing. It will also help managing cutting and polishing units within the country. □

Heavy Unit Exports increased

The export performance of public sector units under the department of industry in January 1979 amounted to Rs. 56-60 crores. But the execution of export orders in December 1978 was only Rs. 14.48 crores. The value of export orders received during January 1979 was Rs. 3.80 crore. This was more than double the orders worth Rs. 1.63 crore received during December 1978.

The total value of export orders executed during April 1978 amounted to Rs. 226.73 crore. It was Rs. 178.38 crore during January 1979. The export orders of Rs. 846.54 crore worth are pending with the various public sector units at the end of January 1979. The major orders under execution are with EPI : Rs. 578.84 crore ; BHEL : Rs. 191.75 crore; HEC : Rs. 22.66 crore; Jessop : Rs. 10.90 crore and Braithwaite : Rs. 10.52 crore.

Prohibition : Pros and Cons

V. K. Sthanunathan
Member, Rail Tariff Enquiry Committee

EVER SINCE the present Government announced its decision to introduce prohibition in a phased manner there has been criticism, some veiled and others direct, against prohibition. Some have called the move a case of misplaced priorities. This article attempts to answer the arguments against the early introduction of prohibition.

The economic dimension

The first salvo that is always fired against prohibition is based on the question of the loss of liquor revenue. Critics have created the scare that there would be a decline of resources, thus hampering in turn development activities in the country. The case for prohibition is also fundamentally a fiscal problem. Where does all the liquor revenue come from ? The answer is simple—mostly from the backward and the economically poorest classes of the community. We must now ask ourselves the question : can the poorest sections of the people afford to spend their meagre incomes on liquor at the cost of more essential commodities like food and clothing ? Is not then prohibition aimed at enhancing the essential commodities by consumption of the poor through putting more purchasing power in heir hands ?

As the tax paid on liquor is only a part of the price paid for the liquor, the saving of the community will be larger than the loss of tax revenue to the Government. This saving will go to improve its nutrition and health, giving better clothing, housing and entertainment and bring about an increase in the general level of living. The excise revenue from liquor is estimated by the Jha Committee on Indirect Taxation to be about Rs. 460 crore annually. At the existing levels of taxation if the excise revenue is of the order of Rs. 460 crore the total expenditure on the purchase of liquor by the people should be of the order of over Rs. 1500 crore. What prohibition if properly enforced would do is to put Rs. 1500 crore more of purchasing power in the hands of the poorer sections of the community to spend on better food, better housing, better health and education and to improve their standard of living. Is this not the result contemplated in expending planned resources by the Government ? It will be seen therefore that the case for prohibition is primarily based on economic grounds for the improvement of the people.

Another point which is pertinent here is that the loss in liquor revenue would be partly made good by increase in excise revenue on other items or whose consumption increased. Prohibition would lead to enhanced consumption of essential items like food, clothing and other necessities, thereby increasing the excise and other revenues from sources other than liquor. New taxes to yield revenues to compensate the net loss can also be levied. In fact, many economic studies have shown that excise levies on liquor are regressive with the brunt being borne more by the poorer sections of the people. The State has to think of taxes more equitably spread over those sections who can afford to pay depending not upon the miseries of the drinking classes but on the rising living standard through affluence. As for the loss of employment in the liquor business, this will be offset by engaging them in other enterprises making essential goods on the purchase of which the expenditure of the public will be diverted.

There is no doubt that the success of prohibition would hinge on its firm implementation. It is here that grave fears are raised. A point is made that the introduction of prohibition would leave a trail of liquor tragedies by giving a fillip to illicit liquor distillation. The experience of the two States of Gujarat and Tamil Nadu, where prohibition has been in operation for several decades, would show that liquor tragedies are no more numerous there than elsewhere in India. A strongly committed government could prove equal to the challenge of enforcement demanded of this useful measure.

A social evil

To descend from the economic dimension to its social aspect is to further strengthen the case for prohibition. A great social evil, the harassment and ill-treatment of women and children may be traced to the drinking habit of the males in the poorer sections. This has brought in its wake the ruin of the entire family. Numerous are the cases where the wife's jewellery is pawned and the women folk are mercillessly beaten and the money which would otherwise go towards the children's education and better living, is frittered away on drinks in a fit of gay abandon. Prohibition's biggest salutory effect would be an improvement in the social environment. Is not social peace in the poorer homes worth the so called loss on liquor revenue to the Government ?

Two visual pictures always haunt me when I think of the subject—one is that of a tear-laden women, the wife of our neighbour in Kerala when I was a small kid in the 1920s. This house-wife every evening used to take shelter in our house to escape the beatings she would be subjected to by her drunken husband. Her gold and jewellery had been pawned and the family driven to economic ruin. Those mist-laden eyes of our neighbour's wife left a deep impression upon me as a child. The other picture is more recent—Calcutta of the 1970's. In the servant's quarters, attached to one of the officer's residences, the husband used to get drunk, create a brawl and beat his wife mercilessly. This sordid drama was being repeated daily and one day the grown-up son took up the cudgels to protect his mother and in this struggle the father was killed. The son today languishes in jail for homicide. Similar tragedies are being enacted in many a home in the villages and towns of the country. The financial appraisal of such an important measure only in terms of the loss of liquor revenue seems absurd in the face of the incalculable social loss to the community in the form of broken homes, neglected children and human misery.

The moral aspect

Let us now move from the economic and social benefits of prohibition to the moral aspect. Prohibition has been dubbed by some drink enthusiasts as a

moral fad of some puritans. It would be relevant to point out here that prohibition is comparable to Drug Control. When we can have a Narcotic Control Act, why not prohibition of liquor. As drugs lead to anti-social activities, so do drinks. Prohibition is thus only an instrument of the State to regulate anti-social activities. Mahatma Gandhi rightly wrote thus in 1921 :

> "You will not be deceived by the specious argument that Indians must not be made sober by compulsion and that those who wish to drink must have facilities provided for them. The State does not cater to the vices of the people. We do not regulate or license houses of ill-fame. The State does not provide facilities for thieves to indulge in thieving. I hold drinking to be more damable than thieving and perhaps even prostitution. Is it not often the parent of both ? I ask you to join the State in abolishing the liquor shops."

The liquor lobby has gone to the extent of quoting, or shall I say misquoting, from the Hindu scriptures to buttress its position. While it might be true that drinks were available in ancient India, it would be a travesty of facts to assert that there was sanction under Vedic religion or Hinduism for drinking. The mere fact of drinks being available or for that matter other vices being prevalent, does not imply their public acceptance. On the other hand, there are strict strictures in the Hindu scriptures, Shastras and Puranas against the evils of drinking. Drinking was considered as one of the Mahapatakas or serious sins deserving severe punishment and heavy penalties have been prescribed for drinking. It is common knowledge that over the centuries and to this day drinking is still frowned upon by society and persons who are addicted to drinking are still referred to in social circles with disparaging remarks. In regard to Muslims, the Quran condemns drinking strongly. Some of the Arab States have State-imposed prohibition.

There is a belief in some quarters that prohibition is an extreme step, amounting to moral compulsion and perhaps the same results could be achieved by recourse to educative publicity and propaganda. The point to remember here is that the ill effects of drinking are quite well-known and public opinion in India is already against drinking. Our people have been taught over the centuries to shun drinking. In this background is it proper for us to tempt the people with open liquor shops ? It is the free availability of liquor that has led to large numbers grabbing the bottle, perhaps, first out of curiosity but latter as a slave to the habit. The statutory warning that cigarette smoking is injurious to health is not preventing people—even very well educated people—from smoking as long as cigarettes are available.

An interesting point of view ladled out by some sections is the concept of permitting moderate drinking. This section argues that what needs to be abolished is not drinking, but drunkenness, not liquor but alcoholism. According to medical authorities, even moderate drinking over long period is injurious to health. Apart from this, all alcohol addicts are those who first started as moderate drinkers. Drinking to moderate drinking and to excessive drinking is one sequence which just follows. If therefore, alcoholism or excessive drinking is to be abolished, moderate drinking must be abolished.

Not by law alone

In the battle against drinking, in addition to legislation it is no doubt necessary to have educative propaganda. The press and the media have to play a constructive role in this. They must persuade, educate and bring home to the public the risks and dangers of the drink evil and the incalculable harm it does to the economic conditions of the poorer sections of the people. Law by itself cannot deliver the goods unless the appropriate social environment prevails. If liquor laws have failed in the past it is because anti-social elements in the society have found it profitable to break them. A civilised community cannot admit defeat. Liberty and freedom cannot be allowed to lapse into licence. □

Adivasis March Ahead

ADIVASIS OF WEST DINAJPUR district in West Bengal, as those in other parts of the country, are backward in all fields. To alleviate their hardships, 25 families were given 20 hectares of land, by the Government. But these poor people were at a loss to know what to do, as they had no knowledge of know-how resources and other essential ingredients for cultivation. At this juncture Sri Vayaram Oraon, one of the adivasis with progressive views, took the lead and initiated "joint farming". The help of the district authorities was readily available. Entire land was brought under collective farming. All the adivasis worked on the farm for daily wages. Agriculture department guided them as to how the farming should be conducted along modern methods and other wings of the district administration provided the necessary irrigation facilities and financial assistance. Thus the barren land was turned to a lush green field.

Did this movement stop there ? No. The cooperative effort forged ahead. Under the able guidance of Sri Oraon, the adivasis are relentlessly trying to extricate themselves from the age old backwardness. Their children now go to the primary school, to be taught by Sri Oraon and other teachers. Moreover an adult education centre started under his stewardship is trying to impart the three Rs. to the adivasis. He is able to open a craft centre with the help of Tribal Welfare Department. The Centre is providing some productive activities for the Adivasi women.

Thus the depressed and neglected people of Ariyagaon are progressing under the leadership of Sri Vayaram Oraon. □

B. B. Das

F.P.O.—Raiganj

Public Distribution System

THE PUBLIC distribution system in India has now become a regular and essential featuer of food management. The basic objective is that essential consumer article of daily use would be made available at reasonable price to the public, particularly the vulnerable sections of the society. This social objective can be achieved only if the Central and State Governments assume the responsibility for assuring availability of essential commodities and articles of mass consumption to the common man at reasonable prices.

The present public distribution system operates through a network of 2.41 lakh fair price shops of which about 1.88 lakh are in the rural areas. Out of these about 67,500 outlets are being run by the cooperatives.

Role of Co-operatives

Consumer cooperatives are the back bone of the public distribution system. The National Cooperative Policy Resolution adopted at the All India Conference of State Cooperation Ministers, in December 1977, among other things, lays emphasis on the need to build up the consumer cooperative movement in order to strengthen the public distribution system and act as a bulwark on consumer protection and as instrument of price stablilisation. Governoment gives preference to cooperatives while granting licence for fair price shops selling controlled commodities. The structure of the cooperative distribution system consists of consumer cooperatives in urban areas and agricultural or service and marketing cooperatives in rural areas.

Presenting the Union Budgt for 1979-80, the Deputy Prime Minister and Finance Minister Shri Charan Singh told Parliament that consumer cooperatives have been doing commendable work in supplying goods to consumers at reasonable prices. In order to encourage the development of such societies, so that they can play a proper part in the public distribution system that is sought to be developed, it has been proposed to raise the quantum of tax-exempt profits in the case of such soscieties from the present level of Rs. 20,000 to Rs. 40,000.

A four-tier structure of consumer cooperatives now covers most of the districts having a population of 50,000 and above. At the apex is the National cooperative Consumer Federation. Then there are 14 State Federations of Consumer Cooperatives and 476 wholesale Central Consumer Cooperative Stores. The latter have 3,500 branches (including about 200 department stores). At the botom are 15,873 Primary Consumer Cooperatives with about 2,500 branches engaged in the distribution of essential commodities. The total value of consumer goods distributed by consumer cooperatives during 1976-77 was estimated at over Rs. 10,040 crore.

Need for New Emphasis

Over a span of time the existing network of public distribution system comprising Government-regulated outlets in respect of food grains, kerosene, soft coke and controlled cloth, the retail outlets of consumer cooperatives in the urban areas and the rural cooperative outlets has expanded and grown in the size and volume of turnover. Even then the phenomenon of fluctuations in production and distribution of several mass consumption items still persist in out economy.

The very first decision taken by the new Government early in 1977 was to assign top priority to increasing the production and thereby availbility of essental articles, both agricultural commodities and manufactured goods. A proposal for increased production and distribution of essential commodities was outlined and circulated to the State Governments for their comments in February 1978. The replies received from the State Governments showed that they generally welcomed the basic approach. The scheme was discussed at the meeting of the Chief Ministers held in New Delhi on 5th January, 1979 and was unanimously endorsed by all the State for its effective implementation from 1st July, 1979. The salient features of the schemes

are as follows.

Area and Population Coverage

The general facilities under the public distribution system are normally made available for all sections of the population. Some States, at present, have, however, adopted a restrictive norm based on income criterion in respect of certain articles. The proposed system shall continue to be operated generally on an area basis as at present, leaving restrictions on the basis of income criterion to be decided by the States depending on local conditions and factors. The distribution in urban centres may also cover the student population, particularly those residing in hostels. In rural areas, the objective will be to ensure that every village or a group of villages having a population of 2,000 and above has a fair price shop. The headquarters of a village panchayat, irrespective of its population, may also have a fair price shop. In remote and inaccessible areas, particularly in tribal belts, the population coverage of a village or a cluster of villages, as the case may be could be even a thousand. State Governments will expand the retail outlets on this basis and as much use as is possible, will be made of privately owned fair price shops subject to their coming under the code of discipline prescribed, in addition to cooperative and public sector outlets.

Commodity Coverage

For the present, the coverage is proposed to be confined to the following commodities :—

(i) Foodgrains (wheat, rice and coarse grains);

(ii) Processed edible oils;

(iii) Common clothing;

(iv) Kerosene and soft coke ; and

(v) Selected manufactured items.

The inclusion of additional agricultural and industrial items may be considered for each region or State on the basis of an assessment of all relevant factors including modalities of their procurement, distribution and other arrangements for ensuring steady and regular supplies to the retail outlets, in consultation with the State Governments. Government of India is appointing a committee to identify industrial commodities to be included in the scheme.

Price Support for Agricultural Commodities

As a measure for encouraging more production, Government have already announced support prices for wheat, paddy, gram, groundnuts soyabean, sunflower seed, mustard seeds, arhar, moong and raw cotton. Adequate care is being taken to ensure that these are not only remunerative but act as an incentive for production and larger market arrivals in the harvesting season. Public sector agencies and cooperatives engaged in price support operations have been strengthened, both administratively and financially to ensure that they are able to purchase all the stocks offered to them at marketing centres, at the aunounced support prices.

Procurement, Buffer Stocking and Supply

For successful implementation of the scheme, it will be necessary to set up satisfactory institutional arrangements for procurement, buffer-stocking and supply, the responsibility for which will be assumed by the Central and State Government. For this purpose, stocking-cum-distribution centres will be located in each State/Union Territory. Subsidies, if any, by the Central Government will be confined to buffer stocking operations only. For the purpose of undertaking procurement and buffer stocking operations, a nodal organisation has been designated for identified commodities.

(i) Food Corporation of India in respect of wheat and rice;

(ii) Union Ministry of Petroleum/Indian Oil Corporation and other public sector Oil Corporations for kerosene;

(iii) Department of Coal/Central Agency for soft coke;

(iv) National Textile Corporation and National Cooperative Consumers Federation for common clothing; and

(v) A Central Public Sector Corporation (to be set up, if necessary) in respect of oils and oilseeds.

In respect of selected manufactured goods, the Central Government shall assist, where necessary, in the establishment of direct links between the manufacturers and the States|Union Territories and|or their approved agencies including cooperative for distribution of such items. A Standing Committee is proposed to be constituted by the Central Government to organise and coordinate such arrangements. At the State level the suply arangements will normally be made either through the State level Cooperative markeing Consumer Federations or Civil Supplies Corporations.

Public involvement and Vigilance

One of the important aspects of the scheme is the effective supervision over fair price shops. This is expected to improve a great deal through public participation, particularly in ensuring the quality of supplies, their availability at fair prices, better service to consumers and elimination of malpractices like "ghost" ration cards and adulteration. Consumers Committees with local public participation at various levels are proposed to be set up for this purpose. The State Governments should while, granting licences to fair price shops, stipulate suitable conditions so that licencees accept a voluntary trade discipline including supervision by the consumers' Committees.

Central Coordination Committee

Ministries of the Central Government concerned with the production of various essential commodities shall be directly responsible for the production and supply of the identified items. In order to review the progress of the scheme and to ensure the needed arrangements for coordination, a comittee is being set up under the chairmanship of the Minister of Commerce, Civil Supplies and Co-operation with the concerned Union Ministers and Secretaries to he Government in respective Departments as members.

Monitoring and Information System

Considering the added responsibilities of the Central and the State Governments, monitoring and information systems are proposed to be strengthened both at the Central and State levels. This will help in maintaining a constant watch on production, availability and prices of essential commodities and to take necessary action well in time whenever distortions appear.

The operation of a permanent public distribution can be successful only if there is a joint effort of the Central and State Governments. Their relative roles and responsibilities have also to be clearly understood. It is envisaged that the responsibility of the Central Government will be formulation of the National policy, adoption of measures for increased production, general price stabilisation, price support operations, imports, buffer stocking and arrangements for supplying to the State Government commodities for which bufier stocks are maintained. The State Governments will have to assume full operational responsibility for arrangements within the State for the distribution of essential commodities through the public distribution outlets. The State Governments will open additional retail outlets. Wherever, necessary, monitor and supervise the functioning of such shops, set up consumers' committees and assume all other administrative responsibilities that are necessary at the State level for the successful implementation of the scheme. Wherever possible State Governments will also have to ensure that cement, kerosene, paper, clothing and other items are distributed through these outlets, especially those run by the cooperative sector and ensure viability of these units.

Financial Responsibilities

As the Central Government will be assuming financial responsibility of a considerable magnitude for price supported and buffer stocking operations, for making available certain essential commodities to the State Governments, it may have to be ensured hat the benefit of subsidy on buffer stocking is not neutralised by the imposition of taxes or levies on such commodities by State Governments or by their recovering the cost of administrative over heads from the consumers. The State Governments may distribute such commodities, as far as possible, within the margin as may be agreed to by the Central Government. The State Governments should also consider relaxation of sale|purschase tax on essential commodities particularly those which enjoy a direct or indirect subsidy and are distributed through the fair price shops. Simultaneously, they should consider a reduction in the burden of local taxes on such essential commodities.

The operation of a permanent public distribution can be successful only if there is a joint effort of the Central and Sate Governments.

Welfare for all

The permanent distribution mechanism which the Government is seeking to create and put into operations from 1 July 1979 would aid and guide in the allocation of mass consumption items to all sections of the society in a fair and equitable maner, so that the unorganised sections of the society do not become victims of blind market forces. On the whole the new scheme is designed primarily to cater to the needs of the weaker sections of the society. □

Number of Fair Price|Ration Shops and Population covered by them

State	Number of fair price shops	Population covered (in lakhs)	As on
Andhra Pradesh	22,153	435.0	30-11-78
Assam	13,039	163.3	31-7-78
Bihar	27,109	632.3	31-10-78
Gujarat	8,956	325.5	31-10-78
Haryana	4,361	120.0	30-11-78
Himachal Pradesh	2,765	37.3	31-8-78
Jammu & Kashmir	1,167	41.9	31-8-78
Karnataka	14,642	293.0	30-9-78
Kerala	11,813	226.0	30-6-78
Madhya Pradesh	16,540	439.0	31-10-78
Manipur	435	13.5	31-10-78
Maharashtra	27,553	579.0	30-9-78
Meghalaya	1,393	15.9	30-9-78
Nagaland	38	1.1	31-8-78
Orissa	11,203	196.2	30-9-78
Punjab	11,834	167.9	31-7-78
Rajasthan	9,236	286.1	31-8-78
Sikkim	12	0.2	31-3-78
Tamil Nadu	9,850	490.8	30-10-78
Tripura	654	18.0	31-5-78
Uttar Pradesh	25,086	929.5	31-8-78
West Bengal	17,858	519.0	31-8-78
Total (States)	2,37,702	5,930.5	

Number Of Fair Price/Ration Shops And Population Covered By Them In Union Territories

Union Territory	Number of fair price shops	Population covered (in lakhs)	As on
A & N Islands	181	2.0	31-10-78
Arunachal Pradesh	110	1.5	30-9-78
Chandigarh	141	4.1	30-11-78
Delhi	2,193	54.6	30-10-78
D & N. Haveli	24	0.8	30-11-78
Goa, Daman & Diu	393	10.3	30-11-78
Lakshadweep	21	0.4	30-9-78
Mizoram	314	4.2	30-11-78
Pondicherry	176	6.1	30-11-78
Total (Union Territory)	3,553	84.0	
Total (All India)	2,41,255	6,014.5	

Irrigation Works

Under

Employment Guarantee Scheme

Smt. P. Deshmukh
Information Officer,
Maharashtra Information Centre,
New Delhi

THE EMPLOYMENT guarantee scheme, launched in Maharashtra in 1974-75 has attracted considerable attention all over the country because of its impact on the economic conditions of weaker sections of the community. The fundamental objective of this scheme is the guarantee given by the State to provide employment in manual work (gainful to individual and productive to community) to unskilled persons, in rural and 'C-class' municipal areas, who are in need and desirous of rendering manual work. As far as possible, work is to be provided within a distance of 5 kms from the place of residence of the needy persons. Wages are paid to the labourers according to the quality and quantity of work out-put without discrimination of sex. The work enables an average worker to earn Rs. 3 per day of 7 hours work.

The irrigation works find an important place in the scheme. Table 1 indicates the prominent role played by the irrigation department in the implementation of the employment guarantee scheme :—

Table I

Year	Total Expenditure on E.G.S. (Rs. Crore)	Expenditure incurred on Irrigation works	Percentage
1974-75	13.72	10.67	77.8
1975-76	34.43	17.93	52.1
1976-77	49.88	25.91	51.9
1977-78	52.50	26.20	50.0

On major and medium irrigation projects, excavation and earth-work for the canals is the most suited work for the scheme. For excavation in hard rock, drilling and blasting is done departmentally and much removal is done manually under the scheme. Canal works of the Jayakwadi Project and Ujjani (Bhima) Project have been completed to a large extent under this scheme. Earthwork for the earth dams is done under the scheme. Percolation tanks are mostly being done under the employment guarantee scheme. Near water scarcity conditions are prevailing in many areas of the State due to failure of the rains. In those areas, percolation tanks, village tanks and works in Canals have been undertaken to provide work for the affected people.

Sectoral distribution of expenditure under the employment guarantee scheme in the annual plan for the year 1978-79 is : Major irrigation projects—Rs. 11 crore, medium irrigation projects—Rs. 3 crore, minor irrigation works Rs. 16 crore, soil conservation and land development—Rs. 19 crore, roads and other works—Rs. 6 crore, forests works—Rs. 3.60 crore and administrative charges—Rs. 1.40 crore.

The number of irrigation works sanctioned, completed and in progress as on July 31, 1978, is as given in Table 2.

Table II

Category	Sanctioned	Completed	In progress
Major Irrigation (Canal centres)	1019	307	476
Medium Irrigation (Canal works)	265	100	56
Minor irrigation tanks	1338	284	324
Percolation tanks	3634	1180	887
Village tanks	557	414	4
Other minor & Small irrigation works including seasonal bunds in the stream	4848	3624	29
Flood control works	22	11	1

About 3.55 lakh shown livelihood under the scheme works during July 1978. Of which 1.83 lakh were employed on irrigation works. □

SFDA in Quilon District

P. N. Krishna Pillai

Field Publicity Officer, Alleppey

THE SMALL FARMERS Development Agency in Quilon points out the problems of the small, marginal farmers and landless agricultural labourers in the district. An evaluation of the financial performance and physical achievements of this Centrally sponsored Agency during the last eight years of its existence shows that the Agency has been able to lessen the disparity between the more privileged and the less privileged in the rural sector of the district, by successfully implementing a series of schemes.

Registered on 29th September, 1970, the Agency completed the first phase of its functioning on 31st March, 1976, and is in the second phase since 1st April, 1976. The various programmes of the Agency are implemented through the 17 Development Blocks in the district. Since inception upto the end of 1978 the Agency identified 78,468 small farmers, 1,07,191 marginal farmers and 15,271 agricultural labourers in the district. Out of them, 26,319 small farmers, 37,878 marginal farmers and 4,101 agricultural labourers were enrolled as members in co-operative societies.

Subsidy to the identified farmers got the lion's share of the grants received by the Agency from the Central Government. The Agency received Rs. 224.78 lakh upto the end of 1978. A sum of Rs. 5,851 lakhs was utilized for strengthening the co-operatives, by giving them share capital loans and interest-free loans. The remaining portion of the grants received (Rs. 10.598 lakh) was spent on items like administration, survey, evaluation study etc.

The total financial allocation for the Agency during the period under review comes to Rs. 235.734 lakh. The excess amount of expenditure over the receipt from the Centre (Rs. 10.954 lakh) was met by the share of beneficiaries in implementation of certain schemes.

Almost all the programmes of the Agency are linked with credit. During the eight-year period, the identified small and marginal farmers received a total sum of Rs. 914.20 lakh as short-term loans and Rs. 186.83 lakh as medium-term loans from the co-operative sector alone. The quantum of credit extended by the nationalised commercial banks to the above categories of farmers is Rs. 70.60 lakh— Rs. 36.29 lakh as short-term loans and Rs. 34.31 lakh as medium-term loans. Besides this, for implementing various agricultural development schemes by the small and marginal farmers, the cooperative land mortgage banks have disbursed long-term loans, spread over a period of 7 to 15 years, to the tune of Rs. 107.29 lakhs.

Soil Conservation Schemes were implemented as community schemes in the eastern parts of the district by way of permanent improvements on their lands with the main objective of creating durable assets to the small and marginal farmers. Soil conservation works have been executed in 3063.90 hectares. As these schemes were labour-intensive, assistance in the form of bulgar wheat from "CARE" was also provided, besides 50 per cent of cost as subsidy from the Agency. With the construction of contour bunds in an area of 3063.90 hectares, about 12.25 lakh mandays of rural labour could be created.

The Agency has been providing assistance to identify small and marginal farmers to execute land development works at the rate of 25 per cent and 33.33 per cent respectively. About 900 works comprising an area of over 400 hectares had been executed so far.

Under the scheme, Community Irrigation Works deep tube wells have been installed to harness ground water in Sooranad North, Mynagappally, Thrikkaruva, Clappana, Chemmekkad, Umayanelloor and Kalakode. As a result, 228 hectares of paddy fields owned by 869 farmers could be irrigated, enabling them even to raise a third crop of paddy. The Agency also executed 167 minor irrigation works benefiting groups of identified small and marginal farmers on a community basis. The works include renovation of tanks, construction of bunds, sluices, cross bars, irrigation channels etc.

Under Individual Irrigation Works, digging of well for irrigating mostly coconut gardens benefited largely the weakest among the small and marginal farmers. During the project period upto 31st December last, 8162 wells were dug.

Installation of pumpsets over wells for providing irrigation facilities to the coconut gardens of small and marginal farmers has been taken up on a large scale in the coastal tracts of Quilon and Karunagappally taluks. About 865 pumpsets had been installed.

Single crop paddy fields of 482 hectares belonging to about 1250 farmers were converted into double crop lands in Ithikkara and Cheloor Kayals.

Five tractors and two power tillers were supplied to cooperative institutions at 50 per cent subsidy, on condition that these would be hired out to small and marginal farmers for agricultural operations at concessional rates. The Agency had a scheme to

supply plant protection equipments and modern agricultural implements to small farmers at 25 per cent subsidy, to marginal farmers at 33.3 per cent subsidy and to co-operatives at 50 per cent subsidy. So far, about 1500 plant protection equipment and over 19200 hose ploughs had been distributed. To popularise improved farming practices on major crops like paddy, tapioca, banana and pulses among the marginal farmers, the agency implemented a scheme of supplying fertilizers at 33.3 per cent subsidy, subject to a maximum of Rs. 100 per season. On important crops, 2145 demonstration plots 325 fodder grass plots, 2500 gardens attached to the "One Lakh Houses Scheme" and 520 homestead gardens were laid out. Seeds, fertilizers and insecticides were also arranged for supply to farmers.

To supplement the farm income of identified farmers and agricultural labourers, the Agency implemented a scheme for granting eligible subsidy to them for subsidiary occupations like dairy, goat rearing, poultry farming, inland fishing etc. Over 5,400 dairy units, 27,250 goat units and 1,000 poultry units were set up during the report period. Since 1976-77, the supply of goat units has been restricted to the weakest among the marginal farmers and agricultural labourers, preference being given to persons belonging to Scheduled Castes and Tribes. Nearly 150 country boats and nets were supplied at subsidised rates to fishermen residing in Perinad panchayat, which was selected under the Intensive Area Development Programme of the Government of India. Over 60 persons belonging to Scheduled Castes and Tribes were supplied with draught bullocks and carts.

To provide wage employment to the unemployed agricultural labourers, the Agency implemented a scheme for construction of rural roads, irrigation channels and sluices, renovation of tanks etc. in Kottarakara taluk. About 1.5 lakh mandays of labour was utilized in over 80 work under this scheme.

Under Rural Artisans Training programme, 150 rural artisans had been trained in different trades like repair and servicing of farm machinery and implements, black smithy and carpentary. A few trained artisans were also given financial assistance for setting up their own workshops. Under another scheme, about 90 women belonging to the weakest sections were imparted training in tailoring and 73 sewing machines were supplied to them at subsidised rates.

Apart from these, a market with adequate storage facilities has been constructed at Charumoodu in Perinad panchayat. The share of expenditure of the Agency towards this is Rs. 1 lakh.

To facilitate the marketing of milk and milk products, milk co-operatives were given subsidy for purchasing cycles, cans, fat testing machines etc.

Almost all the programmes implemented by the Agency were employment generating in nature, and hence were of immense help to the poorer sections of the farming community who constitute the majority in this district. □

They Did It

Daya Prakash Sharma
Field Publicity Officer
AGRA

ATOOSH, in Achnara block near Agra in U.P. was like any other backward village in India till recently. The people, about 1500, were languishing under extreme poverty, illiteracy and illhealth. Their way of life was pregnant with blind beliefs, taboos and superstitions. Myriad lifes swarming on the rain water and the refuse from houses, drained into the ditches on the so called roads, was a common sight. Pair of bullocks under a yoke was still the means to till the soil and other methods of cultivation were primitive. Lack of communication facilities rendered the Atoosh people ignorant of the experiments being conducted in the Agriculture Training Centre at Bichpuri, a nearby place. Sri Pratap Singh, a retired colonel emerged as the saviour of the villagers of Atoosh. For a long time opinions were exchanged between him and the guardians of traditional living. Sri Singh convened a meeting of the villagers and was able to implant in the villagers' mind the need for improving their life style, thus, heralding the dawn of a new era in the history of Atoosh village.

The spirit of cooperation, and dedication, newly injected into their blood brought them together to transform the face of the village. Pucca roads, neat and clean, were laid, both within the village and to the nearby ones. The communication facility established between Atoosh and Bichpuri opened many new vistas of progress to Atoosh people who were no better than a frog in the pond. Cereal based agriculture under old-fashioned methods of cultivation was gradually converted to high yielding varieties by adopting improved agricultural practices being preached and practised in the Agriculture Training Centre at Bichpuri.

No more are the villagers a set of illiterate lazy people. After toiling in their fields throughout the day they attend adult education classes in the evening and send their children to the recently established Junior High School. New avenues of more income gave an impetus to shed their lethargy. Villagers no longer while away their time in litigation. Carpet weaving and other village industries have become their pastime so also sources of extra income.

Thus the seeds of progress sown by Sri Partap Singh, slowly sprouted and at last flowered with the formation of Yuvak Sanghathan, a youth organisation devoted to such activities as rural development, child education, adult education an so on.

Every other Indian village needs a person like Sri Partap Singh to realise the true connotation of development and to put into practice the aims our Father of the Nation had cherished in regard to village life.

Books

Rural Calcutta

Fringe areas of Calcutta—Development of Three Rural Situations *by S. D. Thapar, Association of Voluntary Agencies for Rural Development, New Delhi; 167 pages, Rs. 30.*

TO THE ARMCHAIR proponents of rural development, this book will be a guide towards the *real* problems of rural uplift and the challenges the rural folk and those who want to do something for them face.

Though not far from the matropolis, the three areas covered in this book remained virtually untouched by the going on in the city. Where the farmers continue to cultivate the meagre crops they have done for years and any change is beyond their comprehension. This virtually complete insulation from the winds of change is a challenge to whosoever is interested in their welfare. It would be a sad story if they are not able for long or made to take advantage of the reasonable progress elsewhere.

The Badardah basin a cluster of 29 villages is hardly 20 kms from main Calcutta and is not conveniently accessible to daily commuters. Dairying, poultry-keeping have not been adopted. Hardly any young men go to Calcutta for work. The total number of project persons working outside is estimated at 300, total inflow of remittances at Rs. 1,16,000 i.e. about Rs. 5 per head per annum. There is a lot of water around (the area is at the tail end of DVC system) but no water at the time of need. The area hardly produces anything worth selling in the insatiable market of Calcutta.

In Damodar West Basin too many people are packed in a small, physically handicapped area. This limits the number of economically feasible schemes. Cash crops are not produced and in the absence of cooperation among cultivators, whatever little that is saleable is produced, may be exploited by middle men to their advantage.

The Hooghly River Canal Basin is an example of what can happen when large scale industrial units are set up in a rural area without integrated rural planning. Semi-urbanisation has over taken Fort Gloster, Radhanagar and Rameshwarnagar. Since the area residents have been finding employment in the factories, agriculture has been totally neglected to the disadvantage of the area.

The book places in clear perspective what rural or area development involves and what voluntary agencies can do. Much more than an academic study, it is of practical use and there is need for such studies all over the country so that some rationale and sense can be brought into our planning. In the light of current talk on rural development and district industries centres, industry can come forward to finance such studies because diagnosis of the problem is necessary for treatment of the malady.

Kewal Soeny

Small Industries

Small Industries in India—Commemoration Volume—*Development Commissioner, Small Scale Industries, Ministry of Industry, Govt. of India, New Delhi—Published by J. L. Saaz, Director (Technical Publicity).*

THE PUBLICATION by the Small Scale Industries Development Organisation brought out on the occasion of National Small Industries Fair—1978 is intended, in the words of Secretary, Industrial Development, to meet the growing need of entrepreneurs for authoritative information on the growth of small and rural industries in India. In fact, it is more than that as it, in its various sections, includes papers on industry status in several well defined groups, the state of industry in different states, organisational set up of institutions like S.I.D.O., N.S.I.C., C.I.T.D., etc engaged on furthering developmental efforts in small and rural industries sector and some statistical information. Industry papers on the different groups of industries viz. (i) Mechanical and metallurgical (ii) Electronics (iii) Chemical and allied (iv) Leather and sports goods (v) Food processing and (vi) Ceramics reflect the giant strides made, the problems in the way of further development, future prospects and export possibilities. This section is informative and gives an insight into the potential for growth to help prospective entrepreneurs.

The State Industry profiles are, however, more in the nature of official handouts and give an impression of "little done and undone vast". In most cases the information is scrappy except for identification of slow-growth areas and mention of small industries promotional institutions. A would-be entrepreneur would hardly if ever tell from this which area he has to choose and for what industry. No doubt some profiles as of Maharashtra or Punjab are more informative and helpful. Truly speaking the intentions in the Policy Statement of December 23, 1977 that has unambiguously given top priority to the development of small and village industries were to be followed up by the State in right earnest. For this purpose too it was worthwhile earmarking specific industries for development in particular areas depending on availability of raw materials, proximity of marketing centres, availability of skilled and unskilled labour etc.—in short, a blue print for achieving the objectives. While it was too early to attempt an assessment of their achievements, if any, bearing on the new Industrial Policy, the profiles could try to indicate in which direction the States were moving and what pragmatic ways they found to compensate for slow and tardy developmental efforts in the past.

Even so, the publication is invaluable in providing in a short compass authentic information on small scale and village industries in India, the institutions engaged on their advancement and the scope of their activities.

J. Chakrabarty

Land Reforms

Land Problems and Land Reforms by Dr. C. Ojha, *Published by Sultan Chand and Sons, New Delhi, Pages* 327; *Price Rs.* 45.

POVERTY, massive unemployment and economic backwardness are problems which have defied solution for decades now. One of the major causes for this state of affairs is the defective distribution of available cultivable land all over India and the consequent low productivity.

Before independence, our leaders felt that once we threw off the foreign yoke we could find a speedy and satisfactory solution to all our socio-economic problems.

It is now over thirty years since we achived independence. What do we find today? All the old problems imposed on our peasantry are very much with us. What is worse, some of those problems have, in fact, grown in immensity because of several factors including the rapid rise in our population which threatens to defeat each of our carefully devised plans. It has been estbalished that the rate of growth of the population has been high, but the rate of economic growth has been low.

A comprehensive in-depth study of the land problems in Bihar is presented in the book under review. With the historical background, the study examines the social and economic conditions of the State at present in the context of development in other parts of the world.

There has been a spate of legislation on land reforms in Bihar since independence, but as the foreward rightly observes, the "reformers make more noise than sense and leave sufficient time and loopholes to rig the business and corrupt the empowering machinery". What we notice now is a glaring unevenness in the possession and distribution of land. A tiny insignificant minority of the population continues to possess most of the cultivable land, while an overwhelming majority is struggling hard to make both ends meet from the very small portion of land which alone they own.

The main aim of the abolition of the system of Zamindari was to put an end of the intermediaries who exploited the vast majority of the rural poor. Zamindari has been abolished, but the exploitation of the masses continues. In place of Zamindari we now have the idle rent receiving sections of the population besides the traditional money-lenders and traders. There is also rack renting. With all these factors working at top gear, the human, animal and land capital have been subjected to a new kind of multiple exploitation resulting in extermely low productivity and extensive unemployment and disguised unemployment causing infectious feeling of general discontent and social unrest amoong the exploited peasantry.

The book examines in minute detail, and from various aspects, every piece of legislation since independence and lays bare the fact, with as many as seventy-five illuminating tables, that while not much thought has gone into the drafting of most of the legislative measures on land reforms, there has been financial and administrative failure in implementation.

After identifying the causes responsible for the failure of the various land reform measures, the author suggests what should be done to remedy the situation which alone could help increase production, wipe out poverty and unemployment, solve the socio-economic problems and lay a firm foundation for the State's prosperity.

There are a number of books dealing with the land problems of Bihar and other States, but this one is somewhat unique in at least one respect; it deals with the land problems of Bihar in a detailed and scientific manner.

It is signficant that the land problems of Bihar are similar in several respects to other States, and any solution for the problems affecting this State will have a healthy effect elesewhere in the country. One is left with the impression that with a little more effort, the author could have brought out a blueprint for the solution of the land and other socio-econimic problems of the country as a whole. □

—**Arun Sharma**

Agriculture

Some Aspects of Change in Agrarian Structure by *G. P. Mishtra : Institute for Social and Economic Change (Bangalore) Monograph No.* 4 *(Sterling Publishers Private Ltd., New Delhi, page* 76, *bibliography, Index (Cloth) Price : Rs.* 20.

FROM THE MID Sixties onwards there has been significant technological improvement in agricultural production in India; and an equally important aspect is there have been continuous efforts since the inception of planning in India to reform the rigid rural society, which are more often simply called 'Land Reforms'. Dr. G. P. Mishra using data collected from various secondary sources tried in this small monograph of 76 pages to find out the effect of the technological development and the land reforms on the basic agrarian structure—the agrarian composition of owner-cultivator, tenant-cultivator and landless agricultural labourers, on the production-*cum*-land relations, on concentration of land, income distribution in agriculture etc. The land reforms policy, its implementation and its performance have also been critically evaluated though not in a great detail.

Some of the findings of this study are worth-noting. The proportion of the landless households in the total number of households declined from 23.09 in 1953-54 to 9.34 in 1970-71. Similarly the proportion of tenent-households also went down to 8.4 per cent in 1970-71 from 31.32 in 1953-54. But the proportion of marginal farmers (owning less than 2.5 acres) has increased from 48 per cent in 1961-62 to 53 per cent in 1971-72, and the proportion of small farmers (owning less than 5 acres) remained the same during the period.

There is no improvement in the economic conditions of the weaker sections. The increased prices favoured the large farmers and worsened the position of the weaker sections. The size of the agricultural holdings, amount of marketable surplus, and degree of market dependence for consumption are the important channels through which gains from increase in output and prices are distributed between different classes of the rural population in different proportions.

The work, on the whole, is very well done. The book is dedicated to Professor V. K. R. V. Rao, who is also the general editor of the series, and who wrote the Foreword to the book.

Jandhyala B. G. Tilak

World Economy

The World Economy-History & Prospect

by W. W. Rostow,
Macmillan Press Ltd., London, 1978.
Pages—i—XXVii ;
1—833

THE book is a bold attempt at contributing to a unity of view as between the dynamics of demand and supply that is necessary, both, for comprehending the past, and for moving ahead in the next quarter a century or so. The Neo-classical and Neo-Keynesian Economic theories are impunged since both fail to setforth a framework for understanding either the past or the character of contemporary economic problems.

Rostow, accordingly, in the first five parts of the book gives us a glimpse of two hundred years of world economic history from a variety of perspectives. There is an excellent analysis of how population expanded from one billion in 1800 to 4 billion in 1976, and projecting an estimated increase of another 1.5 billion in the next twenty five years. The author narrates the story of expansion in production, its distribution and trade since the eighteenth century. In the context of scarcity and abundance of food and raw material, a description of Kondratieff long cycles is presented. The causes that resulted in the failure of the world economy since 1945, to contain inflation within manageable limits, are searchingly investigated. Finally the author presents succint case studies of twenty countries-underdeveloped, developing and developed-in the light of his own "Stages of Growth" theory.

The above examination precipitates the character of the problems facing the world today. For instance, chapter 4 and 9 (together) pose the question of whether population is likely to expand in future. The case studies of the twenty countries, read with chapter 5 questions if existing resources would allow advanced societies to grow, while at once, underdeveloped countries would achive affluence. Chapter 26 puts the question whether in the advanced societies higher average unemployment levels and lower average rates of growth, are to be expected than what has been found in the last three decades or nearly so. It is also asked whether advanced industrial societies have the capacity of containing "wage-push" inflation, by "equitable co-operation for perceived common purposes".

In contrast to Marx—the author of the 'Communist Manifesto' who predicted the doom of Capitalism, —Rostow—the author of the 'Non-Communist Manifesto'—, is optimistic in that he predicts, in *Part Six* of the book, next twenty five years to be critical and by the year 2000, birth rates in the developing coutries will be slowed down ; Malthusian crisis will be avoided, expanded population will have enough food; water and air pollution will be arrested; energy crisis would be over; raw-material for industrialization to proceed, will be available; the pattern of investment, scale and direction of research and developm et, techonlogy etc. will have to change for ensuring growth in the century ahead of us; growth and price stability will be reconciled and finally per capita income in the developing countries will be doubled. Late commers to modern growth can catch up with early commers.

Restow prescribes that to achieve all this, substantial changes in politics and policy are called for. He calls for inter-national co-operation for a better tomorrow.

That material progress is not enough, is realised by the author of the 'Non-Communist Manifesto'. The humanist speaks out for the cultivation of the joys of family, the arts, the religion and for the full expression of unique prsonalities, while "governments and their citizens struggle through the challenging agenda of the next quarter century".

Conventional economic theory deals abstractly the long-run economic change. It does not fully take in its fold willingness of private or public enterpreneurs to innovate, changes in technology etc., and then neat statements of static equilibrium are extracted. Modern theory of growth is also formulated in aggregated terms. Rostow abandons the above methodology as it is of limited use and makes his analysis in terms of dynamic dis-aggregated theory, which makes it possible for him to conceive of a dynamic equillibrium path for an economy and its sectors. Conceptually the author is justified in so doing for a book of this nature which seeks to tell us the story of the world economy over the past two hundred years and attempts to chart out our course into the future. What we, after-all, observe in the real world, are dynamic interacting national economics attempting an approximation of optimum sectoral equillibria and not static aggregate processes.

Rostow elects deliberately to choose the more complex dynamic disaggregated theory of production and prices, in an attempt to capture a reasonably coherent view of the evolution of the world economy, over the 200 years under reference, but he does not achieve fully the task he addressed himself to. The complexity of the analysis, forces the reader to trace and retrace his steps back again and again, to catch the lost thread ; indeed at times the complexity sort of grins at the reader.

As a footnote to the forgoing it needs to be observed that more regorous statistical treatment of the data would have been more appropriate to an analysis of the data presented in the book. This would have made the data amenable to a more precise appreciation.

The author has not dealt with, systematically, a good many aspects of modern economic history ; for instance the evolution of modern corporations, labour unions, banking sysem and soical legislation are some. Then there are the whole set of non-economic factors : caste, religions, social institution, political system, government etc. After all the basic determinants of economic growth are non-economic. The author has nothing to say on these. The only explanation the author has to offer in this regard is "in limitation lies mastery". In this perspective something is left to be desired in the work.

Despite the shortcomings, the book, has to be ranked as a monumental work of a master-mind. In the realm of "Economic History" it may easily be given the place, that Joseph Schumpeter's "History of Economic Thought" has acquired in economic thought. Compressing the sweep of two hundred years of world economic history within the combines of two covers, is by itself a formidable achievement. Whether one wishes to build on its positive achievements or criticize the failures, it is a major reference that no student in the field of economic history can fail to read with interest and enlightment.

Amitava Mukherjee

Reply to the Yojana Review on Planning for a Future less Economy

DURING the course of his review of my recent book titled "Planning for a Futureless Economy" : A critque of the "6th Plan and Development strategy, Yojana, 1st April, 1979 Vol. XXIII, No. 6 Mr. Bipin Behari has informed the readers that he prefers caution and reserve to imagination, that he does not like acronyms, and that he disapproves of invectives. Unfortunately he keeps the readers in the dark about why he rejects (?) the analysis and arguments in the above book.

Though he says he has read the book a number of times, some errors about my position as in the book have crept into the review. I would like to correct them : (i) On page 30, Mr. Behari states "Emphasis on feasibility rather than accelerated high growth-rate, adoption of labour intensive projects instead of setting of Mahalanobisian basic industries and inbuilt inflationary potential of the order of 14 to 22 per cent per year, according to Brahmanand, contradict the objectives and claims made in the Draft Plan". The book clearly states that feasibility is not the characteristic of the chosen growth rate; the Mahalanobisian model is definitely rejected in the book; and the claim of labour-intensive projects is criticised on the score that they do not reduce capital-intensity of labour. On page 35 Mr. Behari states the following : "The recommendations made under *Fullmangal* stipulated that the rate of growth of the proportion of money used as liquid-money would be limited by law to 5 per cent. Under conditions of fluctuating rates of growth of the economy because of undertainties beyond human and institutional controls, the restricted elasticity of the money supply may even paralyse the economy". A careful study of he FULLMANGAL proposal will reveal that the average of 5 per cent is struct sequentially over every 5 year period. It is possible during the five-year period for the growth rate of money supply to depart in any one of more years, from 5 per cent norm. In fact the FULLMANGAL proposal is different from the Friedmannian proposal of a fixed rate of 5 per cent growth each year, which is further apportioned in a fixed manner within each year.

Mr. Behari appears to feel that the book lacks caution and reseve and places a premium on imagination. May I ask the following queries ? (i) Is it or is it not true that the capital-output ratio has been rising steeply and so despite technical change ? (ii) Will it not be true that it will continue to rise in future as well, particularly because new land has become scarce, the additional mineral resources can be exploited only at higher and higher cost, additional irrigation and power projects are more and more expensive, additional investment in transportation too is more and more costly and so on ? (iii) Is is not true that the population growth rate is high and has been probably rising, and that the size of population unchecked will reach nearly 100 crores by 2000 A.D. ? (iv) Even assuming that the relative profits' share is constant, if the incremental capital-output ratio is going up, will not the prospective profit rate go on falling ? (v) Is it not true that before the expected profit-rate becomes zero, the long-term investment process will come to a halt. (vi) Is it not true that currently the average rate of return to capital is only 7 per cent as compared to 12 per cent fifteen years ago ?

Mr. Behari thinks that it is not possible to have a moral ethical code in society, and a convention of discipline and social norms in the functioning of the political process. Given the above barring through a quick goal of stationarizing the population-size, is there any other way to redeem the future ? It is not the failure to realize the nature of the future the biggest 'crime' on the part of our leaders ? How does caution and reserve help when the nation is going to be on fire ? And is not the majority the victim of the policy of shutting one's face against the future ? Should not the Planners become and act as the lobby for the Future ? And if they do not tell the political leaders of the impending doom, not far off, and do not request them to control the parameters, are they to be admired for their caution and reserve ?

May I request Mr. Behari also to consider whether the following criticisms of the Draft 6th Plan are due to my excessive imagination ? (i) The Plan seeks to achieve a 25 per cent increase in real national income with only a 14 per cent increase in the supply of wage-goods; the past experience indicates that the supply of wage-goods must expand at about the same rate as the growth-rate of national income. (ii) With a 14 per cent increase in the supply of wage-goods the planners hope to increase employment by 30 per cent without a massive cut in the real wage-rate. (iii) Without measures like immobilization and on the assumptions of a reduction of foreign exchange remittances of no increment, through credit, to public grain stock the Planners hope to make the income to savings ratio 16 to 21 per cent. (iv) With a 100 per cent increase in money supply and huge addition to indirect taxes, the Planners hope to keep the level of prices constant, even though the supply of wage-goods goes up by only 13-14 per cent. What are Mr. Behari's answers to the demonstration in the book that all the empirical hypotheses underlying the Plan invalidated in terms of all India data taken from the Plan itself.

Mr. Behari would have liked me to constrast the goods in the wage-goods model with the revised minimum needs programme. I am afraid that the analytical purpose of the two are not the same, the goods that enter in either are rather different; even the minimum needs seem to be arbitrarily chosen; by calling a set of services as public goods, won't make the latter more sacro-sanct !

Mr. Behari seems to object to the 'acronyms'; these are harmless strings of letters; they have the convenience of easy rememberability; all the three (including SEMIBOMBLA) have managed to get some circulation, thanks to both to those who dislike them and to those who like them ! If he examines 'HOPERASHHMI, carefully, he will find that the strategy seeks

to take into account the communicational, sociological and institutional problems confronting population-control programmes. Actually the new strategy is very different from those practised in 1975-76.

Mr. Behari has given a quotation from Marshall, May I give him another ? 'Truth is the only thing that matters and not peace'. That quotation also explains why the book had to be written quickly. Time is *not* on our side; the echoes of the bells of the not-to-distant Stationary state can already be heard. (How do we account for the stagnation in private productive investment ? Why are gold and scarce-asset prices zooming) ? The Future is there for any one to see. But then we must have ears and eyes ! should whatever will be, must be ?

Why not ignore INVECTIVES and go over the book again ?

P. R. Brahmananda

Reviewer's Submission

AS ADVISED by Professor P. R. Brahmanand, I have gone over the book once again ignoring invectives but do not find any reason either to alter my views or enter into personal-cum-theoretical arguments.

The author's strategy for controlling the Malthusian Devil has already been commented upon. The need for restricting monetary expansion according to output and supply of wage-goods (p. 178) is innocuous and non-controversial, but quantitative ad-hoc-ism of 5 per cent upper limit on money's annual growth as *per law* stirs the hornet's nest. Even the integrated wage goods strategy which is an important plank of the author's alternative thesis lacks clarity and specificity. The definitions of wage-goods as given on pp. 172, 175, 176, 179, and on pp. 180-181 do not provide suitable analytical or operational guidelines. The list of wage-goods given on pp. 180-181 is more elusive for any practical use than the "arbitrarily chosen" goods and services included under the Revised Minimum Needs Programme of the latest plan. Unless the concept itself is clear, deductions regarding its implications are bound to be faulty.

Caution and reserve, if adopted, could have made the analytical exposition cocise, errata (as found, for example, on pages 5, 13, 36, 37, 48, 49, 89, 97, 143, 182 etc.) considerably reduced, and operational recommendations effectively tested. The quality of publication would have thus greatly improved.

In reply to various queries made by the author, may I venture to cite another quotation from Marshall's *Principles*: "We have seen that the economist must be greedy of facts; but that facts by themselves teach nothing." ?

Bepin Behari

Further correspondence on the subject is closed.

—Editor

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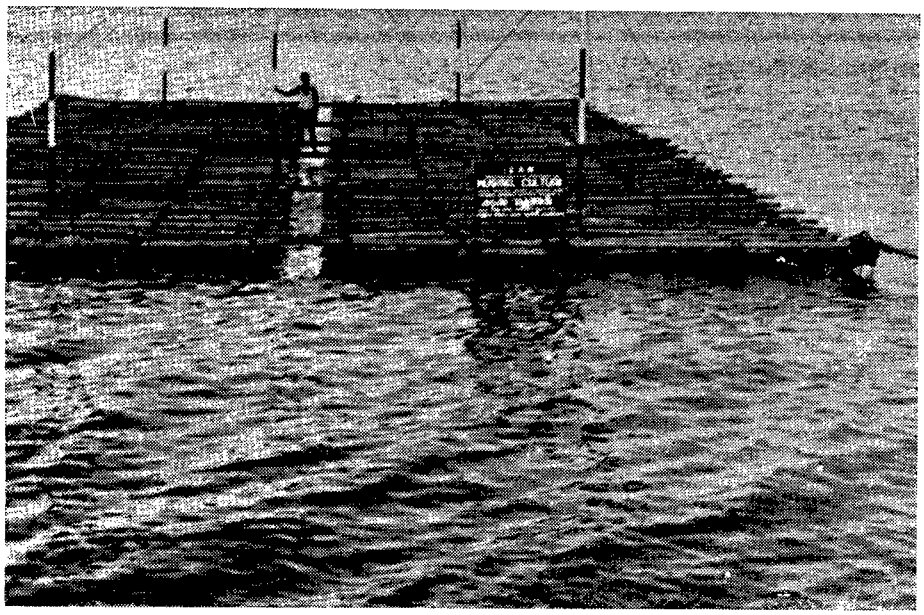

New Strides in Mussel Culture

V. K. Abdulia, *F.P.O. Kozhikode*

India has a 4000 mile long coast line. To a considerable extent we are tapping the sources of the sea. But unlike agricultural operations, usually we do not sow ir the sea to reap a good harvest, though we have perfected a lot of technical devices to boost the fish catch. The Calicut Research Centre of the Central Marine Fisheries Research Institute Elathur has gone a long way in this respect. The development of the kaduk ka or kallummakai which is very popular in the coastal areas of Kerala State has been the target of the Scientists of Calicut Centre. Their experiments with simple methods have proved the the techno-economic feasibility of mussel farming. A break-through has been achvied in increasing the production of protein rich mussel in our country. The cultured mussels are superior to natural ones because they grow faster, are healthier and give more meat. Harvesting is easier and production rate is very high.

Ten fishermen families at Elathur were selected and were given all technical assistance to experiment with the new techniques. The techniques are very simple. Seeds of kadukka collected from natural beds are tied to the rope of 8 metre length by knitted cloth. A raft is made and the rope on which the seeds are wrapped are suspended from the rafts properly anchored in the open sea in a depth of 5 to 10 metres. The cloth disinte grates in the sea water after a few days and the juvenile mussels get firmly attached on the ropes. Growth of juvenile mussels over the ropes are very rapid and they attain the harvestable size after 4 to 5 months. Availability of the entire vertical water column for the growth of mussel is the crucial feature of the technology developed. One hectare area of the open sea has been found to produce about 500 metric tonnes of mussels within a period of about six months.

To construct a raft of 64 sq. metre it may cost about Rs.4000—including labour charges, cost of drums, teak, bamboo, etc. Kadukka worth about Rs.8000 can be produced from such a raft. That means a raft earns about Rs.16,000 a year. This is no small income especially for poor fishermen families. While the natural mussels give 30 per cent of the weight, the mussel cultivated on the rope give about 50% of the total weight.

The technical knowhow developed by the scientists of Calicut Research Centre of the Central Marine Fisheries Research Institute is of great benefit to the marginal fishermen and landless labourers, to augument their family income and to achieve the goal of full employment.

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HE STORY OF TOBACCO

MPLEMENTATION

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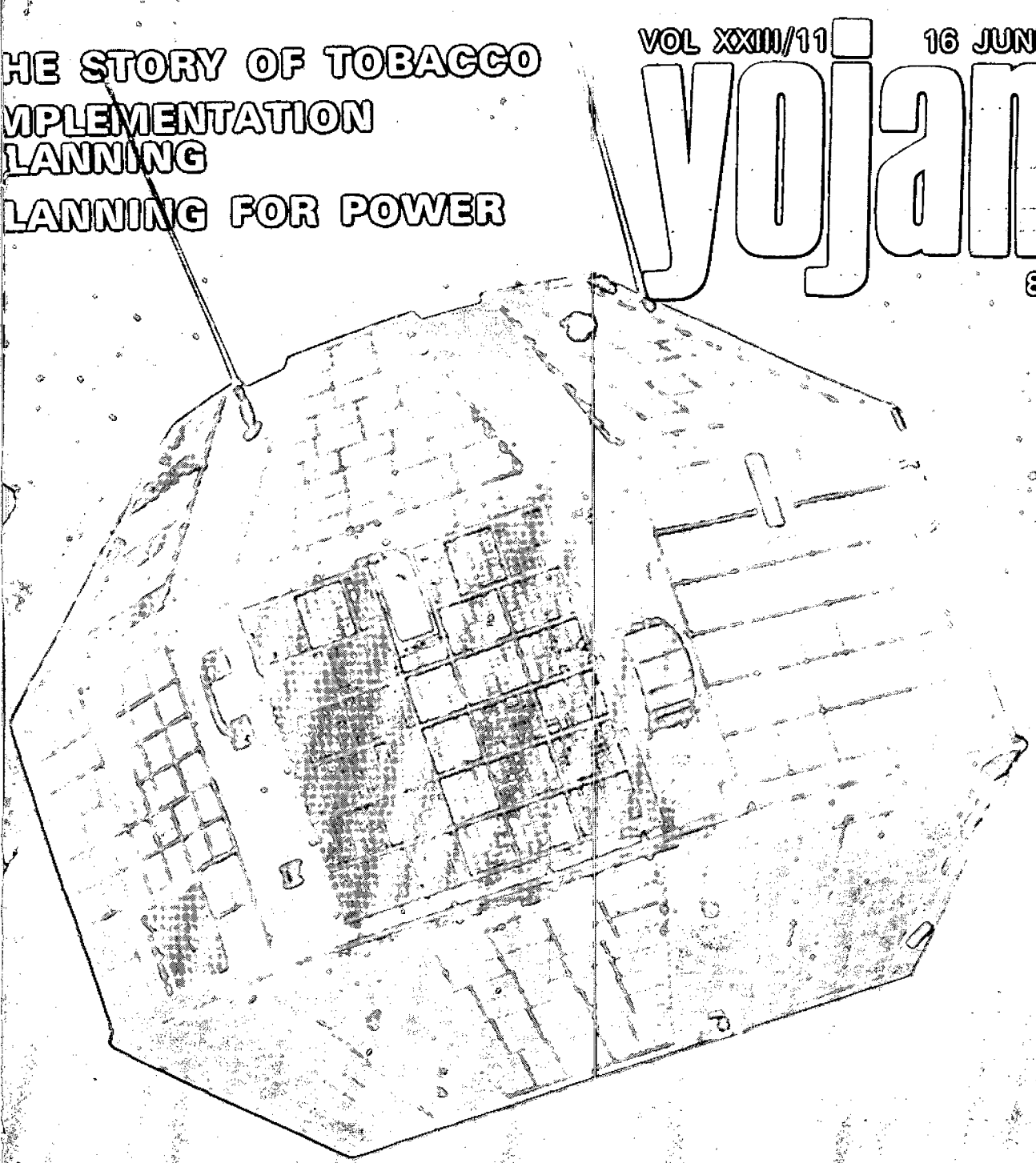
LANNING FOR POWER



INDIA'S SPACE PROGRAMME

OUR ACHIEVEMENTS

BHEL's Landmark in Design

THE FIRST PROTOTYPE D.C. motor rated at 250 kilowatt, 440 volts has been successfully manufactured and tested at the BHEL's Heavy Electrical Equipment Plant at Ranipur near Hardwar. The overall dimensions and output of this motor conform to internationally accepted standard IEC 72A-1970.

This marks a landmark in the design and manufacture of a new series of D. C. motors in IEC frames. These motors are for supply, among others, to Bokaro Cold Rolling Mills and processlines as well as to Mishra Dhatu Nigam Ltd., for the mills.

The 250 KW, 440 volts, 500/1500 r.p.m. D.C. motor has several new and important features and is packed with about 35 per cent more power and torgue as compared to the earlier designs. Other features of this motor are termo-reactive class 'F' insulation, low GD value, high short time overloads, glass banded mature, improved ventilation and constant pressure brush holders.

Cooperative Milk Supply Scheme Earns Profit

IN MADHYA PRADESH the Betul district milk cooperative union purchased 4,77,000 litres of milk through 20 cooperative societies and delivered it to Betul, Serni and Pathakheda areas and also to Bhopal milk scheme. The society members received Rs. 8 lakhs as the price of their milk and the milk union earned Rs. 12.85 lakhs.

With the share capital of Rs. one crore, the district milk cooperative union, formed recently, has received Rs. 1.10 crores under the D. P. A. P. and the State Government and the Milk Development Corporation have given Rs. 6 lakhs to the union. Chilling plants of 4,000 litres capacity are being set up at Betul and Multai blocks and Pathakheda colliery with this money. Each milk cooperative society in the district has been given Rs. 3,000 for collecting milk and purchasing necessary implements. All these societies are running in profit and it is hoped that the union will soon have 200 societies as its members and will succeed in installing a chilling plant of 60.000 litres capacity in the near future.

16 Per cent Increase in GSFC's Assistance

AN ALL TIME record rise in sanction and disbursal of loans, for accelerating the tempo of industrial development in Gujarat State, has been achieved during 1978-79. 1185 units were approved loans of Rs. 28.38 crore recording a rise of 16 per cent over previous year. Disbursements rose sharply by 33 per cent during the year reaching to Rs. 18.57 crore.

This assistance to the units will catalyse investment of Rs. 65.30 crore in the State. These projects will create employment opportunities for 15,433 persons and generate sales of goods and services of Rs. 169.76 crore, when commissioned.

The GSFC has approved 13402 projects with loans of Rs. 183.34 crore since its inception. The aggregate disbursements amounted to Rs. 109.15 crore.

Rural Electrification

MORE THAN 51,000 villages have so far been electrified in the country under the REC-Financed programme of rural electrification. The number of irrigation pumpsets energized exceeds 3.3 lakh and to the rural network, over 2.5 lakh kms of power lines have been added.

Rural Electrification Corporation had to-date sanctioned 2,150 projects for an aggregate financial assistance of over Rs. 840 crore. Together these projects, to be implemented over a period ranging up to five years, envisaged electrification of 1.16 lakh new (unelectrified) villages and energization of 9.73 lakh agricultural pumpsets. Besides nearly four million domestic commercial connections and street lights, it was proposed to provide power for 1.44 lakh small scale agro-based and other industrial units in rural areas.

Indigenous New Technique in Steel Welding

NEW TECHNIQUES of electro-slag welding of thick steel plates and steel castings of thickness of 100 mm and above have been successfully perfected and introduced in the Heavy Machine Building Plant of Heavy Engineering Corporation, Ranchi.

Strips cut out from the same plates or castings are used and this ensures homogeneous welding and eliminate the use of expensive welding electrodes.

This technique also guarantees welding of special steels as well as castings of alloy steel and nonferrous metals quite conveniently.

HEC has also developed a process of remelting scrapped high speed steel tool bits utilising the electro-slag welding machine and making new tool bits, from the same, by forging or machining. Large quantities of such tool bits that get scrapped every month are thus salvaged.

District Industries Centres Make Headway

DURING LAST financial year over 33,495 small-scale and cottage industries were set up in the country. Of these, 22,453 were artisan-oriented. The new industrial units provided jobs for about a lakh of people.

It is worth to note that 8,492 of the new small-scale and cottage industries set up in the country were established in the 22 districts of Madhya Pradesh State where district industries centres were opened. Of this, 4,252 were artisan-oriented. The new industrial units provided employment to about 20,000 people.

Thus, a fourth of all the small-scale and cottage industries and a fifth of all the artisan-oriented industries were set up in Madhya Pradesh and of the total employment generated in this sector in the country, a fifth was in this State. □

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Editorial

National Policy on Education

SO MANY policies uneasily coexist in our country that the Draft National Policy on Education (1979) immediately evoked a mixed reaction from the people vitally affected and interested. Since the attainment of independence education had been on the melting pot which has yet to yield a recipe, satisfying and stimulating in equal measure. Saveral commission and committees have exercised their minds to seek a practical solution to the educational problems until the National Commission on Education indicated a policy which was adopted by the Parliament. The new Draft Policy is more than a quinquennial review as envisaged by the Resolution of 1968. It breaks new grounds, indicates new lines of advance and raises controversies which need to be resolved.

The draft rightly emphasises the urgent need for universalisation of elementary education in the course of the next ten years. It we go by the enrolment figures as a proportion of the total number of children in the age-group 6 to 14, the targets look very much unrealistic. An entirely new feature has been the emphasis on non-formal education programmes for the older children who have dropped out of the school and those who have not been to the school. Low enrolment and high drop-outs will however continue to plague the policy makers who have suggested detailed study of the problem with a view to initiating remedial action. Programmes like more incentives, school books, uniforms, mid-day meals, scholarships etc., may ensure reduction in the rate of drop-outs but the resources position will hardly be adequate to cover the expenses.

The new policy is remarkable for the attention it has given to the 230 million of the country's adult population for whom a National Adult Education programme has already been organised. In the way the programme is being tagged to multiple agencies to create awareness of other programmes like family planning, health, nutrition, child and mother care, it is apparent that the adult education programme is beyond the capacity of a single Ministry of Education & Social Welfare. Finding educators both men and women, particularly in rural areas, having the requisite ability to impart literacy, numeracy, functional development and social awareness will be no less baffling as the lack of adequate financial support for the implementation of such a programme.

The Draft Resolution does not spell out precisely the educational structure. It appears that the eighth class will mark the end of the elemenary stage and the secondary stage of education will be of 4 years duration. A student will, therefore, have to make, at the age of 14, the hard choice of the stream which he or she proposes to join. The existing system, providing the study of science and mathematics upto class X, contributes to better understanding of the processes of production and enables the common masses in the urban and rural areas to go in for higher studies in science and engineering. Even vocationalisation of secondary education would be more meaningful if it is done at the end of Class X. Massive vocalisation will do more to ease the pressure on universities and offer alternatives to school leavers. But the government must give much more careful and serious thought to it than it has given evidence of doing.

Among others, the regional language as the medium of instruction at all stages will not be to the liking of many who look upon it as a clever urse to banish English and pave ultimately the way for installation of Hindi as the sole alternative to English. Similarly the proposal to charge fees from student at secondary and higher education stages will meet resistance. The bulk of the poor, the lower middle class and middle class families will be hard hit if the process of providing free education at secondary stage of education is reversed. □

LETTERS

Profitability in Public Enterprises

Sir,

The Editorial in YOJANA dated 16th April, 1979 under the above caption is neither revealing nor a novelty. The facts are known to one and all who have taken pains to have an objective view of the State of affairs in Public Sector Undertakings. "The officer on special duty" is a legacy analogous to the political appointment "Minister without Portfolio" to confer some special favour on the favourite. There are at least more than 1000 such posts both in Union and State Governments.

It is true that the Public Sector Undertakings are incurring heavy losses whereas they should have been torch bearers for creation of adequate resources for financing Public enterprise and reduce the burden on tax payers. The experience is just the reverse. What are the causes for such a State of affairs in spite of several enquiry committees, commissions and departmental enquiries ?

These could be analysed as follows :

1. The Public Sector Enterprises are the rendezvous for granting political favours and patronage either as head of the organisation or at subsidiary level. Norms of Government sanction and recruitment do not apply to these undertakings. Further the recruitment is very often based on relationship, patronage and telephone calls from some VIP's. There is no limit to the potential strength of the establishment. If a few efficient and motivated hands find their entry into these undertakings their hands and feet are tied even in day to day working. It is not as though that an individual by entering from public to private sector suddenly gathers better capability and high talents to make the private sector efficient and viable. But it is the environment his accountability and scope for display of his originality which enables him to make his mark in the private sector.

2. The heads of Public Sector undertakings initially start with good intentions making all solemn promises of a well knit compact organisation. But within a short time one finds the easy channels he can wade through to achieve personal gains and satisfy the ego of his authority. The means for amassing wealth by several dubious methods are well before him and few can resist the temptations. There is little check on the positive physical targets set and achieved by him. By the time he is unearthed by his misdeeds and incapacity his godfaher finds him another place of comfort and security. On the other hand one has to be imbuded with a spirit of service and sense of pride in the growing prosperity of his organisation. This is acquired over a period of years with hard result oriented work in the organisation which is hardly recognised or rewarded.

3. The undertakings apart from its normal working are called upon to involve in several ancilliary activities such as a high style of living, easy and luxurious transport facilities and palatial accommodation with ever expanding comforts and perquisites. All these are carried out in the name of reception to public and private visitors, Ministers and Government officers who are accompanied by a large entourge during their visits. On the other side one could see the subordinates and the workers living in slums under most insanitary conditions.

4. Lastly the very functioning of these fully autonomous undertakings even when inducted with competent and motivated hands are defeated by the bureaucrats of the State/Union Governments who could apply spokes at every moment. The result is loss of face for the heart with his subordinates and demoralisation at the lower levels when they see blatant insults hurdled at their superiors.

A number of probing bodies have gone through all these exercises but none has dared to point out the inner working lest they may be deprived of their own positions, in their present and future assignments. It is rarely that independent free-lancers of high ability ever admitted into such enquiry bodies who could have unearthed the mysteries of Public Undertakings. Even when these unpleasant findings come out they never see the light as the top hierarchy often finds a place of censor for such reports.

M. K. R. Menon
Tripunithura

A useful journal

Sir,

It is with great interest I saw an Issue of 'Yojana' carrying articles on Archaeology in Vol. XXIII-3, dated 16th February, 1979, which is extremely useful for reference purpose. Since articles ranging from Proto-historic to medieval period and also on preservation in museums it is valuable not only for reference but also for research purpose as it carries article of eminent scholars like Shri B. K. Thapar, Director General Archaeological Survey of India.

Dr. C. Margabandhu
Vadodara-390009.

Readers writing to this column are requested to restrict their letters to two typed pages. They are also requested to give their Complete postal address, clearly.

--Editor

India's Space Programme

Modest but Impressive

India joins the select ranks of the Space Elite

BHASKARA

India's second satellite for Launch

Special Report :

Rosscote Krishna Pillai

Our correspondent, who had a close look at India's space endeavour, gives a graphic account

OVER 7,000 young Indian Space scientists, engineers and technicians, most of them below 30, engaged in India's impressive space programme, described as "modest" by Prof. Satish Dhawan, Chairman, Indian Space Research Organisation, are now agog with excitement, with their senses keyed to a remote Soviet cosmodrome from where the second Indian Satellite (the first was the 360 kg Aryabhata launched on April 19, 1975 using a Soviet launch vehicle) is heed into the Space.

Aims of the Project

The Satellite for Earth observation (SEO) is the first satellite based on remote sensing programme of ISRO for the survey of the natural resources of the country. It aims at conducting earth observation experiments for getting scientific information primarily in the areas of hydrology, forestry, oceanography and meteorology. India's vegetation, snow cover, mineral resources, water resources, sea surface temperature and ocean winds will either be photographed or the relevant data recorded by the satellite.

SEO, an application technology satellite, modelled exactly on Aryabhata, weighs about 444 kg. and has a quasispherical polyhedral shape with 26 flat faces having a diameter of 1.55 metres in the equatorial plain and 1.66 meters along the longitudinal direction. The temperature inside the satellite will be maintained within the limits of 0° and 40°C. The power of the satellite is supplied by a system of silicon solar cell arrays and nickel-cadmium batteries. The solar cell array can provide an average raw power of 47 watts. The batteries are used to meet the peak power demand during the operation of the primary payloads as well as to supply power during the orbital eclipse and during the launch phase.

SEO will orbit the earth at a height of 557 kms. with an inclination of 50.7°. The orbit height of the satellite is so chosen that the complete coverage of the country is possible with the TV cameras within a reasonable period, say two to three weeks.

The primary payload will include two TV cameras made abroad, and three microwave radiometres called SAMIR. Besides these it will also carry a data collection system and experiments to test the efficacy in space of indigenously developed heat pipes, thermal paints, solar cells and an x-ray sky monitor for astronomical studies.

SEO is expected to give the country a total systems capability which includes (1) satellite fabrication, testing and qualification (2) payload fabrication, testing and qualification (3) payload satellite integration (4) reception and data handling and (5) data analysis. More than 20 user agencies including Government agencies, research institutions and universities will use the data collected by SEO.

Two ground stations, one at Sriharikota and the other at Ahmedabad will track SEO. They have facilities for telemetry data, reception and telecommand transmission besides tracking. Facilities for attitude

control of the satellite have also been set up at the ground stations. In the early phase of the mission, the ground station at Bears Lake near Moscow will also be used for monitoring and control operations of the satellite.

A Major Mile Stone

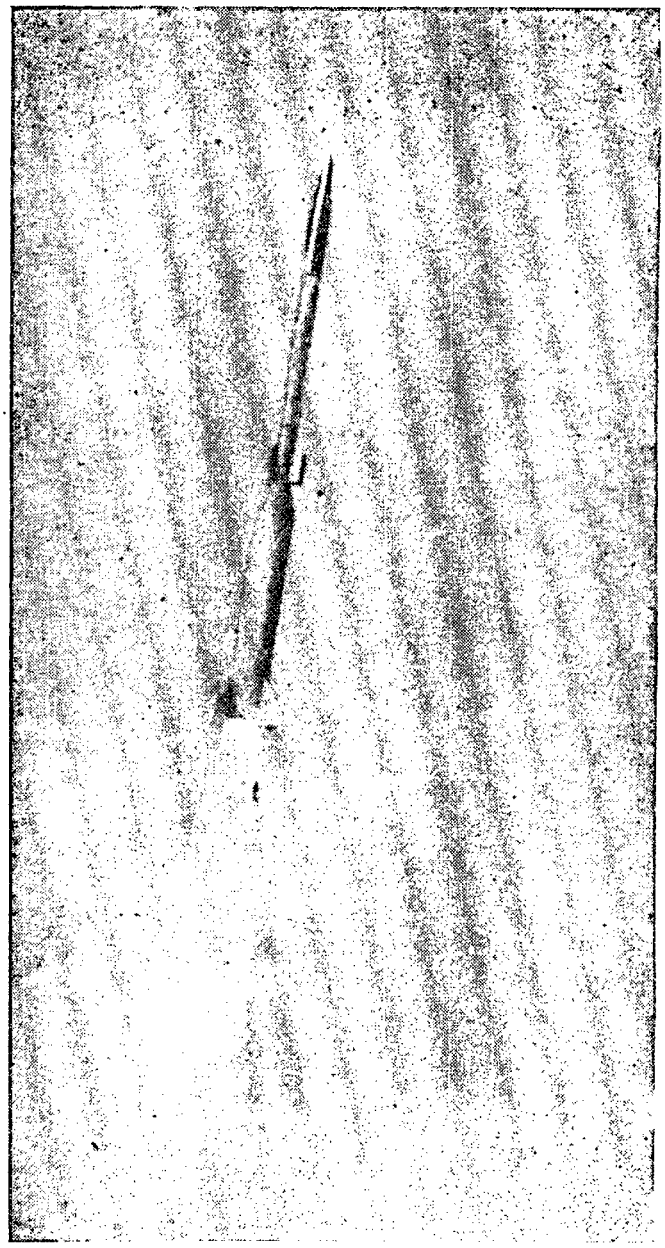
The launch and conduct of the proposed experiments with SEO, if successful, will be a major milestone in India's Space programme with its primary exphasis on Communication and Remote Sensing applications. It will also be a big boost to numerous teams of brilliant young engineers and scientists in over 20 organisations who have been dedicatedly working during the last two years for making a success of the SEO programme. This correspondent, who toured all the major space projects under ISRO in the latter half of last year as a member of an all-India team of journalists and science writers, had the privilege of watching at close quarters the scientists and engineers at work and the enormous number of extremely sophisticated and miniaturised components, instruments, gadgets, machines and sub-systems that they have innovated, fabricated, integrated and tested for supreme accuracy and precision and stringent quality and reliability standards.

According to Prof. Dhawan, the aims of the Indian space programme are very different from the goals set by other countries with their emphasis on defence. These were based on an entirely Indian concept of development which must be cost-effective within a limited time-frame. The elements that made up this programme were derived from the unique capabilities of satellites. Prof. Dhawan pointed out that the major objective of the programme were communication and investigation of natural resources. Since our rural areas had very little facilities of communication and education and our communication media catered mostly for the urban elite, the possibility of reaching the maximum number of our rural people using communications satellites had to be tackled. The other objective was the investigation of natural resources using remote sensing satellites.

No Defence Aims

Was it at all possible for a country devoted to developing itself and engaged in a war against poverty to go in for big enough launchers for defence, asked Prof. Dhawan. Although there was a great degree of similarity among the launchers needed for our space programme and the missiles for defence purposes, Prof. Dhawan asked, "Why do you want a ballistic missile ? What will the missile deliver ?" and without waiting for an answer he said categorically, "Even if you have a launcher, a whole series of steps will have to be taken for making it a missile." He said India, which is scheduled to put a satellite in a synchronous orbit by using its own launcher, could use the same launcher with modifications for delivering weapons. However, our country could ill-afford to divert its not-too-abundant resources for a huge defence programme for manufacturing missiles.

To questions obliquely casting aspersions on the wisdom of making huge investments in the space programme, Prof. Dhawan's answer was that India, which was trying to modernise its technology, could not afford not to have a space programme. He added, "Take the SEO satellite. What it could contribute to the country's development in the next few years is not easy to quantify. The Indian national remote sensing satellites would give from 1981 onwards data on weather phenomena every half an hour." He pointed out that the country has suffered great losses from floods in the last 200 years and said that the gigantic problems posed by floods, drought and other natural phenomena had to be studied. Prof. Dhawan added that the communications part of the space programme was a revenue earner.



Although India had spent about Rs. 250 crore in the last 15 years up to 1978-79 and would be spending another Rs. 325 crore in the next five years, the expenditure on space was much less when compared with the other advanced countries which had engaged themselves in space programmes. Japan had spent five times more than India. In Europe, France and Germany had spent 10 times more in the European space programme. The USA and the USSR would have each spent roughly 200 times as much as India for space research. Prof. Dhawan tellingly pointed out that what was spent on the Indian space programme was not even as much as the cost of four Boeing-747s.

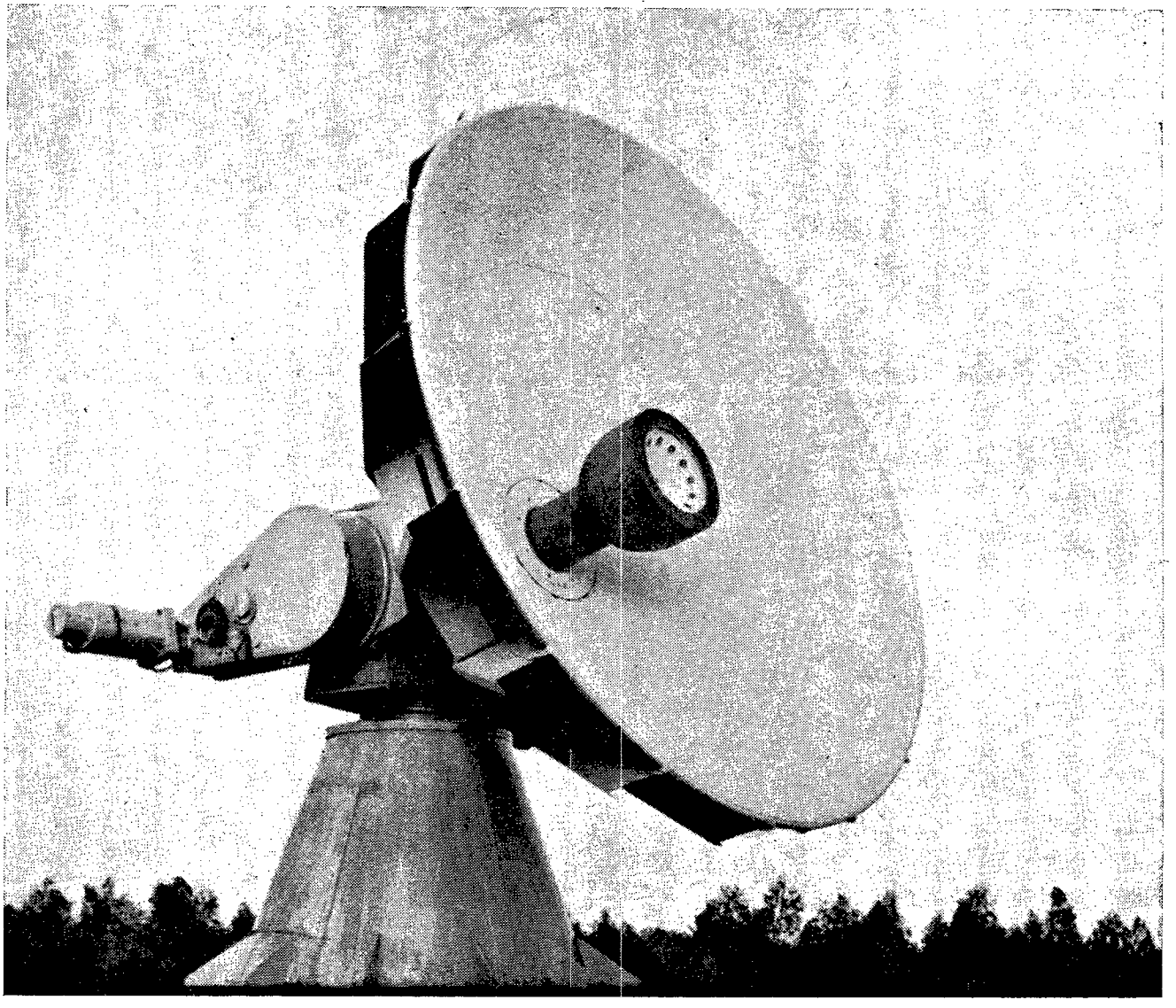
Soviet Help

He emphatically added, "Satellites don't do anything on their own. It is the human beings who are involved in the programme who really contribute. He said the space programme was a hybrid system, partly space and partly terrestrial. Asked why Aryabhata had been launched and SEO was now being launched using Soviet rockets, Prof. Dhawan replied that India was fast acquiring launch capability but even before that India accepted the Soviet offer to launch India's first satellite free of cost. When negotiations were proceeding on the launching of Aryabhata, the then Chairman of the USSR Academy of Sciences, the late Prof. Keldysh promised an additional launch, also free of cost, in case the first one failed. However, even though Aryabhata was successful, the ISRO scientists approached the Soviet Union for a second free launch for SEO which was then at a conceptual stage. The Soviet scientists gladly signed an agreement on April 22,1975 for the launching of SEO from a Soviet cosmodrome. The USA was not prepared to launch Indian satellites free.

Prof. Dhawan pointed out that it would cost the Soviet Union at least 10 million dollars for a launching. To a question what the pay off was in this regard for the Soviet Union and for India, he said it was goodwill and togetherness in space that resulted from this combined effort. He also pointed out that India had earlier supported the space launchings of the USSR and the USA by telemetry. He said that a peaceful co-operation programme between two countries was in the interests of both.

Murderos Time-Table

Along with the launching of the SEO, the Indian Space Research Organisation is geared to a very tight schedule, which Prof. Dhawan described as "a murderous timetable". The immediate item in this schedule is the launching of the Experimental Satellite Launch Vehicle (SLV-3) proposed for mid-1979, which will carry into space a 40 kg. technology satellite called Rohini Satellite-1 (RS-1). The other for the coming items are the development, launch and in-orbit operation of an Ariane Passenger Payload Experiment (APPLE), a 630 kg. geo-stationery



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communication satellite, which is expected to be launched next year by the European Space Agency from a launching pad in what was formerly French Guyana, the launching of two Insat-I satellites, multi-purpose geo-stationary spacecraft being built in the USA to Indian specifications and requirements, the launching of a series of Rohini satellites with scientific, technology and application payloads using SLV-3 and ASLV launch vehicles, the launching of a Rohini Sounding Rocket (RH-560) in 1979, the launching of the first Indian Remote Sensing Satellite (IRS) to be launched in 1983-84 and a proto-Insat also at about the same time.

The scientific and technological work relating to these satellite launchings is done in the four major centres of ISRO which have, in the last 15 years, gained considerable complementarity in their roles and have synchronised and coordinated the various segments of the Indian space programme to the minutest detail. The four major centres under the ISRO are the Vikram Sarabhai Space Centre at Thumba near Trivandrum, the ISRO Satellite Centre (ISAC) at Bangalore, the Sriharikota Range (SHAR) off the coast of Andhra Pradesh and the Space Application Centre (SAC) at Ahmedabad. Besides these, the Department of Space supports basic research in space science at Physical Research Laboratory (PRL).

The first and the largest centre set up by ISRO is at Thumba near Trivandrum. Now called the Vikram Sarabhai Space Centre, named after the late Dr. Vikram Sarabhai, the founder of the centre, it has several units, namely the Space Science and Technology Centre (SSTC), Thumba Equatorial Rocket Launching Station (TERLS), the Rocket Fabrication Facility (RFF), Rocket Propellant Plant (RPP), the Propellant Fuel Complex (PFC), and the Fibre Reinforced Plastic Centre (REPLACE). These units are geared to the generation of technologies for launch vehicles primarily and for certain technologies for spacecraft.

The Space Science and Technology Centre is composed of different groups, namely aeronautics, avionics, chemicals and materials, composites, propulsion and systems reliability. These groups share the responsibility for research and development in propulsion systems, rocket hardware, design, on-board and ground electronics and control systems for application in launch vehicles, payloads and spacecraft system and for their test and qualification.

The two principal ongoing activities managed by VSSC are the Satellite Launch Vehicle (SLV) project and the Rohini Sounding Rocket (RSR) programmes. The Thumba centre develops rockets for satellites and for atmospheric research.

VSSC was started in 1962-63 with the setting up of the Thumba Equatorial Rocket Launching Station (TERLS) primarily to conduct experiments in equatorial aeronomy, monsoon meteorology, cosmic rays, astronomy and geodesy. It was converted in February 1968 into a UN-sponsored International Sounding Rocket Range open to various member countries of the United Nations for conducting sounding rocket experiments for investigation of the upper atmosphere. The only condition is that the nations who make use of the facility should share the information so gathered with other nations.

VSSC has facilities in chemical, electronics and rocket launching areas for development, production and testing. These can fulfil most of the needs of the ongoing programmes.

Spectacular SLV-3

The most spectacular work on which VSSC is now concentrating its attention is the SLV-3 rocket. The scientists have grappled with all the complex problems that have arisen in the building up of the rocket and have solved them to their entire satisfaction. "We have now a rocket bigger than what Britain has and as big as the one only France has, besides the USA and the USSR", said Dr. V. R. Gowarikar, Scientist-in-Charge. He pointed out that the VSSC had developed over a period of 11 years from 1968 rockets weighing from 10 kg to 18,000 kg. Japan which started in 1955 took 15 years before it could put a satellite into orbit in 1970. Dr. S.C. Gupta Director of a division, said : "We have now a sense of accomplishment although we had our set-backs and disappointments in the last 11 years in developing a whole range of small and medium-size sounding rockets, from RH-30 weighing 370 kg. to RH-560-B weighing 2250 kg. and to satellite launchers culminating in SLV-3 weighing 18 tonnes".

Without any foreign collaboration or aid, the Indian scientists have solved various problems of design, reliability, precision and testing. "We have developed a scientific culture in which man is at the centre," said Dr. Gupta.

Technological Capability

The ISRO scientists have built up a tremendous technological capability involving complex tasks and challenges using primarily fresh graduates from Indian universities. The scientists were keen to emphasise that the whole space programme was intended not to achieve glamourous tasks but to make available a technology for development in the country which would meet not only ISRO needs but also the needs of others in the fields of industry and science. There have been a number of spin-offs from the space programme at VSSC like reinforced plastics, telemetry equipment, a number of new chemicals and gyroscopes which may find use in defence systems and have been taken by the Hindustan Aeronautics Ltd.

Although the major work relating to SLV-3 done at VSSC, there are various centres and 40 national industries spread all over the country doing time-bound and quality controlled working relating to sub-system of the rocket. The launch vehicle, with four stages S1, S2, S3 and S4 has 44 major sub-systems and 250 modules with 100,000 individually identifiable components. These have to work in unison to launch the satellite into orbit. All the sub-systems have to undergo a number of environmental tests.

Around 10 per cent of the SLV components is indigenous. The foreign component is progressively getting reduced. The scientists at VSSC said that in guidance systems, controlled systems and solid propellant technology, India could be counted along with any other advanced country in the world. SLV-3 has undergone various tests (10 for the lower stages and 20 for the 4th stage) and every part has been proved. Referring to the tests, Prof. Dhawan said, "We had failures but we had no disasters. We have complete confidence in our young people. They have shown us that we have a reasonable chance of success."

If ISRO is able to launch RS-1 successfully into orbit using SLV-3 in the second quarter of this year, India will be joining the small elite group of five nations, the USA, the USSR, Britain, France and China who have put into orbit their own satellites using their own rocket.

Before the satellite is in orbit, the 13 tonnes out of the total 18 tonnes weight of the SLV-3 launch vehicle would burn off. The specific impulse of the energy level of propellants is a very important factor in determining the capability of attaining velocities that will take a satellite into orbit. When the VSSC started its work, the specific impulse of propellants used was only 200 seconds. When the specific impulse is 230 seconds plus, the propellants will have enough energy to take the satellite into orbit. The scientists at VSSC said that India had reached the level of advanced countries in realising the energy level of propellants.

A successful SLV-3 launch would take ISRO to realising bigger vehicles like the Polar Satellite Launch Vehicle (SPLV) which would launch 650-kg. satellites. The scientists of ISRO are confident that they would be able to attain the operational capability for launch vehicles for putting 850-kg. communication satellites into space in the near future.

A number of spin-off benefits and sub centres have developed from the work on sounding rockets and launch vehicles at VSSC : the Integrated Structural Testing Facility, which has achieved a breakthrough in making a honeycomb of aluminium used for making solar panels, the Fibre Reinforced Plastic Division which makes fibre-reinforced plastic motor cases, nozzle and pressure vessels for SLV, the Rocket Propellant Plant, which was established in 1969 and which gave birth to the bigger plant at Sriharikota making solid and liquid propellants and carrying out hazardous tests, the Rocket Fabrication Facility, which produces rocket hardware and SLV sub-systems and renders support to various divisions in non-destructive testing and the calibration of instruments. The Meteorological Laboratory, which is claimed to be the most sophisticated laboratory of its kind in the country, at which the various precision instruments have been developed indigenously, the Precision Instruments Laboratory which is mainly meant for control and guidance equipment and which has the biggest clean room in Asia excepting Japan, and the Telemetry Section has an order worth Rs. 17 lakh for its HAL ISRO Project on flight instruments and telemetry (hipfit) for aircraft testing. The scientist incharge said that each of the six sub-systems that they had made would cost Rs. 6 lakh, if imported. Ninety per cent of them was indigenous.

SHAR—Principal Rocket Centre

The SHAR centre at Sriharikota is India's principal rocket launching and testing centre from where the SLV-3 is proposed to be launched later this year. Besides providing rocket test and launch facilities, SHAR is responsible for managing ISRO's nationwide tracking network for the operational support for maintaining national satellites and for producing solid propellants for launch vehicles. The various stage motors and sub-systems for SLV-3 have been produced and tested at SHAR and the launch facilities have been got ready.

The stupendous confidence of the scientists working at SHAR is reflected in a saying prominently displayed there : "We are today where our thoughts brought us. We will be tomorrow where our thoughts take us." In SHAR situated in Sriharikota island in the eastern part of Andhra Pradesh, 100 kms, away from Madras, has sprung up in an area of 100 sq. kms. a vast complex with buildings and sheds far removed from each other and a huge housing colony accommodating 1600 employees and a 50-bed hospital. The main divisions are ISRO Range Complex (IREX), Statistic Test and Evaluation Complex (STEC) ISRO Tracking, Telemetry, Command Data Acquisition network (ISTRAC), the Solid Propellant Space Booster Plant (SPROB), SHAR Computer Facilities (SCOF) and Sriharikota Common Facilities (SCF).

The SPROB, a 250 tonne solid propellant plant, has started production in March 1977. The entire plant (Rs. 8 crores investment) has been built by Indian engineers from drawing to commissioning in four years, said Shri P.D. Mazumdar, Manager of the Plant. The solid propellants for the first third and fourth stages of SLV-3 are made at SHAR; that for the second stage is made at Thumba. The filling of the propellants into the various stages of the rocket is remote-controlled.

The rockets are tested on the static bed (STEX) by firing and measuring the pressure, temperature and other parametres. Every little control of each stage is groundtested and flight-tested. A mock-up model of SLV-3 is made to test all the mechanical systems.

The scientists pointed out that in sophistication we were far behind the United States and the Soviet Union because we had very poor industrial support whereas in the USA, every little component was made and supplied by industry. In Japan too, industry gave full support. However, one of the scientists emphasised, "In rocket technology India is in no way behind Japan".

This correspondent felt that the young scientists and engineers working in SHAR, one of the most sophisticated projects of the country demanding utmost precision, deserve not only kudos but support and sympathy from the men at the helm in solving the humanitarian problems faced by them living in an isolated area 'far from the madding crowd' and deprived of the attractions of metropolitan or urban life. □

Appropriate Technologies For Rural Uplift

Development and Adoption

Anand Sarup
Secretary,
Planning Deptt., Govt. of U.P.

THE MEANING of the term "Appropriate Technology" has been a subject of considerable controversy for a long time. This has happened, however, only because those responsible for individual investment decisions often do not consider the impact of their decision on the environment, the settlement pattern, the urban and rural and inter regional disparities or on the consumption pattern, poverty levels, employment and income distribution.

It is normal for any public or private entrepreneur to consider technological alternatives but usually he does so purely from the point of view of financial profitability of one vis-a-vis another readily available alternative.

Most of the technological research is taking place in the organised large-scale sector in India and abroad. In the highly developed countries from which technologies are being constantly and often blindly borrowed, there is a tendency to substitute capital for labour. Consequently, the portfolio of readily available technologies all over the world has been progressively becoming oriented to capital intensive, labour saving and large scale operations. Unless this process is counteracted, poor countries with high rates of unemployment and under-employment and inadequately developed infrastructure for power transmission, transportation, marketing etc. would experience a progressively higher incidence of income inequalities and social disparities. A few concentrated belts of industrial activity would develop in specially favourable locations where large industrial units of production would cater to the needs of huge hinterlands where the majority of labour force would be subsisting exclusively on agriculture at sub-marginal levels of income.

One of the pre-requisites for achieving the kind of balanced spatial and socio-economic development envisaged in India's National Plan is that every attempt should be made to bring about not only an overall augmentation but also a diversification and dispersal of employment opportunities. This would mean that a large number of small enterprises would have to be encouraged so that the countryside all over the nation would be interspersed with small and cottage enterprises which would, as is happening on a large scale in Japan, provide seasonal or part-time employment to small land holders and landless labourers. To realise this objective, it would be necessary to take investment decisions after a systematic appraisal of technological choices for different size-dimensions of enterprises keeping in view demand, marketing, transport costs, resource endowments, employment, capital investment parameters etc. In this context two major factors which will have to be taken into consideration are :

(a) that there has been a tremendous expansion of the communication and rural electrification in the past few years;

(b) and now because of electrification and infrastructrual expansion, it is increasingly possible to think in terms of small scale technologies which would incorporate some of the latest findings in the field of scientific research and thus produce products which would be competitive not only in prices but also comparable in quality with goods emanating from large scale manufacturing units.

It is not necessary in all conditions to make a deliberate effort to introduce small scale technologies and call these "appropriate" because of their limited dimension. For certain items and in certain situations and places, when presented with a choice, choosing a large scale technology may be the only "appropriate" decision. However, as a general proposition, it does seem reasonable to assume that in a capital-scarce, labour-surplus situation requiring balanced development from the point of view of social as well as personal income distribution, choice of capital saving, labour intensive and small-scale technologies would be more "appropriate" provided it does not involve waste of real resources or indefinite artificial propping up of entrepreneurs at the cost of society. In any case diversification of the rural economy and augmentation of the income of a very large percentage of rural population is just not possible without thinking of small scale centres of production.

It is often argued that a decision to choose small scale units of production inherently involves either capital subsidies or tax concession or price support because the technologies involved are inherently less efficient than large-scale technologies of production.

A careful examination of this assumption would, however, show that there is no real basis for such a generalisation because there is no evidence to indicate that such a conclusion is based on a careful and determined effort to choose or evolve small scale technologies which incorporate the fruits of latest scientific research. Most of the time, the concept of "appropriate technology" gets debased because of the tendency to think of it in terms of either the revival of old technologies of production or the miniaturisation of large-scale technologies.

A reasonable decision on the comparative viability of various technologies involving different scales of production for various products would be possible only if well equipped laboratories and highly trained technical personnel had examined the scope of technological innovation for small scale manufacture and provided data for comparison for various production-situations. This, however, has not happened because the best laboratories as well as the best minds continue to be occupied with enlarging the unit of production and the substitution of labour by capital.

Another major problem in relation to the development and adoption of appropriate technologies relates to the tendency of various organisations concerned with technological innovation to look myopically at technological processes and find solution in isolation of the constraints of capital, management, labour and entrepreneurial skills and marketing. On the other hand in case of large-scale technologies the process of manufacture is invariably considered in the context of a package of constraints and environmental conditions. That is why innovative research for large scale technologies is much more successful.

It is unfortunate that whenever the question of "appropriate technology" is considered, perhaps because of resource constraints, innovative work is looked upon as one time operation. On the other hand, in the case of large scale technologies, R & D is continued all the time and it is assumed as a matter of course that technological processes would go on changing and improving and, therefore, there would inevitably be a certain rate of absolescence. Another major problem in relation to technological research for finding 'Appropriate Technologies' for rural development is the tendency of sponsoring agencies and government departments to assume that viable groups of highly qualified, experienced and well-paid scientific manpower are essential only for working on problems of large-scale manufacture. Even a moment's consideration would show the fallacy inherent in such a simplistic approach. The turth is that since development of small-scale and "appropriate technologies" involves work which runs counter to the current orientation of research, special incentives have to be provided to researchers willing to take up work on them. Moreover, it has to be recognised that the basic intellectual equipment and methodological approach required for developing "appropriate" and small technologies is no different from those required for research in large scale technologies.

Perhaps the most spectacular work in the field of developing and popularising "appropriate technologies" for small scale production has been undertaken by the Planning Research and Action Division (formerly P.R.A.I.) at Lucknow. It has to its credit the development of the processes and prototypes for small-scale crystal sugar manufacture; production of whiteware and other ceramic goods; relatively less expensive small and community scale biogas plants which do not need steel drums for holding gas; cheap water-sealed latrines for rural areas; and kacha-pucca houses for rural poor. It also started work on small-scale cement manufacture but this had to be given up because of insistence on instant results and bureaucratic obstacles in obtaining adequate and appropriately qualified manpower. Presently, it is engaged in work on small-scale processing of Soyabeans, development of Windmills, construction of a bullock driven pump and a number of other areas concerned with rural enterprises. The Planning Research and Action Division has succeeded in doing useful work only because it is committed to technologies for the development and utilisation of local human resources and structurally organised as a multi-disciplinary institution which can attract talent from well-established technical organisations, convert laboratory research into prototypes, test prototypes in the field and demonstrate the practical technical and economic viability of the "appropriate technologies" evolved by putting up Pilot Project operating in real-life conditions. In short, the P.R.A.D. can go from identification of a problem right upto turn key demonstrations for small scale technologies and thus stimulate the work done for large scale technologies by giant enterprises and their R&D associates.

In 1977-78, the U.P. Government took another major step to facilitate the development of "appropriate technologies" by providing a large chunk of money to its Science and Technology Council laying down that it would be used for the development of technologies for Rural Industries. It was already laid down that the funds provided could be used for any of the following tasks, which it was felt constituted integral stages of the work on the development of "appropriate technologies":

(a) Exploratory diagnostic studies to identify potential problem areas of work;
(b) laboratory-research for solving specifically identified and carefully formulated problems disaggregated in terms of basic scientific disciplines involved;
(c) fabrication of prototypes; and
(d) testing of prototypes under real life conditions.

Some of the problems which have been taken up by U.P.'s Council of Science and Technology in collaboration with P.R.A.D., the Appropriate Technology Development Association, the Roorkee Engineering College and others relate to:

(i) manufacture of cementing material from paddy husk;
(ii) small scale spinning of wool;
(iii) development of improved spinning devices for producing cotton yarn to support handloom and powerloom industry;

(iv) development of prototypes for more efficient bullock-carts;
(v) construction of cheap but comfortable houses for rural poor; and
(vi) improved agricultural implements for small scale agriculture.

From the experience of P.R.A.D. and other institutions engaged in the development and adoption of "appropriate technologies", it has become clear that rapid progress in the desired direction can take place only if institutional arrangements are made which would make the promoters responsible for the whole gamut of related responsibilities starting with the identification of potentials and problems in their marketing, managerial, labour-skill and resource environment and ending up with life-size pilot projects demonstrating the success of the new processes and prototypes advocated for adoption. Nothing short of this comprehensive approach will deliver worthwhile results.

In addition to the encouragement of institutional arrangement for assuming these responsibilities, it is also essential that measures should be taken to:

(a) promote the recognition that development of "appropriate" small scale technologies requires the same quality of expertise and technological support as in the case of large scale technologies;
(b) create conditions which would provide special recognition to technologists and thereby "legitimise" work on small scale technologies;
(c) promote systematic exploratory|diagnostic research to demarcate areas of application and assign inter-se priorities;
(d) create technology clinics with actual users of relevant technologies as referees to evaluate the results presented by R&D institutions, and
(e) provide for failure of experimentation. □

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(ii) Implementation or construction or execution ;

(iii) Operation.

In the first phase, the project is conceived, formulated and investment decision is taken with the help of techno-economic analysis embodied in the project feasibility report, after examining various alternatives. After the project approved detailed technical design work is undertaken and the implementation or construction is started thereafter. However, between the investment decision and start of implementation, lies an important stage where complete and detailed planning for the entire implementation effort is to be undertaken so that implementation could be smooth, less problematic and in accordance with the assumptions of time and cost considered at the time of making investment decision. This is the stage *of Implementation Planning* and the quality of implementation ing determines to a great extent, the success in the later stage of construction or execution. During the construction or implementation stage, an effective monitoring system would help in the corrective action being taken whenever deviations occur in order to ensure that the execution goes in accordance with the implementation plan.

The construction or execution phase ends with the commissioning of a project, which is physically located somewhere, after which the project goes in operation phase and generates the output or service. The monitoring of physical projects in the operation stage is necessary to ensure that the project is run efficiently and economically and the output or service is available in accordance with targets which, in turn, are laid in line with the installed capacity or original estimates made at the time the project was sanctioned.

In case of programmes or schemes which are not physical entities, but diffused or spread over a given area or population, there is generally no distinct dividing line between execution and operation. The two phase overlap and the operation of the scheme goes simultaneously with its implementation and the service or benefits underlying of the scheme often get generated even from the moment the execution stage starts.

The monitoring of schemes in implementation stage is also meant to ensure that the implementation plan is achieved by taking corrective action, wherever deviations occur.

Thus, the Implementation Planning and Monitoring are inter-related phases of one continuous cycle which enables the management to control the projects and scheme effectively and achieve the targets and expectations of implementation of projects and schemes.

Components of an Implementation Plan

A comprehensive Implementation Plan (which has sometimes been also termed as management plan, operational plan, plan of action, resources plan or project plan)—would ideally provide a complete blueprint of the entire work effort involved in implementing the project, including the inputs, manpower, resources needed, logistics, etc. Thus essential components of an implementation plan are :

(i) Plan for physical work effort, etc.

(ii) Time Plan

(iii) Input Resources plan :
- — manpower
- — materials
- — construction equipment
- — construction utilities such as power, water, transport, etc.
- — Funds

(iv) Equipment and order plan

(v) Project organisation, responsibilities and systems

(vi) Plan for construction inter-linkages with other projects/activities.

(vii) Plan for project operation —
- — Raw materials supply

Manpower recruitment and training
- — Utilities supply e.g., water, power, etc. for operation
- — Operation interlinkages
- — project operation organisation and systems

Plan for physical work effort

This involves a complete definition of the work effort involved in construction of a project, covering :
- — Design, engineering, drawings, etc.
- — Land acquisition
- — Civil work—excavation, land development, concreting, structure, buildings, etc.
- — Plant and equipment—procurement and erection
- — Utilities and services—water, power, road, etc.
- — Township
- — Other works
- — Decision making and administrative activities at different stages and levels

In case of a scheme, work could include :
- — Estimation of requirements of staff, implements, supplies etc.
- — Recruitment and posting of staff
- — Surveys, Investigations, Studies, Reports

ports
- Procurement of implements, credit, supplies, materials
- Land Acquisition
- Distribution of Land, implements, supplies credit
- Physical Works on site
- Other work areas
- Decision-making and administrative activities at different levels and stages

What is needed is a clear visualisation and estimation of the work areas involved, including quantities of (wherever measurable), work areas and activities to be undertaken (if possible and feasible, detailed activities to be identified to the last activity or work item which would need to be undertaken), the sequence in which activities would have to be undertaken, their inter dependence and inter-relationship etc. All work and activities which would need to be undertaken, irrespective of the responsibilities for undertaking them, would have to be very clearly and defined at this stage. What will come out of this exercise, would be a detailed logical plan of work, defined as far as practicable, upto the last element of work.

Time Plan

In the next exercise, estimated time required for each area/activity|element of work and for the project as a whole would be determined. As the time estimate for any work to be undertaken would be dependent upon the resources which will be deployed, in the first approximation, a 'normal' assumption is made, namely, what would have been deployed normally when normal constraints of time/resources were to be applied.

After estimating the time needed for each work area and for the project as a whole, the second stage in time planning is scheduling—i.e. deciding the dates when each work area should begin and should finish.

Many techniques for developing a time plan are available. Traditionally, Bar charts have been used in the country for a long time, Bar chart, indicates the start and finish of each major work area on a time scale. It, however, does not show the inter dependencies, does not give the relative criticality of different work areas, nor can it indicate realistically the impact of delay in one work area on the completion of the total project. Flow charts and Line of Balance are some other techniques used by some organisations but these techniques also have limitations. The Network Techniques namely, PERT (Programme Evaluation and Review Technique) or CPM (Critical Path Method), however, do not suffer from the limitations of the other techniques mentioned above, and are new widely gaining acceptance and use for time planting of projects, though for schemes these have not been applied on a bigger scale. Network techniques involve the development of a logical plan of the entire work effort, after identifying all activities to be undertaken to complete a project, their inter-dependence and sequence ; estimation of time to be taken for each activity, total time for the project, time for start and finish of each activity and scheduling. It also help in identifying critical and slack areas of work, degree of slackness and precise impact of any delay in any activity, on the completion of the project.

Implict in any time plan of the complete work effort of a project are some assumptions of the input resources required for undertaking different work areas or activities. In planning for input resources, these assumed requirements have to be explicitly identified and matched with the likely availability in each time period througout the project implementation. For, if the implicit resource requirement is more than the likely availability in any time period it would be unrealistic to expect the project to get implemented in accordance with the time plan and such an implementation plan will be inherently un-implementable. Secondly the resource requirements may have to be levelled availability is uniform, rather than fluctuating. In such cases working backwards, the time plan may have to be so revised as to match the resource requirements implicity in the time plan, with the likely availability in each time period, both in terms of quantum and pattern.

Thus input resource planning will require :

(i) Identification of such categories of inputs such as manpower, materials, construction equipment, which because of scarcity constraints of pattern of availability, would require detailed planning and matching with availability.

(ii) Determination of total requirement of each category for completing the project.

(iii) Breaking the total requirement into period-by-period components, in line with the time plan formated.

(iv) Making realistic forecasts of likely availability and spelling out assumptions underlying these forecasts.

(v) Comparing the requirements with availability, for each period, both in terms of quantum and pattern.

(vi) Reworking the time-plan wherever necessary, so that the revised requirements match the availability.

It may be observed that when there are many categories of resources to be so planned, it is likely that optimum levelling of first resource may lead to one time plan, while that of second to another and so on. In other words, optimisation of all resources, each taken individually, may not lead to one time plan. In such case, an alternative approach or one composite model considering all variables together could be adopted.

Once the time plan and the input resources have been thus integrated, the resultant implementation plan can be termed as realistic or implementable, depending upon how realistically the conditions have been foreseen (with the best available information, experience and judgement used in foreseeing them). Thereafter, it will be only unforeseeable problems which would need to be tackled during the implementation stage, so as to keep the project 'on course'. In fact studies show that a major portion of delays and cost over-runs are caused by problems which would have been foreseen if a proper, realistic and complete implementation plan had been prepared before the projects were taken up for execution.

Equipment-Order Planning

While major equipment and other items or their composite groups would normally be listed as activities

in the implementation planning as mentioned above, normally each equipment item is not shown in the implementation plan. Separate schedules of equipment and other items to be ordered are drawn and orders placed accordingly. In many projects the purchase action, undertaken by the purchase department, often goes independently of the implementation plan and the two are not in synchronism. Thus even during the initial stage equipment are often ordered out of sequence with the implementation plan or with other items, either too early or too late. As a result some items are supplied much too early and a few items are late, keeping other equipment on site waiting for them.

In order to ensure that the equipment and other items are ordered in sequence and at the right time, the likely dates by which they are required should be taken from the implementation plan and working backwards, after providing for lead time and some time margin for uncertainty (based on past experience) the date when tenders are to be invited, received, analysed and orders are to be placed, should be determined for each equipment item to be purchased. These schedules will form an integral part of the implementation plan, giving a complete logical blueprint for action by the purchase department.

Project Organisation, Responsibilities and Systems

Both for preparing the implementation plan as well as for executing the project in accordance with it, proper project organisation is to be developed the responsibilities for various talks clearly assigned and use of scientific managerial tools and system ensured from the very initial stage of the project immediately after the decision to invest is taken. In some cases, some project organisation can be developed even before the investment decision. It is not only the definition and delineation of organisation structure, but also the filling of key positions with adequately skilled persons that will later determine the success of the project implementation and among the key positions, it is the Chief executives who matters the most. If the Chief executive is committed to the implementation of the project within the time and cost estimates, he would help in developing similar commitment at other levels and also ensure that necessary management techniques are used to achieve the objective.

If an implementation plan has been prepared in detail, and if network technique has been used, all activities and their inter-relations are known and specific responsibilities for groups of activities can be assigned to different executives, specifically indicating the quantities of work, start and finished times for activities, slack available, input resources to be used, etc. etc. In fact, if the executives who have to implement the plan are involved in its preparation, they will have better commitment to ensure the achievement of various targets for work, time, input resources and cost.

While considering the management systems to be used, it is important to think of the monitoring and management information systems which will be used during the implementation stage. Development of necessary report formats to be used as input and outputs of the system, data processing and storage system, flow and communication systems, so as to meet effectively, precisely, and economically the likely information needs for monitoring, will go a long way in estabishing a proper monitoring system, which will lead to a review and action taking mechanism, so as to ensure a calculated control over the project implementation.

Construction Inter-linkages :

It is not enough to concentrate only on the activities involved in the construction of a given project—falling within the direct or indirect control of the project authorities. Most projects have inter linkages with other projects or activities in the same or different sector, which may be under the control of some other agencies or authorities. Either the given project cannot be physically completed or desired benefits from it will not flow unless the inter-related projects or activities are completed at particular points of time. Examples are mining or industry projects linked with power project, bridges linked with roads, irrigation projects linked with agricultural development projects and so on. In such cases unless the whole system consisting of all inter-linked projects is planned together, it is likely that some projects may be completed earlier and some later than required. Thus implementation plan of a given project should also indicate the realistic desired completion dates of related projects which would also need to be achieved if the given project is to be completed in time and is to yield the desired benefits. It is necessary that while specifying such dates the concerned authorities are consulted so that these dates form part of their own respective implementation plans, and are, thus, likely to be achieved. Apart from ensuring a coordinated implementation of the inter-linked project from the very initial stages, such an approach will bring the related project authorities together who would help each other in timely completion of respective projects, keeping the completion of entire system as the common objectives.

Planning for Project Operation

In many projects, planning for their successful operation has to be undertaken during the project construction. Arrangements for raw materials, recruitment and training of manpower needed for operation, arrangements for utilities and services such as power. railway transportation, water supply etc., needed for the operation of the plant, etc. have to be made well in advance of operation. Most of these activities have to be undertaken while the project is being physically constructed. In such cases, these activities should also be included in the implementation plan of the project. If project networks are drawn, then these activities can be shown on the master control networks. A separate details network can also be drawn for these activities.

The organisation system to be developed and managerial tools and techniques to be used in different functional areas of project operation should also be developed well before the start of operation. In other words, a complete blueprint of the organisational plan can be prepared during the project implementation phase itself and necessary managerial action initiated to achieve this.

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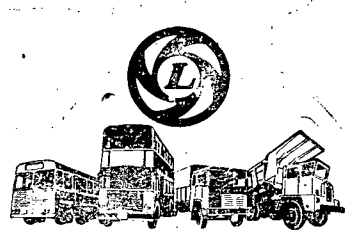

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Conclusion

It is the degree of detail and the effectiveness of the implementation planning which will later ensure the achievement of the targets of time, cost and benefits laid for the projects. If implementation of a project or a scheme is considered like fighting a war where the broad target is to win, then implementation plan would be like a military operation plan with complete details regarding strategy, fighting units, operations, logistics, and so on. It is the effectiveness of this operational plan which, to a large extent, determines the success or failure in the war. Howsoever big or small the war or any military operation may be, an operational plan is a must which is well understood by all these involved and followed religiously. The operational plan is thus like the means to achieve the ends. Similarly, project implementation plan is like means to achieve the project objectives.

For each project or a scheme, preparation of implementation plan is a must. The degree of details and sophistication can vary depending upon the size, nature and degree of flexibility in completion time of the project and so can the tools and techniques to be used and the time to be taken or cost to be incurred on implementation planning. But if even 0.1 to 0.5 per cent of the cost of the project or scheme is incurred on implementation planning and later monitoring. the expenditure will pay for itself many times in terms of minimising costly delays and cost over-runs.

Darkness is Receding

KHAZANI DEVI, 28, knows no bounds to her joy. She can read a small story now, write her name and tailor her own clothes. She need not beg the non-cooperative conductor to tell if the bus goes to her destination. She quickly reads the name and jumps into the bus. In fact, the three months long adult education course, put her on the road leading to an entirely different world.

Like Khazani Devi there are 29 others who have attended the Adult Education Centre at Dhulkote in Ambala district, of Haryana. The Dhulkote centre was opened in December last under the State Adult Education Programme (SAEP) which was launched in Haryana on Gandhi Jayanti Day. Classes are held in a room belonging to the primary school. The instructor, a young Harijan girl with a J.B.T. Diploma, takes keen interest in her 'students', who are well above her age.

For Tapinder Kaur, the instructor, it is a wonderful experience of sharing knowledge with keen and simple people. She loves to teach even 70 year old sarpanch of the village who has showed a desire to learn Hindi. Mahinder Kaur, the "Mahila Panch" in her sixties also wants to learn how to write her name in Hindi. Apart from the three R's women at the centre are taught tailoring and other simple crafts like making jute bags, paper flowers and decorative fans. The Education Department provides all the stationery needed like books, charts, slates, pencils and even ink. All teaching material is kept in the class room after study hours. Occasionally, a student may be allowed to take home her book if she wants to study at home. In just 10 weeks, these students have learnt to write their names, addresses and numbers upto 100.

The syllabus has been prescribed by the National Resource Centre and the formal method of starting with the alphabet is no longer in vogue. Adults learn to distinguish Hindi characters from short sentences and words. Every day the instructor spends 1-1/2 hours with them. The adult education class is conducted in an informal way. Students are free to discuss any problem including household ones. So the class-room atmosphere is punctuated by the occasional cry of a breast-fed baby. Nursing mothers sometimes bring their babies along, and they are not discouraged, because the idea is to attract them to these classes. The instructor bears with their difficulties cheerfully. For a class of women students of 15—35 age group, there is a female instructor, while a male instructor is appointed for teaching men. Attendance is never below 50 per cent for both men and women.

Ambala district already has 248 similar centres. As soon as 30 students are enrolled, one centre is opened. A group of 30 centres has a supervisor. The supervisor at Ambala, Kamlesh, is wholly dedicated to her job. She goes round the villages on her bicycle to at least two centres a day on a surprise visit.

Mostly the younger people have formed the backbone of this programme. Miss Rakesh Kapoor, a middle-class teenager from Ambala City, is amongst those who have taken up the challenge of educating children and adults belonging to the Scheduled Castes within the Harijan Basti, near Nahan House, Ambala City. Women at the basti are regular and well in time. Actually they finish their work at home early with a view to attend the class in time.

As a follow-up of the programme the State Government has plans to operate two mobile libraries so that the neoliterates can borrow books and continue their self education and do not relapse into illiteracy. □

TOBACCO INDUSTRY IN INDIA

Shakti Pal Kewal
Freelance Journalist

SMOKING FOR pleasure and as a palliative was unknown in ancient India, though the practice of inhaling smoke from aromatic herbs for curing diseases and suppressing mental troubles prevalent. Smoking of tobacco as a habit was introduced into this country by the Portuguese, towards the beginning of the 17th Century A.D. Edward Torry, an Englishman who travelled in malwa and Gujarat in India (1616—1619) as Secretary to Thomas Roe mentioned about the production of tobacco in this country. "People sow tobacco in abundance, but know not how to cure and make it strong, as those in the Western India". (West Indies).

The production of the commodity which by virtue of its flavour and smoking qualities had rapidly become the favourite among the common as well as the elite people of India, received a serious setback for some time as the then Indian rulers prohibited smoking of tobacco. The cultivation of the tobacco plant started in Gujarat, Golconda and other places. People took much interest in its cultivation and grew it abundantly. In certain years, they even allowed the crop to suffer by neglect, as there was over-production. J. B. Tavernier, a French Gem Merchant, and F Vincenso Maria who travelled India during 1659 and 1672 made a mention of the large scale production and export of tobacco to other countries.

Early Measures for Improvement

In 1829, experiments were undertaken by the then British Govt. with some Maryland and Virginia seed obtained from America. Steps were taken to grow finer exotic varieties of tobacco suitable for foreign market.

The most important tobacco growing districts at that time were, Godavari, Krishna, Coimbatore and Madurai in composite Madras, Rangpur in Bengal and Kaira and Ahmedabad in Gujarat.

In 1906 three research stations were established; one in Bengal for the trial production of Wrapper Tobacco imported from Sumatra and two in Bombay for the improvement of Bidi Tobacco. Experimental stations were set up in Madras, Bihar and U.P. for cigar, chewing and hookah tobacco.

Attempts were also made to produce cigar wrapper leaves under shade. The results of the trials were sometimes encouraging, sometimes not, but never entirely successful. Some of the samples sent to England were exceptionally good and even better than American tobacco, but generally tobacco, failed to gain wide acceptance. The Chief defect of Indian tobacco was stated to be in handling, curing and packing, in the presence of dust and sand in its being soft and soggy.

By the latter half of the 19th century, five important centres of production of tobacco had come to be recognised. They were (i) Nadiad and Petlad in the then Baroda State, (ii) Masulipatnam and Kakinada, (iii) Ranpur and Coach Behar in Bengal, (iv) Pusa in Tirhut and (v) Trichy and Dindigul in Madras.

The trials at Pusa (Bihar) received an impetus with the establishment of the Pusa Institute in 1905, particularly under the Howards. An indigenous type 'PUSA 28' suitable for cigarettes, but cured in 'country fashion' was evolved by them. But the long-sought-after breakthrough had been achieved by the Indian Leaf Tobacco Development Company. They started trial-cultivation in Guntur in 1920 and obtained definite results in about 8 years by using scientific techniques.

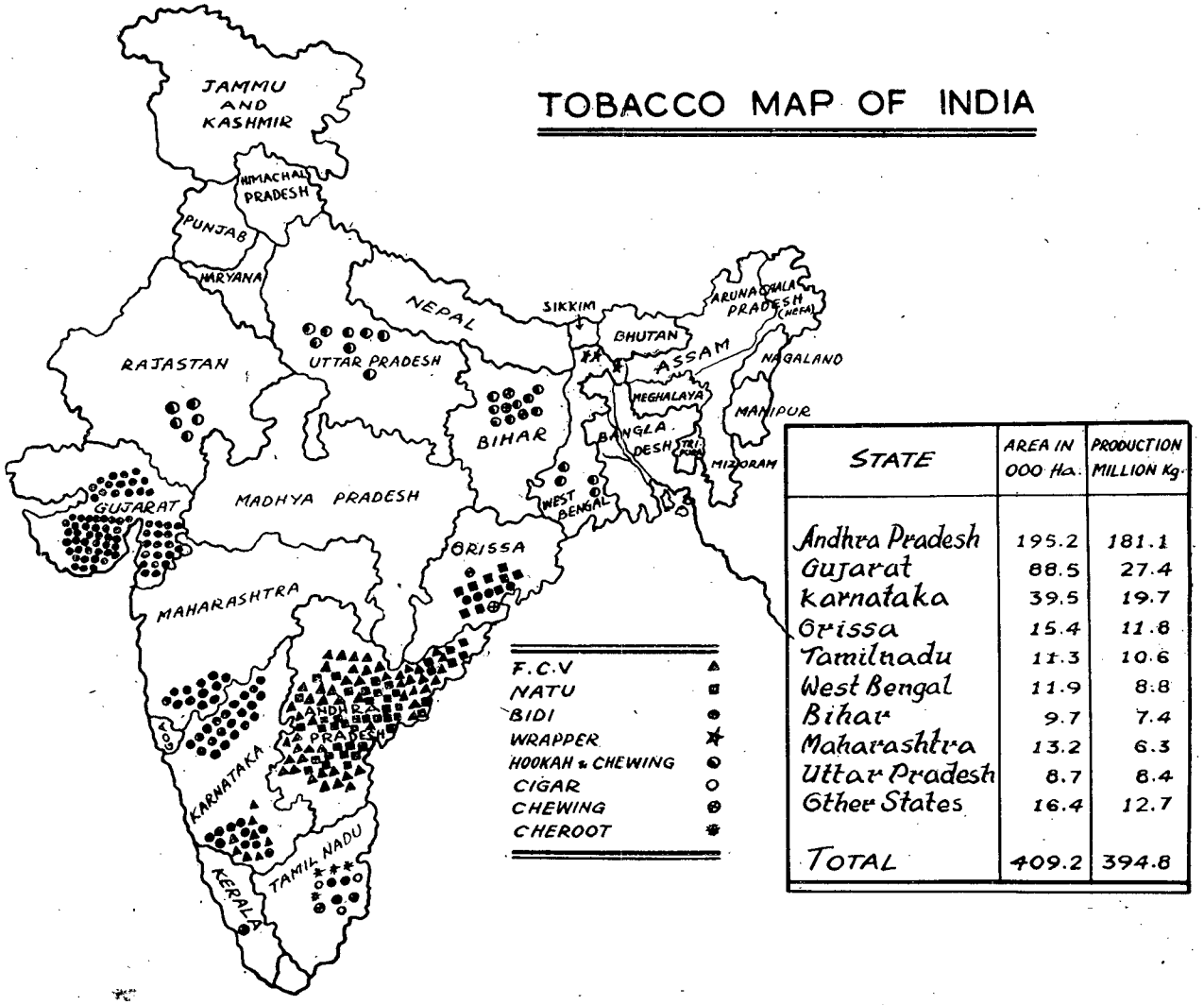
Earlier in 1897 a Rothanstead Scientist had suggested trials with Virginia tobacco in South. The Royal commission on Agriculture under the Chairmanship of the Marouis of Linlithgow, also recommended "American Tobacco" as one of the crops for introduction in India with further investigations. Cultivation of virginia tobacco in Guntur district of Andhra Pradesh was started in the year 1920 and in about four years large areas were brought under this crop.

In the history of tobacco cultivation in India, 1929 is a land mark. Flue-cured tobaccco was successfully cultivated for the first time. An experimental station was established in Guntur for the exclusive development of this tobacco.

Recognising the commercial value of the crop, the Government of India, established the Indian Central Tobacco Committee in 1945. The Committee set up the Central Tobacco Research Institute, Rajahmundry two years later. The experimental station at Guntur was taken over, and later regional stations were launched at Vedasandur (Tamil Nadu), Pusa (Bihar), Dinhata (West Bengal) and Hunsur (Karnataka). Various exploratory schemes were also started at different parts of the country.

Economic Importance of the Crop

Tobacco is an important commercial crop of our country. It provides employment to about 750 thousand farmers and a little more than 20 lakh persons engaged in curing, grading and redrying, packing and manufacture. The Central Exchequer earns revenue to the extent of Rs. 450 crore from excise duties on unmanufactured and manufactured tobacco. The growers get an estimated farm returns to the tune of about Rs. 200 crore. Tobacco is one of the important agricultural commodities earning precious foreign exchange of about Rs. 100 crore (1977-78) per annum. Taking into consideration the growth in the world tobacco exports and our own achievements during the last decade, the forecasts made by expert bodies like FAO and like organisations on world supplies and demands of unmanufactured tobaccos and on the basis of demand projections made by the National Commission on Agricuture and other Organisation connected with the development of tobacco in our country, the planing commission and the government of India have estimated that by about 1978-79 and by 1983-84 the



STATE	AREA IN 000 Ha.	PRODUCTION MILLION Kg.
Andhra Pradesh	195.2	181.1
Gujarat	88.5	27.4
Karnataka	39.5	19.7
Orissa	15.4	11.8
Tamilnadu	11.3	10.6
West Bengal	11.9	8.8
Bihar	9.7	7.4
Maharashtra	13.2	6.3
Uttar Pradesh	8.7	8.4
Other States	16.4	12.7
TOTAL	409.2	394.8

foreign exchange earning through exports of unmanufactured tobacco would be in the order of Rs. 110 crore and Rs. 150 crore respectively.

Commercial types of tobacco

Although from botanical point of view there are as many as 50 species of tobacco, only two NICOTIANA TOBACUM and NICOTIANA RUSTICA are of commercial significance. The chief commercial tobacco is Nicotiana Tobacum which occupies the largest part, nearly 90 per cent of total world tobacco acreage. The variety provides the bulk of all leaf material for the cigarette, cigar and cheroot industries. The nicotiana content in this tobacco varies from 0.16 to 11 per cent depending upon the variety.

Since the introduction of Nicotiana Tabacum, the Rustica species have been relegated to the secondary position. The chief difference between the two species lies in the size and shape of leaves and flowers. They also differ in chemical composition as also in flavour. From commercial point of view, Nicotiana Tabaccum is a group of crops each having distinctive characteristics and uses.

Methods of curing leaves vary materially and as such the tobacco fall into the following main classes ; (a) Fluecured, (b) fire-cured, (c) Sun-cured and (d) air-cured. Table 1 gives an idea of main commercial types of tobacco grown and its end-uses.

The growing demand for light cigarette tobacco has stimulated the production of FCV tobacco. Dark air-cured or fire-cured types are locally consumed as cheroot, bidi manufacture; hookah, chewing and nicotine extraction.

Area and Production

Tobacco is cultivated in almost all the states in India and constitutes 0.3 per cent of the total cropped area. Andhra Pradesh has the largest cultivable area with over two million acres followed by Gujarat 0.1 million. Other important tobacco producing states are Karnataka. Orissa, Bihar, Gujarat, West Bengal and Maharashtra together constituting over 75 per cent of total area under tobacco.

The annual production of tobacco is about 4000 lakh Kg. of which 1150 lakh Kg. is FCV tobacco. Table 2 shows area and production of tobacco during 1970-71 to 1976-77.

Table 3 shows the production centres of different varieties of tobacco.

Trend in Demand

In a country the level and rate of consumption of tobacco is determined principally by the size and expansion of its adult population. Further, consumption is influenced by four factors, namely ; income, price, taste and technology.

FCV tobacco is consumed as such and other varieties are used in manufacture of cigarettes, smoking mixtures for pipe and cigarettes, bidi, cigar and cheroot, snuff, hookah and agricutural purposes.

There has been a tendency for domestic consumption to rise faster than exports. During 1974-75 home consumption was 3010 lakh Kgs. as against exports of 750 lakh Kgs.

The table 4 indicates trend in domestic consumption or raw tobacco.

It will be seen from the above that internal consumption of tobacco used in the manufacture of cigarette rising at an annual rate of five per cent per annum while consumption of other types of tobacco excepting bidi tobacco is actually declining. This is mainly due to the shift in the consumption pattern as a result of urbanisation and rise in income. Moreover, tobacco produced in northern light soils of

Table *1*

Commercial Types of Tobacco

Class Method of curing	Tobacco types	End use
1. Flue-cured	Broad leaf Virginia.	Chief component in cigarette tobaccos; mild type of tobacco.
2. Fix-cured	Kolenchury Virginia	Strong flavoured tobacco, Used for making snuff, strong cigars and roll, plug pipe tobacco.
3. Sun-cured	Small leaf, Smyrna, Samsun and virginia	Mild type of tobacco; Chief component of so-called Turkish or oriental cigarette tobacco.
4. Air-cured	Murky, Maryland	Light air-cured types used for blending purposes in cigarette and pipe tobacco.
	Dark Brasil-Bahia, (Brazil) certain Havana types, Kentucky Criollo (Ceole)	Filter type of cigar tobacco; heavy leaves.
	Havana seed, Broad-leaf (connecticut) Java.	Binder type of cigar tobacco, medium heavy leaf.
	Sumatra (Deli-type) Havana, cuba	Wrapper type of cigar tobacco.

north India, Andhra Pradesh and Karnataka are being increasingly preferred by the exporters and manufacturers.

India's Export Trade in Tobacco

India's export of manufactured tobacco comprised mostly of flue-cured Virginia, sun-cured Natu Virginia sun-cured, burhy, hookah tobacco, and tobacco for manufacture of bidi and chewing tobacco. During the past decade, India's exports of leaf tobacco registered phenomenal increase from 280 lakh Kgs. valued at Rs. 13 crore in 1966-67 to 740 lakh Kgs. valued at Rs. 93 crore in 1975-76, thereby showing a growth rate of 11.5 per cent in terms of quantity and 24.2 per cent in terms of value. Similarly, India's exports of manufactured tobacco comprising mostly cigarettes has risen from Rs. 0.2 crore in 1967-67 Rs. 5.3 crore in 1975-76. The bulk of the leaf tobacco exports consist of FCV tobacco. India ships this item to nearly 40 countries, the major market being the U.K., U.S.S.R., Japan, Bangladesh, Italy, Senegal and Netherlands.

Cigarette Industry

About 22.7 per cent of the total 4142 lakh Kg. of tobacco produced in India during 1976-77 was of the cigarette type. Of this 683 lakh Kg. was exported and the rest consumed internally.

The proportion of filter-tipped cigarettes has been trebled since independence. It increased at a compound rate of about 6 per cent during the 1950s and 1960s. In 1976 the production was 672000 lakh pieces, 13 per cent more than in 1975. This, however, was hardly two per cent of the world production. The per capita production of about 120 cigarettes in India is one of the lowest in the world.

More than 100 brands of cigarettes are manufactured in the country. The types of cigarettes manufactured in India are spread over 35 different unit prices.

The proposition of filter-tipped cigarettes has been going up steadily ; it has gone up from 27 per cent in 1975 to 33 per cent in 1976.

There are ten companies manufacturing cigarettes in the large-scale (private) sector. The ITC Ltd,.

Table *2*

Area and Production of Tobacco

Year	All Tobaccos		Virginia Tobacco	
	Area	Production	Area	Production
	(000 Hectares)	(Lakh Kg)	(000 Hectares)	(Lakh Kg)
1970-71	446.9	3619	159.0	962
1971-72	458.3	4189	173.4	1394
1972-73	444.9	3722	169.2	1201
1973-74	461.5	4621	168.6	1591
1974-75	380.6	3631	119.0	995
1975-76	369.2	3471	117.7	934
1976-77	431.6	4142	142.7	940

Kanaka Prabha—An improved variety of f.c.v. tobacco

is the largest having its factories in Monghyer, Calcutta, Bombay, Bangalore and Saharanpur accounting for about 50 per cent of the total cigarette sales in the country.

While Vazir Sultan Tobacco Co. of Hyderabad accounts for about 25 per cent of market share, the remaining is shared by Golden Tobacco Company, Bombay ; National Tobacco Company, Calcutta ; Godfrey Phillips, Bombay ; D. Macropolo, Bombay ; Crown Tobacco Company and Master Tobacco Company, both of Bombay ; International Tobacco Company, Ghaziabad and Universal Tobacco Company, Hyderabad. Indian cigarette Industry in 1974 had a total paid up capital of more than Rs. 110 crore. Their gross sales exceed Rs. 450 crore. The industry is highly monopolistic. The first six companies control nearly 95 per cent of the market, 80 per cent of it being controlled by the erstwhile foreign owned one such as ITC, Vazir Sultan, Godfrey and D. Macropolo.

The first joint sector cigarette factory at Bari Brahmnan, 18 Kms. south of Jammu has been put up by

Table 3

Production Centres of tobacco varieties

Variety	Production Centres
1. Virginia Tabacco	Andhra Pradesh—Prakasam, Guntur, Krishna, East and West Godavari, Nellore, Kurnool and Khammam. Mysore—(Karnataka). Gujarat, Tamilnadu
2. Bidi Tobacco	Gujarat—Charatar Karnataka—Belgaum. Maharashtra—Kolhapur and Sangli.
3. Hookah Tobacco	Bihar—Muzaffarpur, Darbhanga & Purnea. West Bengal—Cooch Behar and Jalpaiguri. Uttar Pradesh—Farukhabad.
4. Chewing and Cigar tobacco	Tamil Nadu—Madurai and Coimbatore West Bengal—Cooch Behar.

the State-owned Jammu and Kashmir Industrial Developmental Corporation and Golden Tobacco Co. Ltd. The factory attained a production level of 15 lakh cigarettes per day.

Bidi Industry

More than 85 per cent of the world's bidi production is accounted for by India. The present production of bidi tobacco in the country is about 1000-1100 lakh Kg. of which 900 to 1000 lakh Kg. is used annually in the manufacture of bidis, the actual quantity used during 1976-77 being 998 lakh Kg.

About 46 lakh Kg. of bidi tobacco valued at 3.2 crore and 12 lakh Kg. of manufactured bidis valued at Rs. 30 lakh were exported from India during 1975-76.

Three types of bidi manufacturing systems are in vogue in India namely; (1) factory (2) contract or thekadari and (3) Charkhata. According to the latest data, there are 2171 bidi factories registered under the Factories Act employing about 1,80,000 workers. Another 28 lakh people are employed in this industry under the other two systems. The total wages paid to the labour employed alone works out to about Rs. 110 crore.

The major bidi manufacturers in the country are: Basitiram Narayandas Sarda, Bombay, Mohanlal Hargovind Das, Jabalpur, Bina Biri Works, Purulia.

Bidi Wrappers

Bidis are rolled with special types of tree leaves. Leaves of several trees are used for this purpose. The most widely used is the Tendu leaf. The following leaves are used:

(i) Tendu, Kendu or Timuru (Diospyros melanoxylon) obtained from the forests in Madhya Pradesh, Utter Pradesh and Orissa.
(ii) Apta or Ashitri (Bauhimia recemosa and B. Vahili) from Maharashtra and Tamil Nadu.
(iii) Sal, Shores rebusta in Assam, West Bengal and Bihar.
(iv) Castanopis indica in Assam.
(v) Diospyras tomentosa in Assam.

The wrapper leaves are characterised by their flexible texture, agreeable flavour and resistance to decay. The best quality leaves should be soft and pliable, fairly fully developed, slightly reddish in colour and without excess of pupescure on the dorsal side. The total production of wrapper leaves is about 3000 lakh Kg. of which 30 lakh Kg. or about one per cent exported and a foreign exchange of about Rs. 74 lakh realised. The annual revenue earned by the various State Governments from the wrapper leaves ranges between Rs. two crore and Rs. eight crore.

Tobacco grading operation in a factory

Cigars and Cheroots are made from uncut tobacco. A Cigar consists of a Centre Core or filler, a middle portion which holds the filler in shape and the outer wrapper which imparts colour, texture and feel. Cigars have a finished head which is closed or tapered. Cheroots have a thick and thin end both of which are open. Cigars are milder, more flavoured and costly.

About 150 lakh kg. of tobacco is consumed annually in India in the manufacture of cigars and cheroots : 15 lakh kg. for cigars and the rest for cheroots and country cheroots.

The present production of cigars and cheroots is estimated to be about 30,0000 lakh pieces. Spencer & Co., Madras, Shri Ambika Tobacco Co; Hyderabad and D. Macropolo Co. Bombay are three large cigar producing units in the country. In addition, there are 300 other Cottage and small-scale units also.

Tamilnadu, Andhra Pradesh, Maharashtra, and West Bengal are the important States manufacturing cigars and cheroots; Tamilnadu alone accounting for 95 per cent of the total production.

Andhra Pradesh, Tamilnadu and West Bengal are the important states cultivating cigar and cheroot tobaccos. The cigar-wrapper tobacco produced in Cooch-Behar area of West Bengal is well-known.

Hookah Industry

The average annual consumption of hookah tobacco which was about 500 lakh Kg. in the 1950s has come down to 260-280 lakh Kg. in the seventies. The decline in the consumption of hookah is attributed to the shift in the consumers' preference.

The hookah tobacco is manufactured by mixing the tobacco with treacle. Both Kurwah (strong and pungent) and mitha (sweet and mild) forms of hookah tobacco are made.

Chewing tobacco and Snuff Industry

In Tamil Nadu alone a separate type of tobacco meant to be used exclusively for chewing is grown. In other states tobaccos for hookah, bidi etc. are used for chewing purposes also. Important chewing tobacco grown states are Tamil Nadu, Bihar, Uttar Pradesh, West Bengal and Orissa. About 500 lakh Kg. of tobacco is for home consumption under this type.

In 1975-76, about 5 lakh Kg. of chewing tobacco valued at Rs. 33 lakh and 2 lakh Kg. of manufactured product valued at Rs. 13 lakh were exported from India.

The more important types of chewing tobacco are Surti, Zarda, Kivam or Paste, Danedar or granules and pills.

Uttar Pradesh and Delhi are the important areas for manufacture of chewing tobacco and account for about 85 per cent of the total manufacture in the country. In Uttar Pradesh, important centres for the manufacture are Varanasi, and Lucknow.

The quantity of tobacco used for snuff making during 1975-76 was 44 lakh kg. About 10,500 kg. of snuff valued at Rs. 2.8 lakh was exported from the country during the same year. Important snuff manufacturing States are Tamil Nadu, Punjab, Gujarat and Uttar Pradesh. Madras City is the biggest production Centre. The major consuming centres are located in Tamil Nadu, Kerala, Karnataka, Orissa and West Bengal.

Tobacco waste results from procuring of tobacco like bidi, chewing and hookah and during handling in the case of virginia and other air-cured tobaccos The National Chemical Laboratory has evolved and patented a single process for the manufacture of nicotine sulphate from tobacco waste. The National Research Development Corporation, New Delhi are patent-holders of this process. It is learnt that a factory following the patented process and utilising one tonne of tobacco waste (containing two per cent Nicotine) per day can produce about 45 Kg. of Nicotine Sulphate solution. As per the available information two firms namely M|s. Urokunj Nicotine Industries, Dharmaj, Kaira District, Gujarat State and M|s. Coromandal Tobacco Byproducts, Industrial Estate, Guntur, Andhra Pradesh have undertaken manufacture of Nicotine Sulphate from tobacco as per the process evolved by National Chemical Laboratory. One more firm M/s. Agro-Chemical Industries, Parachur, Prakasam District, Andhra Pradesh, has also been licenced to manufacture nicotine sulphate. The basic date such as utilisation of tobacco waste, production of nicotine and nicotine sulphate, cost of production prices, exports etc. are not available.

Manufacture of Solanesol

Scientific Research has established that Solanesol can be processed from Tobacco waste. Japan is working on the development of new Cardiac medicine using solanesol as pharmaceutical intermediate Solanesol is also reported to be used for synthesising methodically active quinons and vitamin K. analogue. As per the available information three firms i.e. M/s. Bommidala Brothers Ltd., Guntur, A.P. ; Vinod Solverotracts Private Ltd., Vijayawada, A.P. and Synthetic Industrial Chemicals Private Ltd., Kolenchery, Kerala have undertaken manufacture of crude solanesol from tobacco waste and exporting the same to Japan. The reliable data in this aspect is not available.

Tobacco Seed Oil Industry

Tobacco seed contains about 35 per cent of semi drying oil which is nicotine free. Since the seed is obtained from FEV tobacco in Andhra Pradesh, the industry is concentrated in that State. Guntur, Ongole, Uppugundur and Vijayawada are important centres.

The annual production of oil is estimated to be about 3,000 tonnes. The entire production now is used by the home industry, though earlier some quantity used to be exported.

Tobacco seed oil which is a semi-drying type is used in the manufacture of soaps, enamels, paints, and varnishes, in making artificial rubber and even for illumination purposes. It can also be used for hydrogenation purposes. However, the Indian production at present is consumed by the soap and paint industry in Bombay, Calcutta, Kanpur and other places.

Research

In view of the dominant role the tobacco industry plays in the national economy, Government of India set up the Indian Central Tobacco Committee in the year 1945 for the improvement and development of all aspects of production and marketing of different types of tobacco. After the abolition of Indian Central Tobacco Committee, the administrative control of the Central

Tobacco Research Institute and its five Regional Research Stations were transferred to the Indian Council of Agricultural Research from October, 1965. The Institute is at present having (1) Division of Agronomy and Soil Science (2) Division of Plant Breeding and Genetics and (3) Division of Biochemistry, Technology, and plant nutrition, (4) Section of Entomology (5) Section of Plant Pathology, (6) Section of Statistics, (7) Section of Seed and Seedlings and (8) Section of Agricultural Engineering, (9) Section of Scientific Co-ordination, (10) Farm Management. Further research works in two main centres and three subcentres of All India Co-ordinated Research Project on tobacco operating from 1971 are also conducted by the Central Institute. The research programme in various disciplines is aimed at enabling the country to produce more and better tobacco especially the expostable types.

The Institute and its stations are at present having 100 scientists supported by technical, auxillary and administrative staff, well equipped laboratories, library and experimental farms, besides inseotary, green-house, glass-house and other facilities for research work.

To meet the present day shift in the quality requirement of FCV tobacco, the principal foreign exchange earner to the country the Institute by following pure-line selection, recombination breeding and nutation breeding has evolved superior varieties suitable to different agroclimatic zones. The varieties released so far for commercial cultivation are Kanakaprabha, Dhanadayi and CTRI Special. Among the mutant derivatives, the performance of VE, has been found to be consistently good and is in the final stage of recommendation. To cater to the needs of varying demands of importing countries the Institute has in its collection a wide spectrum of varieties ranging from low to high nicotine. To overcome the ravages caused by pests and diseases and to avoid use of pesticides and fungicides that carry residue in the cured leaf, the Institute has evolved resistant varieties in FCV tobacco specific for powdery mildew (PMRR-3, line 2359 and Line 1494) and for Tobacco Mosaic Virus (TMVER 2 and 3). Combined resistance to both these diseases has been incorporated in Burley tobacco (Burley Momi-2). Resistance to diseases has also been incorporated in other commercial types of tobacco. For incorporation of resistance against aphids and Spodoptera litura F, the species N.

Gossei has been utilized in interspecific hybridisation with 4n. *Tabcum* and lines resistant to individual posts and to both have been screened and are in advanced stages of testing. Even in other types of tobacco which are indigenous and consumed mostly within the country, improvement has been effected in both yield and quality and improved selections evolved under different types.

The doses and schedules for spraying of approved pesticides have been worked out and recommended to the farmers. Except Endosulian no other chlorinated hydrocarbon pesticide is permitted for use on tobacco. It has been found that neem kernel suspension serves as a good antifeedant against *Spodoptera litura* Forgiving good protection to seedlings in the nurseries. This finding enables the farmers to avoid use of hazardous pesticides and will fit in with the integrated pest control programme. Integrated pests and diseases control is being adopted by suitable cultural practices and crop rotations that are effective in reducing *crobanche*, nematodes, black shank etc. and also by Biological Control of Leaf Eating Caterpillars by mass-breeding and release of the egg-parasites of Telenomus remus.

Objectives assessment of quality by chemical and physical methods has been standardised and criteria laid out for sugars, nicotine, nitrogen chlorides, chemical quality ratios, filling value, porosity, moisture equilibrium, shatter index etc. Extensive investigations on the carcinogenic properties of tobacco produced under various agro-climatic conditions, agronomic practices and breeding programme with the objective of isolating breeding lines and cultural practices that yield safer and less harmful tobacco are being initiated. Methods for detection and estimation or organochlorine organophosphorus and carbonate pesticide residuess have been standardised and the work on monitoring the pesticide residues on representative tobacco samples from the market yards and warehouses has been initiated.

An improved design for the barn and an improved curing schedule have been formulated and the farmers are adopting them profitably. Paddy husk as an alternate, cheeper fuel in the place of coal has been recommended to farmers for whom the husk is easily available. A furnace for use of paddy husk constructed at Rs. 160 has been demonstrated. A Low Profile Barn of $7.2 \times 4.8 \times 3.15$ metre dimensions was found to be more economical than the conventional barn, recently by saving Rs. 143/- per charge because of saving in fuel, curing time and labour.

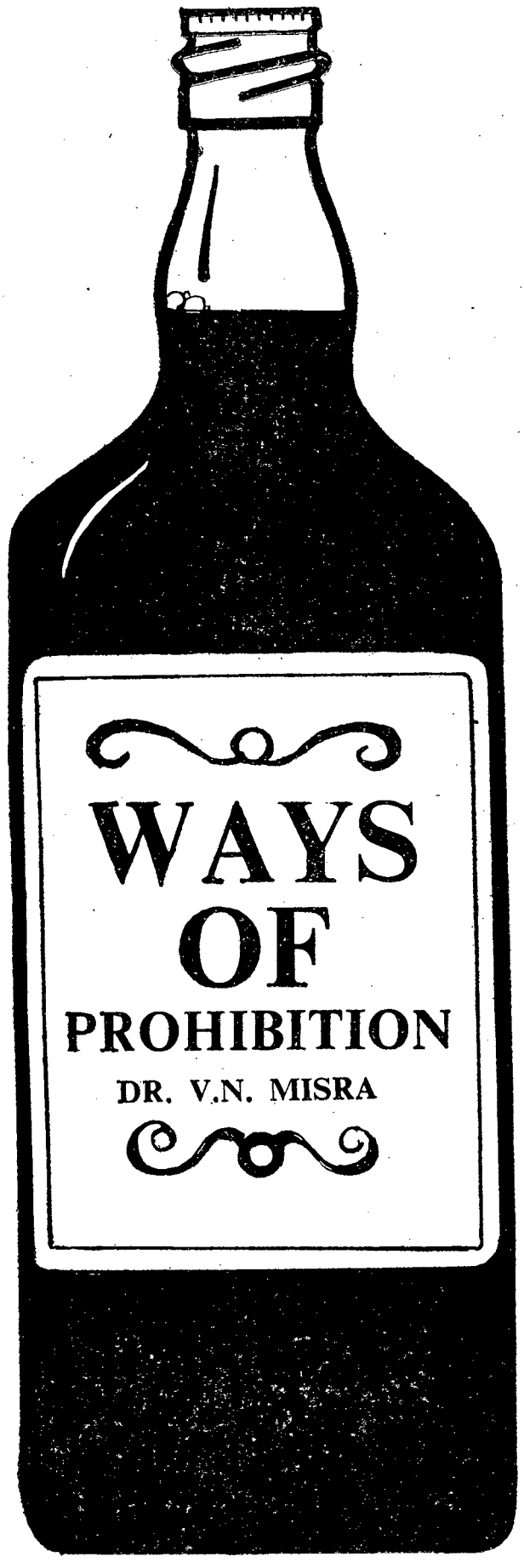
Table 4

Trends in Domestic Consumption

Qty. Lakh kgs.

Variety	1971-72	1972-73	1973-74	1974-75	1975-76
Flue Cured Virginia (FCV) . .	460	430	480	370	430
Other than FCV used in the manufacture of cigarettes and smoking mixtured for pipes and cigarettes . . .	290	260	240	320	300
For manufacture of Bidi . .	790	770	780	810	1050
Others (cigar, cheroot, snuff, hookah, chewing etc). .	1080	880	880	740	760
Agricultural purposes and waste .	410	550	480	480	350
Stalks . . .	350	440	470	290	150
Miscellaneous .	30	4	4	6	4

(*continued on Page* 29)



BY ACCEPTING promotion as a necessary step for achieving higher social good and the individual welfare we come across the question as to what should be the ways and means of its implementation ? The legal aspect of the problem has already been questioned as it unduly restricts personal liberty of a citizen. The social aspect is also not giving an encouragement to the solution of the problem by which we could achieve our goal with any opposition or contradictory thinking on this line. Where the prohibitionists would like to see that the prohibition is not at least absolute. Some laxity in the laws of prohibition would be the real intention of such a group of persons which does not want to come in confrontation with either of the groups.

Tracing the early history of the use of intoxicants we find in Vedas the mention of an Aryan drink known as SOMRASA. The Ayurveda, mentions of certain herbs which have an intoxicating effect. The names like CHARAS, BHANGA, GANJA, APHIMA, have been known in our society since time immemorial. The present form of wine is the result of gradual evolution in the art of distillation. In case of ideological conflicts or the swift process of ideological thinking the man has often been tensionful and worried. In such situations the plea in favour of intoxicants rests on the reason that due to their seducive effect on human mind they provide a sort of relief to a tired human body. But the medical reports regarding the effect of wine on human body have always been discouraging.

Social customs and traditions in some sections of society can also be mentioned which might have accelerated the use of wine. The environmental conditions, the individual and collective feelings of merry-making could have been behind such traditions. The idea of forgetfulness of wordly worries might have tempted some Persian Philosophers to say that the wine is but the love of God. The literature of medieval India is full of poetic imagination and the philosophical and physiological expressions. A few dieties can be named as using some sort of intoxicant a religious colour. The modern club-culture has left no stone unturned to propagate the use of intoxicants. A large number of varieties of intoxicants has appeared on the scene. It is a matter of surprise that all sections of the society, despite all such propagations have not accepted the validity of intoxication on any ground. Even a regular drinker, from the very core of his heart, would always advise others to abhore it. Hence the idea of prohibition at the level of social reformers and the great addicts is proved beyond any reasonable doubt. Even an occasional use of intoxicants will not be advised by any section.

The only question which remains unanswered before us is that as to why the people do not stop doing the things which they feel to be worth stopping. If we go a little deep in its philosophical thinking we will find that the vices and virtues move hand in hand in the society. One exists with the other. The only desired thing is that the ratio of vices should not be such which might disturb the balance of society. The total elimination of vices may not be possible but we can definitely mitigate them. Hence the problem before us today is that how can we minimise the use of intoxi-

cants in our society ? As such the valuable suggestion put forth by our top leaders is prohibition. But what about the other intoxicants ? By prohibiting the use of liquor the addicts may shift over to other intoxicants. The recent cut of 100 days in a year announced by Delhi Administration may shift the use of liquor on other days or at least the quota for the dry days could be purchased in advance. There may be many other loopholes. Due to various difficulties and drawbacks in the process of prohibition many countries have failed in bringing a complete prohibition. A similar experience in some states in India has not yielded the desired result. Illegal distillation has always been a great barrier in the path of prohibition.

After all why do we want to prohibit the use of intoxicants ? The simple answer to the question is that it is because of some personal and social goods which we want to achieve. Personal things may be safely left to the individual in a democratic society. There can hardly be any greater insult to a democratic system than snatching away the personal liberty from its citizens. It is only the social good which can be the concern of a democratic government. How a democratic government can bring down the excessive use of intoxicants so that it may not tell upon the health of society ? One may plead that how can we talk of achieving the social good without first implementing the same at the level of each and every individual ? As a matter of fact the problem is a delicate one. But we must know that it is not each and every individual who is desired to be moulded for an ultimate social goal. Social objects desired to be achieved by prohibition can be fulfilled even by allowing the same for certain useful purposes. If the raw human urine can be used for medicinal purposes it may not be prudent to exclude the distilled liquor from the list of medicines.

The dangerous consequence of intoxication have always been referred to as the basic reason of prohibition. It can be not only health hazarduous but may also lead to some wrong doing under the effect. Unfortunately the Indian law in place of prescribing a punishment provides an excuse to escape the punishment. While prescribing general exceptions, the Indian Penal Code under section 85 and 86 specifically mentions certain exceptions provided for the crimes committed under the influence of intoxicants. These exceptions have often provided a good ground for excuses even when the real intent to commit an offence existed. Intoxication is an exception even in a case of the greatest offence. To quote section 85, 'Nothing is an offence which is done by a person who at the time of doing it, is by reason of intoxication, incapable of knowing the nature of the act, or that he is doing what is either wrong or contrary to law ; provided that the thing which intoxicated him was administered to him without his knowledge or against his will'.

Section 86 of the Indian Penal Code while searching knowledge or intent in a particular offence also gives due importance to intoxication. On a mere abscure excuse the Indian law has provided an exception of paramount importance. A great deterrant law for the offences if committed under the influence of intoxication must be provided to check the wrong consequences of intoxication. It is better to kill various enemies on one front rather than unwisely running after each of them. This has been our experience that the influence of intoxication lessens with a fear of some substantial punishment. The disturbing ghost must be made to run away from the seene rather than creating unpleasant scene for the genuine law abiding souls. A deletion of general exceptions mentioned in the aforesaid sections of the Indian Penal Code regarding intoxication can do miracles.

Restricting the consumption of introxicants at certain times and places must be further tightened. The excise rules must be followed in the right earnest. The healthy and creative community development programmes should be taken up with a greater zeal by the Govt. Adult education and education of uneducated programmes must be strenghtened.

If our national leaders have really the intention of undoing the wrong effects of intoxication, they must fight on a right front. They must amend the wrong provisions of law rather than adding new ones. A widely acceptable moral sanction will be available to them from all sections of society if they can proceed on the right path with a real spirit. □

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Making people give up their habits with the help of law does not by itself constitute brute force or violence — to stop the sale of liquor by law and there by force the addicts to give up the habits of drinking is not violence.

Gandhiji

Planning for Power

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THE IMPORTANCE of electricity in economic development needs no emphasis. Electricity, the most versatile form of energy at the service of mankind today, possesses the greatest advantage in its adaptability and possibility of transmitting across hundreds of kilometers to quench the thirst of a variety of consumers at all times at their door step. Electricity has become very indispensable in these days. It is an economic necessity and no longer a luxury. A nation's progress and economic development can indeed be measured in terms of supply demand and the level of electricity consumption. The power development of industrially advanced countries is spectacular in terms of power generation and percapita consumption, when compared with that of developing countries like India. Inspite of continued upward trend of power generation, most of the advanced countries are crippled by the problem of energy in recent times and are striving to find new resources, to keep the pace of development.

It is in this background and in the context of continuous power shortages in a growing economy like India, there is need for national approach in exploiting and utilising power resources available in an optimum manner.

Institutional Framework

The institutional framework for power development in India, as envisaged by the Electricity Supply Act 1948, constitutes five bodies including the Central Electricity Authority, State Electricity Boards etc. The SEBs, which are autonomous corporations, are entrusted with the responsibility of integrated power development with in the State, inter alia, preparation of plans, execution, maintenance of power projects, generation and distribution of Electricity. The autonomy of SEBs and their functioning with in the policy framework of and control by the respective State governments left the regional and national power grid systems in a conceptual stage, for a very long time. A beginning was made to bring the SEBs of a region to make a concerted effort by constituting the Regional load despatch centres very recently in Bangalore under the control of Southern Regional Board. The Regional Boards which represent a form of voluntary collaboration of the various SEBs concerned, possess no legal financial status and their decisions must be implemented through the actions of individual SEBs. Thus, it does not seem to have much impact in creating an organisation for developing potential energy resources. The poor performance of SEBs is reflected in their inability to cope up with the ever increasing demands for power and solve prolonged inter state disputes over natural resources to set right imbalances in power availability and cost, with the result that power targets are revised downward very often.

Planning And Progress

Power development during the successive plan periods has been significant with huge outlays on power sector, adding substantially to generation, transmission and distribution capacity. Large amounts of money have been allocated, exceeding even the outlay for agriculture and allied programmes, during the entire planning period so far. Out of the total public sector outlay in each of the Five Year Plans, the investment outlay on power has been gradually increasing from 13-3. per cent to 18.6 per cent. The draft Five Year plan for 1978—83 proposes Rs. 15750 crore on power development including rural electrification; an all time record of 24.57 per cent of the total public sector outlay.

The power production has recorded the highest rate of expansion and emerged as a leading industrial sector of India. The power industry is the largest public sector in terms of investment of productive capital followed by Iron and Steel and Textiles. Power generation ranks next to textiles followed by Iron and steel in the country.

Spectacular strides have been made in the growth of installed capacity and power generation over these decades. The total installed capacity including utilities and non-utilities, increased from 2300 MW in 1951 to 24,039 MW, in 1977. At the commencement of the Five Year Plan 1978—83 it stood at about 26,000 MW. The generation of electricity rose from 7513.97 million Kwh, by the end of the Fourth Five Year Plan. By the year 1977-78 the gross power generation too has grown in the same proportion as that of growth in the capacity.

Short Supply of Power

Inspite of the impressive improvement in installed capacity and power generation still our economy is infested with power shortages. Entire world is engulfed in power famine and India too.

The growth of demand for power has always been over-shooting the growth of capacity. There have been restrictions of all kinds, such as cutting off of the supplies during the periods of excess demand and imposition of imitations on the amount of electricity that might be consumed by a customer. There had also been restrictions on new connections, and sometimes even denied. The widdening gap between the available capacity and demand for power has not only imposed restriction on quantity of consumption but also resulted in the deterioration of the quality of supply of power in the country.

The power famine has retarded the economy with disastrous consequences particularly during the last few years. The sluggish growth of the economy has mainly been attributed to the power shortages, which in turn had adversely affected per-capita income. Power shortage and per capita income have close relationship as evident from advanced countries. The interruptions in industrial production and utilisation of full capacities, came in the way of expansion of industrial production and maximum exploitation of available resources. As

was estimated by the power engineers conference held early in 1978 at New Delhi, the short fall in power generation has cost the country Rs. 3,000 crore in terms of industrial production and three million jobs.

Projected Levels

The Government of India in its Draft Five Year Plan 1978—83 estimated the All India consumption of electricity at 128.8 billion units, requiring a generation of 167 billion units by the year 1982-83, and 265.0 billion units by the year 1987-88. This will call for an addition of about 18500 M. W. of generating capacity by the end of 1982-83 and further addition between 20,000 and 25,000 MW of capacity in the Five Year period 1983—88. In other words annually about 4000 MW of power is to be added to achieve the desired capacity by the year 1987-88.

Constant Slipping Back of Power Targets

In spite of the increasing allocation to power sector in the successive plan periods and huge expenditure on additional capacities built up, the physical achievements in additional power generating capacity have been lagging behind the target since the First Five Year Plan. The percentage short-fall was 15.4, 37.1 and 35.8 in the First, Second and Third Plan periods respectively. The Fifth Five Year plan too, it was estimated, would slip back in achieving the desired target by about 25 to 30 per cent.

The continuous increase in the cost of erection of power projects which are capital-intensive in nature, the divergence of the institutions responsible for execution of power projects and the present trend of poor financial performance of many SEBs raise a sense of doubt the extent of achievement in the construction of power projects projected to meet the increasing demand on time. Doubts have also been expressed in many quarters, including the All India Power Engineers Conference, about the possibility of achieving an addition of 4000 MW annual average. The short fall in the achievement of targets coupled with the under-utilization of capacity, which was a little less than 4,000 Kwh/Kw for all India average and huge power losses in transmission and distribution would continue to keep the gap uncovered between the demand for and the supply of power impending a disastrous situation, unless the centre steps in with a comprehensive plan for tackling the problem.

The planning for power development in India has so far been on the basis of the power needs of different SEBs in the country. The planning commission approves and sanctions the schemes brought before it, by SEBs keeping in view the financial constraints. Thus the emphasis of planning has been on meeting the power requirements of different states in the country, excepting the recent move for Super Thermal Stations based on the regional demand. This has led to planning of power stations of smaller size than what the technological developments in the industry dictate for economical operation. There has been a mushroom growth of thermal stations of smaller and medium sizes at the places of consumption, far away from the coal pitheads. Thus the uneconomical power stations in terms of technology and long distance transportation of coal, escalated the cost of power generation and the ultimate price to the consumer.

Regional Imbalances

Besides the overall power shortage, the regional imbalance in terms of self-sufficiency of power needs attention. It is seen that there is wide variance in per-capita consumption from one State to another. A few states are in a position to export power to other States. The supply of power by the surplus SEBs to the deficit States, seems to have to cut through several barriers in reaching an agreement, since the SEBs do function under the policy frame work of the respective State Governments, which have different political set up and ideology.

The cost and supply price of electricity also show wide variance from one State to another. The SEBs which are endowned with cheap Hydel power resources can supply at lower rate than SEBs, which have only or mainly thermal capacity, since the cost of production differs from one system to another. Thus the imbalances of power availability and the cost difference of power, which is a major infrastructural ingredient for economic development, dictate a national policy and approach

Table

Region-wise potential and utilisation of hydel resources in India

Regional	Total Potential		Potential Developed		Potential under Development		Potential Developed plus potential under development	
	MW. Cont.	Twh	MW. Cont.	Twh	MW. Cont.	Twh	MW. Cont.	Twh
Northern . .	6438.90	56.40	1092.60	9.57	1232.30	10.79	2324.90	20.27
Western . . .	4301.34	37.68	626.50	5.49	61.50	0.53	688.00	6.02
Southern . .	4858.20	42.56	1889.00	16.54	916.08	8.02	2005.08	24.56
Eastern . . .	2180.22	19.10	339.00	2.97	222.06	1.95	561.06	4.92
North Eastern .	7478.64	65.51	27.00	0.24	55.00	0.48	82.00	0.72
Total	25257.30	221.25	3974.10	34.91	2476.94	21.77	6461.04	56.49

for equitable distribution of resources to promote balanced regional development.

Natural Resources and National Resources

The Federal structure and provincial jurisdiction of States on natural resources lead to regional differences and prejudices and hence the vast potentialities remained untapped. For example, the States could not reach amicable settlement in sharing perennial water resources available in the country. Added to this, the meagre resources for investment left large potentialities of cheap Hydel power unexploited.

As per the Report of the Ministry of Energy, based on the surveys carried out by the erstwhile CW & PC during 1953—59, on specific schemes of the availability of Hydel electric resources in the country, the economically utilisable power potential was assessed at 25.26 million KW continuous, corresponding to an annual energy generation of 221.25 Twh, excluding the seasonal energy generation possible and the potential of small schemes, as shown in Table. Subsequent surveys conducted by some of the State Governments have indicated that the potential may be much higher.

Of the known specific resources, the potential developed constitutes 15.73 per cent and potential under development 9.81 per cent bringing the total of potential developed and the potential under development to 25.85 per cent. This accounts for 6461.04 MW continuous, corresponding to an annual generation of 56.48 Twh. Thus still about 74.42 per cent of the potential is yet to be developed and harnessed for power.

The National policy for power seeks to declare "Natural Resources" to be "National Resources" for utilising the same in the larger interests of the country. Such a policy would facilitate in overcoming the interstate disputes, which have been the important cause for delay in optimal development of Hydel resources, many of which continue to run waste. Super Thermal Stations as are now being planned can be located near coal pitheads relieving heavy strain on Railway transport, and reducing the cost of power.

The technological advancement in power industry, unutilised and uneven distribution of Natural resources and the prospects for growth in demand for power necessitate consideration of an organisation at a national level to Plan and operate the power system. The concept of an all-India power system seeks to fulfil an important socio-economic objective, namely harnessing all the power resources in the country, as economically as possible, according to the latest known techniques and to ensure an adequate and reliable power supply to the consumer, wherever the consumer may be situated in the country. Such a system would make it possible to plan systematically the economic utilisation and conservation of natural resources of the country.

The institutional frame work to achieve the above objective may be on the lines of British Electric Power System, with suitable modifications, if necessary, in view of geographical differences and problems. The multifarious institutions in planning and construction of power projects can be brought under onefold and the constant slipping back of power targets can be reversed. The existing power generation facilities can even be transferred to the CEGB, leaving the SEBs with the responsibility of purely distributing electricity in their jurisdiction. The SEBs would be free from the present financial constraints in handling project construction, generation and distribution and thus can reduce the power losses and contribute additional power for consumption, easing the problem of power shortage.

This will also facilitate the liquidation of uneconomical power stations gradually and in planning an optimum balance between Hydel, Thermal and Nuclear power stations, in terms of size, location etc. The Hydel power can be exploited to the maximum, Super thermal stations can be located near coal pit-heads and atomic power stations away from coal fields and Hydel potential. By carefully worked out programme of operating the Hydel, Thermal and Nuclear power stations the working costs could be reduced to minimum. Power can be supplied to various SEBs at a uniform tariff and in turn by the SEBs to different consumers at the consumption end. The regional imbalances in terms of power availability can be minimised, the differences in standard of living in different regions be reduced through balanced regional development which will also help in narrowing down the regional differences and create a sense of oneness among all the regions. □

The Tobacco Story

(*Continued from page* 24)

Lipid matters from tobacco wastes exhibited effective sucker controlling properties. Work on extraction and isolation of organic acides, solanesol and nicotine from tobacco wastes is initiated for diversification of the uses of tobacco. Improvement of low grades by thermohygrometric treatment and improvement of smoking quality of Natu and flue-cured tobaccos by chemical treatments were achieved.

The Soil Testing Laboratory of the Central Institute is analysing freely the soil and water samples received from the farmers and advising them as to the suitability of the soil for cultivation of tobacco and water for irrigation and, if suitable, the amount of fertilizers to be applied. Pure seed and seedlings of the approved cigarette, Natu, chewing, cigar filler and cigar wrapper varieties are being supplied to the farmers at moderate cost. The latest research findings of rotations, varieties and packages of practices are demonstrated in the farmers fields in district trials and National Demonstration Trials.

Training is being imparted in tobacco cultivation and curing at Rajahmundry and its Regional Stations for the State Extension Staff, scientists and technicians from other countries and also to the recruits of various tobacco companies.

Further with the interest recently evinced by foreign countries, in cigar filler, wrapper and Burley tobacco, research is being streamlined to produce the right types of tobacco with the ultimate object of creating permanent export markets in overseas countries for these types. In other types of tobacco, through indigenous and mostly consumed locally, considerable improvement has been effected both in respect of yield and quality through systematic research satisfying the needs of the growers and consumers.

The developing countries account for only two percent of the total research and development of the world. While they produce only about one per cent of original technological innovations.

It is not merely a question of developing the appropriate technology in laboratories and research institutions. What is really important is the transfer of the technology to small workshops. To scale up the process or the product developed in the laboratory to its commercial exploitation and to follow it up with the provision of consultancy services to the entrepreneur during the nascent stages of commercial production.

Technology For Small And Village Industries

S. K. Ray
Sr. Correspondent, Yojana, Calcutta

THE SCOPE, content and direction of planning has been geared to the attainment of the objective of eradicating poverty and unemployment within the eighties. The new strategy is aimed at restructuring the country's economy to promote an integrated development of the rural areas. The revival of the decadent village and cottage industries and the accelerated growth of the small-scale industries constitutes a principal feature of this changed approach.

With the capacity of the organised industrial sector in absorbing newer entrants to the labour force being only a bare 10 per cent and the potential of the agricultural sector in creating new employment opportunities being limited, even with the universal application of modern agricultural practices, the small and village industries sector has been rightly chosen for the role of creating employment opportunities on a massive scale by exploiting local talents and local raw materials. Its capacity to do so is beyond dispute. According to one estimate, the output of the small industry is nearly three times as compared with the large-scale factories for a given investment, and employment five times for a given production.

The policy of giving a prestigious place to the small and village industries in the future scheme of industrialisation and of placing man at the centre of planning and implementation of projects and schemes has been interpreted in certain circles as one of denying the importance of science and technology in the development process. But the facts speak otherwise. That science and technology has been recognised as an indispensable medium of economic progress is evident from the new Industrial Policy which says that the development and application of technology appropriate to our socio-economic condition will form an integral part of the policy. The emphasis is clearly on the adoption of improved methods of production and the use of better machinery and equipment for the small industry.

Bigger Challenge to Scientists

The issue is not technology itself but the nature of technology. The technology will be such as to suit the Indian genius and create immediate and substantial employment opportunities at a relatively small capital cost, there being a large force of idle manpower on the one hand and dearth of capital on the other. Suitable small and simple machines and devices are required to be evolved and applied to increase the productivity of the worker, improve the quality and reduce the cost of the products made by the small and village industries. The need is for a diffusion of appropriate technology into the small-scale sector with the research results percolating to the small workshops. This, in fact, widens the frontiers of scientific research and technological innovation and throws up a bigger challenge to the scientists and technologists in the way that they have to tackle technological problems in fields where not much R&D work has so far been done.

This is not to suggest that technology is yet to make its debut in the small-scale sector. This sector is already producing goods ranging from simple items to technologically sophisticated products. It is manufacturing hundreds of consumer and producer items with a high degree of skill and precision, particularly in the electronics and electrical, chemicals, engineering, leather, hosiery and sports industries. There has been a spectacular progress in diversification too. The small industry now accounts for roughly 35 per cent of the industrial production in the country, worth Rs. 13,000 crore and by the end of the Sixth Five Year Plan the production is likely to go up to Rs 19,000 crore. In the total manufacturing activity the share of small-scale and village industries is around 50 per cent and they employ nearly 80 per cent of the total working force engaged in the entire manufacturing sector. The fact that this sector is playing an increasingly important role in earning foreign exchange testifies to the competitiveness of its products both in price and quality.

Area of Operation

The small and village industries sector, however, will have to operate now in a vastly expanded area as envisaged in the new Industrial Policy, announced on December 23, 1977, whose main thrust is on the "effective promotion of the cottage and small industries widely dispersed in rural areas and small towns". To accord a pre-eminent place to such industries the policy statement unequivocally underlines that whatever can be produced in this sector shall be produced in this sector and the large-scale industry will be curbed to enter into these fields. As a natural corollary, the list of items reserved for the small-scale sector has already been enlarged from 180 to 807 items with the possibility of more and more items being added to the list from time to time. In fact, this sector will meet a substantial part of the increased demand for consumer and simple producer goods. Within the small-scale sector special attention will be given to units in the Tiny Sector whose investment in machinery and equipment does not exceed Rs. one lakh and which are situated in villages and in towns with a population of less than 50,000, according to the 1971 census. This is the sector which has the potential of providing livelihood to millions of households.

If the small and village industries are to fulfil the responsibilities entrusted to them there should not only be a horizontal expansion of the existing production lines but production of more and more new items also. A concerted effort on a much broader footing is called for in the field of R&D work to evolve technologies which will upgrade the traditional skills and put to industrial use local raw materials which have hitherto remained unexploited. Products from traditional methods will not attract rural consumers as their consumption patterns have changed with the entry of the products of the large-scale sector into rural markets.

Transfer of Technology

It is not merely a question of developing the appropriate technology in the laboratories and research institutions. What is equally important is the transfer of the technology to small workshops. The vital part of the entire process is to bridge the communication gap between the laboratory and the workshop, to scale up the process or the product developed in the laboratory to its commercial exploitation and to follow it up with the provision of consultancy services to the entrepreneur during the nascent stages of commercial production. The success of a product or a process evolved in a laboratory will largely depend on the correct translation of the research findings. In other words, the transfer of technology to the entrepreneur should be arranged in a way that will make it a viable proposition for him to undertake commercial production with positive results.

One of the most effective ways of closing the gap between the laboratory and the workshop is to bring the small entrepreneurs and the scientists and technologists to a common platform for an open exchange of ideas. For, many entrepreneurs are not aware of the facilities available with the different R&D organisations in the country nor do the scientists and technologists of these organisation know of the needs and problems of the entrepreneurs. One such get-together was organised in Calcutta by the West Bengal State Level Research & Development Committee in collaboration with the National Research Development Corporation and the National Council of Science Museums from 8 to 11 April this year in which eminent scientists from 22 National Laboratories participated.

State Level Research & Development Committees have been set up in different States under the joint auspices of the Department of Science & Technology and scrutinise specific R&D problems of the small-scale industries and refer them to appropriate technical institutions and laboratories in the country wherever the necessary expertise is available. The industrial extension service of the Small Industries Development Organisation also seeks to provide technical, economic and management consultancy service to small-scale industrialists through a net-work of Small Industries Service Institutes, Branch Institutes, Extension Centres, Training Centres and Production Centres. Then there are the District Industries Centres which are coming up one by one in all the districts in the country to provide under one single roof the entire package of services to the small entrepreneur and the village artisan ranging from research, extension, entrepreneurial training, supply of machinery and equipment, quality control down to marketing assistance. And the National Research Development Corporation, a Government of India enterprise, is there to transfer the technologies developed in the R&D organisations to the entrepreneurs, setting up pilot plants and demonstration units, if necessary, to make the research results of the laboratory suitable for transfer to industry, and thus acting as a bridge between the scientists and the entrepreneur.

Need for Coordinated Approach

What is of paramount importance is to attract as many small entrepreneurs as possible to get into production ventures. According to one view, small entrepreneurs will get over their inhibitions if in all cases of transfer of technology NRDC accepts full responsibility including financial for the success of a technology upto the production level. At the same time, it is necessary to streamline the services of all the developmental agencies operating for the benefit of the small industry to avoid duplication of effort and to evolve a coordinated approach. The working of NRDC, SISIs and DICs is to be so corelated as to offer to the prospective small entrepreneur not only expert advice in setting up a particular industry but also the requisite technological guidance in his venture. It is only by providing a full measure of incentive and support that the latent entrepreneurship in the rural areas can be suitably tapped. □

The Tribal face

Smt. Maithily Jagannathan
Editor : Home Science

IT WAS A sunny day. The bright sun light filtered through the sal trees towering above. Below was the leaf-carpeted forest floor. The hills of Purulia district of West Bengal, the home of *Santal, Munda Bhumi, Baura* and other tribals were rugged. Now and then, in the midst of a small cluster of hills, a few goats, or women carrying fire-wood on their heads, striding down the jungle path were seen. The jeep in which we were travelling jumped and stopped near a turning in the jungle. Two sturdy boys of dark faces glustening against the greenery with bows and arrows in their hands emerged from the trees. "We are guarding goats" said the elder boy and added proudly, We and *shikari* (hunters)". We went down the slope and came to *Bhupatipalli,* a cluster of mud walls in a dry field.

The sun blazed on the huts. Men were seen in loin clothes, while women a piece of coarse cloth wrapped around their body. They were short and sturdy. Their bodies and faces looked dried by sun and wind. In the interior of the huts, a few clothes were hung in a corner. There was a basket or two with rice. "The rice is not for eating but for growing seedlings", told an aged women. Some dusty pumpkin vines were seen climbing up broken walls, probably to strengthen the walls.

A haggard young woman, with a baby on her lap was taking gruel.

What else can he eat ?

"Gruel" from "mocca" (maiz) or "gom" (wheat), with some salt or chillies. Something *sag* (spinach). They also eat kendu and mohua flowers and roots like this "gethialoo". It is very bitter and must be cooked for a long time. They showed a black root, hard as a stone.

"The baby is very weak, will you take him to a hospital if he is ill ?"

"We do our own *chikitsa* (treatment). The hospital is six Km. away. We cannot afford to lose a day's wages", said a sturdy looking middle-aged woman.

The Sarul tribe of Bhupatipalli are nomades who have been given some land in an effort to settle them in agriculture.

"Jomin ache, Jol nai, Goru nai", (We have land, but no water or cattle) they said. "We do majoori (field labour) and buy grains from the market. They are very costly." "So are sugar and kerosene oil," said another. "There are no ration shops here," said a third.

Under Food for Work schemes, which are run for eight months in the year, in this drought prone area, they get Re. one and one Kg. of wheat for a day's work. Women take firewood to the market and men sell bark of *sehor phol* 30 n.p. per bark and hand-made ropes at 75 N.P. per twenty foot rope.

How about shikar ?

A sturdy young man showed some trapping nets "with this we can hunt *bagh* (tiger) *banswar* (boar) *bandor* (monkeys), *bhalu* (bear) and *kheda* (rabits)", he said. "But the forest guards harass us. They take away the shikar and put us in jail," resentment smouldered in his deep set eyes.

"If there were wells and we had some cattle, we could make a living from the land", said a gnared old man whose body was all knotted muscles and bulging vains.

What are your important festivals ? "Makar Sankranti in Winter, Sarul Puja in Phagun (February-March), when we kill cockerels, and eat fresh leaves and mohua." On Buddha Purnima, all *adivasis,* only men from hundreds of miles, come to Ayodhya hills. We set out at 4 a.m. and climb the hills hunting animals on the way. At mid-night, we light a big fire, cook rice and hunted animals. There would be drinks and dances all night long. This is the biggest festival of all tribals of Chotanagpur".

When did the festival start ?

"Baap dadar bohut age (long before our ancestor time), "Ayodhya ke Bogaban esechilen" (God had come to Ayodhya hills), said an old man firmly.

Raju, with his wife, "Churu" (daughter), and "Churki" (sons) lives in a Santal village in the picturesque Ayodhya hills. Raju is more fortunate than his brothers, because he has a regular job in the charming forest Rest House. From his red eyes and wavering gait, one can guess that the surplus money keeps him well supplied with liquor.

Raju's wife earns Re. 1/50 a day as a labourer. His 14 years old daughter works at present in the Lutharan Mission nearby and gets Rs. 3 per day, a blanket and a sheet. The Mission gives employment to tribals by rotation.

"Our women work very hard", said Raju, shaking his head. "They are up at 4.00 a.m. to cut wood or pick leaves. They then go to the market for selling wood, and getting "majoori". To grind wheat, they walk to Baghmundi six Km. away. Many of us take only one meal of gruel per day."

What if there is sickness ?

"Matha Buru and Lugu Buru protect us. "Pathor ache". There is a stone for the jungle deities. We worship it with *sindur* and *tel* (verimelion and oil)) and kill cockerels." When will you marry off your daughter ? Raju's blunt features creased into a delighter smile. "Why should I ? It is for the boys to come and offer for her. I will get at least Rs. 100 or 120, one maund of rice and extra rice "nishar jonye" (for liquor) for the entire village."

Who performs the marriage ?

"We do" said Raju. "The boys and girls" people stand opposite each other. The boy puts *sindur* (vermission) on the girls forehead. Then there are drinks and dances all night long. Next day the girl goes to her in-laws village escorted by three girls and three boys from our village."

There are a number of official and private projects in the area. Among them is LAMP, a Cooperative Society financed by United Bank of India. To reach LAMP, we climbed up the steep slope of Ayodhya hills. Suddenly dusk fell we were eveloped in darkness. The jeep stopped. We grouped our way to the petromax welcoming us to LAMP office.

Lively, dark, sharp featured Manek Chatterji, the supervisor, working in the area since 1975, is there.

"I am proud that we have been able to break through the wall of centuries and win the confidence of the tribals here", he said. "They are simple and honest and except very little from life, except drinks and festivities. They do not like charity and will starve and go naked rather than ask for food or clothes".

"When I came here, they were completely in the hands of mahajans to whom they would sell a standing crop for Rs. 5 or 10/-. At first the mahajans were very angry and threatened me. But the local folk accepted me. *Era pant pora babu ke vishwas koren* (they trust a person in trousers)", added Manek with a smile.

We now have 1137 members. The monthly turnover from sale of controlled cloth is nearly Rs. 4,000/-.

How do you explain the acute poverty in spite of so many socio-economic schemes are operating here ? With an engaging smile, Manek asked "And how many of us are here to implement those schemes ? I am the only person here for an area inhabiting 96 villages. How can I go from door to door, assess the needs, or prevent unproductive use of loans ?

Poverty is not due to lack of land. Some tribals here have upto 25 acres of land, but it is not much fertile and water is also insufficient. With water and land development suited to these hills, there could be great improvement.

What are the practical problems ?

"Rules for giving credit" he replied promptly. "We give interest free loans for agricultural purposes, but we cannot give short-term loans for consumption purposes which is necessary in scarcity area like this, particularly when it is largely a tribal area. The result is that once again loans are taken from the mahajan and even benefit of development goes to him".

Are you married ?

"Of course not," he replied. "We are 80 km. from the district headquarters and 10 km. from the nearest town Baghumundi. During rains, we are cut off from the outside world. There is no electricity, or transport facility. None but a bachelor can survive under such conditions ?"

The tribals of Purulia district are among the oldest ethnic races of the world. Some like the Sarul hunters near Baghumundi are the only ones of their tribe. Many development schemes started in the district have languished due to lack of men and resources. Buffeted by waves of social and economic change, tribals have retreated to the jungles Chotanagpur. They live on roots, leaves, insects, reptiles and small game, emerging periodically for "mazdoori" (farm labour), patently waiting in the market-place of towns like Purulia, for the "Thekedar" to offer work.

Programmes like food for work, give temporary relief but are really a form of charity, which goes against the tribal ethos and may finally break down their morale.

Tribals are only half of the total population of marginal and small farmers in Purulia, yet they are the hardest hit, because they have to face an abrupt entry from the primitive and self-sufficient world into the modern inter-dependent society. Apart from light irrigation and livestock schemes like those sponsored by DPAP setting up of local industries for making ropes, baskets, pottery, based on local skills are necessary. These centres could also provide education which will help tribals in their daily life and work, so that they can boldly face the harsh glare of modern life. □

T.V. Recording on Wheels

The Centre for Educational Technology, NCERT, has achieved a break-through in sophisticated technology with the acquisition of a new, made-to-order TV Recording Van. Now the CET has at its disposal complete TV programme production facilities mounted on wheels.

Weighing 12 tonnes and costing Rs. 25 lakh, this TV Recording Van, specially airconditioned to suit tropical conditions, is a self-contained mobile production unit, which can be taken to various locations. Programmes made with this Van will have greater realism and authenticity as against the artificial studio situation. With this Van, real-life situations and setting natural back-drops and genuine people in their natural environments can be recorded. What cannot be brought into the studio can now be put on tape on locations.

This Van represents a completely indigenous design and fabrication effort, which is the outcome of very close collaboration between the CET and Bharat Electronics Ltd., Bangalore, specialising in electronics systems design and manufacture.

The TV Recording Van is equipped with three electronic Plumbicon Cameras (complete with the intercommunication systems between the producer, the floor manager and the cameramen), a Video Mixer, a Special Effects Generator, an Audio Mixer(with a large number of microphone channels) and a picture-and-sound monitoring unit. The Van also has a one-inch dual video-tape recording console. The electronic cameras and video-recording equipment have been donated by UNESCO/UNDP. The audio, inter-communications and power system and air-conditioning equipment are entirely indigenous. At the rear end of the Van are installed the rolls of cables sufficiently long for enabling the cameras to be placed at various places within a range of 150 metres. The roof of the Van has been specially designed so that one camera can be placed there too for top-angle shots, as and when necessary.

The TV Recording Van has been already field-tested in and around Bangalore. The Van will be based at the CET Headquarters New Delhi and can be taken to any place for recording. Educational Television scripts specially designed for children and adult education programmes are under preparation, which will be used when the TV Van Production Programme starts in mid-1979. □

BOOKS

Agricultural Development

Dynamics of Agricultural Development in India—*Editor Ali Mohammad : Published by Concept Publishing Company, 65F Anandnagar, Delhi-110035; Pages xxviii+209 : Price Rs. 90; $ 18.*

THE COMPILATION is of a dozen articles based on in-depth study of some factors influencing agricultural development in India with an able introduction that traces the history of Indian agriculture and complex problems that beset its growth. It is but too clear that a small volume like this cannot do justice to all the factors—environmental, technological and institutional,—that are responsible for agricultural growth in a vast country like ours with innumerable variations in each one of them. But the thought provoking articles written by experts for the experts can give them the impetus for similar studies in different regions under varying conditions in order to isolate the factors responsible for slow and unequal growth. Truly speaking, effect of some factors like transport facilities for marketing of agricultural produce, land tenure system or education on agricultural development are known in a large measure to persons who can feel the pulse of rural India. They have given such impressions the authenticity and accuracy through scientific observation and analytical processes. The comparative importance of various inputs and infrastructures have been weighed carefully but the human factor, which has not been ignored altogether, tends to topple the balance. In one of the articles the author is intrigued over the lack of response to H.Y.V. Paddy although H.Y.V. wheat became a craze in Punjab and Haryana. Here undoubtedly the human mind which does not subject itself to scientific precision plays the major role and although the author does not say so, the reason appears to be the critical mind and scepticism of the people in rice growing belt as also acceptability of the produce qualitywise.

The introduction itself is very informative and some of the statements are revealing. For example, the average consumption of fertilizers on all India basis is stated to be about 15 kg per hectare in 1974-75 compared to 610 kg in Netherlands etc. Can the reduction in fertilizer prices alone bring the consumption to a respectable level or the factors responsible for such low consumption have to be isolated and tackled ? Again, 'Green Revolution has been limited to the farmers who have the resources or access to institutional finance. Most small farmers are therefore untouched by Green Revolution'—who own more than 70 per cent of holdings and 20 per cent of cultivable land—less than 2.02 hectares being the size of a holding. And again, the larger the operational holding the lower is the efficiency of the farm'.

Agricultural production without doubt is a function of many variables. Since the factors have been isolated it should not be impossible with detailed analysis to find ways to optimum growth. The book will enable ardent workers to take the cue and study the problems in each region for finding remedies.

J. Chakrabarty

Business Economics

Economic Environment of Business *by M. Adhikary, Sultan Chand & Sons, New Delhi, 1978, Pages 462, price Rs. 25/-.*

RAPID INDUSTRIALISATION since independence has created an ever increasing demand of properly trained and professionally competent business managers. In direct response to this growing demand for managerial talent a number of institutes and departments of management have been established to impart sophisticated training and instructions in the management sciences to aspiring managers.

Most of the reading material for the course work in such faculties of management was till recently of Western origin since good scholarly and specialised texts based on Indian conditions and produced indigenously were not available. The book under review is an important contribution to the efforts made to fill the gap.

To a great extent, a manager can improve his style of functioning by becoming fully aware of those aspects of his environment that have a direct bearing on his business. In particular he must have a general understanding of the national economic system under which he has to operate. This book is an attempt to provide the conceptual and analytical tools necessary to understand the economic situation prevailing in a country. (The Section on Theoretical Framework). However, since a lot of political control on business exist in India the author has rightly tried to incorporate those political factors also that influence the economic environment of business in India. (Section II : The Indian Case).

A salient feature of this book is that true to the Weberian tradition, the author has presented alternate models for understanding the politico-economic environment of business and left it to the reader to decide for himself the model he would prefer to utilise.

In the appendix to the book, the author has presented vast amount of related data which would be of immense help to students in writing their term papers. Students of Management doing their course work in Indian Universities are likely to find this book to be indispensible.

—Rakesh Sharma

Problems in South-east Asia

Socio-Economic Development : Problems in South and South-east Asia
Reddy, Published by Popular Prakashan, Bombay, 1978. Pages. **xxi**+346, **Price** Rs. 80

THE PROBLEMS of South-east Asian Countries are, by and large, common-densely populated, abject poverty, social tensions and wide economic disparities inefficient and corrupt administration, and above all, they are unable to build a development-oriented political ethos. It is high time that the intellectuals of these nations start thinking seriously and lay down priorities to tackle these problems in a manner so as to provide a direction for the policy makers. Some headway was made in 1973 when the Asian Association of Social Scientists founded the Asian Association of Social Science Research Councils. The first International Seminar of AASSRC on Inter-Regional Cooperation in South and South-east Asia was convened in January 1975 at Osmania University, Hyderabad. The present book is the outcome of the proceedings of the Seminar.

In his Keynote address, Malcolm Adiseshiah rightly pointed out that Asian nations have a 'common background of colonial-cum-feudal past with its tragic accompaniment of economic underdevelopment'. The poverty culture has to be replaced with another culture be it growth, progress, affluence, welfare or sufficiency.

Of the three papers in the first theme—Planning and Plan Implementation—Gautam Mathur's paper deserves more attention. His contention is that the type of research which is being conducted currently in our countries can be easily relegated to archives, for they provide little or no solution to the problems faced by us. Further, such literature is finding place in our text books. What is required is a serious research into this aspect and promote that type of research which can help building up 'literature on the new pattern written in prose and not in the poetry of equations'. He goes on to suggest that Economic Democracy should be established which is based on a moral judgement and not on a scientific one. Introduction of disparity taxes—an actuative instrument for establishing Economic Democracy—would help in reducing effective demand and increasing effective supply.

The second theme comprises ten papers on diverse issues dealing with Urbanisation and Urban Development. It is well known that the level of industrialisation determines the level of urbanisation. Paper by Gore and Sharma corroborate this, whereas Panditratna has observe that it is the tertiary sector which has led to urbanisation in Sri Lanka. Since South-east Asian countries are not highly industrialised, therefore, even with a marginal introduction of industries in an area will obviously attract more unemployeds than in a similar situation in developed countries. The reviewer feels that it is this aspect which has contributed more towards congestion in urban areas than other variables. Moreover, the impact of the demonstration effect on the rural poor has also played an important role. This calls for adequate research in regional planning, area development, avenues to generate more employment and, above all, how best the basic amenities like housing, sanitation, drinking water, medical facilities etc., can be made available to the masses at large in urban areas. Or else, alternative employment opportunities have to be generated in rural or semi-urban/semi-rural areas to put an end or minimise the migration of population to urban areas. What is needed is a systems approach to regional planning with more growth centres spread widely throughout the area under study. This is what Rashmi Mayur states in his paper. On the other hand, Alam and Gopi show that there exists a marked disparity in regional development leading to a highly distorted system of hierarchy of settlements. The pluralistic structure of the societies in the region is yet another problem coming in the way of development of these countries. This is the third theme of the Seminar. Rasheeduddin Khan suggests that the geographical boundaries should be redrawn based on the principles of economic viability, socio-cultural homogeneity so as to promote cohesiveness in the country. This would mean further complicating the existing situation, for there will be more intra-communal conflicts. Moreover, the reviewer is sceptical whether such viable entities can be formed when various regional and communal societies are fast becoming cosmopolitan. Ratna Naidu traces the process of communalism and politics in India and Malayasia; Jatiman assesses the extent of plurality of the Indonesian society; and Komai peeps into the Thai society.

The fourth theme—Bureaucracy and Political Development—is perhaps the root cause of all the evils in this sub-continent, bacause there has been a lack of commitment on the part of the bureaucrats to implement the policies laid down. There is hardly any change in the administartive structure in these countries. Even if there is any, there is a dominant influence of the top bureaucracy on the rest of them. All the papers except that of Pringgodigdo emphasise this point. In Indonesia, after all the political turmoil, when the power was vested in the hands of the Executive it resulted in economic regeneration of Indonesia.

All said and done, the Seminar brought out a number of areas which require further research and a fresh approach. The Editors of the book should be complimented to bring out all the viewpoints in one volume and throw pointers to future researchers. These efforts should not only be meaningful but also implementable. Lastly, such volumes should be brought out at an early date and widely publicised, so that they are read in time and raise a national debate on some critical issues.

C. V. Rao

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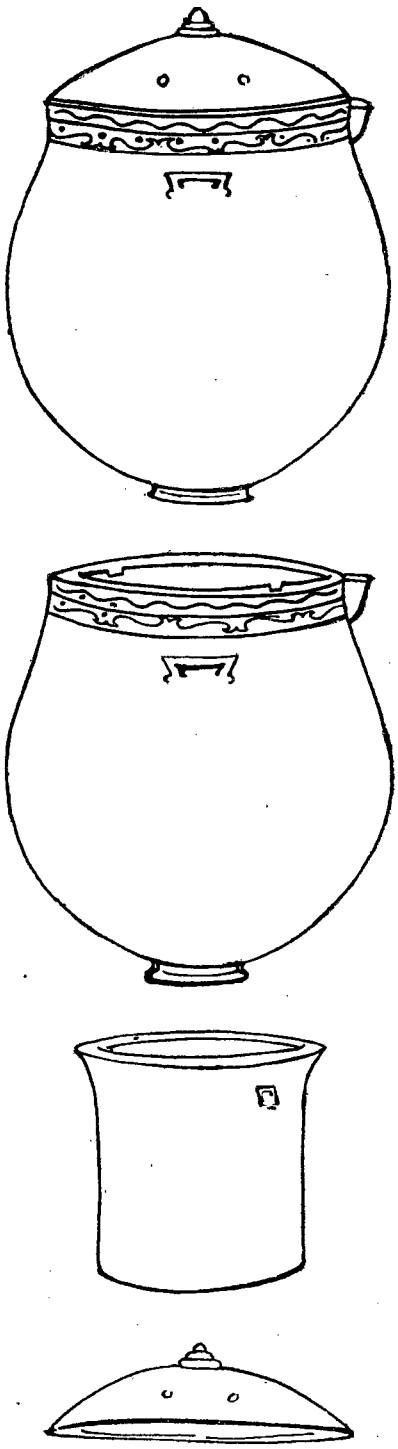
No Further Instalments

WHO SAYS a refrigerator is a luxury ? Every common man can not only dream of but also possess such a household appliance. The Central Village Pottery Institute of the Khadi and Village Industries Commission which has been introducing several special innovations in Village Pottery Industry, has developed a "Janatha Refrigerator" too, popularly known as "Grameen Sheetak" in which vegetables, fruits, eggs etc. can be preserved for a week. Flowers too will be fresh for 2-3 days.

This fridge is made out of common clay only. But it is based on purely scientific principle. The Grameen Sheetak consists of a double walled vessel normally of cylindrical shape with slight bulging in the middle as shown in the drawing. There is a spout at the top on the outer vessel through which water can be poured, which remains all around the inner vessel. There is a locking arrangement with 2 clay studs at two places in the bottom of the brim of inner vessel which rests on the brim of outer vessel. Due to this the inner vessel is not pushed up when water is poured around it through the spout. This double vessel is covered with a convex lid having a few holes to allow the moisture to escape. The inner vessel is given a coat of shellac solution for making it impervious (non-porous) while the outer one is a porous one. It is all that happens in this simple device. The outer vessel being porous, water inside gets evaporated through the pores in the outer vessel. The inner vessel being made nonporous, there is no possibility of water evaporating through its walls to the inner container. For evaporation, some heat is needed. This latent heat is taken from the inner vessel in small quantities, thereby the temperature of the inner vessel slowly comes down. Thus a cooling effect is obtained inside the inner vessel. Vegetables, fruits etc. kept inside this inner vessel are not spoiled for about a week. Such a simple device is of great advantage to the common man in the villages as he can buy the vegetables etc. from weekly shandies at cheaper rates and preserve them for a week. The efficiency or the cooling effect depends upon the quality of clay with which the vessels are made, the size of the pots as also the atmospheric conditions. In places where humidity is very high, this Sheetak may not be as effective as in dry places. The outer vessel should be as porous and as wide as possible for increasing the rate of evaporation. These Sheetaks, if properly handled last for 5 to 10 years, although the effectiveness of the pot may reduce gradually. This Janatha Fridge does not cost more than Rs. 10/- in a village. The Central Village pottery Institute Khanapur is selling this at Rs. 15. Some improvements in the design of Sheetak are also being undertaken at the Institute.



While presenting to the common man a cheap but useful device for preserving his vegetables, curd etc. this effort of the Central Village Pottery Institute brings a ray of hope to the poor potter artisan who finds it difficult to carry on his profession, as the demand for the traditional pots and pans is decreasing day by day. There are several similar special innovations evolved at the Khanapur Pottery Institute which can be adopted by the potters for earning higher wages. Though efforts were made to introduce the benefits of such innovation in selected places, concerted efforts are to be made by the pottery field staff under the Khadi Commission and State Boards to diversify the production of at least a section of the potters in each village by introducing the special innovation like Grameen Sheetak (Janatha Fridge), Smokeless Choolah etc. □

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