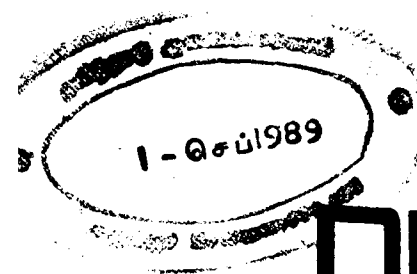


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MADRAS DEVELOPMENT
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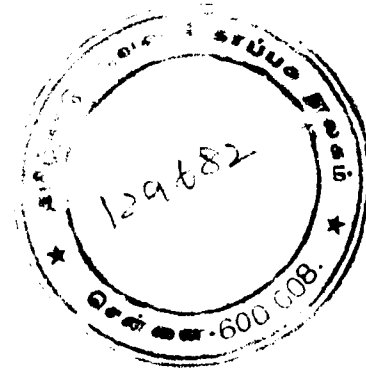
Conjunctive use of Surface and Ground Water
in Tamil Nadu

The Future of Village Industries - Part 1

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EDITORIAL - SOME HIGHLIGHTS

1. General Economic Scene

State

Climate and Prices

June in its first half was a continuation of the drought situation in 12 districts set forth in detail in the last issue of the Bulletin. Borewells for drinking water were dug in all the districts and special employment generating works were undertaken. The Union government announced the sanction of Rs. 38.05 crores for drought relief for the state against the state's request of Rs. 222 crores. The basis for the Union government's grant was with reference to work which could be completed before September 30, when the North East monsoon would set in. Of the Rs. 38.05 crores sanctioned, Rs. 29.83 crore was for drinking water works to be completed by September 30, for employment generation Rs. 3 crores plus the funds under Jawahar Vela Vaayppu Thittam, which is the Tamil translation of JRY available for employment. The rest of the grant is for agricultural subsidy,

supplementary nutrition, public health, animal husbandry. It will be recalled that the state had earlier sanctioned Rs. 53 crores towards drinking water supply, employment generation and drought relief in anticipation of the Union assistance. From the third week of June, the south west monsoon set in the southern districts of the state, rains which were a great relief both to the villagers and animals needing drinking water and for farmers for their crop. Some districts like, Ramanathapuram, Salem, Coimbatore, Tiruchi, Tirunelveli received plentiful rain almost daily. Madras and the north received occasional rains and thundershowers which however did not augment the water supply position. On prices, CSO's monthly abstract of statistics for April 1989 states that the index number of consumer prices for industrial workers declined by 5 points to 843 in December and remained at that level for January 1989, the index number of consumer prices for agricultural workers rose by 3 points to 712 in January 1989 despite a 3 point fall in food prices, while

the index number for urban non manual employees shows a rise by 1 point to 146 in January and a fall to 145 in February for Madras, no changes for either month at 140 for Coimbatore, a rise by 1 point to 145 in January and a fall to 144 in February for Madurai, no change at 138 for both months for Salem and a rise of 2 points to 143 in January and no change at 143 for February in Tiruchirapalli. The fairly stable level of prices in the major metropolitan centres once more contrasts with the inflation suffered by the rural areas.

Power

The power situation in June, after the mid way point, began to improve in the state, with the Tuticorin thermal working to full capacity (630 MW), Mettur thermal generating 300 MW, Ennore 145 MW, Ramagundam Super thermal contributing 200 MW, Neyveli however, generated 356 MW later increasing to 490 MW against the 1st stage capacity of 600 MW, plus 150 MW against the second stage capacity of 630 MW which became nil 4 days later, hydel generation was improving at 170 MW later to 235 MW with the onset of the SW monsoon. The second unit of Kalpakkam which was to be synchronised on June 11 was synchronised on June 14, starting with 90 MW against a capacity of 235 MW. Ennore was generating 200 MW. A total of 1970 MW was thus generated in the state grid. All this meant that from June 16 there was no unscheduled load shedding, with improved generation from Neyveli, with the first stage generating 520 MW and the second stage 470 MW. And so from June 21 the power cut on small units (LT industries with load of 75 HP

and above) was lifted and from June 29 the 60 per cent power cut on HT industries which number 460 was reduced. Thus June ended for the state with a good normal power consumption situation for consumers — industrialists, and cultivators and domestic. The government announced a master plan for use of wind energy from 15 wind masts by both the public and private sector. It also is establishing 30 wind mapping stations.

For the country as a whole, the power situation in June is still in a serious situation with Kerala announcing increased load shedding (to 5 hours in the day time and 1 hour at night) because though the state is receiving its full share of the south west monsoon, its hydel reservoirs have not profited by them. Despite this, the government announced a 25 per cent relaxation in the cent per cent cut on industry (reported in the last issue) provided an undertaking is given that no worker is laid off. Orissa is the other state, which like Kerala was once a power surplus state, but now faces severe power shortage, which has led it to encourage captive generation facilities, now amounting to 1074 MW out of the total power capacity of 2579 MW. The severe 3 year drought has seriously affected its hydel power generation, while power demand for its industries is 1272 MW, against the state's capacity of 1505 MW and generation of 835 MW. It is planning therefore to create an additional capacity of 3371 MW during the VIII and IX plans, starting with the 3000 MW Talcher project to be executed in 3 phases. One of the most disturbing reports on the performance of the State Electricity Boards is by the Comptroller and Auditor General. It reports that against the VI Plan sanction of 29,665 MW capacity, with an

outlay of Rs 19265 crores, the actual addition was only 14226 MW (50 per cent). The outlay for the VII Plan is Rs. 39,272 crores to add 22,245 MW capacity, which is 50 per cent more than that of the VI Plan achievement. The PLF at the end of VI Plan was 50.1 per cent compared to 55.9 per cent in 1976-77. Distribution and transmission losses increased from 20.44 per cent in 1978-80 to 21 per cent in 1983-84. So while power investments have been increasing, performance has been unsatisfactory. The total commercial loss of the State Boards rose from Rs.103 crores in 1973-74 to Rs. 450 crores in 1979-80 and to Rs. 4500 crores in the VI Plan and is projected to go upto Rs. 11,757 crores in the VII Plan, due to runaway capital costs and excessive interest and depreciation charges. The report points out that the high costs are due to poor maintenance, excessive staff, high inventories, low PLF and heavy subsidies. The way forward therefore is clear and must be fully and carefully planned and executed. The government and the planning commission estimate that power will need an additional outlay of Rs. 6320 crores to take advance action for well implementing 38000 MW power capacity during the VIII plan. The Commission is exploring various means of funding this additional outlay.

Water

The main event on the water front in June was the agreement between the chief ministers of Tamil Nadu and AP to get the Telegu Ganga project which would supply drinking water to Madras city moving again. Tamil Nadu has paid AP Rs. 30 crores now and has promised a further Rs. 30 crores later in

the year. March 1993 is the date when the water will flow into Madras. As a piece of engineering, the canal poses no problems. There are political problems arising from lack of clearance of the project by the Union government because of Karnataka's objection to using the surplus water till 2001, which it fears will give AP a permanent right. The project will cost Tamil Nadu a total of Rs. 480 crores and for this some Union or institutional assistance is needed, which the agreement between the 2 State governments should help to achieve. The State government has sanctioned Rs. 4.76 crores this year to the Madras Metropolitan Water Supply and Sewerage Board for increasing the drinking water facility to Madras. With this 500 additional Mark II pumps are to be installed and more water tanks will be hired. The Board has also taken up a Rs. 20 lakh project to reduce loss of water in Red Hills, as was done last year.

Transportation

On the transportation side, on the urging of the World Bank, the government has given notice of a graded increase in the fares ranging from 10 paise to 40 paise in the city, and an increase of 1.5 paise a km for the mofussil where the fare will go up from 9.5 paise per km to 11 paise. There is some resistance to these increases from some of the political parties but the fare increases are needed to get the buses on to the road. The State government has agreed to joint funding with the Railways of the Mass Rapid Transit System and now the technicalities of the joint funding is being worked out.

V Pay Commission revision, state finance and poverty in the state

In early June, the government announced accepting the recommendation of the V Pay Commission on pay and DA allowance revisions to bring the state employees remuneration into line with that of the Union employees. The Pay and DA revision, gives a minimum increase of Rs. 284 and a maximum of Rs. 1200 a month to 11.3 lakh state employees and teachers effective from June 1, 1988. The arrears payable from June 1988 to May 31, 1989 will be credited to their Provident Fund Account, the revised pay will be drawn from June 1989. The pay revision increases the scales from 17 to 23, giving pay parity with the union scales to 32 categories, with improvement to 8 categories. Also the government has gone beyond the commission recommendation and has accepted DA rates on a par with union employees. Similarly the government has accepted the recommendations on pensions which will be raised from Rs. 245 a month to Rs. 375 and the increase in ceiling from Rs. 1000 to Rs. 1260. This Fifth pay commission recommendations will cost the state Rs. 262 crores, while the parity on DA will increase it to Rs. 400 crores outgo per annum. This decision of the government is in accordance with the election pledge. It comes at a time when the state faces a rather severe financial crunch which has led it to reduce the 1988-89 plan as noted in the earlier issue of the Bulletin. The impounding of the revised pay arrears of Rs. 250 crores in its provident fund is one result. Even so, for this year it has to find Rs. 300 crores — Rs. 400 crores in a full year. The state's fragile finances have come under strain on account of escalating food and public subsidies — covering the free rice distri-

bution and subsidising the increase in the Union offtake price of rice and the current year's subsidy of Rs. 250-300 crores to TNEB. This has led to shedding some of the less conspicuous plan schemes and to the tapping of additional resources from liquor, bus fares etc. A recent seminar in Madras organised by the Association of licensed surveyors highlights the acute poverty in Madras city — more than in other metropolitan cities. Unplanned growth, galloping population, irrational rules which have resulted in the growth of slums and the city's unemployment are the reason for the city's high poverty level. A 1987 survey shows that there were 990 slums inhabited by 1.27 lakh families, despite the construction of 870 tenements between 1971-1987 to accommodate 45,000 families. There is also the city's financial crunch. While Bombay city has Rs. 1200 crores, Delhi Rs. 1000 crores, Bangalore Rs. 6200 crores and Calcutta Rs. 150 crores, Madras has only Rs. 50 crores. There is lack of coordination among the many agencies that have been created for the city and above all the absence of a popularly elected council (now for over 10 years) have added to the problem of poverty, which cannot be tackled by the civil service alone. And all that the city has is the civil service.

Decentralisation and Pollution Control

As part of the State governments scheme for decentralisation and devolution of power to local bodies, the government has transferred the control and care of all the 393 animal husbandry sub centres to the respective panchayat unions. The sub centre will be under the administrative control of the panchayat union and under the technical control of the animal husbandry department. The Tamil Nadu Pollution Control

Board announced that it has set up an environmental Welfare Engineer's office in Manali because of the fast growing capital intensive petro chemical industries in that area. The office has its headquarters in Madras and will be known as the Chengai Anna (North) District Environmental Engineer's office covering Saidapet (Manali, Ennore, Thiruvottiyur), Ponneri, Gummidipoondi, Thiruvellur, Oothukottai and Pallipattu. Similarly the Chengai-Anna (South) district Environmental Welfare Engineers office will have its headquarters in Maraimalai Nagar and cover Sriperambattur, Kancheepuram, Uthiramerur, Mathuranthagam and Seiyur.

National

Plan

The Planning Commission proposes that growth and modernisation should be the VIII Plan's major objective, which will be aimed at reducing poverty levels to 18 to 20 per cent of the population from the current 28-30 percent, at a sharper focus to reduce regional disparities to ensure more dis-

persed growth, at an annual employment growth of 3 per cent, at international competitiveness in our expanding range of manufactures and excellence in select sectors, at the minimum needed programme providing 194 kg per capita per annum of foodgrain, at universalisation of elementary education and eradication of a illiteracy in the 15-35 age group, at providing clean drinking water for all, at containing major communicable diseases by 1995 with a view to eliminating them by 2000 AD and expanding the comprehensive health system to achieve health for all by 2000 AD and at greater decentralisation making for peoples participation in plan. A higher growth rate than the traditional 3.5 per cent upto 70s is needed in the 80s (at 5 per cent) to attain the above objectives and clear the backlog of unemployment and provide employment to labour force entrants. This means a 6 per cent growth rate for the VIII Plan to be secured by higher efficiency which would reduce ICOR by shifting investment from sectors with high ICOR to those with low ICOR and by economy in use of inputs, particularly energy. The macro economic magnitudes for the 6 per cent growth in the VIII Plan in comparison with those of the VII Plan are set forth as follows :

	7th Plan (average)	8th Plan (expected)
I ICOR	4.6	4.3
II Total savings of	21.4	24.1
— Private corporate sector	1.8	2.0
— Household	17.2	19.0
— Public	2.4	3.0
III Total Investment as % of GDP	23.2	25.9
IV Net Capital inflow as % of GDP	1.9	1.8
V Tax ratio as % of GDP	16.9	20.0
VI Subsidies as % of GDP	3.4	1.9
VII Revenue deficit as % of GDP	-2.1	-1.2
VIII Public Consumption as % of GDP	11.9	13.0
IX Export growth (volume % per year)	6.7	10.0

The Commission also points to certain weaknesses of the economy. 1) Population growth of 2.1 per cent per year involving an annual addition of 17 million persons. 2) Employment growing more slowly at 2 per cent per annum while the labour force grows at 2.5 per cent per annum. 3) Rapid urbanisation during 1971-81 which will mean 330 million urbanites by 2000 calling for large resources for urban infrastructure. 4) Persistent regional disparities in social and economic infrastructure. 5) Declining average household holdings. 6) Stagnancy in the savings rate, and 7) Lack of correspondence between economic progress and peoples well being. The aggregate investment at 1989-90 prices will be Rs. 645,000 crores, with public sector outlay at Rs. 345,000 crores to Rs. 355,000 crores of which public sector investment will be Rs. 295,000 to Rs. 300,000 crores. District Planning, zero based analysis on centrally sponsored schemes in agriculture, forestry, irrigation and rural development will be part of a major effort to economise on governmental expenditure. The major debate on the VIII Plan still centres around the rate of overall growth. A member of the Planning Commission pointing out that the good 1988-89 monsoon has resulted in agricultural value added of 20 per cent and industry of 8 per cent gives a growth rate for that year of 11.6 per cent (and not 9 per cent as projected by the Economic Survey and RBI). Again with the good monsoon being repeated in 1989-90, agricultural growth will be based on 170 million tonnes foodgrains and industry growth at 8 per cent, giving an overall growth for the year of 5 per cent. This means that for the VII Plan a 6 per cent growth will be reached with an investment of 23 per cent and ICOR at 3.6 per cent. Under these

conditions, he argues that for the VIII Plan a 7 per cent growth will be easily attained at an investment of only 24.8 per cent (Rs. 6,27,000 crores) and an ICOR of 3.5 per cent. There is in this argument an underlying belief that the level of the growth rate is solution to our problems of poverty and inequality, which is questionable as our past experiences over 7 plans shows and on assumption that we will in the VIII Plan have the same bountiful monsoon that we had in the last 2 years of the VII Plan, which also is questionable in our drought prone country. The World Bank in its report to the Aid India consortium meeting in June (to be referred to later) forecasts a 6 per cent growth for the VIII Plan if reforms ensure a) productivity improvements, b) correction of low public sector savings and budget deficits, c) a real export volume of 10 per cent per annum. The Planning Commission proposes a package to increase farm exports in the VIII Plan and suggests foreign collaboration in fruit and vegetable processing where there is export commitment. It states that the private sector will have to play a greater role in the VIII Plan as the bulk of the incremental growth in industry during that period will have to come from that sector. The Commission favours a reappraisal of FERA to attract larger direct foreign investment during the VIII Plan. It proposes that the replacement and maintenance costs of assets be part of normal working operations and not form part of Plan, outlay. The VIII Plan HUDCO loan target is placed at Rs. 4100 crores and the milk output target at 67.5 million tonnes. The railways states that they plan Rs. 41,600 crores investment in the VIII Plan compared to Rs. 16,538 crores in the VII Plan.

Prices

Inflation during May was around 2 per cent with the wholesale price index standing at 460.2 at May 27. This price rise was due to the 40 per cent rise in the price of newsprint, and increase in the prices of wheat, rice and pulses and sugar. Prices of tea, bajra and spices declined. Remained unchanged were prices of mustard, fuel, power, lubricants, beverages, tobacco and tobacco products. On a point to point basis, this year's inflation is 8.8 per cent. Both to counter inflation and keep the budget deficit within the approved limit of Rs. 7737 crores, the finance ministry has issued strict guidelines to all spending authorities to contain their expenditure within the limits set down in the 1989-90 union budget. Following the recommendations of the Rangarajan Committee, the government announced that the wholesale price index which had 1970-71 as base is to be revised with 1981-82 as the base from July 1989. The new revised series will have a substantially enlarged coverage of 447 items and 2371 price quotations against the 360 items and 1295 price quotations in the old series. The number of primary articles is increased from 80 to 93, the fuel, power and light items doubled to 601, manufactures 334 in place of 274. The official release says that the coverage has been rationalised by including important recently emerged items and deleting unimportant ones. In weightage terms, primary articles get less weight at 32.295 against the previous 41.667, manufactures 57.042 against the previous 48.874 and power, fuel etc. at 10.663 against 8.459.

Stock Exchange and Finance Commission

The capital market has grown fast from Rs. 550 crores raised in the V Plan to Rs. 3680 crores in the VI and an expected Rs. 21,500 crores in the VII plan. From the primary capital market, the increase has been Rs. 165 crores in 1980-81 to Rs. 5600 crores in 1988-89. In the secondary market, the daily turn over has topped Rs. 100 crores a day in Bombay. The other side of this encouraging situation is that only 1 per cent of people in India invest in shares compared to 10 per cent in industrialised countries, only 7 per cent of household savings are invested in the capital market against 19 per cent in Japan and 25 per cent in US. While the potential in the country is immense, the infrastructure has not kept pace with the rapid growth of the market. In this connection the proposal for investor protection prepared by SEBI and discussed at the Calcutta, Madras meetings are timely. The information to be sent forth in the prospectus must meet the needs of both the investor and the share issuing company. The chairman of SEBI points out that in the VIII Plan Rs. 40,000 — Rs. 50,000 crores will have to be raised and for this the balance of investors interest against those of the company must be realised. The question of the merchant banker signing the prospectus which has given rise to controversy is needless and can be dropped. The capital market can join LIC, the banks and UTI in promoting savings from the middle and lower income group and channel them in industrial investment. The launch of the Certificate of Deposit (CDs) announced by RBI in March 1989 will further widen the range of money market instruments and give investors greater flexibility in deployment of their short term funds.

These CDs are in addition to the Participation Certificate permitted by RBI for banks to issue. On CDs, RBI has issued guide lines which include the rule that CDs issued by a bank should not exceed 1 per cent of its total 1988-89 deposits. The Discount and Finance House of India reports that the 182 day GOI Treasury bills issued in November 1986 have not developed into a major money market instrument because of the less than expected response from the major players in the market — banks and the corporate sector. The Securities and Exchange Board of India (SEBI) has proposed creation of a capital fund to strengthen the operations of stock exchanges and to promote investor education. RBI announced in June changes in interest rates for US and Yen deposits under the foreign currency NRI scheme, reducing by 0.75 per cent the interest rates. The government announced in June that the term of the IX Finance Commission is extended by 6 months—to December 31, 1988.

Economy

The Ministry of Programme Implementation reports that in 1988-89 NREP spent upto December 1989 only Rs. 496.87 crores against an allocation of Rs. 812.91 crores, with 325.9 million mandays against the target of 370.4 million mandays, irrigation works upto December 1989 were 11,000 compared to 47,000 in 1987-88, in drinking water there were 15,000 against the previous year's 40,000 and rural roads 16,000 kms against the previous year's 44,000 km. In regard to bonded labour NSS estimates the number as 3.45 lakhs, but the state identified only 2.36 lakhs. The effect of Operation Black Board on the drop out rate is

not referred to, it declined from 67 per cent in 1970-71 to 52.1 in 1982-83 before the Operation Black Board. PLF in power stations stagnated at 53 per cent in 1988-89 compared to 55 per cent in 1987-88. Coal recorded a lower growth of 7 per cent against the previous year's 10 per cent. Now the report of the ministry needs to turn from the annual recital of inadequacies and failures in implementation to proposing measures for rectifications and redressal. Even as the IDBI grows stronger, there are some questions posed by the RBI on the source of its funds, the cost of funds and the interest rates. They are all interconnected. SLR cannot provide all the funds required by IDBI and so it must resort to the market and this will raise its interest rate. Its resources can increase if there is better recovering of loans and more strict applications of viability criteria vis a vis potential industrial sickness. RBI suggests that the term lending institutions can give up the convertibility clause as that has not helped the economy. On poverty schemes while IBRD wants the anti-poverty schemes reoriented so that they move faster and translate higher growth into employment and real wage increases, it also calls attention to increasing concentration of the poor in specific regions and occupation groups and cites in the matter the sharp — fall in poverty incidence in the south that has left over three fifth of the poor in the eastern and central India where 412 million people live on low wages and lagging social services. It suggests changes in revenue sharing arrangements to target the poorer states through larger plan allocations. A similar backlog is in a futuristic study of India in 2021 which shows that the abolition of poverty and creating full

employment by 2000 AD as envisaged by the VII Plan is not realisable even with a 5.5 to 6 per cent growth because of sharp fluctuations of agricultural growth and the skewed distribution of income. It states that NRR=1 will be possible in 2015 when population will be 1.2 billion. It refers to the trend of increasing urbanisation which will convert 2 million hectares of land to urban use. It states that the per capita availability of nutritional food will be below the minimum and malnutrition will prevail even in 2021. It forecasts that by the turn of the century 45 per cent of the rural poor will cross the poverty line. The abysmal record on land reforms recorded at the Planning Commission seminar is due to the poor performance of most states. The Ministry of Rural Development does not know the real land surplus and even the amount of surplus land under litigation. One estimate is that it is 25 lakh acres, while the land already distributed is reported at 44.92 lakh acres benefiting 41.772 lakh persons. Not only is the land distribution sadly and badly lagging, the elimination of intermediate tenancies has become complicated, so that oral and informal tenancy arrangements are 30 per cent of cultivated lands. And then there are the benami holdings. The question can be asked why are land reforms so badly administered even as a plethora of programmes — NREP, RLEGP, IRDP & new JRY are set forth and some like JRY implemented in a hurry at break neck speed. Can computerisation help the land recording? This needs immediate attention. Dissatisfaction in the National Wasteland Development Board, particularly over the eucalyptus trees which it was promoting, its low and slow afforestation schemes, the absence of motivation and properly trained staff, the lack of co-ordination

between various implementing agencies, the unreliable data collected on the social forestry — all have led to the closing down of the National Wasteland Development Board and the launching of the technology mission into which it has been reorganised. The mission should act on the valuable recommendations of the fuel wood study committee of the Planning Commission in developing a greening strategy for the country under which is developed both fast growing trees for degraded areas along with traditional forest varieties in a balanced manner to meet the ecological and economic needs of the country.

Industry

Industrial growth, which was 12.1 per cent in March 1989, recorded a rise of 8.8 per cent for 1988-89 compared to 7.3 per cent for the previous year. Manufacturing rose by 8.9 per cent, power by 9.4 per cent, mining 7.8 per cent. The good growth performance in 1988-89 was due to buoyant demand conditions arising from the resurgence of agriculture. Government decided in June to delicense automobile tyres and tubes, which continues the earlier liberalisation exempting MRTP companies from sections 21 & 22 of the Act and the fixing of the minimum economic size at 1.5 million tyres and 2 million tubes. This will enable the industry to meet the growth in demand for its product caused by the rapid expansion of the automobile industry. The liberalisation policy for the industrialisation of backward areas has not had a good response. Out of 282 letters of intent issued in January-March 1989 those issued for units in the backward areas was 46.45 per cent — 131 units compared to the 48 per cent (72 out of 150) in January-March

1989. In the SIA delicensing registration scheme also there is a decline from 115 out of 200 companies to 256 out of 400 in the previous year. One of the reasons for this poor response is because the entrepreneurs are awaiting the setting up of growth centres. Hence it is good that the Union government has asked the states to gear up their rural development machinery to set up 100 growth centres to ensure the consolidation and diversification of IRDP, TRYSEM and DWCRAs. A total of 61 growth centres is being developed in the first phase. Metkem Silicon reports that the total industrial production of polysilicon wafers and their utilisation in solar cells and photo voltaic module containers are to be much below the projections of last year. It is faced with inadequate capacities of downstream crystal pulling and wafering of polysilicon resulting in its working below capacity, carrying a growing inventory. The June 1989 overall Survey of the Economic Times reports that the value of production of 153 private sector companies in 1987-88 rose by 12.1 per cent and their aggregate cost of production rose higher at 12.7 per cent. So their gross margin declined from Rs. 478 crores (2.2 per cent of the value of production) in 1986-87 to Rs. 418 crores (1.7 per cent in 1987-88). The fall in margin was due to increase in depreciation (34 per cent), wages (13 per cent), repairs (11.6 per cent) and raw materials and stores (10.3 per cent). In the public sector, 218 companies increased their cost of production by 13.8 per cent compared to the rise in their value of production of 13.4 per cent. The interest charges and depreciation were the main cost factor and their gross margin fell from 6.9 per cent in 1986-87 to 7 per cent in 1987-88. TISCO reports for 1988-89 a record turnover of

Rs. 1861.77 crores, a growth of 21.94 per cent and a high 30 per cent dividend on its enlarged capital.

Public Sector Enterprises

The Bureau of Public Enterprises reports that the net profit of Union public sector units increased by 50 per cent in 1988-89 at Rs. 1000 crores. The profit has increased from Rs. 2100 crores in 1987-88 to Rs. 3100 crores. The petroleum sector has contributed only 30 per cent of the profit so that profits this year have come from steel, coal, heavy engineering and power sectors. The companies leading in profits are SAIL (Rs. 300 crores), Air India (Rs. 30 crores), SCIC (Rs. 63 crores), IPCL (Rs. 95 crores), HEC (Rs. 13 crores). The profits of the petroleum sector is Rs. 318.70 crores while that of the non petroleum sector is Rs. 651.64 crores. This turn around in the profitability of the public sector should be welcomed. 33 public sector units under the Department of Industrial Development report a 24 per cent higher production in April 1989, with aggregate production of Rs. 374.37 crores which was 93 per cent of the target. The good performers were BHEL (101 per cent), Bharat Pumps (101 per cent), Bharat Wagon (105 per cent), Bharat Ophthalmic Glass (135 per cent), Cement Corporation (128 per cent), HPFL (109 per cent), Hindustan Salts (138 per cent), Engineering projects (138 per cent). In 1987-88 despite reported profit of Rs. 2100 crores, there were 102 companies which made a combined loss of Rs. 1718.77 crores, led by IISCO and Sponge Iron. One way of improving the performance of these enterprises is to protect them from government interference which was the basic reason for the losses holding companies (HCs) like

SAIL, CIL, NTC, BYNL etc. But as the Public Enterprises Selection Board states these HCs only hold equity in the subsidiaries which are separately controlled by BPC. This should be ended by establishing a clear division between HCs which should have sole responsibility for commercial decisions while governments will have responsibility for policy issues. The other problem is the appointment of directors in subsidiaries which is now being done by government bureaucrats and should be turned over to professional HCs. There is also urgent need for personal and purchase policy which does not exist till today.

National Production Front

Steel

In the ranking of the International Iron and Steel Institute (ISSI), by 2000 AD, SAIL will have moved up from the current 13th position in the world of steel producers to the 3rd, after Nippon steel of Japan (26 million tonnes) and Potong steel of South Korea (20 million tonnes) and SAIL (19 million tonnes). This means adding 1 million tonnes every year to the current SAIL capacity of 8.4 million tonnes. There are other deterring factors like the cost of production of steel in which India held the first place in 1975 increased now by 125 per cent compared to the cut of 25 per cent increase by Japan, 8 per cent in US, 6 per cent in UK and 2 per cent in West Germany. A key measure is reducing use of energy which is 35 per cent of the cost of production in India against 20 per cent in other countries. SAIL's plea for ideal operating environment is not convincing when compared with Japan whose steel inputs come from far away places. All this is some distance away

from the low steel target which was fixed at 75 million tonnes by 2000, lowered to 45 million tonnes in 1980 and now lowered to a mere 25 million tonne. Upto now SAIL's capacity is 15 million tonnes, Tata and Vishakapatnam's 6 million tonnes and 4 million tonnes from arc furnaces. The accent now is on modernisation and consolidation with no increase in production capacity, which will face a problem in 2000 AD. SAIL has called attention to the fact that while it will continue to produce 1.5 million tonnes of pig iron against the demand for 2 million tonnes and more, it should not be expected to increase this low value added item when it is equipped to produce more sophisticated items. Hence the further production of pig iron can and should be opened up to the private sector which can meet their growing demand.

Crude

ONGC states that the western offshore will contribute between 27 and 30 million tonnes annually during the VIII Plan, up from the present 20 million tonnes. The increased production will be contributed by the new discoveries and the Penna, Heema and Ratnafiels—all outside of Bombay High. On the basis of the results of the 7 horizontal wells in western offshore, the drilling of horizontal Wells is expected to yield large increases. A 1 per cent increase in oil recovery from existing wells can give the country an additional 30.5 million tonnes of recoverable reserves. ONGC proposes to improve oil recovery from its fields by 5 to 10 per cent by upgrading technology. The VIII Plan envisages an annual rate of production of 43 million tonnes of oil and 27.46 billion cubic metres of gas by 1994-95 which is a quantum jump from the

current 15 million tonnes of oil and 13.60 billion metres of gas. Further, ONGC also reports that it has finalised a scheme to develop the Neelam field 45 kms from Bombay, where the first structure yielded 1542 barrels a day and the second 1685 barrels, making Neelam a major oil field on which the investment will be Rs. 1583 crores.

Coal

The coal production target for 1988-89 is 210 million tonnes, including 183.50 million tonnes by Coal India compared to 194.62 million tonnes in 1988-89. Coal India reports a massive modernisation plan involving investment of Rs. 14,000 crores during the VIII Plan which will increase production from the current 171.85 million tonnes to 270 million tonnes in 1994-95 and 350 million tonnes in 2000. Meanwhile CIL reports increasing pit head stocks because of quickening production, slackness of demand and some overestimations on demand. The Geological Survey estimates the country's additional coal reserves at 2,213 million tonnes, with 2104 million tonnes in the proved category, 1283 million tonnes amenable to open cast mining. West Bengal has largest reserves at 778.54 billion tonnes, followed by Bihar 736.52 million tonnes, MP 405.84 million tonnes and Maharashtra 244.94 million tonnes. Total coal reserves are estimated by GSY at 1,76,330.35 million tonnes in January 1989.

Non Ferrous

The winding wire industry reports facing a difficult situation because of the shortage of copper. Since October 1988, the rather sudden 50 per cent reduction in the allotment of copper has slowed

production in the industry and has affected the consumer industries—motor, transformer, defence organisations, electronics and atomic energy. The suggestions to restrict the import of copper scrap in the situation of scarcity to actual users seems sane as it is the curtailment of the rampant misuse of foreign exchange resources by traders.

Cotton and Sugar

The Cotton Advisory Board (CAB) estimates the 1988-89 cotton production at 104 lakh bales—comprising 6.63 lakh bales of short staple, 46.41 lakh bales medium staples and long and extra long staple 50.96 lakh bales. Mill consumption is placed at 98 lakh bales for the year and non mill consumption 6 lakh bales. CAB recommends export of at least 2 lakh bales, comprising 1 lakh bales Bengal deshi and one lakh bale of extra long staple. This dilutes the earlier government decision to export 6 lakh bales a year for 3 years starting 1986-87, on the basis of which a favourable market for selected varieties of Indian cotton has been created and Indian cotton growers benefit from this. In the interest of developing the long term export market, the government must act on the recommendation of CAB for a minimum export of cotton. On the sugar front, the January forecast that the October 1988 — September 1989 sugar production would be 102 lakh tonnes against the previous year's 91 lakh tonnes and the government decision announced to export 3 lakh tonnes later reduced to 1 lakh tonnes have all gone awry. It is now estimated that sugar production will be 91-92 lakh tonnes (the same as last year), that consumption will go up to 100 lakh tonnes, resulting in dropping all kinds of sugar export and instead a decision

to import 5 lakh tonnes to meet the shortage of domestic supply. This will mean a foreign exchange outgo of Rs. 150 crores, which the country can ill afford. The downward revision of production is attributed to lower recovery rates in many states and diversion of cane to gur and khandasari units which offer high prices than mills. There are 2 actions needed. First, there is need to contain the consumption of sugar by allowing its price to go up and not increasing the free market quota release. Second, there should be some control over the prices offered by the gur and khandasari units, which are completely uncontrolled. There is strong pressure to increase sugarcane production from 180 million tonnes in 1987-88 to the 186.36 million tonnes in 1988-89. This marginal increase can be secured by better farming practices but any large increase in this water intensive crop is not in the interest of the masses of the poor people of the country or of agriculture.

Cement and Jute

Cement industry wishes to export its surplus as a permanent factor of the industry. There is a large foreign demand for cement but at competitive prices which unfortunately the Indian Cement industry cannot provide. Thus the major manufacturers report that their export realisation does not cover their costs. That is why the industry aiming at exporting 4 million tonnes a year, could export only 66,000 tonnes in 1988-89. The industry reports a negative post tax net worth which has slackened its capacity creation. In 1989-90 addition to capacity will only be 1.5 million tonnes. Two actions are needed. Domestic prices are too high leading to curtailment of

demand and they need to be reduced by improved productivity. Second, on the export side, the government needs to provide a level of CCS that will make cement export prices competitive internationally. On the jute industry which is passing through a crisis, with the union's demanding reopening of closed mills, nationalisation of the mills, ban on synthetic packaging values, revision of wage rates and payment of provident fund, gratuity and ESI arrears and strict enforcement of the 1984 tripartite agreement, the mill owners blame it all on official apathy, the fast changing market complex and workers resistance to technological compulsions. Of the 72 jute mills in the country, 58 are in West Bengal where over half a lakh employees are out of work. There is need for the Union and State governments, managements and trade unions to sit together and develop a way forward. Nationalisation is out. Workers unions have officially declared that they are not against technological upgradation provided they are consulted. Under these conditions short term measures such as mandatory use of jute packaging material should be pushed along with the long term solutions for developing new markets, expanding export and selling off unviable units and investing the sale proceeds in sunrise industries in which the workers could be redeployed.

Agricultural Production

With the timely and bountiful onset of the south west monsoon kharif operation are being actively pursued by farmers all over the country. The timely onset of the monsoon in the oil seeds producing centres has brightened prospects of a good kharif harvest. The Saurashtra region of Gujarat has received 12 inches of rain and will produce its 25

per cent of the country's aggregate. The technology mission has taken steps to improve the productivity and bring more area under cultivation, using minikits to distribute quality seeds. The target for oil seeds for 1989-90 (Nov-Oct) is 165 lakh tonnes covering ground nut, sesame, soyabean, sunflower, castor seed and niger seed. Similarly a two fold strategy is being followed to raise the production of pulses for which a production target of 15 million tonnes has been set. The production aims at increasing the yield both through expansion of the area under pulses crops and increase in the productivity. Inter-cropping of pulses with cereal crops is becoming popular and land left fallow in kharif to grow rabi jowar etc. are being used to grow pulses. Hence the 1989-90 agriculture production should see a satisfactory cereal output as well as of oil seeds and pulses yield.

Foreign Trade

1988-89 ended with export earnings of Rs. 20,281 crores (29 per cent increase) and the first month of 1989-90, April 1989 records a heartening export earning of Rs. 1957.7 crores which was 35.8 per cent increase compared to April 1988. Imports increased to Rs. 2278.23 crores compared to Rs. 2199.77 crores in April 1988, thus reducing the April trade deficit from Rs. 758 crores in 1988 to Rs. 320.53 crores in April 1989 — a large 57.7 per cent decrease. Engineering exports increased by 57.7 per cent in 1988-89, tyre exports were Rs. 75 crores in 1988-89 and will be Rs. 100 crores this year, and oil seeds for the first time will be exported for Rs. 100 crores. The government extended the coverage of the scheme of duty draw back on exports to 16 more items

ranging from tools made of high speed steel, galvanised pipes to brass builders hardwares and aluminium utensils and pressure cookers. Plastic exports in 1988-89 increased by 128 per cent to Rs. 120.28 crores. The 1989-90 export target is still under discussions against the previous year's level of Rs. 20,281 crores which may lead to a target of around Rs. 30,000 crores. The 1989 turnover of Rupee trade with USSR, Czechoslovakia, Poland, Rumania and GDR has been fixed at Rs. 9609 crores. The major event in June was the decision of the US government to invoke clauses super 301 and special 301 of the Omnibus Trade Act against India, with which Brazil and Japan are clubbed. Under super 301, the US government regards the limitation of equity investment (under FERA) by foreign companies as discriminatory trade practice and the exclusion of all foreign insurance companies from operating in India as also being discriminatory. Under special 301 the US government holds that India does not protect US intellectual property rights adequately. If these charges are finally upheld, there will be various forms of reduction of India's exports to the US. While the question of tightening the Indian legislation on foreign intellectual property rights is a sound issue and is under consideration, the two cases under super 301 are not discriminatory and even more are a clear case of interfering in the internal economic management of the country and have to be rejected by India. Most countries oppose the US Act and OECD goes so far as to say that it "threatens the integrity of GATT" where negotiations are under way on trade matters which will influence the economic and trade of member countries for the next decade.

Loans and Aid

The major event in June in the loans/aid field was the meeting of the Aid India consortium in Paris on June 21, when the World Bank and the countries members of the consortium pledged \$6.7 billion for 1989-90, which was 6 per cent over the 1988-89 pledge which itself represented a 16 per cent increase. One reason why a greater sum was not pledged was because a sum of Rs. 20,000 crores of external loans and grants are unspent in the pipeline to date mainly because they are project loans which cannot be disbursed faster than the time it takes to implement the project. There is also the shortage of rupee resources which does not permit speedier utilisation of aid. Further, in an election year the government has been reluctant to obtain more World Bank aid involving structural adjustments in the economy. The time has come for a complete review of the loan/aid policy of the country, taking into account the desirability of reducing aid as planned way back in the draft fifth plan, reviewing the relation between domestic and foreign savings and resources and the question of commercial borrowing vs equity investment. This review should be made public and presented for discussion to Parliament and on that basis the aid/loan policy should be based. IFC has agreed to grant the Ahmedabad Electricity Corporation a loan of \$20 million as part finance to its expansion. The Investment Finance Corporation of India is negotiating a loan of \$156 million from ADB to meet foreign currency needs. The International Fund for Agriculture Development is making a loan of \$17 million for a women's development project in Tamil Nadu. UNDP is providing \$3 million to strengthen the Ocean Engineering Centre at IIT, Madras. On

raising loans from the international commercial market, the Shipping Corporation has been permitted to raise \$50 million from a Consortium of European Banks, ICICI has been permitted to raise \$100 million from 3 Japanese and French banks, and the Indian Bank in Singapore has been permitted to raise \$25 million through a floating rate certificate of deposit and IFCI permitted to raise a loan of 12 billion Yen from a consortium of foreign banks. On India's foreign debt the Economic Survey states that it is Rs. 55,000 crores, OECD states that it is Rs. 75,000 crores and an Indian Express statement places it at Rs. 96,000 crores. All three figures are right on the basis of the assumptions each makes. The Economic Survey figure of Rs. 55,000 crores excludes short term debt and NRI deposits, the OECD figure of Rs. 75,000 crores includes short term debt and the Indian Express of Rs. 96,000 crores includes NRI deposits and portfolio investments. The last figure is really the definitive one (why the government excludes short term debt from its statement is not known) and what is clear is that India's external indebtedness is large, heavy and places it in the fourth place after Argentina, Mexico, Brazil and needs attention.

International

IMF & IBRD

The major issue that concerned both IMF & IBRD was the position of world debt. IMF adopted in June broad guidelines on Third World Debt strategy, in particular for fund support for debt and debt service reduction operation, which is linked to medium term adjustment programmes with a strong element of structural reforms. Similarly, IBRD

announced also in June its new debt and debt service guidelines to help the heavily indebted countries over the next 3 years also based on medium terms adjustment policies and not involving transfer of debt on risk to the public sector. An IMF survey shows that the pace of international bank lending slowed in 1988-89 after several years of increase. In 1988 net bank lending was \$ 491 billion compared to a rise of \$ 778 billion in 1987. But loans to the developing countries excluding Bahamas, Bahrain, Cayman Islands, Hongkong, Netherlands Panama and Singapore fell by \$12 billion in 1988 against a rise of \$19 billion in 1987. IMF Managing Director has called upon commercial banks to give up their confrontational attitude and give debt and debt service relief promptly to third world countries for whom the stakes, debt reduction is essential. The previous Managing Director of the Fund quantifies this proposal and suggests a reduction of \$125 billion in the debt owed to commercial banks by heavily indebted countries. The latest world debt tables published by the World Bank shows that while US, Japan and West Europe have been boosting both their consumption and investments in the 80s, developing countries have lagged in both. While the average Japanese used \$ 5269 worth of goods in 1986 and \$6206 in 1987 and the average West European \$ 6127 increasing to \$ 6922, and the average US citizen from \$ 7609 to \$ 8957, the average III world person faced stagnant consumption in deep poverty.

UN Survey

A united Nations survey of its council for Transnational Corporation states that the share of developing countries in direct foreign investment increased from \$ 2.4 billion in 1970-71 to \$ 14.2 billion

in 1981 but declined to \$ 10.7 billion in 1988. As a share of the world total it was 23 in 1970-71, 27 in 1981, and 22 in 1984, while the share of industrial countries increased from 73 per cent (\$38 billion) to 78 per cent (\$37.8 billion) in 1984. The question of whether direct foreign investment to developing countries can be increased is examined and the conclusion is that despite various liberalisation measures to promote foreign capital inflow, the prospects for the countries are not bright.

Developing countries statements

127 developing countries, some of whom are on the US trade hit list have at a conference in Caracas issued the Caracas Declaration that a multi-lateral, comprehensive and concerned approach is vital to solve contemporary North-South problems and that arbitrary, unilateral actions by any industrial country will only undermine the multi-lateral economic system that has been developed laboriously over the past 4 decades. Similarly the Group of 77 has called the 1980's the lost decade for development as industrialised countries by their protectionist policies caused a decline in the growth of the developing countries during this period. There is need for a revival of the North-South dialogue for the industrialised world to create new markets for the developing countries whose advances in 70s, — primarily in improved health and education — have been whittled away in the 80s by 81.3 billion debt that the third world is struggling to pay. It calls for urgent and effective international action on currency, finance, debt, trade and development, particularly a substantial general reduction of capital and debt service payments.

UNCTAD

The annual report of UNCTAD reports that the 42 least developed countries with 400 million people had, during 1980-86, an aggregate growth of only 1.9 per cent per year (compared to 3.4 per cent in the 70s), while their population increased by 2.6 per cent. The countries which are diverse in population, territory, location and economic structures, share a common feature in the extent of poverty, utterly inadequate health, education and transport facilities, high exposure to natural disorders and rudimentary economic structures with declining agricultural productivity. The data given in the report is most sombre — per capita GDP in 1986 was \$227 for the least developed countries, \$900 for all developing countries and \$9838 for industrial countries, export per capita for the 3 groups were \$26, \$255, \$1235, literacy rate 32, 50, 99 and so on. The second conference on the least developed countries to be held in 1990 will, it is hoped, not only identify and recommend policies and measures but help in implementing them to accelerate development in these countries.

IFAD

The International Fund for Agricultural Development, which promotes rural

development in the Third World, is to get \$522.9 million against a target of 750 million as its third replenishment. At this instance OPEC developing countries trebled their contributions to 15 per cent (\$52.9 million), OPEC contributed \$345.5 million (matching \$3 to every 1 dollar contributed by developing countries). The developing countries trebling was due to India increasing its contribution sharply to \$10 million which was followed by China and Brazil.

GATT

The GATT meeting in special session in Geneva on June 23 devoted the entire session to a discussion of the US Omnibus Act and its clauses super 301 and special 301. The developing countries, the OECD countries and the Scandinavia group were extremely critical of the US act and pointed out that if pursued it could sink GATT. The US rejected the criticisms and recognised its commitment to the Uruguay round and multilateral trading agreements. It held that there was confusion and misinformation about Section 301. It is to be hoped that the US assurance is right and the Act is not pursued as is being done to date.

II Agricultural Development in Tamil Nadu

Paddy and other crops

With the onset of the south west monsoon, farmers in Thanjavur, Kanya-

kumari, Tirunelveli, and Tiruchi have begun to grow nurseries and are most insistent on receiving adequate waters from Mettur. To demonstrate their concern

over having had to skip the kuruvai crop for 5 consecutive years in the Thanjavur delta over 1.6 lakh hectares owing to the delay in the opening of the Mettur reservoir on the scheduled date of June 12, over 2 lakh landless farm workers, including 1 lakh women small and marginal farmers on the designed day, June 12, organised a human chain demonstration starting from Rajaji Park at Vedaranyam to the Raja Raja Cholan statue in Thanjavur town. This spontaneous response of farmers and farm workers who lined the 110 km route was a symbol of the extreme hardship caused to them by the denial of Mettur water. While the State government was advised not to hurriedly release the very meagre quantity of water at Mettur, the Union and Karnataka governments were urgently requested to make ad hoc arrangements so that waters will be available to the delta farmers. The State government on its side has fixed 80 lakh tonnes of grains including 60 lakh tonnes of rice production for 1988-89 against 57 lakh tonnes during the last year which was a drought year and for this purpose is making available to the farmers a) 24000 tonnes of quality seeds, b) 8 lakh tonnes of chemical fertilisers including zinc sulphate as a special nutrient, c) training of 1000 farmers in each block in the biological control of pests and d) Rs. 8.20 crores on subsidy for the special foodgrains production programme. Farmers in Cumbum valley are busy sowing paddy and growing nurseries as water has been released from the Periyar reservoir.

Research results

Research reports in June cover a report from CIAE Bhopal on a grain infestation detector it has designed,

from TNAU on use of Triaccontanal to increase crop yields, from the research station, Jagatal on the good results of foliar feeding of nutrients, from the Bangalore communication centre on the use of of certain fungicide to increase crop yields sharply, from the Tukkugada water shed project on the growing of a sturdy plant like khun that helps in soil and moisture conservation, from TNAU's Paramakudi station on the biological and chemical measures to control the bug that destroys chilli fruits, from Kerala agricultural university, manuring centre on growing bush pepper in small gardens, from Chembanakodu demonstrations on marketing the yellow mutant of red bananas, from the CTCR, Sreekariyam on growing short duration varieties of sweet potatoes, from the research institute, Madurai on foliar application of phosphorous for soya bean, from the Tuticorin research centre on the success in induced breeding of sea cucumber, from TNAU on the new variety of redgram, BSR-I, it has developed and the means of controlling the flowering parasite of sugarcane, from the Padappai institute on five major constraints in oyster mushroom cultivation and means of over caring them, from Harrisons Malayalam plantation on disease resistant rubber strain - PB 217, from TNAU's research station at Veppankulam as means of countering some maladies like barren nuts, button shedding of coconuts, from Periyakulam's research station on how to control the blackening of off season neelam and other mango varieties, from Kodapannakuni's poultry farm on means of countering the infectious bursal disease of poultry, from college of Veterinary and animal sciences, Trichur on the treatment of vascular stomatitis in pigs and other animals, from the agricultural university

Guntur station on means of increasing milk yield from cross bred cows, from TNAU's Madras poultry station on how to reduce obesity or fat accretion in chickens and from the college of Veterinary Science, Tirupathi on how to cure inflammation in poultry flocks.

Tea

The tea industry in June welcomed the substantial delegation of powers of the Tea Board — on the sanctioning authority, on tea plantation finance schemes, replantation subsidy scheme, tea area rejuvenation and consolidation subsidy scheme, interest subsidy scheme for irrigation and drainage, interest subsidy and new planting — to its chief regional executives at Gawahati and Coonoor which will speed the decisions and actions and help achieve the 2000 AD target of 1,100 million kg. The chief regional executives can now receive, scrutinise, sanction and disburse payments on all applications on area upto 50 hectares and for above that the Deputy Chairman and chief regional executive should act jointly. This delegation will go a long way to reduce the time lag between application and decision. There is partial decentralization on tea machinery on irrigation equipment, hire purchase scheme and tea packaging and bagging scheme on which the Deputy chairman and the chief regional executive can act on 75 per cent of the power of the chairman.

Coffee

The International Coffee Agreement discussions in June have broken down and this is a setback to India and all coffee producing countries. The first effect of the break down is the sharp

fall in coffee prices from \$1.15 a pound to less than \$ 1. The member countries are meeting again in July but whether that will result in an agreement is doubtful. Even if a new agreement is arrived at, there is insistence that there should be no class of consumers called non quota countries which are able to extract huge discounts from small producers like India. In 1988-89 for instance Indian coffee production is estimated at 2,20,000 tonne. The domestic market consumers 60,000 tonnes, exports to quota countries is 52,000 tonnes. The surplus of over 1 lakh tonnes is sold to non quota countries, notably the USSR. This distinction is to be abolished and all non quota countries will then have to buy from the quota countries. In this situation, India's first line of defence should be to expand its ridiculously small domestic market and the second action should be to make coffee production more cost effective so that it can be sold under the quota internationally.

Rubber

The Rubber Board chairman believes that India will reach self sufficiency in rubber production in the next 3 years. In 1988-89 rubber production was 200,000 tonnes and imports, 50,000 tonnes. The Board states that it has identified 5 specific areas which will increase rubber production within 3 years. It states that more than 425,000 hectares have been brought under rubber cultivation and another 16,000 to 17,000 will be added to it in the current season. Some short term measures are under way to increase production. With a government contribution of Rs. 53.4 crores, the Board is investing Rs. 73 crores during the VII Plan. The Board is over confident

of meeting the fast increasing rubber demand by 2000 by bringing more areas under cultivation of rubber. The North Eastern states, Tripura, Assam and Meghalaya are emerging as important rubber producers. This is necessary and should be pursued. But the real future solution to making the country self sufficient is by expanding rapidly

the production of synthetic rubber and to invest in it, so that India's use of natural and artificial rubber which is 79:21 will bear a closer relation to the proportion as that of industrial countries at 33:67. At the rate at which automobile and rubber using industries are expanding, natural rubber will not be able to meet this aggregate demand.

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III. Industrial Development in Tamil Nadu

Industrialisation in Tamil Nadu

The general developments in the state industries need comment. First, in May and June there was a sharp fall in coal supply because Tamil Nadu's coal from CIL was diverted to Ramagundam. But because of the heavy power cut (60 per cent) on HT users, this coal shortage did not bother the state's industries. Second, IDBI reports that Tamil Nadu has moved to the first place at all India level in sanctions to industries by IDBI. IDBI characterises Tamil Nadu as an active state industrially, its share of IDBI assistance moving from the earlier 7 per cent to 10 per cent. Though it has not attracted large union investments, it has brought in small and medium industries whose flow had increased in textiles, oil, chemicals, engineering, sugar etc. In the 9 month April-December 1988, Tamil Nadu had Rs. 444 crores sanctioned (10 per cent of the total) and Rs. 337 crores in 1987-88 (10.9 per cent). Third, the State government announced in June that it has decided to impose pollution control conditionality for the clearance of environment sensitive industrial projects. For such units, clearance will be

given if pollution control equipment is installed. This is in addition to the existing environmental clearance of such projects by Tamil Nadu Pollution Control Board. The Board set up 2 monitoring units to measure air and noise pollution in Madras city on June 29. The first results show serious pollution by petrol and diesel using vehicles and the noise pollution being 50 per cent above permitted 90 decibels at 9 'O' clock in the spencers junction.

Salem

Government announced in June that orders have been placed for the purchase and installation of the second sendzimir mill and associated facilities at the Salem Steel plant at a cost of Rs. 75 crores. The second mill will be commissioned by the middle of 1990 and will double the present production of cold rolled steel of 35,000 tonnes per annum. It is also announced that the first lot of Durgapur alloy steel plant slabs, hot rolled abroad will be reaching the Salem plant in early July for production of high grade stainless steel for industrial and domestic use. Salem has so far imported

hot bands from Japan and France at 38,000 tonnes and the Durgapur slabs will now replace them. Salem is now producing superior quality of stainless steel conforming to the most stringent international standards for high tech applications and when the second mill begins operation next year there will be no more need to rely on overseas supplies. Exercises are on to cut the price of Salem steel on the basis of various technologies and economies. The Union government reports that the Neyveli Lignite Corporation has massive expansion plans afoot which will make it a mega power station that can meet the regional power needs of AP, Karnataka, Kerala, Tamil Nadu and Pondicherry. It is to be upgraded to produce 32 million tonnes annually and have a total installed capacity of 4200 MW by 2000 AD with an investment of over Rs. 6000 crores. This is long way from 1957 when Neyveli started with one mine cut of 4 million tonnes, 6 units of 50 MW each and 3 with 100 MW each, to which 2 more units of 210 MW was later added.

BHEL and ONGC

BHEL reports a record turnover of Rs. 2601 crores and a profit of Rs. 205 crores for 1988-89. It states that it has exceeded the profit of CEB target for commissioning BHEL sets. It has made progress in developing new photo type products and has entered electronics, transportation and allied sectors. ONGC announces that it is setting up gas grids in the southern region as well as in the north east and Gujarat for using the large gas reserves optimally. It is planning to lay over 150 km long gas trunk pipeline network in the east and west Godavari basin. About 10 chemical and agro industrial units have

been committed to using about 1,39,000 cubic metres of gas daily from Narasapur and Razola wells. The location of gas in Py 1-8 (38 lakh cubic metres of gas a day) in the Cauvery offshore basin has brightened the prospect of gas availability in the basin. Gas is now being supplied from Narimanam to a steel mill and a ceramic factory at Nagapattinam by a pipeline.

Pig iron and engineering exports

The raw material starved foundries in the state expect better supply of pig iron in July following the decision of SAIL to produce it at the rate of 5000 tonnes a day. The main steel producers have now started production and the first consignment should reach the Coimbatore foundries in a week. The power scarcity in the state and the south is preventing the secondary steel producers from producing pig iron. The Visveswaraya steels in Karnataka is ready to produce pig iron if Tamil Nadu or the Union government gives it power. But neither has been possible. CEA is seeking a practical solution to the problem and now as the Union power units have started picking up, there may be power supplied to these units. The special mission of the Regional Iron and Steel Commissioner to Trivandrum, Bangalore and Calcutta to persuade the secondary steel producers has not been successful. This means that the pig iron needs in Tamil Nadu and the rest of the country can be met only by importing 2 lakh tonnes in 1989-90. EEPC reports that engineering exports from the south amounted to Rs. 272 crores in 1988 which was a growth of 22.62 per cent. This record could have been higher if the obstacles like the general shortage of pig iron and steel just referred to, power cuts

and steep increase in steel prices had not occurred. Tamil Nadu was the second largest exporter at Rs. 118.10 crores which was a 60 per cent increase over the previous year. The exports of scientific and surgical instruments, aircraft accessories, steel fasteners, industrial valves, stainless steel utensils, bicycles and parts, air compressors, food processing machinery and steel forgings showed sizeable increase. The 1989-90 record has started well with Rs. 166 crores at April 1 for the south.

Hybrid micro circuits and TASMAL

In its first major decision in the high tech area, the State government has approved a Rs. 8.90 crores joint project to manufacture hybrid micro circuits. The project is to be set up by ELCOT with an NRI at Hosur. The government is subscribing Rs. 2.97 crores, ELCOT Rs. 77.34 lakhs, the NRI 75 lakhs and the remaining 49 per cent is equity subscribed by the public. The State government has also approved another Rs. 1.67 crore electronics project to make phase lock sources and block down converters. This again will be a joint project with a 40 per cent participation by an NRI. The State government announces its decision to license state sponsored manufacture of Indian made foreign spirits (IMFS) through a new company, the Tamil Nadu State Marketing Corporation (TASMAL) which will be a monopoly wholesale in the IMFS field. The company is to set up 2 IMFS manufacturing units and Rs. 5 crores each and 1 beer producing unit (Rs. 10 crores).

SIPCOT & AAC

SIPCOT has decided to shift its exclusive leather complex from Gummidipoondi

to Tirupathur. The North Arcot location has the infrastructure and a pool of skilled labour. Only SIPCOT must make arrangements for the proper disposal of the effluents in order not to worsen pollution in the district. The State government has constituted an advertising corporation — Arasu Advertising Corporation (AAC) to deal with the advertisements to the various departments, corporations and boards. It will also impart training in mass communications to the officers of the state governments.

MRF, SPIC and Kothari Sugars

Madras Rubber Factory (MRF) reports that its project for making procured treads for tyres at 6000 tonnes per annum at Arkonam where the needed infrastructure is available in its factory has been cleared by the Union government. The investment is Rs. 50 lakhs. MRF faced strong opposition for its project from Indag Rubber which raised questions of capacity, cost, largeness of the firm etc. But all these were examined and the MRF project was approved for its soundness. The good performance of the company for the 18 months ending 31 March 1989 recorded a turnover of Rs. 744.71 crores (a growth of 60.9 per cent) and a profit of Rs. 55.47 crores was an element. SPIC reports that it is promoting new projects in engineering services, ships for importing ammonia and phosphoric acid and now it has obtained government approval for a gas carrier which is being constructed in South Korea. It is promoting Mansli petro chemicals and will be participating jointly with Madras Refineries in the PTI project. (See Vol XIX p23). It is also branching out in electronics at Maraimalai Nagar and in Tamil Nadu Petro products

producing linear alkyl benzene. It has invested Rs. 100 crores in modernising its fertilizer plant with which it started. Altogether SPIC has turned out to be a fast moving multi product firm. Similarly the HC Kothari group led by Kothari Sugars and Chemicals is diversifying. It is putting up a Rs. 18.46 crores polybutene plant at Manali, a Rs. 25 crores nitro aromatics plant and a Rs. 36 crores malic anty-dride plant. The corporate plant of the group will be investing Rs. 60 crores in petro chemicals in the next 3 years. Its sugar division is doing very well with a record recovery of 10.99 per cent.

Handlooms and power looms

Both handlooms and power looms face problems in the state. The number of handlooms has declined from 5.56 lakhs in 1973 to 4.5 lakhs today, due mainly to the proliferation of power looms. The Union Handlooms Reservation Act which reserves 22 items for handlooms has not reached the handloom weavers as stay orders from the courts have been obtained by the power loom associations. Power looms on their side, through the National Power looms Action Committee has decided to suspend production in power loom units in Tamil Nadu from July to press the government to take steps to bring down the prices of all varieties of yarn to the level of last January. All dyeing, winding, warping and other units related to powerlooms are to be closed and no yarn is to be procured. This is a serious situation because while 25 years ago textile production was 60 per cent by composite mills, 25 per cent by handlooms and 10 per cent by power looms, today power looms account for 55 per cent, handlooms 25 per cent and

mills 20 per cent of all textile production. Power looms have been efficient but their wage and employment policies pose problems and this pause could be used to look into and straighten out some of these problems.

Leather

Exports of leather and leather goods from the country increased by 29.20 per cent in 1988-89 and earned Rs. 1608 crores. There was a substantial increase in exports of value added items like footwear components and leather garments and a noticeable decline in semifinished leather. There has also been a steep rise in unit value realisation, the average unit value of footwear was Rs. 132.40 per pair and of garments was Rs. 860.19 per piece. On this basis the 1989-90 target for leather exports has been fixed at Rs. 2000 crores by the Council for Leather Exports. Product-wise, leather garments recorded the maximum growth at 57.48 percent followed by leather goods at 53.03 per cent and footwear components 31.74 per cent. Country-wise USSR was the main importer followed by West Germany and UK.

Private Sector reports

The annual reports of SPIC were earlier referred to. Madura coats in its report for the 9 month period ending March 31, 1989 states that its sales increased by 8 per cent, that its engineering product mix improved benefiting from modernisation and new technologies and products, while closing down losing segments. Its sales were Rs. 210 crores and profit after tax Rs. 11.43 crores.

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IV. Education, Culture, Science and Health

Educational reforms

This is the season June — when the results of the high school and higher secondary schools are published. In general girls/women have done better than boys and the elite schools are in the forefront of examination results. On the other hand a city survey shows that 5 years in the corporation schools in Madras do not result in students who know how to read or write simple sentences. The situation in rural primary schools is worse. Funds are not lacking as the education budget in the state has been increased by Rs. 100 crores for 1989-90. The revised text books have been supplied to standards I, III, V, VI & VIII and those for standards, II, IV & VII are being sent at June end. 622 lakh books are being supplied to 117 lakh students, of whom 64 lakh students receive free text books. Further, the Union government reports that it will open 50 more Navodaya schools this year which has no relation to the problem of the primary schools. The State government has constituted 4 tier teachers consultative councils to redress the grievances of school teachers. With the declaration of the school results, the rush for college admission has begun. The usual craze for admission to BCom seats continues, leading to enormous sales of admission forms at Rs. 10/- each colleges earning a tidy profit. In fact to meet the rush for college admission, Madras University syndicate has allowed colleges to offer 20 per cent more seats in all disciplines. It also decided to introduce the semester system without internal assessment in 7 colleges. An interesting development is active participation of universities in

adult literacy programmes. In Kottayam, the Gandhiji University joining with the city colleges and voluntary bodies has imparted literacy to the 7000 people in the city who were illiterate, so that Kottayam has become the first city to have complete literacy. Bombay University has made Adult Literacy teaching part of the undergraduate curriculum and plans to use university and colleges students to make Bombay completely literate by 1991 and when the census will be taken. Mysore university has introduced rural extension programme at the undergraduate colleges as part of the curriculum from the 1989-90 academic year. UGC reports that its six task groups on the information literacy net work project will be reporting soon to make possible the launching of this multiple function service cooperative, network project by March 1990. UGC announced in June that a national qualifying test for lecturers will be established from January 1, 1990 from which recruitment of lecturer can be made. This centralization is a retrograde step and will cause delays. To promote the study of Indian philosophy and India's intellectual tradition, the International Society for Indian Philosophy has been launched in Madras with the vice chairman of the UGC, Prof. Satchidananda Moorthy as its chairman.

Technical education

There is a stalemate over the IIT entrance examination valuation which is being boycotted by the IIT teachers because of differences in the multiplicity of grades. The institution of capitation

fees which characterised technical and professional education in the private colleges of Karnataka is being replaced by a system of tuition fees. The new fee structure which apply to these private colleges is still high but it is now open and legal. The Tamil Nadu commission on private engineering colleges has reported that only 5 out of the 28 self financing engineering colleges possesses the needed infrastructure for providing sound engineering education. Next come 11 colleges whose deficiencies could be rectified, followed by 7 colleges which are to be given severe warning for not providing the facilities and finally are the 5 which are "in the hopeless category". This is clear and the government can act and not give into the pressure for more seats in engineering for which future employment is doubtful. The State government states that it has decided to introduce from this year counselling for allotment of colleges to students successful in the entrance examination to professional colleges in order to expedite the admission procedure. Also students will not be allowed to transfer from arts and the science college to professional colleges on the publication of the results of the entrance exams to the latter. The State government has decided to take over the Sri Ramachandra Medical College located in the Poonamallee High Road in agreement with the college and repay the Rs. 11 crores taken as loans by it to financial institutions. Of the 176 acres that the campus occupies 124 acres belonged to the government. The government has decided to locate the MGR Medical university in the spacious grounds of the ex-Ramachandra Medical college. The MGR Medical University is to have an Institute of Medical Sciences and Research on the ex-Ramachandra Medical college complex.

The State government also announced that a veterinary university on the lines of the agricultural university is to be established in Madras on September 15. It will have several farmers training centres and will conduct research in various aspects of animal husbandry that would help farming, poultry keeping and cattle breeding. The government also announced that a new agricultural college will be established in the first week of August in a Lalgudi taluk village, Kumulur. The intake of the college will be 56. This would be good if it functioned like an agricultural polytechnic for the sons of farmers in the area. The state committee to suggest measures to improve hospitals and medical education is at work but is not receiving the public help and participation it merits.

Satellite

Satellite I-D which was to be launched from Cape Canaveral in the US has been repeatedly postponed from May 31, to June 9 and later to June 29. The satellite was damaged after it has been mounted on the launch pad because of the malfunctioning of the hoist cable and attached hook which hit the cable. The damage to the satellite which seems very serious is being assessed. It affects the TV and telecommunications facilities of the country. The INSAT-I series have had a sad and unfortunate history. INSAT-IA launched by the Delta vehicle from the US on April 10, 1982 died after 147 days in orbit, INSAT-IB launched from Kennedy space centre in August 1983 suffered a 6 day hang up of its solar array and trouble in release of its solar sail. Special manoeuvres were executed to overcome these problems so that it is in use to this day for TV and telecommunications. INSAT-IC was

to go up with a US space shuttle and an ISRO scientist but after the Challenger explosion on January 28, 1986 killing all its seven crew, all shuttle flights were cancelled and so INSAT-IC launch was postponed. It was restructured and launched by the Ariane vehicle on July 22 1988 but has suffered a number of problems — short circuit, loss of pay load capacity and thermal and power management problems. Now INSAT-ID's damage means that the TV and tele-communications tasks of the country will be affected as will the festival of education videos for primary schools which NCERT had been preparing.

Culture

The Comptroller and Auditor General in his 1988-89 report to Parliament criticises the Indian Council of Cultural Relations for the 55 per cent short fall in the implementation of its programmes. Out of 878 programmes in the plan of action only 293 were implemented and 93 which were not in the plan were executed. It reports that contrary to the official policy of increasing contacts with African and developing countries, more visitors and delegations were sent to Europe and US between 1982-83 and 1987-88. Moreover incoming visitors far exceeded outgoing visitors contrary to the guidelines, 9 troupes were sent abroad more than once, dance troupes were sponsored to 3 different countries separately within 3 months, there were more days lived abroad by the troupes than warranted by their performance. Artists

V. Employment and Labour Relations

KVIC announces that it is launching a crash programme to generate employment for 100,000 people this year.

and scholars who had travel grants did not submit reports on completion of their travel, most of the council's conferences and seminars were held without prior financial appraisal, the cultural window opened in Bonn was done without proper assessment of its need etc. It makes a sad account of the way the country's resources were wasted to which if the various Festivals of India in UK, US, France, USSR, and Japan and the Apna Utsav were added it will make a very serious showing of failures and short comings.

Health

The effect of demographic fundamentalism on the government's family planning programme was assessed at an ISPS seminar in Dharwar in June and the conclusion were that unless policy correctives are made in such matters as the tradition of early marriage of girls or the desire for one or two sons at all costs the programme will not succeed. From this point of view the Tamil Nadu programme in 8 districts to delay the age of marriage of women through providing training in some skills and a monthly stipend to 30 women selected from 8 villages is a good start. Similarly the pilot project to cut maternal mortality in 2 districts in the state through upgrading PHCs is also on the right lines. Also the 500 ICDS projects being launched by the Union Government making the number of projects 2236 as an effective contribution to family welfare and increased literacy and education.

Under the scheme, Charka spinning units will provide employment to 50,000 people in addition to the 1.4 million

now employed. The others will be employed in 7 honey processing plants 6 fibre processing plant, leather units paper making plants and a broad programme of rural industrialisation. The Jawahar Rozgar Yojana has been expanded from Rs. 2100 crores to Rs. 2626 crores to generate employment. The State government states that it will implement a scheme for providing jobs for atleast 2 educated unemployed youth in every village from 1989. Two high level countries to supervise the employment exchange offices and industrial training institutes have been set up by the State government, the former under the Deputy Director of the Department and the latter under the joint director. 26 lakh persons are registered in the Exchanges of whom 12 lakh were degree holders and 50,000 post graduates. The Exchanges need to be worked and supervised so that they promote employment of the unemployed. The World Bank is providing Rs. 10.5 crores over 7 years to reorganise ITI's and start a women ITI this year. The Indian Labour Journal in its May 1989 issue summarised the report on the minimum wages act on the bauxite mines of the country as follows: a) the minimum

wages act 1948 does not provide for the registration of establishments covered under the Act and Bauxite mines report on opening, abandonment, change of ownership which shows that the labour employed in smaller mines come from near by villages and report for work when they are free: b) there is high incidence of closures of mines: c) the proportion of unskilled labour is lowest in captive (Public Sector) mines: d) women were employed on unskilled work: e) in the private sector mines all the work is done by contractors: f) 88 per cent of the contract labour is unskilled and the proportion of casual labour is 55.6 per cent: g) wage levels in captive mines were 3 to 5 times more than prescribed minimum wages: h) wage rates in different type of bauxite mines vary widely from those in organised industry or captive mines: i) price index since initial fixing of minimum wages has risen by 486 per cent, while statutory wages have risen by 125 per cent during the 21 years and j) 2.58 per cent of workers mostly in the unskilled category employed in other mines are not receiving the prescribed minimum wages.

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VI. Other Items

IIEP

The Executive committee of the International Institute of Educational Planning met in June in Paris. It had two major items of business. First, it reviewed and approved the draft V Medium term Plan of the Institute which was on a) comparative education, b) basic educa-

tion, c) educational finance, d) school mapping and e) management problems of education. Second, it also discussed and established the biannual report of the Governing Board to the General Conference to Unesco for the years 1988 and 1989, assessing its annual training and other training programmes, and the research studies under technology,

diversification of education and the decision making process.

IIEP Seminar

One of the seminars in the IIEP strategic seminar series was held in June in Paris. Attended by economists and educational planners, it dealt both in historical and analytical terms with the problems of development today. One of the insights which arose from the seminar discussion was the truth that there could be economic growth without development and equally that there could be development with little or no growth.

National Council for Industrial Harmony

The governing body of the Council met in early June and reviewed the follow up of the seminar on the draft legislation on trade unions and industrial relations (See Vol XVIII p430). There was a discussion on the major problems presented by the loss of values in society and its effect on industrial relations. It was decided to concentrate the council's programme for the coming year on this question of values in society through seminars and lectures.

Adult Literacy

The occasion of the visit of the Union Education Secretary to the state was used to review and reorganise the state's adult literacy programme. The concentration of the technology literacy mission in Coimbatore District and its aim to make the district completely literate by 1990 was reviewed and approved. Also it was decided that a special mass literacy drive by college and university

students in Madras city should be undertaken so that the 38 per cent illiterates in the city are all made literate by the time of the next census in 1991. There was also a review of the operation Black board programme of primary education where the good progress made by the state was noted.

IIC

The planning group of the Economic Affairs Group of the India International Centre met in Delhi in June. It reviewed the 1988 and the 1989 programme of panel discussion, seminars and publications and expressed satisfaction with them. For 1990, it was decided to concentrate the panel discussion in some 10 major industries. Seminars on industrial perspectives of the country, liberalisation, privatisation and economic administration and management were proposed. The group emphasised the importance of bringing out the publication on the VIII Plan perspectives on which the 12 panel discussions would be completed in July by December 1989. There was a panel discussion in June on the VIII Plan prospects in education, science and health. In the discussion, the importance of containing the runaway population problem was stressed.

RDI and AIBEA

There was a meeting of the Board of Directors of Readers Digest in June in Bombay. The Board prepared for the Annual General meeting where the main business will be the approval of the issue of bonus shares of Rs. 3 lakhs. The Board also approved the budget execution, for 1989-90 and the prospects for 1990-91. The 21st conference of

the All India Bank Employees Association was held in Madras in June. It was attended by 3000 representatives of the unions from all over India. It concentrated its 3 day discussions on two main items — the improvement and safeguarding of the conditions of work of the bank employees and the campaign to ensure that the public sector banks are carrying out the purposes for which they were nationalised, by mobilising peoples resources and using them for the priority sector established by the RBI and government.

July Development Seminar

Another paper from the May workshop, Conjunctive use of Surface Ground Water by S. Janakarajan appears as the first article.

Second Article

A note on Future of Village Industries —Part I appears as the second article.

Third Article

The statement of the 19th interdisciplinary workshop on Renewable Sources of Energy appears as the third article.

MIDS News

Dr. A. Vaidyanathan attended the workshop on Zonal Planning organised by the Economic Affairs Group in the India International Centre on 22nd July.

Dr. A. Vaidyanathan and Mr. S. Subramanian attended the workshop on the Tamilnadu Integrated Nutrition Group Project on 1st August.

Dr. A. Vaidyanathan attended the Director's meeting of the ICSSR to discuss the procedures for award of institutional Doctoral Fellowships on 9th August.

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Mr. S. Subramanian presented a paper titled 'Some Notes on Poverty in India' at a conference on 'Perspectives for the Eighth Plan : Problems of Poverty, Inequality and Unemployment', organised by the Economic Affairs Group of the India International Centre at New Delhi on 20th July.

July Development Seminar

Conjunctive use of Surface and Ground Water in Tamil Nadu

by

S. Janakarajan

Research Associate, MIDS

Introduction

The ground water development in the country has been quite impressive (share of ground water irrigation in India is about 40% in 1984) and this is more pronounced in the State of Tamil Nadu. The percentage share of canals in the total net irrigated area (NIA) of the State registered a small decline from 36% in 1960-61 to 34% in 1984-85; in the case of tanks the percentage share of NIA declined steeply from 38% to 27% for the same period. But there is a sharp increase in the percentage share of NIA by wells from 24% to little over 38%. This phenomenon is more striking in North Arcot

District, where canal irrigated area is insignificant. The percentage share of canals in the district declined from about 7% of NIA in 1960-61 to 2.6% in 1984-85. The only available surface source of irrigation in this district is tank, the area irrigated by which source too declined sharply from about 53% of NIA in 1960-61 to little less than 38% in 1984-85. However, the percentage share of wells in the total NIA of the district which stood at 36% in 1960-61 shot up to 57% in 1984-85. Again in this district, it is interesting to note that the proportion of area irrigated by supplementing wells to total net area irrigated by surface sources was 16.4% in 1960-61 and rose to

23.8% in 1979-80. In Coimbatore district on the other hand, the area under canal and well irrigation remains almost constant over a period of two decades from 1960 to 1980, irrigating together about 97% of NIA. In 1960-61, the percentage share of canal irrigation to total NIA of the district was 42.3% and rose marginally to 43.3% in 1979-80. The percentage share of well irrigation to total NIA for the same period remained almost at 54%. However, the proportion of area irrigated by supplementing wells to total area irrigated by surface sources rose steeply from 2.5% in 1960-61 to 8% in 1979-80.¹ (See Table 1 for similar information for other districts).

All these only indicate that ground water irrigation is gaining much greater significance in several districts of the State, which also show that the conjunctive use of surface and sub-surface irrigation is becoming more and more common in command areas of surface irrigation systems.

In this context, this paper attempts at a modest level a discussion on the pattern of ground water utilisation, in particular, the phenomenon of conjunctive use of surface and sub-surface waters in Tamil Nadu with particular reference to North Arcot District (where tank is the only available surface source of irrigation) and Coimbatore district (where canal is the only available surface source of irrigation).

2. Data Sources

This paper is based upon the field survey carried out in the selected tank

irrigated areas of North Arcot and in the selected canal irrigated areas of Coimbatore district. The former is a series of system tanks fed by an old system called Palar Anicut System (PAS). This system feeds 317 tanks combined ayacut of which is about 80,000 acres. For the purposes of the detailed survey 15 tanks have been selected somewhat purposively to cover various reaches across main / branch channels as well as to capture various characteristics of tanks such as size, sources of supply, number of villages benefitted etc.

The latter is called Parambikulam-Aliyar Project (PAP), which is fairly a new canal irrigation system, irrigating an ayacut of 1.8 lakhs acres (the ayacut is almost doubled recently) through the net work of main / branch canals and distributaries. For the purposes of detailed survey, 12 distributaries from two main canals have been selected. The field survey was carried out at different phases during 1986-87.²

3. Pattern of Ground Water Utilisation

There are two ways of Utilising ground water for irrigation. One, as the sole well irrigation and two, as supplementing surface sources of irrigation. While the former may be seen generally in dry lands (where there are no surface sources of irrigation), the latter may be found in the command areas of surface sources such as tanks and canals. The crop pattern and productivity in the areas where wells serve as the only source of irrigation (i.e., in the so called 'dry'

lands) will be completely different from canal or tank irrigated areas. Unless and otherwise ground water is available in plenty, the generally observed crop pattern in such dry tracts would be coarse cereals such as ragi, maize, bajra, pulses, groundnut etc. Unless ground water extraction matches recharge, even in the areas where ground water is available in plenty, the constant use of ground water and overcrowding of wells may result in depletion of ground water source. Ultimately, due to the over exploitation, the ground water table goes very deep and that results in high cost of ground water extraction. This has infact been the case in several parts of Salem, Periyar and Coimbatore districts in Tamil Nadu, where the extraction rate is much more than the recharge. In Coimbatore district, which has a long history of ground water irrigation, water table during the 40 years preceding 1969 is estimated to be lowered by as much as 16.5 metres.³

Nevertheless, ground water use in association with adequate recharge may be extremely conducive and desirable for crop production. The natural recharge through rainfall may be helpful, in particular, for those wells located in the dry lands. But due to the frequent failure of monsoon recharge is very often found to be less than the extraction rate. Thus the natural recharging through rainfall is unpredictable. But the recharging through artificial means such as percolation ponds, tanks, canals, etc. may serve a useful purpose, but may be restricted only to respective command areas. However, fast recharg-

ing in some canal commands results in waterlogging causing drainage and salinity problems (Dhawan, 1988). Hence a proper management of surface and sub-surface water is needed in the canal and tank commands taking into account the factors such as the availability of ground water potential, pumping rate, extent of recharging desirable and actual extent of recharging, drainage conditions, soil type etc.

4. Importance of conjunctive use

The conjunctive use of surface water and ground water has become a very serious issue in the recent times precisely because of the strong felt need for an integrated approach of water management in the Indian agrarian conditions. The Irrigation Commissions (1972) clearly indicated the need for conjunctive use and infact emphasised the importance of taking into account the ground water position while attempting on river basin plans. Thus the Irrigation Commission stated :

"Surface and ground water resources are inter-linked. Therefore, integrated studies are needed to cover both the resources" (p51, vol. I)

Seventh Five Year Plan also thrusts so much on this issue and strongly recommends that the existing irrigation facilities could be put to the best use if ground water irrigation is encouraged in the command areas.⁴ The National Water Policy confirms the views of Planning Commission and Irrigation Commission :

1 I am concerned with North Arcot and Coimbatore district only for the purposes of analysis in this paper.

2 The survey was a part of the Project funded by the Central Planning Commission. Title of the Project : "Management of Irrigation and its effect on Productivity under different Environmental and Technical conditions".

3 See for a detailed discussion on this issue Palmgren and Jakobson (1982).

4 "The conjunctive use programme under the various development sectors would be co-ordinated so that the existing irrigation facilities are put to the best use and the gestation period of irrigation utilisation under major and medium irrigation schemes is reduced" Seventh Five Year Plan, 1985-90, Vol-II, P.80

"Integrated and co-ordinated development of surface water and ground water and their conjunctive use should be envisaged right from the project planning stage and should form an essential part of the project".⁵

5. The Concept of Conjunctive use

The Irrigation Commission (1972) interpreted the conjunctive use as follows:

"It can take the form of full utilisation of surface water supplies supplemented by ground water or the direct use of ground water during the periods of low canal supplies or canal closures. It can also take the form of irrigating pockets exclusively with ground water in a canal command, especially where the terrain is uneven" (p. 96, vol. I). Scholars who have been working in this area look at the conjunctive use in almost similar angle. Tushaar Sha (1988) suggests three ways of conjunctive use: First, supplementing well water when either canal water or tank water is inadequate and/or unreliable; second, pumping the well water into the canal to augment the canal water resources; Third, the canal system itself should be designed in such way to provide extensive irrigation rather than to provide intensive irrigation & thereby inducing farmers to go in for well irrigation as a supplementary source. Palanisamy (1988) and Venkata Reddy (1988) confirm the superior nature of conjunctive use in crop production in tank commands and canal commands respectively. Dhawan (1988) in fact goes a step ahead to argue that the well irriga-

tion in the command areas protects farmers during drought years also. Thus, he states,

"That ground water availability is substantially enhanced from the seepage of canal/tank water is well known. Consequently, dugwells and tube wells benefitting from such seepage are much less affected by drought than those located outside the commands of canals and tanks Farmers can substitute more costly ground water for low cost (from their private angle) surface water whenever surface supplies diminish due to drought. Such conjunctive users of ground and surface waters are best placed to withstand effectively the adverse output impact of a drought" (P. 187 Dhawan, 1988).

On the whole, from our foregoing discussion, the following points emerge:

1) The surface and ground water are interlinked and they complement each other. Precisely for this reason the price of ground water or the cost of water extraction will be more when the surface sources are depleted and vice-versa. Moreover, the use of either one of these sources constantly for a long period of time may prove dangerous and may result in ecological problems.

2) The use of surface water along with ground water protects farmers in the command areas to a great extent from the vagaries of uncertainty of surface sources. In effect, the conjunctive use helps farmers to overcome the chronic drawbacks of surface irrigation such as irregular and inadequate supply.

5. Govt. of India, Ministry of water Resources, National Water Policy, New Delhi 1987, P.9.

3) If only canal or tank water is used constantly over a period of time salinity in the soil increases; it may also result in water logging if there are inadequate drainage facilities. Both salinity and water logging may drastically reduce the crop yield. But the proper management of ground water in the command areas may minimise these problems to a great extent.

4) Wasteful use of precious surface water may be conserved if well water is also used along with surface water. Moreover, by the conjunctive method of irrigation, larger area could be brought under cultivation or in other words, extensive rather than intensive cultivation is possible if surface irrigation systems are properly designed (right from the project planning stage) taking into account the availability of ground water potential, number of existing wells in the proposed ayacut, number of wells feasible in the proposed command with the available ground water potential etc.

5) The degree to which farmers can sustain the drought conditions, depends to a great extent, the access to ground water irrigation in command areas. However, when there is a continuous drought for more than one year, then it may not be possible to get out of the grips of severity of droughts.

In the light of the foregoing discussion on conjunctive use, I shall present below some evidences on the extent of conjunctive use and its impact on cropping intensity in the selected tank and canal irrigated areas in Tamil Nadu.

6) Conjunctive use in the selected tank irrigated areas — The case of Palar Anicut System

As it has been mentioned earlier, 15 tanks fed by PAS have been selected for the detailed survey. Of these, one is a large tank having an ayacut of 6500 acres irrigating 14 villages. So, for the purpose of our analysis we have selected ayacuts in the deepest sluice and in the elevated sluice. In the deepest sluice again sample plots have been selected separately from the ayacut of a head reach village and from a tail end village. Since most other tanks are single village tanks, sample plots have been selected from the entire tank ayacut. In effect sample plots have been selected from 17 ayacuts. Size of the sample is 40 plots from each ayacut, of which 5 are plots with wells. Such sampling was done with the expectation that only those plots which have wells would receive well irrigation. However, our survey showed that even the non-well plots have access to well irrigation from the adjacent wells — either own or purchased well water.

Table-2 gives information on the extent of conjunctive use in the sample non-well plots during 1985-86, which was a normal year. In terms of the extent of conjunctive use in the selected tank ayacuts, one gets quite a varied picture: Firstly, one can observe two extreme situations; a) there are two tanks (Paranthur and Neervalur) where well irrigation is nil and the only source of irrigation is tank. In these two tanks, percentage of area reporting tank irrigation is of the order of 92.4% and 89.3% respectively. b) On the other extreme, there are five tanks (Gafour sluice, Perumbulipakkam, Poiganallur, Tiruppukkuzhi and Vembi) where it is insignificant or absolutely no tank irrigation. In these tanks, percentage reporting well irrigation is of the order of 50%, 67%, 39%, 65%, and 88% respectively. In between, there are 10 tanks where

percentage reporting tank irrigation only varies from 0 to 66.7% and percentage reporting well irrigation only varies from 0 to 66.8%

Secondly, if one goes by the strict interpretation of the conjunctive use as plots receiving both tank and well waters, it is seen that only in few tanks such reporting of conjunctive use is significant (See Table-2). For instance, T+W in KVP-LH is 42%, in Peruvalangam 37%, in Agavalam 70%, in Thakkolam 58.4% and in Sirungathur 76%. In all other tanks it varies from 0 to 30%. However, it makes a lot of difference if we slightly relax the definition of conjunctive use as the plots reporting well irrigation only as well as tank plus well irrigation. The rationale for such relaxation of definition would be that wells in the command area of tanks are recharged from tanks and hence even those plots which received only well water ineffect used the surface water to some extent.⁶ We will see from Table-2 that under the changed definition of conjunctive use, i.e., area reporting (t+w)+w only, is significantly high in several tanks. For instance, KVP-LH (42%), KVP-Gafoor (50%), Peruvalayam (51%), Agarvalem (78.5%), Thakkulam (96.5%), Perumbulipakkam (70%), Poigainallur (39%), Thiruppukkuzhi (65%), Velur (66%), Vembi (88.4%), and in Sirungathur (80%). It is low or insignificant only in tanks such as KVP-L-T, Karivedu, Pudupakkam, Paranthur, Neervalur, and kaliyur where it ranges from 0 to 30%. This is precisely because in these tanks, well density is very low or nil except in Kaliyur tank where well per acre is 0.21 but still area reporting (t+w)+w is only 21%. This is because, this tank

receives almost regular and assured supply from two other systems other than PAS.

Thirdly, it is interesting to note that in some of these tanks (Perumbulipakkam, Poigainallur, Tiruppukhuzhi and Vembi) tank is used basically as a percolation pond for recharging purposes into the wells in the command area. It was infact specifically mentioned in the case of Vembi tank where sluices have been permanently closed and moreover in these tanks farmers take absolutely no interest in the maintenance work of inlet channel, distributaries and field channels etc. In other words, the traditional irrigation institutions are defunct in these tanks, while it reflects the intensity of conjunctive use, it directly affect those who do not have access to ground water in particular resource poor farmers.

In Table-3 area benefiting from well irrigation have been estimated for the total tank ayacut and for the GCA of tank ayacut using the sample well plots. This data very much confirms an sample data analysis reported in Table-2.

Table-4 demonstrates differences in cropping intensity between non-well plots getting well irrigation and non-well plots getting no well irrigation and also differences between own well irrigation and purchased well irrigation. The difference is also clearly seen between normal year (1985-86) and drought year (1986-87). The following points emerge from this table.

Firstly, it can be seen from the table that the cropping intensity is much higher for those plots which receive

well irrigation-own or purchased - than those plots which receive no well irrigation.

Secondly, it indicates that the cropping intensity is higher for those plots which received own well irrigation than those plots which received purchased well irrigation. In 1985-86, out of 14 tank ayacuts except in three tanks (KVP, LS-H, KVP-Gafoor, and Vembi) in all other tanks cropping intensity is higher in those plots which received own well irrigation and in 1986-87, this phenomenon was seen in all but one tank (KVP-LS-H).

Thirdly, it emerges clearly that those plots which have access to well irrigation in the command area sustained the severe drought of 1986-87. This is seen from the fact that cropping intensity in 1986-87 differed very little in those plots which had access to well irrigation from 1985-86, whereas it was very low and infact zero in 7 out of 14 tanks for those plots which received no well irrigation. Thus it reinforces the point that wells in the command area serve a good purpose of insurance against drought conditions.

7. Conjunctive use in the selected Canal Irrigated area — The case of Parambikulam-Aliyar Project (PAP)

In this canal irrigation system, for our analytical convenience the sample farmers in each selected distributary have been divided into two broad groups, viz., those who have wells (WW) and those who have not (NW). The results are quite fascinating and different from that of the tank irrigation system discussed earlier. Firstly, we will notice that the incidence of wells in this area is quite high which is

clear from the fact that the proportion of area owned by WW farmers is over 70% in majority of the selected distributaries (i.e., in 8 out of 12 distributaries). See Tables 5a and 5b. Part of the reason for such high incidence of wells in the command area is that many of them were dug long before the construction of PAP. However, several of them were deepened to a great extent and also, ofcourse, new wells have come up since the construction of this project. But as a result of high concentration of wells and due to frequent failure of monsoon, the ground water table has gone down very deep (at present the depth of the wells range from 40 to 100 feet in this area). The yield of water from wells is also reduced to a great extent. Consequently, only a limited area could be cropped with the available well water in several parts of this command area. Nevertheless, introduction of the canal irrigation system have made a big change partly because several wells in the command area get recharged from the canal water. We shall probe into this aspect in detail in the following pages: (See Tables 5a and 5b).

Firstly, we will see that the zone I of PMC (Parambikulam Main Canal) is better placed than the other zones mainly because distributaries of this zone are in the upper reaches of the system. The advantage of being in the upper reach of the system is clearly manifested in the much higher cropping intensity in the distributaries of zone-I of PMC than the distributaries of other zones. Such higher cropping intensity is noticed both in spell and non-spell years and also for both NW and WW group of farmers. For instance, 1985-86 was a spell year and 1986-87 was a non-spell year for zone-I, but there is only little

6. For a detailed discussion on ground water recharge from surface sources and its impact on productivity see Dhawan (1988).

difference in CI between these two years except that as one would expect for NW group of farmers, CI was higher during the spell year than the non-spell year. This is because, when the canal water flows, distributaries of zone-I being in the upper reaches of main canal, have easy access to water and so they are able to raise one full crop with the canal water. After the canal water is stopped, large majority of farmers in this zone use well water (which are by then sufficiently recharged by canals) for another 2 or 3 crops. This is possible because even when the water is stopped for zone-I, water will keep flowing in the main canal for other zones and so several wells get recharged for several months in a year. For instance, water was released for Zone I from 15.2.1986 to 20.6.1986; but after a small gap, again water was let in the main canal for zone-II from 1.9.1986 to 30.1.1987.

It becomes more revealing when we compare the performance of Udumalpet canal with that of PMC-Zone I. Although, the distributaries of Udumalpet canal get water along with PMC-Zone I, CI in the former canal is less than one in the year 1986-87 (which is a non-spell year) for both NW and WW group of farmers. Only in the spell year (1985-86), CI appears reasonable and also one notices difference in the CI between NW and WW group of farmers. This makes the point clear that wells would serve a good purpose only when there is a possibility for sufficient recharge from surface to subsurface.

Secondly, it is emerging that CI for WW farmers is much higher than the NW farmers (in both spell and non-spell years) in zone-I. One can

straightaway attribute it to the phenomenon of conjunctive use of surface and ground water by WW group of farmers. For instance, although 1986-87 was a severe drought year, CI for ww farmers in the distributaries of zone-I was much higher (i.e., 1.68, 2.37, 2.09 and 1.54 respectively from head to tail) than the NW farmers (ie, 1.13, 1.00, 1.14, 0.73 respectively from head to tail). This is again the clear case of wells serving a good purpose of insurance against drought conditions in the command areas.

In the second and third zones the picture that we get is quite different. In both these zones, the CI appears reasonable only in the spell year and in the non-spell year it is less than one or insignificant for both NW and WW group of farmers (See Tables 5a and 5b). In particular, the proportion of sample farmers having wells is over 90% in the zone-III, but its impact is not reflected at all in the non-spell year. As stated earlier, one of the basic reasons that could be attributed for this phenomenon is that of location. That the third zone being at the tail end of the main canal, the advantage that the upper zone distributaries (in particular zone-I) enjoy is totally absent for this zone. The main advantage is that as it has been mentioned earlier, even if water is stopped for zone-I, the water will flow in the main canal, which provides almost constant recharge throughout the year for majority of the wells located in the command area of upper distributaries. But this is not at all possible for zone-III and that is why although the density of wells is higher in zone-III (than the other two zones) cropping intensity is much lower than other two zones. Thus it is clear that wells serve the

desired purpose only when there is possibility for recharge and otherwise there exists very little difference between NW and WW group of farmers, in particular during non-spell years.

On the whole, while looking at the pattern of ground water utilisation in these two systems, the following points emerge:

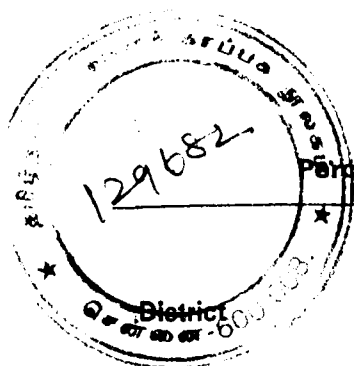
Firstly, it has been noticed that more and more pumping of ground water in the river/canal beds and in other restricted zones results in the depletion of surface sources of water, in particular at the tail end area of irrigation systems. This is particularly true in the case of PAS. Another dimension of the problem, is that as more and more wells come up in the ayacut (in particular tank ayacuts) the capacity of tanks to withhold water is reduced. Its direct effects are as follows: The traditional irrigation institutions which took care of the maintenance and water distribution network lost interest and as a result tanks have been in disuse in several villages. In our survey of 15 tanks, in six of them traditional irrigation institutions are defunct and infact in one village, as reported earlier, sluices have been closed permanently. In effect, the tank merely serves the purpose of a percolation pond. While it is desirable in principle to use the tank water for recharging purposes into sub-surface, there is another dimension to this problem. Who have taken such decision of closing the sluices of tank? Although we have not probed into this aspect, there is every reason to believe that the decision must have been taken by the leading land owners who have greater access to ground water and who benefit a great deal by way of getting regular recharge of water into their wells. For them, the well irrigation serves better since it is much

more assured and controllable. However in such tanks, the section that is worst hit are those who do not have wells or those of resource poor farmers whose cultivation is entirely dependent upon tank water. Such farmers, ultimately resort to purchase of well water from the adjacent well owners.

Secondly, it is interesting to note while in PAS command water sales is prevalent and absolutely not in prevalence in PAP command area. This is because the conditions are favourable for water sales in PAS and not so in PAP. In the case of PAS command, there is a possibility of regular recharging from tanks; ground water table relatively is not very deep; and holdings are very much fragmented. Whereas in PAP, holdings are large; ground water table has gone very deep which results in high cost of water extraction, there is no possibility for regular recharging into the wells except in few places and so most of the wells yield poor water supply which may not be adequate even for self cultivation; and the incidence of wells is very high in PAP command.

Thirdly, some degree of stability is achieved in agricultural production (in both PAS and PAP) wherever there is incidence of wells with adequate recharge from surface sources.

On balance, one cannot deny the fact that conjunctive use of surface and ground water is much more superior to both sole well irrigation and pure surface irrigation. Now the question is, how to plan, induce and encourage conjunctive use in the command areas. A serious thinking is necessary in this line which should also take into account the question of regulation and equitable distribution of both surface and ground water for all sections of farmers.



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TABLE 1

Percentage of area irrigated by different sources

Period	Canal	Tank	Well	Proportion of area irrigated with supplementary wells to total net area irrigated by surface irrigation
1	2	3	4	5
Chinglepet	1951-52	2.38	84.52	11.47
	1960-61	1.89	78.20	17.10
	1970-71	2.94	74.24	18.55
	1979-80	3.22	61.35	32.71
South Arcot	1951-52	33.08	50.03	23.72
	1960-61	26.26	46.85	22.12
	1970-71	25.71	37.42	33.90
	1979-80	24.00	27.42	45.57
North Arcot	1951-52	5.63	60.69	32.14
	1960-61	7.42	52.41	36.63
	1970-71	4.77	44.21	49.63
	1979-80	7.27	37.25	54.12
Salem	1951-52	9.97	28.34	55.42
	1960-61	17.84	18.63	61.30
	1970-71	13.05	19.41	67.03
	1979-80	7.27	37.25	54.12
Coimbatore	1951-52	23.72	4.42	69.88
	1960-61	42.31	2.59	54.47
	1970-71	46.37	2.10	50.17
	1979-80	43.30	1.62	54.89
Trichy	1951-52	37.89	40.10	19.84
	1960-61	42.11	33.75	21.84
	1970-71	32.40	35.02	29.83
	1979-80	30.94	37.96	30.05
Thanjavur	1951-52	94.92	4.40	0.48
	1960-61	93.68	5.42	0.89
	1970-71	94.41	4.02	1.42
	1979-80	96.77	0.74	1.87
Madurai	1951-52	30.56	30.86	36.55
	1960-61	33.00	29.01	36.44
	1970-71	30.04	26.35	42.47
	1979-80	23.84	26.10	49.20
Ramanathapuram	1951-52	0.73	88.25	10.12
	1960-61	0.11	89.20	10.62
	1970-71	0.17	84.93	14.86
	1979-80	0.13	82.15	17.57
Tirunelveli	1951-52	17.72	52.96	28.41
	1960-61	14.14	57.68	27.63
	1970-71	14.10	47.10	39.95
	1979-80	12.51	48.12	38.30

Source : Season and Crop report (Various Issues).

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TABLE 2

Proportion of area under conjunctive use (in percentages) in the sample non-well plots and well per acre, 1985-86

Sl. No.	Tanks	T+W	W only	(T+W) only	W T only	R or Not cultivated	Total	Well per acre
1.	KVP-LS-H	41.6	0.	41.6	23.9	34.4	100.0	0.26
2.	KVP-LS-T	2.8	8.1	10.8	0.	89.2	100.0	0.26*
3.	KVP-Gafoor	0.	49.6	49.6	0.	50.4	100.0	0.26*
4.	Peruvalayam	37.3	13.9	51.0	41.9	7.1	100.0	0.04
5.	Agavalam	70.1	3.4	78.5	13.4	8.1	100.0	0.14
6.	Thakkolam	51.4	38.1	96.5	3.5	0.	100.0	0.18
7.	Karivedu	7.3	10.6	17.8	52.4	30.0	100.0	0.01
8.	Perumbuli pakkam	2.7	66.8	69.5	0.	30.5	100.0	0.25
9.	Poigainallur	0.	38.8	38.8	0.0	62.0	100.0	0.16
10.	Tiruppukkuzhi	0.	65.1	65.1	0.	34.9	100.0	0.07
11.	Puduppakkam	30.0	0.	30.0	61.7	8.2	100.0	0.02
12.	Paranthur	2.9	0.	2.9	92.4	4.7	100.0	0.01
13.	Neervalur	0.	0.	0.	89.3	10.7	100.0	0.00
14.	Velur	17.9	48.1	66.0	5.1	28.9	100.0	0.20
15.	Vembi	0.	88.4	88.4	0.	11.6	100.0	0.28
16.	Sirungathur	75.9	4.2	80.1	6.7	13.2	100.0	0.33
17.	Kaliyur	21.0	0.	21.0	66.6	12.4	100.0	0.21

Notes :

* For the entire Kaverippakkam tank ayacut

T + W = Atleast once in a year a plot should have received Tank plus well irrigation. It also includes Tank only in one season and well only in the second season in the same year.

T only = It will be either Tank only and Tank plus Rainfall

W only = It will be either well only or well plus Rainfall

(Source : Survey)

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TABLE 3

Estimated area under total ayacut of selected tanks benefiting from well irrigation 1985-86

Tanks	Area of ayacut		GCA in ayacut		Well per acre in the ayacut
	Total	% reporting well irrigation	Total	% reporting well irrigation	
KVP-LS-H	NA	NA	NA	NA	0.26*
KVP-LS-T	NA	NA	NA	NA	0.26*
KVP- Gafoor	54.4	52.5	81.4	75.2	0.26*
Peruvalayam	NA	NA	NA	NA	0.04
Agavalam	NA	NA	NA	NA	0.14
Thakkolam	411.4	97.2	838.7	64.3	0.18
Karivedu	480.1	18.7	417.4	23.5	0.01
Perumbulipakkam	159.5	72.2	332.4	85.6	0.25
Poigainallur	132.9	41.38	149.1	93.5	0.16
Tiruppukkzhi	538.4	67.4	914.0	91.0	0.07
Puduppakkam	709.9	30.8	1418.2	16.2	0.02
Paranthur	759.0	2.8	1430.0	0.0	0.01
Neervalur	730.4	0.0	1457.0	0.0	0.00
Velur	483.3	70.8	933.6	62.0	0.20
Vembi	214.2	89.9	445.4	78.4	0.28
Sirungattur	200.1	83.8	367.9	25.7	0.33
Kaliyur	497.9	27.5	899.9	12.9	0.21

* Estimated for the entire Kaverippakkam taluk ayacut

Notes :

Estimated total ayacut : Estimated ayacut of non-well Plots + Estimated ayacut of well plots

Estimated ayacut of non-well plots : Total number of sub division without wells in ayacut X average size of sample non-well plots

Estimated ayacut of well plots : Total number of sub divisions with wells X average size of sample well plots.

Similar procedure used to estimate gross cropped area

(Source : Survey)

TABLE 4

Gross Cropped Area (GCA) and Cropping Intensity (CI) under different well irrigated conditions for selected tanks 1985-86

Sl.No. Tank	Well Plots			Non well plots getting own well irrigation			Non well plots getting purchased well irrigation			Non well plots getting no well irrigation		
	Plot area			GCA			CI			1		
	1	2	3	1	2	3	1	2	3	1	2	3
1. KVP-LS-H	6.20	6.56	1.06	6.21	9.94	1.60	6.12	12.81	2.09	10.12	5.07	0.50
2. KVP-LS-T	7.19	3.28	0.46	2.56	4.16	1.63	1.07	1.73	1.62	29.83	0.	0.
3. KVP-Gafoor	2.41	1.62	0.67	3.45	6.67	1.93	0.99	2.35	2.37	5.54	1.60	0.29
	15.80	11.46	0.72	12.22	20.77	1.70	8.19	16.89	2.06	45.49	6.67	0.15
4. Peruvalayam	5.06	14.24	2.81	7.14	14.53	2.04	2.04	1.24	1.59	5.80	4.73	0.82
5. Agavalam	3.04	7.40	2.43	9.66	25.07	2.60	3.16	3.76	1.19	1.05	0.93	0.89
6. Thakkolam	5.60	11.35	2.03	17.57	38.31	2.18	1.66	1.98	1.19	0.70	0.70	1.00
	13.70	32.99	2.41	34.37	77.91	2.26	6.86	8.98	1.31	7.55	6.36	0.84
7. Karivedu	1.72	1.01	0.59	1.51	3.07	2.03	1.15	1.15	1.00	8.32	5.38	0.65
8. Perumbulipakkam	2.26	4.88	2.16	6.54	16.71	2.56	3.59	7.63	2.13	4.36	2.52	0.58
9. Poigainallur	1.06	2.58	2.43	4.19	9.40	2.24	0.33	0.33	1.00	7.19	4.29	0.60
10. Tiruppukkzhi	4.41	5.43	1.23	8.46	21.07	2.49	3.11	5.07	1.63	4.80	0.	0.
	9.45	13.90	1.47	20.70	50.25	2.43	8.18	14.18	1.73	24.67	12.19	0.49
11. Velur	3.85	4.85	1.26	5.39	11.55	2.12	1.02	1.29	1.26	4.82	3.27	0.68
12. Vembi	2.18	5.55	2.55	13.73	23.98	1.75	0.40	0.80	2.00	1.75	0.24	0.13
13. Sirungattur	3.85	4.91	1.27	10.58	21.96	2.07	0.	0.	0.	7.89	7.43	0.94
14. Kaliyur	1.67	2.66	1.59	1.84	4.03	2.19	3.	0.	0.	14.32	23.96	2.00
	11.55	17.97	1.56	31.54	61.42	1.95	1.42	2.09	1.47	28.78	34.90	1.32

Table 4 contd...

Table 4 contd. ...

Gross Cropped Area (GCA) and Cropping Intensity (CI) under different well irrigated conditions for selected tanks 1986-87

Sl.No. Tanks	Well Plots			Non well plots getting own well irrigation			Non well plots getting purchased irrigation			Non well plots getting no well irrigation		
	Plots area		CI	1		2	1		2	1		2
	1	2		3	1		3	1		3	1	
1. KVP-LS-H	6.20	7.59	1.22	5.84	12.36	2.12	2.98	6.73	2.26	13.68	0.	0.
2. KVP-LS-T	7.19	4.00	0.56	1.92	3.90	2.03	1.07	1.73	1.62	30.39	0.	0.
3. KVP-Gafoor	2.41	1.22	0.51	3.42	7.14	2.09	1.94	1.00	1.00	4.62	0.42	0.09
	15.80	12.10	0.77	11.18	23.40	2.09	5.99	10.40	1.73	48.66	0.42	0.
4. Peruvalayam	5.06	8.72	1.72	7.09	11.76	1.66	1.30	1.30	1.00	6.54	3.67	0.56
5. Agavalam	3.04	6.78	2.23	9.16	20.07	2.19	0.99	1.34	1.35	3.72	0.	0.
6. Thakkolam	5.60	7.50	1.34	12.84	24.19	1.88	0.24	0.24	1.00	6.85	0.	0.
	13.70	23.00	1.67	29.09	56.02	1.93	2.53	28.8	1.13	17.11	3.67	0.21
7. Karivedu	1.72	2.31	1.34	0.42	1.26	3.00	0.	0.	0.	10.56	0.	0.
8. Perumbulipakkam	2.26	4.47	1.98	6.17	11.54	1.87	3.31	6.18	1.87	5.01	0.98	0.20
9. Poigainallur	1.06	2.22	2.09	4.11	8.57	2.09	0.	0.	0.	7.80	4.29	0.55
10. Tiruppukkzhi	4.41	5.81	1.32	7.09	15.91	2.24	1.77	3.28	1.85	7.83	0.	0.
	9.45	14.81	1.56	17.79	37.28	2.09	5.08	9.46	1.86	31.20	5.27	0.17
11. Velur	3.85	4.75	1.23	4.17	8.20	1.97	1.62	1.78	1.10	5.44	2.93	0.54
12. Vembi	2.18	4.36	2.00	13.45	26.85	2.00	0.40	0.40	1.00	1.93	0.08	0.04
13. Sirungattur	3.85	3.26	0.84	9.01	10.01	1.11	0.98	0.98	1.00	8.48	1.11	0.13
14. Kaliyur	1.67	1.10	0.65	2.58	2.52	0.97	0.	0.	0.	13.58	7.81	0.58
	11.55	13.47	1.17	29.21	47.58	1.63	3.	3.96	1.05	29.43	11.93	0.41

Note : This table excludes three tanks where well irrigation is nil or insignificant.

Source : Survey)

TABLE 5-A

Gross Cropped Area (GCA) and Cropping Intensity (CI) for the selected distributaries for WW (with well) and NW (No well) farmers 1986 - 87 (Area in acres)

S.No Zone	Main canal / Branch canal reach	Distribution (mileage)	Sample Plot area	farmers - NW GCA	CI	Sample farmers - NW Plot area	GCA	WW CI	Proportion of area owned by NW farmers	Year of latest spell	Year of last spell
1. Zone-I	PMC - H	2.6.000	57.02	64.41	1.13	96.16	161.75	1.68	37.2	62.8	15.2.86 to 3.8.84
2. "	PMC - M	13.5.263	3.90	3.90	1.00	125.70	298.16	2.37	3.0	97.0	20.5.86 to 31.12.84
3. "	PMC - T	0.2.640	47.12	53.60	1.14	237.48	496.82	2.09	16.6	83.4	—do— to —do—
	KPBC										
4. "	PMC - T	6.5.600	56.78	41.18	0.73	156.59	241.63	1.54	26.6	73.4	—do— to —do—
	KPBC - T										
5. "	U.Per										
	Canal - H	3.7.330	32.95	27.36	0.83	156.13	134.90	0.86	17.4	82.6	—do— to —do—
6. "	U.Per										
	Canal - T	19.0.15	105.35	74.4	0.71	203.70	202.89	0.99	34.1	65.9	—do— to —do—
7. Zone-II	PMC - H	3.4.500	58.31	62.36	1.07	127.88	216.07	1.69	31.3	68.7	1.9.86 to 28.12.84 to 30.1.87 to 6.5.85
8. "	PMC - M										
	PPBC - H	0.1.180	178.39	170.65	0.96	—	—	—	100.0	—	—do— to —do—
9. "	PMC - M										
	PPBC - T	8.0.220	24.75	23.25	0.94	165.45	211.61	1.28	12.8	87.2	—do— to —do—
10. Zone-III	PMC - 4	31.4.440	12.59	0	0	174.89	93.61	0.54	6.7	93.61	1.8.85 to 16.10.83 to 17.12.85 to 2.3.84 to —do— to —do—
11. "	PMC - M	50.4.445	17.32	3.12	0.18	201.05	187.42	0.93	7.9	92.1	—do— to —do—
12. "	PMC - T	68.0.000	6.00	0	0	146.49	6.00	0.04	2.7	97.3	—do— to —do—

(Source : Survey)

Note : PMC Parambikulam Main Canal

PPBC - Pudupalayam Branch Canal

KPBC - Kovil Palayam Branch Canal

U.Per Canal — Udmalpet canal

TABLE 5-B

Gross Cropped Area (GCA) and Cropping intensity (CI) for the selected distributaries for WW (with well) and NW (No well) farmers in 1985-86 (Area in acres)

Sl. No.	Zone	Main / Branch Canal / Reach	Distributary (mileage)	Sample Plot area	Sample farmers GCA	NW CI	Sample farmers Plot area	GCA	CI	Sample farmers - WW GCA	Proportion of area owned by NW farmers	Year of latest spell	Year of last spell
1.	Zone I	PMC - H	2.6.000	57.02	94.17	1.65	96.16	190.00	1.98	37.2	62.8	15.2.86 to 20.6.86	3.8.84 to 31.12.84
2.	Zone I	PMC - M	13.5.263	3.90	7.80	2.00	125.70	259.06	2.06	3.0	97.0	—do—	—do—
3.	Zone I	PMC - T	0.2.640	47.12	73.96	1.57	237.48	554.50	2.33	16.6	83.4	—do—	—do—
4.	Zone I	KPBC H	6.5.600	56.78	80.61	1.42	156.59	303.79	1.94	26.6	73.4	—do—	—do—
5.	Zone I	PMC T	3.7.330	32.95	36.60	1.11	156.13	275.92	1.77	17.4	82.6	—do—	—do—
6.	Zone I	U Per canal - H	19.0.15	105.35	166.88	1.58	203.70	349.29	1.71	34.1	65.9	—do—	—do—
7.	Zone II	canal - T	3.4.500	58.31	38.38	0.66	127.88	118.09	0.92	31.3	68.7	1.9.86 to 30.1.87	28.12.84 to 6.5.85
8.	-do-	PMC - M	0.1.180	178.38	179.28	1.00	—	—	—	100.0	—	—do—	—do—
9.	-do-	PPBC - H	8.0.220	24.75	0	0	165.45	35.67	0.22	12.8	87.2	—do—	—do—
10.	Zone III	PMC - M	31.4.440	12.59	14.53	1.15	174.89	274.84	1.57	6.7	93.61	1.8.85 to 17.12.85	16.10.83 to 2.3.84
11.	-do-	PPBC - T	50.4.445	17.32	9.02	0.52	201.05	320.30	1.59	7.9	92.1	—do—	—do—
12.	-do-	PMC - T	68.0.000	6.00	5.50	0.92	146.49	172.82	1.18	2.7	97.3	—do—	—do—

(Source : Survey)

Note : PMC — Parambikulam Main Canal
PPBC — Pudupalayam Branch Canal

KPBC — Kovil Palayam Branch Canal
U.Per canal — Udumalpet canal

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Several rounds of discussion I had with Prof. A. Vaidyanathan improved the quality of this paper a great deal. I thank him so much. However, the usual caveat remains.

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The Future of Village Industries* - Part 1

I

I am greatly honoured by the invitation of the Andhra University to deliver the first Professor N. G. Ranga Endowment Lecture. Professor Ranga is among the leading academicians in our country, who, responding to the call of Mahatma Gandhi, has devoted his life to the cause of the vast millions of people in the rural areas of our land, identifying himself with them and organising programmes of constructive work for their upliftment. He continues his noble mission even today at the national level. But I imagine that to him and people of his generation who had thrown themselves into the Freedom Movement with conviction and zeal, it must be a matter of pain and concern, that even after four decades of development activities in Independent India, and notwithstanding many creditable achievements, the condition of life of millions of men, women and children in the villages remains what it has been for ages. But what of the future? Are there reasons to believe that they can hope for a tomorrow that will be different?

In order to concentrate on these questions, I have chosen as the topic of this lecture the Future of Village Industries. The choice of the topic has been partly because of Professor Ranga's own specific interest in these industries. But there has been a broader consideration too. Village industries have had a special place in our socio-economic system. Gandhiji had chosen them as the symbol of India's glorious past and of the destruction that the British rule in India had brought about. He accepted their revival as one of the major weapons—at once economic and political—in the fight against the foreign rulers. And he was certain that even in Free India, village industries would be the kingpin for the reconstruction of the economy. To him, therefore, the past and the future were linked through village industries. Some of these sentiments, possibly in subdued tones, have found expression in our Five-year Plans also, especially the earlier ones, and even in the more recent ones village industries occupy a fairly prominent position.

What I propose to do, therefore, is to make an appraisal of the position of village industries in the Indian economy since Independence and to consider the role they are likely to play, not in the distant future, but in the next few decades. Let me indicate what I bring within the category of "village industries." It is rather difficult to define them, but not too difficult to identify them. One way to identify them is to say that they are the kind of industries that found place in Gandhiji's village reconstruction programme, and hence they may be thought of as the "traditional industries" of India. That description may, at times, turn out to be ambiguous because it is sometimes used to represent all industries other than the more recent ones and in that sense will include the mill sector of the cotton textile industry, which will be excluded from my treatment of village industries. A more professional term is "pre-capitalist industries," but since they continue into the capitalist period, the expression should not be given a literally temporal connotation. "Village industries" should not also be identified too closely with rural areas in a spatial sense. In fact, one of our leading village industries, the handloom industry, is turning out to be more of an urban industry in terms of location. In my treatment of village industries I do not include the modern small-scale units although in policy pronouncements and official statistics, village and small scale industries are clubbed together. I will have some comments about this aspect subsequently.

II

A quick look at the past may be helpful to clear the decks. The recently published — 'The Cambridge Economic

History of India'¹ brings together considerable historical evidence about village industries in the Indian society of the pre-British period. The survey of non-agricultural production of the period from about 1200 to 1750 says. "There is little reason to doubt that the bulk of the rural manufactures in this period, as earlier and later, were produced by hereditary artisan castes bound to the dominant agricultural castes by traditional ties of the client-patron relationship and collectively maintained, like their fellow service caste-groups. Hereditarily fixed shares of the village produce, supplemented or replaced in some cases, grants of rent-free land or cash payments, constituted their main income."² This description of the position of the rural industries within the village economy according to the *jajmani* system is well known. But there are some other aspects of this socio-economic system which are, perhaps, not as well-known.

The first is that from very early times there was, apart from this "community" segment of rural artisans, a "non-community" segment and that weavers and oil pressers belonged largely to the latter.³ A section of the weavers certainly had client-patron relationships with the nobility in the urban areas, but the significance of the presence of the "non-community" segment is that some parts of the village industries had, long before the arrival of the colonial forces, come under the commodity-money domain.

When an economic activity comes under the commodity-money domain where the integral link between producers and consumers characteristic of the *jajmani* system is snapped, a process of intermediation becomes necessary which opens up the role of merchants. Fairly soon the role of the merchant

* Abstracts of Part I of the paper by Dr. C. T. Kurien for the Prof. N. G. Ranga Endowment lecture held at the Andhra University on January 31, 1989.

yields place to the rule by merchants. This happens in a variety of ways. The merchant must not only dispose of the finished products of the producers, but may also have to provide them the raw materials. This dual dependence on the merchant paves the way for indebtedness and to the emergence of merchant capitalism which takes manifold manifestations. Several of these manifestations of merchant capitalism were prevalent in the Indian economy before the colonial period and it is reasonable to assume that a not insignificant section of village industries was under the domination of merchant capitalism.

Secondly, "in striking contrast to India's preeminence as an exporter of manufactured goods, her technology was remarkably backward in comparison with the other advanced civilizations of the period, especially Western Europe and China. Her world famous textiles were produced without the aid of multi-spindle wheels known to China from at least the early fourteenth century and, of course, she had nothing to compare with the water-powered throwing-mills with 200 spindles of the Italian silk industry."⁴

Thirdly, again, in contrast to the splendour of the product, the producers themselves were of rather low estate. Not only were they lower in the caste hierarchy than those who were involved in agriculture, but their earnings were very low, and they were subjected to the extortions by the village headmen, the nobles who were their customers and the middlemen. The Cambridge Economic History of India states that there are no dependable estimates of the artisans' income where they worked as independent producers, but provides data on artisans' wages, and on that basis arrives at the conclusion; "The

artisans' wages in real terms could vary from bare subsistence to a reasonable degree of comfort. If the maximum wages are any indicator, such incomes afforded no scope for savings that could lead to accumulation of capital."⁵

Fourthly, the social system within which the rural industries were situated considerably restricted the scope of organisational diversity. As is recorded in the Cambridge Economic History of India, "it was virtually impossible for an artisan to aspire to a higher social status and, one imagines, like the untouchable who accepted his untouchability as part of a God-given order, the manufacturer accepted his economic as well as his social situation as unalterable facts. The artisans-entrepreneur is an unlikely, and at best a very exceptional product of such a society."⁶

These considerations indicate that the mental image that many of us may have about the nature of the traditional industries of India during the pre-British past may have to be substantially revised. True, they had been known in those days in India and outside for the quality and elegance of the goods that they produced. But such products constituted only a very small component of the wide variety of goods produced and services rendered by the rural artisans of that period. By and large, they produced goods required by the villages and the commoners in urban areas. They belonged to the lower sections in a highly stratified society with little chance of vertical or horizontal mobility. They relied on technology that was inferior by contemporary international standards and their productivity was very low. Their earnings too were low, usually at or just above subsistence level, and frequently they were the victims of the exploitation of the village headman, the

nobility and the merchants with whom they were connected occupationally and socially, and to whom they had to yield because of their inferior position. Let me, again, borrow the words of the Cambridge Economic History of India: "Virtually every relevant feature of the economy, society and state was designed to hold the artisan firmly down to his lowly place in the scheme of things allowing very little scope for upward mobility or differentiation. Nearly every foreign observer spoke of the relentless tyranny suffered by the artisan, a description confirmed by the indigenous accounts of the manner in which sair duties on manufactured goods were collected and literary references to extortions by even the village headman. The whip and cudgel were freely used not only by the noble's minions but the middlemen as well."⁷

It is into such a situation that the colonial forces entered. Since colonialism represented largely merchant capital, what happened during the colonial period was a more systematic, widespread play of merchant capitalism. Some aspects of the impact of the colonial regime on the traditional industries may also be noted. Contrary to what may be expected, the colonial impact fell most heavily on the more advanced segments of traditional industries. According to a scholar, "The most developed elements of India's national economy were threatened most of all. Accordingly, foreign competition largely crippled those areas where relations of production and social division of labour were the most mature. The urban artisan industries which catered for the emergent national market and went through the early stages of capitalist development were hardest hit. The rural artisans offered a far stiffer resistance."⁸ For instance, it was the high quality shirting that lost out to

British competition first. Inferior varieties contained partly because the imported goods were no substitutes for them considering the very low economic position of their clientele, and partly because of the natural protection that the interior areas possessed in a vast country with limited transport connections. The more advanced products lost out also because their clientele, the nobility in the urban areas, was wiped out or changed over to the more fashionable imported goods. Since the more advanced among the traditional industries were the ones to go under because of the colonial impact, the ones that survived were the more primitive ones in terms of technology, productivity and earning power. Some of these have continued to survive into our own times.

Another group of the artisans who showed considerable tenacity were the blacksmiths and carpenters because they were both essential for the preparation and repair of agricultural implements. Of these two, again, the carpenter did less repair and more original work than the blacksmith. Consequently, as the late Prof. Gadgil points out, his position became worse.⁹ The introduction of the iron canecrushing press, for example, undermined very greatly his position in the sugarcane growing tracts. The same may be said of the introduction of the iron plough. Such technological innovations were rare during the colonial period, but it brings out another feature of the impact of colonial rule on traditional industries: those that had links with agriculture survived as long as agricultural technology itself remained stagnant.¹⁰

Those survived too who found ways to fall back upon land. Thus the decay of urban industry heightened the pressure

on land, and made it necessary for artisans to take on agriculture too to make a living. Perhaps another significant section retained their traditional occupations by attaching themselves to merchant capitalists or becoming wage workers in manufactories that began springing up more rapidly than in the earlier period.

There is no doubt that during the colonial period the position of the artisans became worse than in the previous centuries and their relative position vis-a-vis those in modern industry became very pronounced. Thus "in 1908 and 1909 an average oil-maker in the Akola district earned Rs. 9-10 a month, a blacksmith between Rs. 40 and Rs. 50, a carpenter up to Rs. 20 a month, while a second class machine operator earned Rs. 65 and first class operator, Rs. 140, in addition to living accommodation, lighting and heating facilities.¹¹ What was, in fact, more debilitating for the artisans was that the traditional socio-economic relationships of their existence were rapidly disintegrating, with little hope that something new would take their place.

III

Under the impact of capitalist development disintegration of this kind of pre-capitalist production operations and socio-economic relations was experienced in many other parts of the world, especially in Europe and Japan.¹² The Indian experience, as also the experience of most other countries in Asia that came under Western colonial impact, however, had a distinctive aspect about it. While in Europe and Japan the disintegration of pre-capitalist production was caused and accompanied by the steady growth of capitalist production, in India

the disintegration was caused substantially by capitalist trade not sufficiently accompanied by growth of capitalist production. This is the background against which the future of village industries came to be discussed during the Freedom Movement. The issue was how to ensure the immediate sustenance of large numbers of workers continuously being threatened by this disruptive process while at the same time assuring that over time through technological improvements and increase in labour productivity there would be an escape from the self-defeating reliance on lower forms of production.

Any realistic approach to this problem must take into account the twin aspects mentioned above, viz., the need to provide sustenance for millions of people today and the need to enhance productivity tomorrow. The problem is one of balance. Unfortunately there are no easy guidelines as to how a society consisting of diverse elements and diverging interest groups can balance the claims of today and tomorrow and so, not surprisingly, this issue of choice becomes very controversial both on ideological and theoretical grounds. And, as it frequently happens in discussions relating to major social problems, ideological and theoretical considerations tend to get mixed up as well.

What has come to be known as the Gandhi-Nehru controversy on village industries is the best example of the treatment of the problem at the ideological level. A careful reading of the pronouncements of the two leaders on this question will show that they both wished to arrive at some sort of balance between today and tomorrow. Thus, while Gandhi was the champion of village industries, he was not altogether averse to technological

improvements per se. In fact, he had, on one occasion, announced a prize of a lakh of rupees to anyone who invented a 'charka' with higher productivity capable of being plied and repaired in the villages, and was a great admirer of the sewing machine because he perceived that it considerably reduced the drudgery of labour. And yet, it is also a fact that in the approach to the problem of village industries Gandhi was guided by ideological considerations of the virtues of village self-sufficiency, the moral superiority of self-employment and opposition to an industrial civilization. And, of course, he had a tactical consideration as well. The emphasis on village industries was necessary to mobilise the rural masses and the broader principle of swadeshi to win the support of Indian capitalists in the fight against the British. On the other hand, Nehru, the champion of modern science and technology recognised the need to continue and support traditional industries. On Khadi he wrote: "It will do immediate good, part of it more or less permanent, most of it temporary. It will help the villager in his present distress and revive certain artistic and cultural values which were in danger of dying. But insofar as it is a revolt against machinery and industrialism it will not succeed."¹³ The ideological debate is not a thing of the past either. It still continues. The arguments come not merely from those who are sometimes described as Gandhian fundamentalists. There are modern ideologists who propagate the efficiency of the market and hence will not take kindly to reservations and subsidies. There are those who are convinced about the scientific superiority of wage employment over self-employment, and so on.

At the theoretical level the debate manifests itself as the problem of choice of technology. As many of us will recall, there was a lively debate on this aspect in our country in the mid-fifties with special reference to the traditional and the modern in the production of cloth.¹⁴ While that debate was on applied aspects, based on it a "pure theoretical" treatment has also been made.¹⁵ The essence of the theoretical argument was that while in a labour abundant economy a labour-intensive technique would provide higher income and employment in the short run, even in such an economy a capital intensive technology which has a higher reinvestment possibility would ensure higher income and employment in the long run. It was shown also that a time horizon could be specified in terms of which the choice could be effected. That formulation emphasised, rightly I feel, the significance of the temporal dimension in the choice of technology as against the atemporal factor-proportion frame within which it used to be presented leading to the argument that the appropriate technology for labour abundant countries is labour-intensive ones and for capital abundant countries capital-intensive ones. However, the point to note is that neither of these two approaches could be accepted as a guide to policy although policy makers frequently invoke either the one or the other in support of their positions.¹⁶ Their inadequacy from the point of view of policy is because of two reasons. The first is that as theoretical exercises they are both based, and rightly so, on a number of simplifying assumptions, particularly about the nature of technology and about the structure of society. Technology is not a matter of factor intensity alone, and no society makes production

decisions solely based on technological considerations, however helpful such simplifying assumptions may be to develop a theoretical argument. Secondly, and more crucially, both approaches overlook the need to combine or hold a balance between the two aspects of the problem I have referred to, viz., the need to provide sustenance to those who are dependent on traditional industries now, and to raise their productivity later: the factor-proportions approach gives little thought about increasing labour productivity; the reinvestment argument does not consider how the existing low productivity techniques and those dependent on them are to be dealt with. If only one of these is to be attended to, theoretical arguments and ideological positions can be sharply defined. Unfortunately real life is not as neat as either theory or ideology would like to have it, and real life problems are usually paradoxes and dilemmas which need to be understood and resolved as well as can be done.

I must immediately point out that this is not to dispense with theory or even ideology. Theory is an aid to understanding, and the more complex a problem the greater is the need for that aid. This, I am fairly certain, will find general acceptance. I would take a similar position about ideology. Social problems cannot be resolved, even if they are understood, without commitment to some goals and objectives and providing these is one of the tasks of ideology understood in the broad sense of that term. The way in which one would define one's views about the future of village industries (as, indeed, any significant aspect relating to the future, especially the future of society) would depend very much on what can only be described as ideological commitments. In the context of the problem

of village industries I am committed to the view that nothing should be done that will deprive people of their means of livelihood now, and everything should be done to raise their levels of living in the future. It should be noted that neither of these is derived from theory. But given this commitment the role of theory, again in the broad sense of the term, is to facilitate an understanding of how the commitment may be realised.

IV

I started with an attempt to clarify some aspects regarding the past in respect of village industries. I would now like to address myself to the present. By the 'present' I mean the post-independence period. If prior to that village industries were disintegrating, what has been happening since then? Has that disintegration continued? Has it been arrested? How did these happen? An understanding of these aspects is essential to make any meaningful suggestions at all about the future. The questions are partly matters of fact, partly of interpretation. On facts, unfortunately, the position is very unsatisfactory, but for understandable reasons. The village industries consist of small units primarily, often as part of household operations, carried on with the help of family labour as and when convenient and necessary. They are located throughout the length and breadth of our vast country and are not organised into industrial unions or workers associations. And, in most instances they themselves do not possess adequate information about many aspects of their enterprises and activities.¹⁷ Hence it is not surprising that we do not have adequate and reliable factual information about the village industries' sector. Even where some macro information is available, the

local level and unit specific information so crucial for understanding what is going on, is extremely limited especially about their organisational structure which shows considerable variations. Since Independence and under the aegis of planning, attempts have been made to generate some macro data pertaining to the sector, but possibly the pre-independence period was richer in terms of micro level information.

We shall first look at some macro data. Here, again, there is a major problem. The information available is not on village industries as such. The Census Reports have a category of household industries which may give some information about units, but not about all who are engaged in village industries, especially the hired workers in them. The same is also true of the Enterprises Surveys periodically undertaken in recent years. The national income statistics refer to "small enterprises" distinguishing them from "factory establishments" within the manufacturing sector. And five year plan documents club together traditional industries and modern small-scale industries. Reflected in all of these is the "terminological looseness" that Myrdal talked about in his treatment of traditional industries in Asian Drama.

Making use of census data and national income data it is possible to estimate that at the time of Independence, the "small enterprises" accounted for about 7 per cent of the gainfully employed population and 10 per cent of national income. These are, in one sense, rather low figures. But we must recall that only less than 10 per cent of the gainfully employed population was engaged in industries as a whole and the national income accruing from the manufacturing sector was less than 17

per cent. In other words, the small enterprises had almost 75 per cent of those engaged in manufacturing and close to 60 per cent of the income originating in that sector came from them. Since modern small scale industries were not a major segment of the manufacturing sector at that time, it may be safe to assume that the shares mentioned above were substantially those of the traditional industries which, therefore, constituted a sizeable proportion of the non-agricultural activities in an economy dominated by agriculture. The positions changed by the middle of the 1980s. Between 1950-51 and 1985-86 the income originating in the small enterprise segment of the manufacturing sector grew at a compound rate of 4.1 per cent per annum compared to 5.6 per cent in the large scale sector. The share of the small enterprises segment in national income in the mid eighties was a little less than 6 per cent and that of the large sector was a little over 10 per cent so that in terms of the share in national income there was almost a complete reversal of the relative shares of the two segments with the large-scale sector now claiming about 60 per cent of the national income from manufacturing. Within the small enterprises segment itself the growth rate of the modern small-scale units is known to have been much faster, and hence one must conclude that in a relative sense the position of the traditional industries has declined since independence. However, in view of the accelerated rate of growth of large scale industries, the relative decline of traditional industries does not necessarily imply their absolute decline. On the other hand, the fact that the traditional segment still has a fairly prominent place in the manufacturing sector of the economy indicates that they have not been withering away.

It is more difficult to say what may have been happening to the labour force engaged in the traditional industries. Workers in the household industries who accounted for 6.4 per cent of the total workforce in 1961 came down to 3.5 per cent in 1981 while those in other than household industries (within the manufacturing sector) increased from 4.2 per cent to 7.8 per cent during the same period. On the other hand, non-agricultural employment in the rural areas has gone up between 1961 and 1981, although it is not yet known whether the increase has come about through increase in industry, or trade or services.

The National Committee on The Development of Back-ward Areas (Chairman B. Sivaraman) in its Report on Village and Cottage Industries (March 1981) examined in some detail the question of the decline in the number of workers in household industries between the 1961 and 1971 census. Noting that the change in the definition of "workers" in the two censuses may itself have contributed to this decline, especially that of female workers, the Committee concentrated its analysis on male workers. It was seen that the number of male workers in household industries had gone down from 5.86 million to 5.02 million, while in organised manufacturing industries it had gone up from 3.20 million to 4.93 million and in the category of "other than household and manufacturing industries" also there was an increase from 3.98 million to 4.91 million. The Committee, therefore, concluded that these figures may indicate "a favourable shift of workers from lower level technologies to the higher levels." While that may be so, the figures are not conclusive to establish that employment in village

industries have come down because not all household industries are traditional village industries and village industries are not confined to the household sector; part of "other than household and manufacturing industries" may consist of other organisational forms of village industries. The Committee looked into the industrial break-down within the household sector and found that while foodstuff, textiles of different types, manufacture of wood and products, leather and leather products, chemicals and chemical products had declined in terms of employment, cotton weaving in powerlooms, making of garments, manufacturing of paper and paper products, beverages and machinery of different kinds had gone up in terms of employment.

The Five Year Plan documents also provide some information about village industries. But there is little systematic account on the basis of which inferences can be made about production and employment over time. By and large, the data are about handlooms and Khadi. Both handloom and khadi production showed substantial increase in the fifties, the former going up from around 740 million yards in 1950-51 to 1900 million yards in 1960-61 and the latter from 7 million yards to 48 million yards. By 1970-71 handloom production went up to 2280 million meters and of khadi to 57 million meters which was considerably less than the 85 million meters reached in 1985-86. Handloom production stagnated for a while then, but moved upto 2900 million meters in 1979-80 and to 3600 million meters in 1984-85. Khadi made slow progress in the seventies reaching 82 million meters in 1979-80, but then picked upto reach 127 million meters in 1984-85. On employment, the Third

Five Year Plan reported that "fuller employment was provided for nearly 3 million weavers" during the fifties. In the case of Khadi the report was that "employment, mostly part-time, was provided to nearly 11 lakh additional spinners, besides whole-time employment to about 1.4 lakh weavers, etc." The distinction drawn between part-time and whole-time employment, however, disappears in subsequent plan documents. Employment figures shown for handloom are 5.2 million in 1973-74, 6.2 million in 1979-80 and 7.5 million in 1984-85, and for Khadi, 8.8 lakhs, 11.2 lakhs and 14.6 lakhs respectively. Obviously, these figures include both full-time and part-time employment. Apart from these, data are available for the value of output of other village industries which moved up from Rs.122 crores in 1973-74 to Rs.348 crores in 1979-80 and to Rs.759 crores in 1984-85 with the employment figures for the corresponding years being 9.3 lakhs, 16.1 lakhs and 22.4 lakhs. I shall come back to these last set of figures in a moment. But we may say that what these figures, especially figures on physical production, show is that these traditional industries have registered growth over the past three or three and a half decades, at times quite striking, at times sluggish.

The most detailed information available is from the Khadi and Village Industries Commission (KVIC). I have compiled information pertaining to physical output (where-ever available), value of output and employment for Khadi and eleven of the major village industries covered by the KVIC for the period from 1953-54 to 1983-84 at ten year intervals (See Annexure). Judged by these figures the progress of these industries in terms of all the three

indicators should be considered as phenomenal, but since the data are drawn only from registered institutions, cooperative societies and centres assisted by the KVIC, it is not easy to say how adequately the industries as a whole have been covered. In the first ten year period the problem of coverage must have been particularly serious. The figures on village industries quoted by the five year plan documents have originated from KVIC and hence share the same problem. Within these limitations the KVIC data help to draw the distinction between full-time and part-time employment. Thus in 1983-84 out of the 13.59 lakh of total employment that khadi industry provided, 4.43 lakhs consisted of full-time employment and 9.16 lakhs part-time employment and in the case of (other) village industries the total of 21.92 lakhs was split as 6.75 full employment and 14.17 part-time employment.

I have already indicated how fragile some of these data are, but having gone through them critically, I think it is safe to say that what we can infer from them is that since Independence the traditional industries have not declined in an absolute sense in terms of employment, and indeed seem to have picked up, in some instances quite remarkably.

There is one other aspect of that performance that deserves attention and may, to some extent, offer a clue to the understanding of that performance. The Khadi and Village Industries Committee of the late sixties headed by Asoka Mehta conducted a sample survey to find out the extent of "local" orientation of village industries both in terms of their inputs and outputs. Both for sources of inputs and markets for output a three-fold division was made as

"local" (i.e., areas within a district): areas within the state, but outside the district; and areas outside the State. In the case of Khadi, it was seen that in the first two plan periods local areas contributed about 18 to 34 per cent of the total raw materials. Areas other than local but situated within the state accounted for more than 55 per cent. During the Third Plan period, this share came down to about 32 per cent while that of the former increased to about two thirds of the total. In terms of sales too, the local area figured prominently, increasing from 26 per cent in the mid fifties to 54 per cent a decade later while sales within the rest of the state declined from 50 per cent to 25 per cent during the same period.

The local effect was even more pronounced in the case of many of the other village industries. In leather, processing of cereals, non-edible oils and soap, pottery, bee-keeping, fibre and

village oil, the chief source of raw materials was the district accounting for more than 80 per cent of the raw materials. Many others had between 50 and 70 per cent of their raw materials supplied from the district. What is more significant is that as regards sales, the products of all village industries, except those of bee-keeping and hand made paper were absorbed by the local areas to the extent of 80 to 100 per cent, and the local effect tended to increase over time and as the industries grew. It must be pointed out, however, that this phenomenon should not be interpreted as the manifestation of traditional kind of "Village self-sufficiency". For one thing, locality considered is not the village, but the district. Within the district, the rural areas, however, accounted for very high proportions of the sales. But the transactions were purchases of inputs and sale of output, that is, mediated through the market, and not in the form of barter.

Statement of The Workshop*

The Nineteenth Interdisciplinary Research Methodology workshop organised by the Madras Institute of Development Studies in collaboration with the Indian Council of Social Science Research was held at the Institute for Social and Economic Change, Bangalore, from 8th June to 11th June 1989. 30 participants from various Universities, Research and Training Institute, Water Technology Centres and Management Boards attended the Workshop. Scholars from the disciplines of Agricultural Sciences, Economics, Engineering, Environmental Science, Geography, Geology, Management Studies, Philosophy, Political Science and Sociology were present.

The general theme of the current series of three workshops is "Management of Renewable Resources". The focus of the 1989 Workshop, the first of the series, was on Management of Water Resources in Peninsular India. Future workshops will discuss the management of land and renewable energy resources.

Assessment of Water Needs

A debate on Water Management has to take off from an assessment of water needs, present as well as future. Such an assessment could be based on per-capita water demand. Estimates of per-capita water demand vary from 0.08 to 0.10 hectare metre. Thus, for a projected population of 950 million in 2000 A.D., the national aggregate water demand would be between 76 - 95 million hectare metres (mhm) depending on the assumptions. On the other hand, the most optimistic estimate of utilisable river flow is 82.7 mhm (compared to the present utilisation of 64 mhm) for all the river basins in the country.

However, the aggregate water demand estimate is too broad to provide any basis for policy. A national level estimate of needs and deficits is essential, but what is also needed is far more disaggregated estimates of demand (i) in terms of end use — sector-wise (industry, agriculture, domestic

* Statement of Nineteenth Interdisciplinary Research methodology Workshop on "Management of Renewable Resources" held at ISEC, Bangalore between June 8th and 11th 1989.

consumption) and (ii) across basins and across regions. Such disaggregated estimates would require appropriate methodologies to be developed based on micro level and regional studies. While using such estimates we should not lose sight of allocation priorities. The National Water Policy lays down the following priorities, drinking water, irrigation, hydro-power, navigation and industrial use in that order (Section 8.0).

One of the critical issues in water management is related to meeting the ever growing needs of metropolitan areas. High demands which are localised, dwindling supply, and meeting drinking water quality standards pose acute problems. Increasing capacity, diverting surface water, rainwater harvesting, developing ground water supplies, desalinizing water and recycling waste water are potential options. However, each of these options has limitations. A rational policy aims at optimum conjunctive use of ground and surface water on the one hand, and regulating demand on the other. In implementing such a policy, issues such as cost-effectiveness (example: desalinisation), acceptability by the users (example: use of recycled waste water), and appropriate regulatory measures (examples: metering, pricing) are raised.

Ground Water Management

Ground water is a crucial resource. Besides being widely distributed, it facilitates tiding over the deficiencies of canal and tank systems at crucial times and controls hazards of water logging and salinisation in command areas. The annual replenishable ground water resources of the country are estimated to be of the order of 45.66 mhw; of the total ground water

potential, 38.62 mhm is estimated to be available for irrigation. The current estimate of draft for irrigation is 10.47 mhm. Another estimate puts the present utilisation at 24% only. However, the critical challenges for management arise from overexploitation in particular regions, decrease in well yields and deterioration in quality.

A major issue that came up for discussion was "sustainability". In operational terms, it implies ensuring that in the long term, average extraction does not exceed average recharge. On the ground, how is this to be achieved? Increasing natural and artificial recharge, induced stream-bed infiltration, importing of water, conjunctive use of surface and ground water, restrictions on extraction and such other measures can be used to improve ground water management. However, such strategies will require better information. Information systems for assessing ground water potential and use should be strengthened, as stressed by the National Water Policy (Section 2.0).

The case of Tamil Nadu illustrates the kinds of problems faced in ground water development and management. There has been a lowering of the ground water table and drying up of a number of ground water sources at the critical periods of droughts.

The case of Coimbatore district concretises the sort of issues thrown up in ground water management in hard rock areas. Here, the ground water is heavily utilised. The question is raised: as a consequence has there been a long term decline indicating over-exploitation? An outcome of a study, diagnosing this tendency was reported. Taluk-wise data on rainfall and fluctuations in the water table showed a

permanent imbalance between ground water recharge and withdrawals in non-irrigated areas, indicating that the stock of the ground water was getting depleted. In the canal irrigated regions because of the recharge through seepage from canals and applied water, the ground water situation was better and facilitated conjunctive use. One-view questioned the inference that there has been depletion of ground water resource as indicated by a decline in the ground water table. On the contrary, there has been increase in the number of wells and increase in the total area irrigated by wells, implying no such depletion. The issue of restricting over exploitation involves various regulatory measures such as pricing, spacing between wells, ceiling on depth etc. But the regulation through these measures raise questions of enforceability. The absence of rationally codified water management rules, the imprecise articulation of the role and responsibilities of the enforcing bureaucracy, and the structural constraints arising from the power of the landed, have led to the present state of unregulated exploitation and the long term lowering of the water table.

Another critical issue that come up for discussion is that of ensuring equity as part of the management objective in ground water distribution. But, the crucial question here is related to conceptualising equity: Does ensuring equity mean ensuring maximum benefits to the maximum number of people? This depends, however, upon the physical availability of water in a specific region. One may add: Ensuring equity means equitable distribution of water, whether farmer is big, small or marginal. But is the issue merely one of stipulating that available water should be distributed equitably? Is it not a narrow concept

of equity? The National Water Policy speaks of both equity and social justice (Section 10.3). If so, the issue is one of ensuring equity and social justice in the context of a differentiated strata of peasantry who have differential command over resources. It was also observed that the question of ground water utilisation and equity should be viewed in the larger perspective of sharing of a common property resource.

Institutional aspects of Water Management

Water Management can be viewed as achieving efficient use of water resources through appropriate technology, within the framework of priorities laid down by the National Water Policy. The technical features of water management do not take place in a vacuum. They are situated in a broader societal framework. A part of the workshop discourse was devoted to laying bare the institutional basis of water management in three specific contexts.

One such context is tank water management through traditional irrigation institutions, reported in a case study of fifteen different tanks. The existence of such traditional institutions meant evolution of principles of collective action for maintenance and sharing of water. The study analyses a set of interrelated factors-institutional and physical-which influence effective functioning. It was argued that among these factors, control over productive resources such as land and privatisation of ground water were critical.

A second specific context is that of legal institutions, codifying norms, rules and procedures for sharing management of ground and surface water resources.

Why is it that there is, first of all, absence of water legislation-in respect of sharing of ground, tank and river water by various users, for various purposes? Secondly, whatever laws and rules are stipulated, are characterised by certain ad-hocism and ambiguity. Very often in the absence of a normative code as well as rules and procedures, conflicts and tensions arise among individuals, groups, states and nations.

The third context is the role of the state in the management of equitable and efficient use of water resources in the context of its stated commitment to social justice. One study reported that in Andhra Pradesh the development of irrigation is far from being equitable and efficient. It was argued that the role of the state is not neutral. It represents a coalition of interests. The under development of irrigation or the inequitable, inefficient use of water resources is a reflection of the interplay of the various interest groups who influence decision-making and thus influence state power. In response to this observation, it was argued that it is not clear what the precise configuration of the group interests are, and how they influence state power.

One of the papers suggested that the success or failure of irrigation institutions could be studied through a game-theoretic framework. Nevertheless it came up in discussion that such a model may not capture the real world complexities.

Environmental Aspects of Water Management

A part of the workshop deliberations was devoted to the issue of environ-

mental impact of major irrigation projects and the related management problems generated by them. The case studies of major irrigation projects in Karnataka-Krishnaraja Sagar, Tunga Bhadra, Ghataprabha and Malaprabha-provided the context for consideration of the issues. Besides the major environmental problems-water logging, salinity and consequent soil degradation-the eco-environmental stresses comprise of complex set of consequences such as impact on flora and fauna, and loss of biological diversity, siltation and hydrological changes amongst others, even some times amounting to generating proneness to earthquakes. Spatially, these varied across reservoir, catchment, and command area. Deforestation, submersion, destruction of grazing land and disturbing productivity resulted in varying magnitude and intensity. A crucial consequence in human ecology is displacement of local households. Other concerns pertain to crop health, human health, livestock management and renewable energy.

The critical issues in water management are related to dealing with each one of these consequences. Developing effective irrigation strategies would require detailed surveys (check lists) of potential environmental impact in the catchment, command areas and beyond to the deltaic areas. One of the crucial areas that came up for discussion is that of appropriate rehabilitation of displaced people. Before any major irrigation project is approved, proper appraisal quantifying as far as possible all these costs weighed against expected gains is necessary (National Water Policy: Sections 4.1-4.5).

Planning for Water Management

Planning of water management systems can be done at various levels.

A methodology for managing the water resources of a tank irrigation system using a simulation model was discussed. The effectiveness of different management strategies attempted in the tank modernization programme in Tamil Nadu were evaluated by applying the model to a specific tank system. The results of the simulation indicate that the physical measures in combination with management measures do improve the overall performance of the tank system. However, a different ranking of options results if the equity criterion is employed. The tradeoffs between efficiency and equity must be resolved outside the model through the political process.

While conceding that most models cannot include all the complex inter-relationships obtaining in the real world, it was felt that planning of water systems is facilitated by modelling. However, greater utility of the model will result only if it is continuously used in decision-making at the field level. Refinements to the model can be introduced when there is feedback from the field experience. It was also generally felt that the tank model was a major methodological contribution to the management of water resources, especially in water scarce areas of the country.

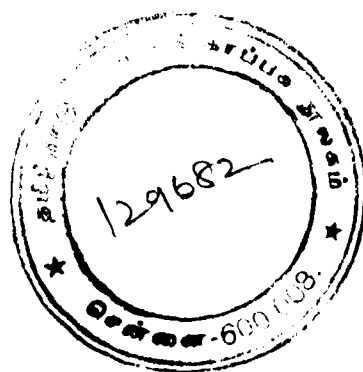
Another planning issue discussed at the workshop was micro watershed management. Most planning efforts in the past have been at the basin, sub basin or watershed level. A micro-watershed by comparison might cover only a few hundred hectares containing one or two villages with a population of about 1000 people. Microwatershed

management involves total resources conservation, involving soil/water conservation afforestation, pasture development and horticulture, with peoples cooperation. The aim is to manage surface runoff by in situ moisture conservation harvesting of excess runoff, thereby keeping the rainwater on the soil for as long as possible. Though the issue was discussed in the context of watersheds in hilly and high rainfall areas, this ecologically-sound principle could be used in dry, drought prone areas as well, as indicated in the National water Policy (Section 18.1).

The success of micro-watershed management is crucially dependent on the participation of the people. One of the ways of obtaining such participation is through people's voluntary associations, panchayats and local educational institutions (National Water Policy: Section 12). Representative projects could be funded by the Government to provide a "demonstration" effect, since the number of micro-watersheds is extremely large. The success of a few well-executed, cost-effective model projects at the District level in each State could lead to the propagation of the concept on a wider basis, and also provide necessary feedback data for policy makers.

The deliberations at the workshop around the central theme of Water Management indicate that it is possible for a diverse group of natural scientists, technologists and social scientists, to communicate across their disciplinary boundaries in a manner which is not merely mutually enriching, but also assists policy-making.

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