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**Some Comments on Tamil Nadu :
An Economic Appraisal — 1991**

**The Linkage Between Urbanisation and
Environment in India**

EDITORIAL HIGHLIGHTS

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Introduction

THE Editorial which has evolved over the twenty two years of the life of the Bulletin launched in February 1971 has, on the advice of the Editorial Committee, had its format changed. There has been no change of substance, but only a rearrangement of the sections in a more orderly logical way - with all matters referring to Tamilnadu State being in one sector in the beginning, followed by all important issues relating to the nation, the country as a whole and ending with the section titled International covering selectively a few major economic events at the world level. There is the usual news in closing continuing to be called other items.

The major highlight in this April editorial which refers to State, National and International events in February is the Union Budget which has many nuances and presents several matters for discussion and reflection. Also the Economic Survey, somewhat more subjectively than in the past, passes in review the happenings during the current year, 1992-93, and is a good introduction to the Union Budget. The appendage to the Union Budget in the form of the Railway budget is a mere revenue raising instrument than even the Union Budget, but unlike the customary system of administered prices, is subject to discussion and approval by Parliament. Its reason for separate presentation from the Union Budget continues to be a puzzle now. At the international level, two

interesting publications by the IMF and ODI support strongly the views of the Bulletin on structural adjustment and consequences of IMF's Standby Credit and Extended Fund Facility. Infact the ODI publication brings to light some empirical facts about the nature and life of standbys and EFF financed projects which are not generally known.

State

Plan

The Governor in his address inaugurating the assembly in February, called attention to the State Plan moving at a rate that the 1992-93 outlay of Rs. 1751 crores is being surpassed and that the Plan outlay for 1993-94, as reported in Vol XXIII p. 2, has been settled at Rs. 2101 crores. While this record is satisfactory, it is going too far to state this indicates that "Tamilnadu has moved into a proper growth trajectory" and that "a new momentum to the development effort has been imparted". The State's growth trajectory does not depend upon and is not indicated by the rate at which the Plan outlay is being expanded, nor does it point to a new momentum to the development effort. The growth trajectory depends on a host of real factors like the level of living of the people, particularly of the rural poor and those living in urban slums; it is the state of this group which makes for development or the lack

of it for the State and on that there is no evidence that there is any alleviation of unemployment or poverty which is a surer measure of the momentum of growth.

Finance

The parlous financial position of the State with a deficit for the year of over Rs. 800 crores outlined in the last issue was worsened by two events: a) a sharp decline in excise revenue and b) the rise in the issue price of rice by the Union Government. The collectorate of central excise, Madras reports that due to recession in the automobile and television industries, the excise collection target of Rs. 2500 crores from the State will not be realised. With only 2 months left, only Rs. 1839.78 crores have been collected. The automobile industry has contributed only Rs. 142 crores against last year's 150 crores. This item does not directly concern the State finances but it has a spread effect on State collections. On the second factor, the first reaction of the State government to the Union Government's price rise was to raise the PDS price of rice by 75 paise per kg, the ordinary (coarse) variety to be sold at Rs. 2.75 per kg and the fine and superfine variety at Rs. 3.50 per kg. This was necessary to avoid the food subsidy increasing by Rs. 60 crores. By giving in to public and party pressures, the government reduced the rise in each variety by 25 paise per kg which adds Rs. 40 crores to the food subsidy burden of the government and will have to be taken into account in the revised budget estimates for 1992-93 and the budget for 1993-94 to be presented next March to the legislative assembly.

Power

The power situation in the state has positive and negative aspects. I suppose it is only

natural that the government should present to the legislature only the positive side, as the Governor did in his address. A World Bank report says that the country loses 1.5 per cent of its GDP because of its erratic power supply. Tamil Nadu shares this loss in its SDP. There are the approved power projects for the generation of 3000 MW calling for an investment of Rs. 11,000 crores, including the important 1500 MW Jayamkondan project and the 1000 MW thermal private sector plant at Cuddalore plus the 2 thermal plants using the surplus Neyveli Lignite (See Vol. XXI p. 252 & Vol. XXIII p. 48). Additionally there is the proposed southern grid to bring natural gas from Bombay High, for which the State Government has offered to make a contribution (See Vol. XXIII p. 3) and has urged the other southern States to do the same. The State will also share in the massive scheme for the development of solar and wind energy and the small hydro, and biogas and biomass areas that is to be launched by the recently established Union Ministry of non-conventional energy. In addition during the visit of German Chancellor to the country an agreement has been concluded for a consortium of German private sector agencies and TIDCO to establish Rs. 7000 crore lignite power project at Jayamkondan referred to earlier. Here the decision of the Union Government to provide counter guarantees for all private investments made in the power sector comes in handy, as this guarantee has been demanded by Germany as well as two other countries - France and Belgium. These counter guarantees need to be examined by governmental authorities carefully as the guarantees are against payments that the State Electricity Boards have to make towards power supplied by the private companies. This is a tricky situation as the State Electricity Boards are still to receive from the State Government Rs. 6351 crores for the free supply of power to agriculture and at reduced rates for domestic consumers. How will the counter guar-

antees be honoured. Once more in January, the State along with AP and Karnataka faced a serious black-out problem because the transmission line of the Ramagundan NTPC plant tripped. Again disconnection of the Tamil Nadu line of Mettur and units from the regional grid to get over the problem was resorted to. But this points to the need for more reticulate transmission lines being constructed. Finally at the end of the month, at long last, TNEB has raised power rates from Rs. 1.10 to Rs. 1.65 per unit for domestic consumers consuming 100 units and over. This increase will bring in Rs. 240 crores in 1993-94 and not worsen the Board's large deficit of Rs. 434 crores for this year.

Water and cyclone relief

The water situation in the state both for farmers and drinking was satisfactory except in Madras city where the two monsoons did not touch the catchment areas of the 3 lakes which supply water to the city. The city is on alternate day water supply at 55 million barrels a day - the lowest of all the metropolitan cities in the country. The real medium term solution is the Telugu Ganga project which will bring adequate Krishna waters to Madras in 1995. Till then there is this scarcity factor. The state has developed a Cyclone and Flood Mitigation and Rehabilitation project for Rs. 2500 crores, which along with the Telugu Ganga project and the Rs. 1100 crores second Madras Water Supply and Environmental project, another Rs. 804 crores Water Resources consolidation project to meet the problem of the state having exhausted its surface water potential and reaching a low level for the ground water have been forwarded by the Union Government to the World Bank. During the visit to Madras of the Vice President of the Bank in February, these projects were discussed and urgent action urged. World Bank loans for these water projects in

Tamilnadu will add and supplement its programme of loans underway for water development in the State. The repayment of the loan will be a burden on the State and the Union over a period of 10 year but there is no escape from it.

Agriculture

Due to the two good monsoons - South West and North East, the farmers have been able to raise two crops and in some areas three crops. NABARD reports that in addition to Rs. 2257 crores for the current year 1992-93, its groundwater potential linked credit plan for next year will be Rs. 2680 crores with long term investments under the priority sector being Rs. 1375 crores at 51 per cent. The balance will be disbursed on short term credit. The Governor's Address to the legislative assembly therefore calls attention to the fact the state's foodgrains production for 1992-93 has crossed 100 lakh tonnes (surpassing 1991-92 foodgrain output of 90.70 lakh tonnes) with rice production reaching an all time high of 78 lakh tonnes, as a consequence of which the State Government reports procuring 9.5 lakh tonnes of paddy during the samba season (February 28) against the target of 12 lakh tonnes. While this comfortable foodgrain position in the State is welcome, it should also be noted that it provides no relief in rice prices, which infact have increased in the open market from Rs. 7 to Rs. 8 per kg. The farmers have also used the plentiful water supply to increase the production of cotton and groundnut while there is no improvement in pulses production which is urgent for the people. In regard to the current controversy caused by the World Bank attaching certain conditions to their loan for agricultural development in the State, apart from the questionable nature of the World Bank laying down conditions on situations it is not familiar with, in this case farmers have accepted

departmental shedding all its trading in fertilisers, pesticides and other inputs but not in seeds and biofertilisers for sound technical reasons. Reason is on the side of the farmers. On the dairy front, Operation Flood III now being implemented with a total outlay of Rs. 68.19 crores is creating new facilities for dairy farmers enabling them to increase milk production beyond 1992's 93.81 lakh tonnes, moving towards the 1997 target of 115.32 lakh tonnes. Again there is need to help milk to reach the lower middle classes and those below for feeding their infants, which with the continuing rise in prices is not happening. The cooperative milk union should aim at this objective following the example of the Tamilnadu Adi-Dravidar Housing Development Corporation which is now operating a Rs. 100 crore prawn culture scheme for the poor SC group. The project which operates over 1000 hectares of the State's coastal area has selected 1000 poor SC beneficiaries each of whom is given a credit of Rs. 1 lakh to set up a one hectare prawn culture plot. This small fishery project is specifically aimed at generating income and employment for the poor sector of the population. On the side of research and extension, February recorded 26 research schemes with a heavy emphasis on fruits and vegetables (12) followed by paddy (7), other cereals (7) and a rather low animal husbandry record (1). This is somewhat uneven and in the coming months there should be more research and extension in animal husbandry - cows, buffaloes, pigs, poultry, and some lessening of the number on fruits and vegetables. Despite the heavy emphasis on vegetables month after month, the effect on increasing their supply and the further result of lowering their prices and certainly stabilising them is yet to be recorded. That is why the question that has been raised in the last six issues as to the effect of the research and even extension work in terms of the farmer's output, income and living levels needs continuous attention.

Industrial Development

The state's thrust in industrial development has been traced in the past 10 issues with satisfaction. This is reflected also in the Governor's address which describes this effort "as purposive and sustained which have yielded good results". He refers to new investments totalling Rs. 20,000 crores in various industrial projects, of which Rs. 8,500 crores resulted from across the table discussion and negotiation with industrialists which the Bulletin has reported (See Vol. XXIII pp. 80-81). In this accelerated industrial development of the State, the modalities have included creation of a good infrastructure (for which a specialised Corporation has been created), the promotion of the growth centres and the finalising of the Indo-Singapore Trade Corridor referred to.

Of the 20 industrial development project approvals recorded in February (in addition to those under power development), seventeen represent the positive side and three the negative. On the positive side, first to deal with the emerging problems of raw materials and marketing of wattle, cement and sorbital the SSM group is restructuring its major company, Tan India which is being expanded and diversified to aid its cement and sorbital divisions and meet the new expanding demand. Second, Navodaya Mass Entertainments Ltd., has tied up with TIDCO for Rs. 15.15 crore venture to set up an amusement park. Third the Bangalore based Bench Mark Group which is engaged in the development of residential and commercial complex is setting up the Benchmark Homes Resorts Ltd. at Ooty. The project is being financed by Rs. 180 lakh equity shares and the loans of Rs. 207 lakh from the Tourism Finance Corporation, Rs. 138 lakh from the Industrial Finance Corporation and Rs. 175 lakh as the promoters share. Fourth, the Shriram group is setting up a Rs. 11 crore acqua-culture project in Mayiladuthurai.

Fifth, Crompton Greaves is setting up a 100 per cent export oriented unit for the manufacture of micro motors in association with US and Japanese firms. The project is coming up in MEPZ. Sixth, the Tamil Nadu Small Industries Development Corporation (SIDCO) reports picking up its business in 1991-92 with its turnover increasing to Rs. 108.92 crores from the previous year's Rs. 87.79 crores. SIDCO also reports setting up a new industrial estate in Karur, in Tiruchirapalli district which will provide small entrepreneurs sheds and all the needed facilities. Seventh, Tamilnadu Ware Housing Corporation also reports a sharp revival, with 61 per cent utilisation of its storage capacity of 5.97 lakh tonnes. Eighth, Vijayakumaran Mills, Palani, reports on its Rs. 26 crore expansion programme in order to accommodate Rs. 100 crore turnover in the next two years. Ninth, Chettinad Silica, a 100 per cent export oriented unit reports that it is going into production in April for the manufacture of high purity silica powder. Tenth, SPIC Electronic and System Ltd. announces that it is taking up the manufacture of video cassettes, and digital data cartridges at its magnetic media plant. It is also expanding the capacity of its integrated circuit packaging unit from twenty five million ICs to thirty million ICs. Eleventh, Kailash Auto Finance Ltd., announces that it is entering the capital market with a Rs. 2.70 crore public issue to fund its expansion and diversification plan in the hire purchasing and leasing of heavy transport equipment, such as excavators, pay loaders, dozers and cranes. Twelfth, as earlier reported, in the power sector, the G P Birla group has tied up with the Siemens Group of Germany to set up the biggest lignite power plant to generate 1500 MW. Thirteenth, Salem Textile Ltd., announces that to help finance its expansion plans, including a joint venture in Malaysia for dying cotton yarn it is going public with an issue of Rs. 840 crores. Fourteenth, the Department of Industry announced in the leg-

islature that between August, 1991 and August 31, 1992, 341 entrepreneurs from Tamilnadu have obtained registration from the Union Government under the Industrial Entrepreneur Memorandum scheme which replaces licensing which has been abolished.

On the negative side: First, with the closure of Tamilnadu Ceramics, the government is considering writing off its loans and advances plus the interest due on them. In the current year, losses amount to Rs. 1.67 lakhs. Second, South India Engineering Manufactures Association (SIEA) report that the pumpset manufacturing industry in the Coimbatore region which accounts for sixty per cent of the country's manufacture of pumpsets is hit by demand recession resulting in huge accumulated stocks and inventories and heavy losses. Third, Tata Kothari Steels Ltd., reports that it has decided to shift its Rs. 75 crores pig iron plant from Cuddappa moving to Madras to Andhra Pradesh because of the 14 months delay in getting its land allotment from Tamilnadu government. This is serious and shows that the optimistic report of the Ministry does not tell the whole story. The chief minister who is the minister of industry should examine this case because it means that the government is still dragging its feet on streamlining and expediting decisions.

National

1993-94 Union Budget

The Union Budget was presented to Parliament on February 27 (the last Saturday) at 5 p.m. This timing which goes back to the days of British rule to enable the members of the British Parliament to listen to the Indian Budget at 12 noon after their question hour is no longer appropriate. The budget could be present at 12 noon after the question hour

in the Indian Parliament and thus give everyone, particularly the economic journalists who have to summarise and comment on it, a little more time, instead of keeping awake all night to write up the budget. Further, the budget continues the UK tradition of total secrecy before presentation (infact some chancellors of the Exchequer had to resign because of the "leak" of the budget). There is no need for this secrecy as the budget and its vari-

ous proposals should be scrutinised by members of parliament, economists and economic journalists for a period of 2-4 weeks at least. The secrecy is justified on the ground that the premature release of the proposals for tax reliefs or levies will lead to hoarding or unloading by traders and producers and so distort the market. This also is no longer true for the tax changes are marginal in relation to the total of the trader's transactions.

The budget presented for 1992-93 is summarised in Table 1.

Table 1: Union Budget

	1991-92 Actuals Estimate	1992-93 Budget Estimate	1992-93 Revised Estimate	1993-94 Budget Estimate
(Rs. in crores)				
1 Revenue receipts	66,047	75,688	78,279	84,209
2 Tax revenue (Net to Central)	50,070	56,456	58,179	62,739
3 Non Tax Revenue	15,977	19,232	20,100	21,470
4 Capital receipts	38,528	38,010	39,245	42,800
5 Recoveries of loans	6,020	6,491	6,225	6,655
6 Other receipts	3,038	2,500	3,500	3,500
7 Borrowings other liabilities	29,470	29,010	29,520	32,645
8 Total receipts (1+4)	1,04,575	1,13,698	1,17,524	1,27,009
9 Non Plan expenditure	80,469#	84,475	87,753	90,072
10 On Revenue Account of which	67,234*	71,233	74,461	77,654
11 Interest Payments	26,563	32,000	32,500	38,000
12 On Capital Account	13,235	13,242	13,292	12,418

	1991-92 Actuals Estimate	1992-93 Budget Estimate	1992-93 Revised Estimate	1993-94 Budget Estimate
13 Plan expenditure	30,96	134,612	36,973	41,251
14 On Revenue Account	15,074	18,337	20,518	24,185
15 On Capital Account	15,887	16,275	16,455	17,066
16 Total expenditure (9+13)	1,11,430	1,19,087	1,24,726	1,31,323
17 Revenue expenditure (10+14)	82,308	89,570	94,979	1,01,839
18 Capital expenditure (12+15)	29,122	29,517	29,747	29,484
19 Revenue deficit (1-17)	16,261	13,882	16,700	17,630
20 Budgetary deficit (8-16)	6,855	5,389	7,202	4,314
21 Fiscal Deficit [(1+5+6) - 16 = 7 +20]	36,325	34,408	36,722	36,959
22 Primary deficit (21-11) Increase in net RBI credit to Central Government#	9,762	2,408	4,222	(-)1,041
	5,508	5,389	5,400	4,314##

* Includes grants under article 275(1) of the Constitution for meeting plan expenditure.

Including other variations in Reserve Bank of India's credit to Central Government.

Not independently estimated.

The Table shows a rather modest increase, allowing tax inflation in revenue receipts in both the estimates and the revised estimates for 1992-93 which was a reflection of the agreement with IMF/World Bank on revenue reductions. This continues into 1993-94. Non-Plan expenditures is being slowed particularly on capital account, while the Plan expenditure if allowed for inflation is stagnant. The revenue and budget deficits should be noted and will be commented on later.

The budget statement starts with the main achievements of the 20 months of the present government described as i) restoring a measure of normalcy in external payments (which is not visible); ii) lowering the annual rate of inflation from 17 per cent in August 1991 to less than 7 per cent at present (during which period not a single price has fallen, this reference being to slowing the rate of increases in prices); iii) restoring of international confidence (which has not however resulted

or made possible any international commercial borrowing); iv) a good agriculture programme in 1992-93 (due to the good monsoon); v) a revival of industrial production (which is at a rather slow pace overall); and vi) the growth of the economy from 1.2 per cent in 1991-92 to an expected 4 per cent in 1992-93 (which is still a hope and a small one at that). The statement ends with attributing the economic strategy based on fiscal discipline and structural reform for this decisive upturn (leaving aside the other negative consequences). The highlights of the budget are:

- a) the priorities set forth in the budget are: i) continuing with the fiscal correction to curb inflationary expectations and to this end aim at lowering the fiscal deficit to 4 to 4.5 per cent of GDP, ii) use resources released by restraining expenditure in the last two years to give a fillip to development expenditure in 1993-94, iii) make further progress with tax reform, moving to a simple tax system, with moderate rates and much greater focus on compliance, iv) ensure that the economic strategy gives full support to agriculture (which has been completely neglected in the economic reforms to date), and v) move exports up to a point where the export income can help in managing the Balance of Payment problem and lessening the need for exceptional financing from abroad.
- b) Rupee is made fully convertible, abolishing its dual rate system.
- c) The sharp reductions in customs amounting to Rs. 3981 crores (wholly borne by the Union) and in excise amounting to Rs. 2248 crores gross, where with Rs. 1000 crores offset from increased production of excisable goods, the net loss of Rs. 1249 crores, shared by the Union at Rs. 708 crores

and states Rs. 541 crores. On these two customs and excise reduction the Union's net loss is Rs. 4572 crores.

- d) A sharp reduction in estimated budget deficit for 1993-94 of Rs. 4314 crores which is reflected in the over Rs. 1000 crores cut in RBI credit to government which is possible because of the new revenue source of 365 days' treasury bill.
- e) A substantial decrease in import duties on capital goods and inputs on specified health drugs, on project and general machinery, on personal computers, typewriters, fax machines upto Rs. 60,000 in value and jumbo rolls of line positive films.
- f) Excise reduction resulting from total exemption of coffee, tea, instant tea and large reduction of 20-25 per cent on excise on vanaspati, biscuits, electric fans, domestic electrical appliances, radio sets, cars, colour TV, refrigerators and air conditioners, buses and trucks, tractors and trawlers.
- g) No change in income tax or corporate tax except for a small increase in standard deduction from Rs. 12000 to Rs. 15000, and Rs. 18000 in the case of working women; wealth tax exemption for one house; and some small changes in gift tax.
- h) Complete tax holiday for five years for new power sector projects and new industries in industrially backward states and UTs.
- i) 125 per cent exemption for donations to approved national laboratories and 100 per cent tax deduction on contribution to approved universities and educational institutions of national importance.

- j) Presumptive tax for small businessmen extended to small transport operators.
- k) Additional incentives to small scale sector, to polyester and nylon filament yarn.
- l) The central Plan outlay for 1993-94 fixed at Rs. 63,938 crores is 32 per cent higher and is to be financed from the Budget to the extent of Rs. 23,241 crores (26 per cent) and the balance of Rs. 40,695 crores is to be met from internal and extra-budgetary resources. The large increase in the budget support

has enabled a step up in social sectors: education + Rs. 483 crores, health from Rs. 952 crores to Rs. 1310 crores, and welfare and rural development which will increase to Rs. 16500 crores (+20 crores) through the 22 per cent increase in NABARD refinance support and the setting up of a Rs. 5 crores venture capital for pilot projects in rural industries. The allocation for JRY is increased by Rs. 1300 crores to Rs. 3306 crores to create 1100 million more days of employment and train 3.5 lakh youths through TRYSEM along with Rs. 740 crores for rural water supply (+Rs200 crores).

Table 2: Union Plan's Sectoral allocations

Sector	(Rs. in crores)		
	1992-93 Budget estimates	1992-93 Revised estimates	1993-94 Budget estimates
Agriculture	1879	2009	2436
Rural Development	2610	3109	4429
Irrigation & flood control	231	206	275
Energy	14998	16520	21911
Industry & minerals	8198	8049	9634
Transport	9129	8265	10893
Communications	4890	4966	6245
Science, technology and environment	935	915	1251
Social services	5126	5189	6459
Others	409	401	603
Total	48407	49719	63936

m) Rs. 5700 crores provided to nationalised banks to meet the gap created by application of the first stage of provisioning norms under which banks will have to make a large provision of Rs. 10,000 crores for bad and doubtful allowances in their portfolios and for which the provision is spread over 3 years and permission to the State Bank and other nationalised banks for access to the capital market to raise fresh equity (through a new bond scheme) to meet the shortfall in capital required over the next 3 years.

n) SEBI which has taken over all powers of CEI is to be further strengthened by legislation for full investor protection.

o) Lending and deposit rates and interest on rupee export credit reduced by one percentage point from March 1, and on credit limits over Rs. 2 lakhs the interest rate reduced from 18 per cent to 17 per cent. SLR reduced from 36 per cent and targeted at 25 per cent in 3 years which will release credit to the commercial sector.

p) For special treatment to health care, import duty on specified bulk drugs reduced from 110-80 per cent to 25 per cent and uniform 50 per cent on specified drug intermediates in place of the current 60-100 per cent.

q) After neglecting it under the new Economic Reforms Programme, the Budget for 1993-94 gives priority to agriculture through:

i) The assurance of remunerative prices to farmers both by raising procurement prices as was done for kharif and rabi and not placing administrative restrictions on movements of agricultural products in the country;

ii) the increase in institutional credit is to be increased from Rs. 13800 crores in 1992-93 to Rs. 16500 crores in 1993-94, plus increase in NABARD investment refinance support earlier referred to and other innovation packages and schemes of NABARD; and

iii) reducing the high levels of protection to industry (it is doubtful whether the reducing of protection will lower industrial prices to farmers, it will certainly help the multinationals to enter the Indian market).

r) Rs. 630 crores being provided for the National Renewal Fund.

The Budget presentation concludes with the statement "Taking into account the revenue loss arising from the proposals relating to Indirect taxes (the Direct taxes were not touched), the Budget deficit for 1993-94 is estimated at Rs. 4354 crores (as set forth in Table 1 and the fiscal deficit Rs. 36,959 crores).

Some Comments

The Budget's main plus point is its clarity on which some further comments will be made subsequently.

The other plus point is the provision at long last made for the development of agriculture which the economic reform programme and structural adjustment policy has neglected so far.

A related plus point is the new emphasis on rural development which receives an increased allocation of Rs. 5010 crores, a step up of 62 per cent over budget estimates and 36 per cent over the revised estimates of last year. As a result both employment generation and capital formation in rural areas will be boosted.

Again the increased allocation to the Social Sector - health (+7.6 per cent), education (+30 per cent), labour (162 per cent) nutrition, rural drinking water supply, science and technology, social and women's welfare - is a small attempt to compensate them for the squeeze they suffered in the structural adjustment programme during the last two years. This is what the Finance Minister in his 1991 memorandum to IMF called "adjustment with a human face". Further the budget provision for the central plan steps up substantially the allocations for infrastructure, energy (+35 per cent), transport (+32 per cent), and communications (+26 per cent). This provision for improved infrastructure will help revive our stagnant industry and improve our exports.

Another plus point is the strengthening of SEBI in order to provide all investors, specially the small investors, protection and make all share and stock operations transparent so that future scams can be detected at an early stage.

Again, the Rs. 5523 crore reduction in indirect taxes (customs and excise) has several facets. To start with, the common man thinks that the Budget has reduced the prices of these commodities. Doordarshan's canvassing of public opinion, of the man in the street, on the evening after the budget presentation showed that 12 out of 15 people - shopkeepers, workers, self-employed, cartmen etc., - interviewed, thanked the Finance Minister for having reduced the prices of tea, coffee, biscuits, TV etc. The cuts in customs and excise have been interpreted as cuts in prices. This is the first budget of the Union government which does not collect additional revenues through increasing taxes. In fact all budgets hitherto have had newspaper headlines about the thousands of crores of rupees collected in additional taxes. Of course the government has built up the tradition of raising revenues outside the budget through raising administered prices

which do not pass through Parliament. In the last month the administered prices of coal and railway fares and freights have been raised. Even so, in this budget the government is giving away over Rs. 5520 crores as a kind of gift. To whom? Is it to the traders so that they can increase their margins? Is it to the producers and industrialists so that they can increase their production, reduce their costs and boost their profits further? Is it to consumers to whom at least a part of this reduction could be passed on, to relieve a little the heavy burden of inflation which they have faced for several, especially the last two years. Could some prices - of some essentials - actually decline as a result of the cut back in excise? On this will depend whether the reduction in customs and excise is a plus point or a minus point. There is also a puzzlement involved. How could the government not only not collect additional tax resources but give away over Rs. 5520 crores and at the same increase plan expenditures, the allocations agriculture and to the social sectors without cutting expenditures drastically. This is a puzzle, which needs unraveling when all budget documents are available for analysis. One of our leading journals after speculating on the various factors that have led to this give away, concludes that "the budget for 1993-94 is a sleight of hand". Further, a former finance secretary turned researcher remarked: "The figure work gives me the impression that it is either magic or bluffing or a combination of both". These are some first reactions that the puzzlement has evolved.

A similar ambivalent scenario is faced with regard to the full convertibility of rupee. Incidentally a question arises as to what happened between the writing of the introductory chapter of the Economic Survey where the flat statement is made that the full convertibility of the rupee on current account will have to wait for 2 or 3 years (para 1.44) and the statement of the Budget

3 weeks later (para 26) when the full convertibility of the rupee on trade account was announced as from 1 March 1993. There could not have been a surge of exports and large inflow of export income in the intervening few weeks. In fact there was no such development. And all the arguments for full convertibility advanced in the budget document - that after the partial convertibility was announced, a year later the exchange rate had remained stable, existed well before the Economic Survey document was drafted. What made the government change its mind so fast on this important issue?

Will the full convertibility which will push up the import cost of crude and petroleum products and fertilisers, which will now have to be paid for with foreign exchange bought at the full market rate push up prices and fuel inflation? The government says that in relation to crude and petroleum product prices, the surplus in the Oil Coordination Account and the current softening of international crude prices will keep their prices down. This is a rather shaky foundation to contain the potential spurt to the inflation. Further given the fact that the 40 per cent lower exchange rate did not lead exporters and large export houses to increase their exports, this full convertibility may not have a positive impact on exports. All import intensive products will have to put up their prices. The possibility of a selective cut in imports is now not possible, because the customs and excise concessions are as much in favour of luxuries and non necessities as capital goods. The exports scene is unclear.

Another minus point is the continuing high revenue deficit, caused by increase or non-reduction in non-plan non-development expenditures. The Bulletin has repeatedly advocated a freeze in the filling in of central government staff vacancies at least for one year to start with. Bringing down the revenue deficit is far more urgent than reducing

the fiscal deficit, which has relevance to the mammoth deficit of the US economy and not to the Indian economy.

Some other small issues relate to: i) the discrepancy between the receipts budget for 1993-94 which puts customs receipts at Rs. 31,000 crores and the figure in Budget at a glance Table 1 at Rs. 27,727 crores. Which is the correct figure is important as that will decide the real net revenue loss from customs and the leeway for the government to reduce total customs; ii) the central plan outlay is increased by 32 per cent on the basis of the 1992-93 budget estimate, but is only 26.39 per cent on the basis of the revised estimate; iii) the number of promises in the budget to be accomplished, while there are at least 8 specific promises in the last 2 budgets, which are unfulfilled. Taking just 2 of them, the small farmers agri-consortium is still a non-starter. Again, the presumptive tax on which much was promised and expected has to date provided only Rs. 600 crores, despite which this year's budget extends it to small transport operators. This will also be a flop. The means of implementation have not been thought through on these and so they are non-starters.

There is some ambivalence also in the reduction of the fiscal deficit for 1993-94. IMF wants it to be reduced to 4 per cent of GDP but the government is holding out for a lower reduction of 4.5 per cent in order to have some resources to promote development. Incidentally, there is some difference in the calculation of the deficit between the government which estimates it at 5.3 per cent in 1992-93 and IMF which estimates it at 5 per cent and which is due to the inclusion or exclusion of some items. This should be straightened out.

The repeated emphasis of the economy becoming a part of the global economy, of the globalisation of the Indian economy

seems irrelevant. Given the fact that we are still far away from a minimum of self-reliance in our industry and services and our employment generation is yet to pick up, and that there are still over 400 million persons (250 million according to the government reckoning) going to bed hungry every night, these are the priorities for our economy and not globalisation.

The budget makes no provision to stimulate savings which are stagnant over the last 5 years. In fact, the lower deposit rate will reduce deposits and the incentive to increase a person's savings beyond the minimum. The household sector which is the main saver has not been given an inducement to increase its savings in financial or property terms.

The states are once more treated as the poor relation. Their share of central assistance is set at Rs. 15010 crores which is a small 5 per cent. On the details, we have to await the receipt of the budget documents.

Finally, it is to be regretted that the budget proposes once more selling public sector equity to the tune of Rs. 3500 crores this year as a means of meeting our budgetary needs. This is a form of eating into our capital, which under no circumstances, except of complete indigence, can be justified.

These are the first thoughts of the Bulletin on the Budget.

Railway Budget 1993-1994

Once again the separate budget for the railways is being presented, continuing the practice introduced by the British when they were ruling the country and for which they had one justification, namely, the railway was an essential part of their strategy of controlling the country and ruling over it

and for them at that time it was also a money maker. Neither of these two reasons is operative in free India today. It is difficult to judge the railway budget in isolation from the general budget (it is to be hoped that the finance ministry at least is able to take an overall look at the total budget for 1993-94 in giving its consent to the various proposals in the railway budget). It is not only not possible to take an integrated view of the railway budget with the separate presentation and the insistence that it be voted upon and approved before the general budget is established, nor is it possible to judge the financial and technical feasibility of its various components. Presenting a separate railway budget is a time wasting operation - the time of government and Parliament is expended on a senseless activity - and has no more justification than presenting a separate budget for SAIL or PSUs as others. The proposed 1993-94 Railway budget and the revised estimates for 1992-93 and actuals for the 1991-92 are presented in Table 3.

The highlights of the proposed budget are: a) the proposed increase in passenger fares and freight and parcel charges will bring in an additional Rs. 1848 crores, Rs. 431 crores from passengers and Rs. 1417 crores from freight, which is in addition to the increased income of Rs. 1366 crores for 1992-93 through similar hikes; the minister had been warning during the last 2 months of a fare and freight increase. The justification is the drastic reduction in budgetary support to the railway's plan outlay from 75 per cent in the V Plan to 42 per cent in the VII Plan and VIII Plan proposal, under IMF pressure to 20 per cent and the 16 per cent in 1992-93 and 14.7 per cent in 1993-94. b) An across the board 10 per cent hike in passenger fares (including 18 to 25 paise increase in season ticket is proposed and a hike of 10-12 per cent in freight charges. c) The rise in freight charges applies to all commodities transported except those exempted from the

Table 3 : Railway Budget, 1991-93

1991-92 (Actuals)	1992-93 (Budget)	(Rupees in crores)	1992-93 (Revised)	1993-94 (Budget)
13,729 00	15,884 00	(a) Gross traffic receipts	116,115 00	19,021 00
9,209 19	10,460 00	(b) Ordinary working expenses	10,575 00	11,955 00
2,000 00	2,300 00	(c) Appropriation to Depreciation Reserve Fund	2,300 00	2,400 00
1,180 00	1,200 00	(d) Appropriation to Pension Fund	1,200 00	1,500 00
12,389 19	13,960 00	(e) Total working expenses (b)+(c)+(d)	14,075 00	15,855 00
1,340 55	1,924 00	(f) net traffic receipts (a)-(c)	2,040 00	3,166 00
200 40	206 00	(g) Net miscellaneous receipts	204 66	282 00
1,540 95	2,130 00	(h) Net Railway Revenue (f)+(g)	2,244 66	3,448 00
1,031 48	1,150 00	(i) Dividend payment to General Revenues	1,146 00	1,253 00
74 47	416 46	(j) Payment of deferred dividend	341 98	
+ 435 00	+563 54	(k) Excess shortfall (h)-(i)-(j)	+756 68	+2,195 00
435 00	563 54	(l) Appropriation to Railway Development Fund	385 56	235 00
337 72	281 82	(a) Repayment of loan & interest	251 96	
97 28	145 00	(b) Development of works	134 60	235 00
	136 72	(c) Balance for Plan Finance	370 12	1,960 00
		(m) Appropriation to Capital Fund railways		
895 %	87.7 %	(n) Operating ratio	87.0 %	83.1 %
87 %	10.9 %	(o) Percentage of net revenue	11.4 %	15.3 %
to capital at charge and investment from Capital Fund Railway				

* Capital Fund to be financed from internal resources is proposed to be constituted from 1992-93. A memorandum has been submitted to RCC in this regard.

increase in the 1992-93 budget - namely, salt, kerosene, livestock, oil seeds, LPG, edible oils, fodder, gur, shakkar and jaggery, fruits, vegetables, tea, and organic and chemical manures. d) A new "sleeper class" is introduced with a 25 per cent rise above the ordinary for second class fare. e) A capital fund with an initial corpus of Rs. 2495 crores is to be set up into which what was termed profits of surplus will be paid in order to compensate for the shortfall in plan and budgetary support, as noted earlier and the failure in 1992-93 of the market borrowing exercise of the Railway issue of Indian Railway Corporation bonds. The Fund is to be used for capital investment for i) track renewals, ii) construction of new lines, and iii) other such developmental investments. f) An insurance scheme is proposed to cover all rail users against accidents and injuries. g) The freight traffic target for 1993-94 is set at 320 million tonnes, against the 1992-93 target of 354 million tonnes reduced to 350 million tonnes because of the Ayodhya disturbances which also reduced the passenger traffic and its earnings, but which in the proposed 1993-94 budget is expected to record a growth of 8 per cent. h) The railway plan outlay for 1993-94 is Rs. 8500 crores, 70 per cent of which is raised internally, of which Rs. 810 crores is for gauge conversion, Rs. 2750 crores for rolling stock and Rs. 1010 for track renewals. Nine new trains and 319 kms new line projects and sectors are also proposed.

The overall impact of the Railway budget on the economy will be inflationary as it will add to the producer's and distributor's costs, some of which will have a cascading effect. It is to be regretted that some essential items of consumption, particularly by the poor - such as foodgrains, pulses, sugar, diesel, oilcake and coal - have not been added to the 12 exempted items. Incidentally, the minister should clarify whether the exemption for the 12 items continues from the previous year as stated in para

32.2 of his speech introducing the budget, while para 32.5 states that "the increases will also apply to the 12 commodities". Further in 1992-93 budget the fares and freight increases estimated a surplus of Rs. 564 crores, while the actual surplus touched Rs. 757 crores. In view of the fall in passenger and traffic volume growth, this increased surplus shows that the hikes are higher than necessary to balance the budget. In the Plan for next year, the priorities should be clearly indicated and should include replacement of outworn tracks, outdated wagons and overaged locomotives which should be given the first rank, while the starting of new lines is given the lowest place. This is not clear, and could go a small way for making up for its inflationary effect of the economy, earlier referred to.

Economy

The Review of the Economy for 1992-93 begins with the Economic Survey of the government, which has been placed on the table of Parliament. The summary conveys different messages to different persons. To the government - that is Minister of Finance and his officials it creates an air of hope and optimism. To the business men and the media, there is the attempt to read between the lines as to what it conveys in the matter of taxation, what relief to business firms, what incentives, etc. For instance, one of the leading papers, The Hindu, summarises the Economic Survey in its headline as "survey hints at tax relief", that it indicates that we will have a budget, to be presented in a week, with stable tax regime and lower taxes, whereas the government says in the opening words of the survey that substantial progress has been made in the course of the year in bringing about fiscal correction and this is reflected in the decline in inflation rates, and that there are pointers that full convertibility of the rupee could come about

only in 2 or 3 years; whereas another daily the Indian Express says that the Survey indicates that we will have a convertible rupee soon. The Survey's highlights may be first summarised. It says that: 1) The phase of crisis management is over and that the growth achieved so far by economic stabilisation measures and structural reforms is satisfactory. 2) It states that the process of structural adjustment and deepening of the reform process has to continue and should cover all areas - fiscal, monetary, financial, trade, exchange rate, industrial, agricultural and energy policies. 3) It expects GDP this year (1992-93) to grow at 4 per cent compared to last year's 1.2 per cent, with agriculture being the lead agent at 5 per cent (the kharif harvest likely at 8 per cent) and industry lagging because of the recession and growing at 3.8 per cent between April and October 1992. 4) The Balance of Payment problem continues to be serious and calls for a) a much stronger export programme, and b) in the short run the mobilisation of external financing from multilateral agencies. 5) In foreign trade the level of imports in 1992-93 is estimated at \$25 billion and total exports at \$19 billion leaving a trade deficit of \$6 billion. 6) The December disturbances continuing into January in Bombay and Gujarat led to bottlenecks in transportation, slowed exports and industrial production and reduced revenue collections. These disturbances and the irregularities in security trading, a polite way of describing the bank and stock exchange scam, slowed economic progress. 7) Inflation, however, declined from 13.6 per cent in March 1992 to 6.9 per cent in January 1993. This decline was marked in primary articles including foodgrains where the annual rate was (-)3 per cent at the end of January 1993 against the (+)24.3 per cent at January end 1992. Administered price rises increase the pressure on prices but this will even out in 3 months when the underlying trend will end up around 5 per cent. 8) It attributes the moderation

of the inflationary pressure to the contraction of the fiscal deficit, and so recommends reinforcing this strategy. 9) It refers to the Chelliah Committee recommendation on taxation and says it deserves full consideration as tax relief leads to better compliance and tax revenues will be more responsive to the growth of the economy. The States should also move in this direction of moderate and stable rates. 10) In monetary policy, where total bank credit is in commercial sector expanded by Rs. 2101 crores upto January 8 against last year's Rs. 7125 crores and M³ at 13.5 per cent, it recommends a comprehensive reform of the banking system, the capital market and their regulation which involves

SLR being reduced to 25 per cent in 3 years and CRR to below 10 per cent over a 4 year period, and a further rationalisation of lending rates. 11) The full convertibility of the Rupee on current account including unification of the dual exchange rates will be achieved in 2 to 3 years, depending on the inflation rate and the overall balance of payment position. The most valuable part of the survey is the data on key indicators as set forth in Table 4.

The Economic Survey is valuable in that it gives some essential information on the economy this year (1992-93) along with that on the last 2 years. Its broad indication of the direction of the economic reform programme for the coming year based on this year's experience and the commitment to IMF and World Bank is important. On the whole, the survey is more subjective this year than that of the last 2 years. It reflects the hopes of the government, rather what has happened and what is likely to happen based on these trends. The most serious factor is the clear statement that the programme of fiscal deficit correction is to be continued and in fact reinforced, instead of acknowledging that this drastic reduction has been the major cause of

Table 4: Key Indicators

	1990-91	1991-92(P)	1992-93(P)
GDP(Rs. 000 cr.)at current price	530.0	609.5	694.8*
Agricultural production	192.0(P)	186.6(P)	195.9*
Foodgrain production(MT)	176.4	167.1	176.7*
Industrial production(2)	212.6	212.4	208.3(3)
Electricity generation (TWH)	264.6	286.7	221.3(8)
WPI(4)	191.8	217.8	231.0(5)
CPI for Ind.workers(6)	201.0	229.0	244(7)
Money supply (M3) Rs. '000 cr.	265.8	315.1	350.2(8)
Import at current prices (Rs. cr.)	43193	47851	47480(8)
Export at current prices (Rs. cr.)	32553	44042	37329(8)
Foreign currency assets (Rs. cr.)	4388	14578	13688(9)
Exchange rate (Rs/US\$)+	17.9	24.5	25.9(10)
Market rate (Rs. /US\$)#+	—	—	30.4(10)

*Anticipated (P) Provisional +Per cent change indicates the rate of depreciation of the Rupee. #indicative exchange rate as announced by FEDAI. 1. Index of agricultural production with base triendum ending 1969-70 = 100. 2. Index of industrial production 1980-82 = 100. 3. April-October 1992. 4. Index with 1981-82 = 100. 5. As in end December 1992. 6. Index with 1982=100. 7. As in November 1992. 8. April-December, 1992. 9. As on Jan.31.1993 for 1992-93 and at the end of March for previous years. 10. April-Jan. 1993.

the industrial recession, the reduction in investment in agriculture and the social sectors and the promise of discussing with IMF the level of the present and future reduction. There is also an air of complacency of the effects of the structural adjustment programme without acknowledging its price as increasing unemploy-

ment and deepening poverty. On inflation, the Reserve Bank, using erroneous advanced time series techniques, forecast in early February that the average annual rate of the growth of inflation for 1992-93 may be 10.5 per cent. This is based on the October and final data that may be 7.95 per cent by March 31, 1993. This

is not taken into account by the Economic Survey which refers to 6.9 per cent annual inflation at January end. It is desirable that the 2 agencies - RBI and Finance ministry (CSO) get together and present a single inflation figure. Further the inflation reduction is based on slender evidence and does not take account of the limitation of relying solely on WPI. It is still not too late to acknowledge some of these aberrations and correct the reform programme during this year. The Economic Survey should be studied side by side with the President's address to Parliament (made a week earlier) where it is reported that i) the total investment has been increased to Rs. 7,98,000 crores, of which the public sector was Rs. 4,34,000 crores, a pointer to our move towards indicative planning. b) The year shows future consolidation on the economic front and structural reform. c) Data on industrial growth at 3.8 per cent in 1992-93 and exports at 3.4 per cent in April-August 1992 and the comfortable \$5.5 billion of foreign exchange reserve are referred to along with the liberalisation of foreign exchange controls which was also repeated in the Survey. d) The operationalisation of the National Reserve Fund and its plan to revive the growth in the small scale sector are referred to. e) The data on agriculture, PDS, and fertilisers, and JRY and IRDP thrust in rural development are repeated in the survey. f) Some issues on disease control and population growth, education, science and technology, and employment generation are also recorded. Related to the Survey is the early February account of the rise in the saving rate in 1991-92 when per capita expenditure has risen along with real per capita income which is explained by the government at a later time as being due to the government's final consumption expenditure falling away marginally by 0.1 per cent along with the fall in real capital formation. But this does not take account of the role of "Black Money", both stock and flow, and its operation through the

Bank scam. The uncertain data base combined with CSO's advance estimate of national income for 1992-93, an innovation are examined. Every item of this estimate is higher than the careful trend study which the Mid-Year Review of the Economy of IIC shows. Again, RBI's Department of Economic Analysis and Policy points out a disturbing fact in the growth scenario - that the consumer durables sector recorded the highest growth rate at 113 per cent in the 1980s, while consumer non-durables consisting mainly of wage goods recorded the lowest growth rate of 68.3 per cent in that period.

Inflation

In addition to the forecasted inflation rate of the Economic Survey at 6.9 per cent for 1992-93 as at January 1993 and that of RBI at 10.5 per cent for 1992-93 as at October 1992 referred to earlier, the government reports that the wholesale price index on January 30 was 238.6, giving the point to point annual rate of inflation at 6.85 per cent. Indices of food articles, chemicals, chemical products, non-metallic mineral products, transport equipment and parts showed an uptrend during the month. The annual rate of inflation based on the consumer price index in December 1992 was 8.0 per cent, the CPI for industrial workers being 243. Taking into account the average of CPI for 1992 over the corresponding period of 1991, the annual rate of inflation works out to 11.8 per cent. On a month to month comparison, the annual rate on a point to point basis was 14.4 per cent in April, 14.7 per cent in May, 12.9 per cent in June, 13.1 per cent in July, 11.5 per cent in August, 10 per cent in September, 9.4 per cent in October, 8.4 per cent in November, and in December, as noted earlier, 8.0 per cent. Two points may be noted in this matter: first that the annual rate of the consumer price index has declined continuously for the third

quarter of 1992-93 and second the near convergence of the inflation rates based on WPI and CPI. Both are beneficial to the common man. But the combined effect of the sharp increases in railway fares and rates and those of administered prices will in the next few months push up the inflation rate. The first administered price increase was effected in mid-February through the 12.42 per cent increase in coal prices, so that the coal consumer will pay Rs. 42-46 more than the existing Rs. 322.388 per tonne. Its first effect will be on the poor housewife, and on the heavy industries like steel, power, cement and ceramics, all major consumers of coal.

Budget Posers

There were some issues to be faced even before the budget for 1992-93 was moved. The most insistent is as to why 3 weeks before the budget was presented, that is, on February 9, the government announcement about the cut in the import duty from 255 per cent to 150 per cent on baggage brought in by those returning from abroad? Why NRIs are permitted to bring in 100 Kgs of silver on payment of Rs. 500 duty per Kg in foreign exchange? Why has the 5 year limit for no sale of imported baggage been waived? Why have 10 items such as TVs, VCRs, cosmetics and cigarettes been removed from the sensitive list? Why another parliamentary convention of announcing any major tax proposals through the budget been violated? There are many views about what these signals convey but the major issue which has been insisted on by the Bulletin so that the Parliament's right to review and accept or reject such proposals should not be abridged. A second issue which the Budget poses is the non-fulfilment of the many promises made in the 2 budgets presented: the Finance Minister has not fulfilled 8 important ones - the setting up of a tariff commission, the establishment

of a chief commissioner for the non-resident Indians, the issue of gold bonds in return for gold, the launching of the small farmers agri-business consortium, a national court of direct taxes, a bill on direct taxes code, the setting up of a settlement commission to deal with customs and excise disputes and the amendment to the customs and excise appellate tribunal. These lacunae should be corrected and the present budget could at least choose the most important of them - like the agri-business consortium for action. A third poser is the decline in the revised central plan outlay which together with the decline in market borrowing is likely to aggravate recessionary conditions. Finally, there is the Chelliah committee report which ranges over a wide field, of which the government has rightly picked only a few that suits it. Keeping on hold its recommendation to abolish IPRI and SDF for now, in relation to the reduction in customs duty, what needs to be borne in mind is that rate of reduction is smaller than the rate of devaluation of the rupee.

Agriculture

The agricultural production setting for the rabi crops is disquieting. The rabi crops in question are wheat, gram, barley and rape and mustard seed in the North where the weather in most of February has been unusually warm. In Punjab, Haryana, Western UP and Rajasthan the temperature is 8-12 degree above normal. It ought to be till mid-March 15C maximum and 3C minimum. The damage to the wheat crop is estimated at about 30 per cent and the meteorological outlook gives little indication of relief. Farmers and governments expect the heaviest setback in wheat. A second cause for the expected reduction in production is the decline in productivity of wheat which is leading to land being diverted from wheat. While the farmers are unloading last year's stock, they are likely to withhold this year's crop in order

to get a higher price. Does this mean that there will have to be wheat imports again this year? The procurement of rice, on the other hand, is looking up. As on February 9, 9.08 million tonnes have been procured, compared to 7.99 million tonnes at the time in 1992. The other positive development is the news that the 2001 target of 230 million tonnes is not impossible if a) in the Green Revolution areas wheat productivity is increased by 1 tonne per hectare and hybrid rice in assured irrigation areas also similarly increased by applying the technology in a systematic and phased manner; b) a better water and soil managed and implemented farming methods in dry land areas are followed which will enable a wide range of hybrid crops to do better than the HYV. With sound dry farming techniques, the potential of the hybrid millets could be well explored. The shift towards ecologically sound agricultural technologies emphasises developing varieties with built in resistance to pests and diseases, integrated pest management and integrated nutrient and water management, which also involves minimising the use of polluting inputs into the agricultural system.

On plantation crops, three developments in February should be noted. First the domestic price of tea has shot up because tea output in 1992 has fallen by 5 per cent, to 702.8 million tonnes from 742.5 million tonnes in 1991. The major contraction was in the south by 18.2 per cent due to weather conditions - frost and dry weather, and the price has risen to a point where the dealers' association has approached the commerce ministry to suspend the export of tea till the new tea crop comes on the market. Specifically they have requested that the Tea Board should not issue export licenses for tea and that tea producers should be compelled to sell 75 per cent of their crop in the country. These suggestions have been made whenever there is a real shortage of tea and a decline

in tea production. The export business, however, is not something in which there can be summary reduction. That would only reduce export demand on a long term basis and also production through creating unwanted domestic surpluses. The real solution should be short term action for the Tea Board to mobilise all sources of tea to tide over the 2-3 months shortage problem. The other development is the opening up of participation in international exhibition as a way of promoting plantation crops. This was sharply demonstrated by the participation of the Spices Board exhibiting Indian spices, Oleoresium, spice powders, spice extracts, etc., at the Seventh Food Ingredients Europe Exhibition in Dusseldorf, Germany in early 1993. It was an eye opener to see the rapid registration of the demand for Indian spices. In International trade exhibitions as a means of expanding exports, introducing plantation crops to importers, dealers, technicians and raising the quality by ensuring the ISO 9000 mark has come to stay - like engineering products, textiles, leather goods, gems and jewelry which use international exhibition to make their goods known. New plantation crops - tea, coffee, rubber, spices which have been somewhat passive, should enter the international exhibition area as a means of finding new markets, improving quality and learning from other producers and technicians the latest development in the plantation crop field. The third development is the realisation that given that plantations consume 5.8 million MW of energy annually, with the tea industry alone consuming more energy than the whole steel industry, a programme of energy management is being elaborated with a start of its execution. The energy consumed by each estate is being identified and alternative non-conventional energy is being tapped with the help of NABARD. This programme is also in the interest of the consumer as with the increase in production and production costs, prices will go up. Or alternatively the increased

production may lead to falling prices and recession, already being experienced by the rubber industry.

Industry

As noted earlier in the Economic Survey, CSO's quick estimates for November 1992 records a growth of 4.3 per cent, while taking account of the IIP upto September and the quick estimates from October and November shows a growth rate of 3.9 per cent for the first 8 month of 1992-93. This is a slow but encouraging revival of the industrial sector.

Public Sector Enterprises

Apart from the problem of disinvestment of profit making public sector units to add to budget resources, which is a form of capital consumption, a recent study of 316 public sector units with investment of Rs. 200,000 crores, the original project cost of which was Rs. 62,287 crore, records a cost over-run of 71.8 per cent and time overrun of 12-75 months. 300 are behind schedule resulting in higher costs and 190 projects had cost increases for physical and financial reasons. The highest cost overrun is the fertilisers (420 per cent) followed by iron ore and steel with (158 per cent). This analysis should alert the managements to the problem that need attention and the macro analysis shows that for the post 1989 projects there are both cost and time overruns. The corrective action suggested include project estimation of costs and gestation periods, detailed appraisal of the state of preparedness from all angles for timely completion of projects and a selection of competent people to manage them. The central public enterprises survey for 1991-92 reports that the profit of the 246 Public Sector companies grossed Rs. 722.14 crores for the year. The fall of the profit of the oil companies

by Rs. 519.54 crores, leaving a net profit for the sector of Rs. 202.20 crores. The fall in the profits of the petroleum companies is due to the decline in profits of the Oil and Natural Gas Commission.

Private Sector Performance

The ICICI study on the financial performance of the private sector of the economy (sample of 370 large and medium units) highlights the curious fact that on the one hand they record an expansion of their sales (+17.7 per cent in net sales) for the period April-September 1992 and a decline in their profitability ratios on the other (decline from 8.1 per cent to 6.8 per cent). The sharp fall in profit ratios has been experienced by the larger companies of the private corporate sector. This needs study as the main motive forces for the private sector units in contrast to the public sector enterprises is to maximise profits. The study itself attributes the fall in profits to demand recession, increase in raw material costs, hikes in power rates and transportation charges and interest payments. These do not explain the sharp fall reported.

On individual production, with sugar products to match the annual domestic consumption of 116 lakh tonnes, the industry has an accumulated inventory of 50 lakh tonnes from the 2 previous years and so the government has hiked the levy sugar price by 20 per cent (which will hit the poor and other middle classes) and its supply through the PDS has been reduced by 13 per cent which will give a fillip to the free sale of sugar and monthly release will be regulated to bring up prices. The storage and associated costs of 10 per cent of the inventory will be subsidised by the government to support the creation of the buffer stock of 5 lakhs tonnes. The export option is ruled out because despite the devaluation, international sugar prices are well below even the new levy price. The

question which arises with all this talk of liberalisation and allowing the free play of the market is, is it actually helping to keep sugar prices high instead allowing the supply demand situation to result in a price decline. Is this not a case where government should free the sugar industry from controls and administering its price and distribution?

On crude, the data released in February is depressing, domestic crude production showing a decline of 10.8 per cent in April-December 1992 compared to the preceding year's 9 months. Domestic production which was 70 per cent of total crude consumption in 1984-85 has been steadily declining to 56 per cent in 1990-91, 50 per cent in 1991-92 and similarly in 1992-93, increasing the pressure on the BOP resources. Further, natural gas declined in April-December 1992 from the previous year's 32.92 million tonnes to 29.44 million tonnes according to the Economic Survey which explain the cause for this decline but does not consider the only solution to this situation that this Bulletin has been urging - namely rationing the available supply among users, including the priority users. This year's import bill will exceed Rs. 13,000 crores. In addition to the question of rationing which has been raised here and on which there is a deadly silence, there is the question of using the price weapon. At long last the government has accepted one of the two major recommendation of the Kaul Committee to convert ONGC into a public limited company and not the other recommendation to split the company into 3 companies, which is a sound decision. ONGC will be able to raise funds from the market to finance both its programme of exploration and renovation of its existing wells. But this raising of 20 per cent of its needed funds from the public will depend on the price which the government pays to ONGC for crude oil. At present it pays \$7 per barrel while the international price is \$17. This anomaly must be corrected as otherwise private companies - both

domestic and foreign - will sell their production abroad and domestic supply will continue to diminish our output. Now that ONGC is going public, this discrimination for which there was never any justification will be ended. Further, it is hoped that the numerical analysis of the enormous fiscal data in oil exploration that is available will help to locate speedily the petroleum bearing and rocks and areas and so increase the supply of crude. But this is a long term - 5 to 7 years prospect.

On coal, earlier the steep rise of 13 per cent in coal prices has been referred to and the question rises whether this is the price being paid for the industry's inefficiency. The reasons given by CIL for the rise are the same as given in December 1991 - the increase in wages, explosions, and interest rates, etc. This is true except that wages which accounts for half of the operational costs have been steady and the administered price policy has not been very fair to the industry. But the question is whether the industry has made any effort to step up efficiency and productivity in achieving economies of production which could have taken care of the major part of the rise in input costs. In other words, this annual demand for price increase should be replaced or supplemented by a more scientific and sensible policy benefiting both the producer and consumer. The past inefficiency was covered by budgetary support which also added to the unfair administered prices referred to. The management can be more prudent in reorienting its production planning, moving away from sole reliance on target oriented production which leads to maintaining pithead stocks, and the non-availability of the right type of coal. Hence, there is the demand for need oriented coal production which will shift the focus from reaching the target anyhow using open cast mining which should be replaced by underground mining which will produce the high quality coal needed. This is needed

and also possibly an expert study on the financial, managerial and organisational implications of moving towards a decontrol regime. In the meanwhile, CIL should streamline its production cost which ranges from Rs. 526.50 per tonne in ECL to Rs. 141.90 in Mahanedo coal fields, arising from large open cast mining and deep underground and bad geo-mining conditions. Here management must control these variations in the short term.

Foreign Trade and BOP

The VIII Plan export target of an average 16 per cent seems well high unattainable and the sober language of the Economic Survey on export prospects for 1992-93 is more than justified. The Trade for the first eight months of 1992-93, April-November 1992 show a more than doubling of the trade deficit from \$1430 million in April-November 1991 to \$3091 million in April-November 1992. This is reflected in the BOP position with the foreign currency assets dropping to \$4.852 billion at November end 1992, the subsequent increase to 5.435 billion reported by Economic Survey as at January end 1993 being due to the loans from IMF, WB and ADB. Exports in the first 8 month of 1992-93 went up by a small 0.5 per cent over their level 2 years ago, when imports were down by 5.9 per cent. The trade deficit was 24.1 per cent less than that for the year before last (as 1991-92 was a crisis year). The export performance of April-November 1992 saw a rise by 5.9 per cent, but in December the exports fell by 12.3 per cent, which means to make even the lower target of 6 per cent exports growth, the January-March exports will have to increase by 12.3 per cent, which is difficult with the unsettlement in Bombay and its suburbs. The VIII plan target of 16 per cent, even if the 1992-93 exports reach the difficult 6 per cent increase, requires an average of 18.6 per cent in the next

4 years which is difficult and causing BOP strain. To promote exports, the Chelliah Committee recommendation to cut import duty will help, but apart from the problem of the loss of revenue for the government, there is also the danger of India turning into a dumping ground for surplus seeds and agricultural commodities produced in the West. There is no anti-dumping legislation in the country, the Chelliah Committee has recommended that the time limits for the investigation and financial findings should be expedited, provided the government and industry gather speedily all the information needed on costs and levels of production on goods whose producers resort to dumping. Meanwhile engineering exports particularly to UK at 42 per cent is doing well; it is reported that the poor quality of textiles is bringing down their exports, its share in world textile exports being a small 2 per cent which should be pushed up.

Aid and loans

In February, IBRD financed its loan of Rs. 804 crores for the Tamil Nadu's water consolidation project referred to earlier under the state sector. On the other hand, it is threatening to suspend the Rs. 530 crores loan for the National Sericulture project because of the lengthening of its life by 2 years. This is good to help develop project execution without time overruns, though it is regretted that an outside body is involved. As noted earlier under the state section, there have been a number of agreements signed with Germany to provide loan for development projects, including Rs. 155 crore as soft credit to the Orissa lift irrigation and a small Rs. 55 crore as a line of credit for ICICI. But its loans for DFL 133 million amounting to Rs. 231 crores each for 1993 and 1994 have been agreed for budget and import support and for projects in rural drinking water, environment, irrigation, agriculture,

women's development, non-conventional energy sources and surface transport. IOC has concluded a 100 million short term loan agreement with the Gulf Bank Kuwait to finance import of crude and petroleum products from Kuwait. The Asian programme of aid/loans is set forth by OECD covering Australia (\$1.1 billion 1991), Japan (11 billion), New Zealand (\$100 million), China (\$120 million) South Korea (\$70 million) and Taiwan (\$121 million). The aid/loan climate in Asia is opening up with improved BOP earnings, except by its poor countries.

Human Resources Development

Education

The main development in the education sector in February was the Supreme Court judgement on the system of capitation fees in higher education. Now the court has set forth clear guidelines on this issue. It rules that a citizen of the country has a right to establish an educational institution but no right to affiliation, recognition or grant in aid. It rules that non-aided colleges in the private sector will have to and are entitled to charge a higher fee than what is charged by government run institutions, which should be subject to a ceiling to be determined in accordance with the "scheme" formulated by it. Under the scheme the payment seats will also be filled on the basis of inter se merit as applicable to the government seats and the management will have no quota which it can distribute arbitrarily. As for the fee, the state governments have been required to constitute a committee which will determine the ceiling after due enquiry. It did not decide on the content of the fees and left it to the state panel, or the Centre or UGC to decide whether only the running cost or even the part or all of the capital costs should be recovered by the fee. There is some agitation against

including capital cost in establishing the fee. But this is necessary and right because only those who can afford it, will resort to these colleges and they should pay the full cost including capital cost. Under the court scheme, at least 50 per cent of seats in professional colleges called "free seats" to be filled by the nominees of the government or university and the remaining 50 per cent called "payment seats" will have to pay higher charges fixed by the state panel. It also ends the reservation of quota of seats for the management or for any family or caste or community, except for constitutionally permissible classes. It is now possible that the controversy over the capitation fee colleges will end, for the capitation fees are shared by private parties, political parties and individuals, and not by any educational body or for any educational purpose. The other side of this issue, which is not before the Supreme Court is the heavy government subsidy of higher education, the majority (70 per cent) of completors, at the last count by UGC in 1975 were from the top 20 per cent of society - which seems to provide some rationale for capitation fees, if they are used for educational purposes and so reducing the drain on government subsidising higher education for the well to do.

Science

The government's decision to reduce drastically its allocation to R & D, and R & D laboratories supported by CSIR is disturbing. The government allocation has over the last 3 years been reduced from Rs. 28 crores to Rs. 16 crores and the laboratories have been trying to find the remaining needed resources, not very successfully. The government has announced that they will have to raise 50 per cent of their research funds. The principle of the laboratories and scientific bodies relying more on their earnings is sound, but the short time given to achieve

these ends is disturbing. In the long run, this course will weed out unwanted and duplicating research. If the laboratories are not able to earn part of their needed resources through consultancy services to industry, as they do in other countries, it means that research is not of the required standard. But they must be given time to do this and not be expected to raise 50 per cent in a short period of 2 or 3 years. This should be phased over a plan period. To achieve this, the government suggestion is sound that half the members of the scientific advisory council to the Prime Minister should be industrialists. This will help close the gap between R & D institutions and industry. The R & D institutions should be fully involved in the government's massive scheme to develop renewable energy resources through the rapid development of solar, wind and small hydro, biogas and biomass energy sources (in the revised VIII Plan, the draft strategy and action plan will establish a minimum capacity of 500 MW of wind power and other such projects). The Medical Research Centre of ICMR reports that it is developing a farm in the Khera district in Gujarat where the different species of larvivorous fish are collected and their role in controlling mosquito breeding studied so that this technique can be spread throughout the country in mosquito infested areas. The centre's pilot project is using remote sensing of many mosquito breeding sites and because of its limitation proposes to use Geographic Information System (GIS) technique to identify mosquito breeding areas.

Health

The Indian Institute of Science, Bangalore, reports that its research on how the chick gets nutrients it needs to grow before breaking out of the egg has stumbled on a unique birth control vaccine which has been successfully tested on animals. Rats first, and later monkeys, which were injected

with the vaccine have become infertile. Similarly, the research at the Defence Institute of Population and Allied Sciences reports developing a contraceptive based on neem oil. These break-throughs are much needed to control our exploding population in the country.

Employment and Labour

In two years since it was launched the mass employment generation by Science and Technology (MEGSAT) has provided employment in rearing bees, cutting gem stones, processing leather, designing garments, producing superior plastics and setting up fish farms to 28,500 men and women. For this year, MEGSAT is providing jobs to 50,000 persons, most of them working right at home. Similarly the Tamil Nadu government has launched a Rs. 20 crores scheme to cover 1.5 lakh educated youth who are being trained for jobs in rural and urban areas. It is open to those registered in Employment Exchanges who are unemployed for 5 years. These are small self-generating, multiplying programmes to deal with the enormous problem of unemployment in the country where the backlog or unemployment is 13 million and the new entrants 35 million in the VIII Plan. As only 10-12 per cent of this group can be employed in the organised sector, the training is aimed at giving them skills for self-employment in the informal/unorganised sector. - Prodded by international pressure against child labour, which started in Europe's scrutiny of our carpet industry and spread to others, our exports require not only to be marked for quality ISO 9000 and safety markings but also a certificate which states "not made by child labour". This has also led the government to launch the \$926,623, child labour action and support project (CLASP) to enforce the child labour laws and to provide support for on-going and future projects in this area. The 3 year project is intended to facilitate the

implementation of the 1986 child labour act and the national child labour policy. The project aims at enhancing the government's policy planning and implementation capacity and contribute to the attainment of the objective of abolishing child labour. The project is to be executed by the ILO in cooperation with the ministry of labour. This bears close monitoring to see how far it conforms to the aim, at long last, of abolishing child labour and putting the children back in school, where they belong.

International

World Economy

The IMF in its publication, *Current Legal Issues Affecting Central Banks*, states that the recycling of Petro-dollar by leading commercial banks of Industrial countries and the apathy of multilateral financial institutions in the 1970s led to the debt crisis of the 1980s and the early years of the 1990s. It states that decisions by the industrial countries encouraged the "recycling of Petro-dollars through the private sector, rather than through international financial institutions. Officials of developing countries deemed credit worthy by the banks were persuaded by the banks to borrow large amounts at floating interest rates, as there were no avenues open to the banks in industrial countries which were deflating their economies to adjust to the increase in energy costs. The book also quotes the IMF Managing Director who said in this context "if the main industrial countries would have given more support to the IMF oil facility at that point, the present debt problem would have been less serious". The UK Chancellor of Exchequer during that period also said "I tried very hard to persuade my colleagues to organise some sort of international, official scheme for recycling the OPEC surpluses". The

industrial countries objected to this suggestion because they felt that it would interfere with the role of the private sector. These have been the views of this Bulletin, now confirmed by the IMF publication and the UK chancellor of the exchequer.

Another study by UK's ODI on IMF programmes in the period 1980-90 analyses 266 out of 298 programme, of which over 52 per cent were not completed. Of this non-completion of projects, standby projects had a lower non-completion rate, while for EFF projects 86 per cent were non-completed. This is serious as India is heavily involved in EFF projects and plans to expand the number in the coming 2 years. On this, the study observes that by our non-completion test, even though we could expect a higher slippage rate on 3 years as against one year programmes, the EFF record now seems little short of disastrous. Also the standbys record is equally poor. Of the 220 projects in this category, half broke down midway, one third broke down immediately with no use of promised support. Was the record of high breakdowns due to inadequate IMF credit? The study advances empirical evidence to support this. This is supported by the number of times the indebted countries come back to the Fund for repeated assistance. It reports that over the 11 year period, 19 countries had 6 or more programmes which was 44 per cent of the past. As for completed projects and their effects on the country's, BOP position, the study's findings are 1) imports and exports, current account and overall BOP are moderate in the short term but could be substantial thereafter; 2) there is little relation between Fund Programmes and abatement of inflation rate; and 3) economic growth is adversely affected, particularly in the short term. Against the claim that Fund programmes stimulate capital inflows, the study shows "the net effect of Fund programmes is a reduced capital inflow; because of the increase in net

repayments of long term loans, which means that Fund credits are used not for investment but to repay other creditors". The overall conclusion is that "the Fund has limited ability to achieve its objectives and assist deficit member countries", a conclusion which is important, as earlier pointed out, to India.

Other Items

Educated Unemployment Symposium

Towards the end of February, Doordarshan ran a symposium on Educated Unemployed. The participating students were of the view that their unemployment prospects were caused by the defective college and university curricula. They also stated that because of the restriction of admission to professional courses, they were forced to take up university and college degree courses which was not their preference and which involved marking time. The economist participating in the symposium pointed out that: 1) it was not the function of education - university and colleges - to provide employment or apart from the professional courses to educate for employment, education's function being to impart and advance knowledge; 2) in a country with a labour force of over 315 million and unemployed of about 35 million, employment can only mean self-employment and not wage employment; 3) the organised sector provides employment only for 10-15 per cent of the work force, and so students and teachers should use education for learning self-employment skills.

TNSC S & T

The new executive committee of the Tamil Nadu State Council for Science and

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Technology met in mid-February. It noted the new membership of the committee which had been speedily set up by the President of the committee. It reviewed the completed and on-going research projects and ratified the grants for the new projects for 1992-93. It also reviewed and approved the new scheme of grants to student scientists for their project work and also the programme of travel grants for young scientists to attend international and national conferences to which they had submitted their research papers. The programme of popularisation of science is developing fast and joint planning and execution with Tamil Nadu Science Centre which had been recommended at the Council meeting is now developing well.

Primary Education

Unicef programme of seminars for the promotion of primary education in the state was concluded in February with the fourth seminar on the subject held at Ramanathapuram. It concentrates on successful programmes to counter the dropout and leftout problems faced by the primary school children. The educators present agreed on the essential changes in the curriculum of the primary school, the change needed in the hours of schooling and the methods of teaching and learning to make primary education really universal, reaching out to the children of the poor, particularly the children of rural illiterate parents.

IIC

There were two important events organised by the Economic Affairs Group of the India International Centre in February. One was the monthly panel discussion which for this month was on Agricultural Policy including labour absorption and land reform. The

point was made that the absence of any reference to agriculture in the new Economic Reforms Policy along side of the long debate on the draft agriculture policy is making for a drift in the sector, the foodgrains production reaching a plateau and both public and private investment in agriculture falling. It was remarkable that these main gaps in agriculture were identified unanimously. The other event was the first seminar for the year which was on liberalisation and planning. Here again there was agreement after a wide ranging discussion in which 30 economists, planners and government officials participated, on the content of liberalisation as allowing the market to play a more dominant role and that this should be reflected in planning in the future of what has come to be called indicative planning.

First article

The paper for the March Seminar "Some Comments on Tamil Nadu: An Economic Appraisal - 1991" by Dr. Malcolm S. Adiseshiah appears as the first article.

Second article

A note on "The Linkage Between Urbanisation and Environment in India" by Dr. Paul Appasamy appears as the second article.

Book Review

The review of the book "This Fissured Land: An Ecological History of India" by Madhav Gadgil and Ramachandra Guha, appears in the Book Review section.

MIDS News

Dr. S. Neelakantan gave two lectures on "Institutional Economics" at the Academic Staff College of Bharathiar University, Coimbatore on March 23, 1993.

Prof. Arun Ghosh gave a seminar in the Institute on "Latest Economic Situation in India, Especially in Relation to External Debt, and Our Responses Through Fiscal and Other Economic Policies" on March 13, 1993.

The Fifth Daniel Thorner Memorial Lecture on "Colonialism and the Environment: The Indian Case - A Comparative Perspective" under the auspices of Madras Institute of Development Studies and Indian Statistical Institute was delivered by Prof. Jacques Pouchepadass at the Institute on March

16, 1993. Dr. A. Vaidyanathan presided over the Lecture. Dr. Alice Thorner proposed a vote of thanks.

Dr. Alice Thorner led an informal discussion on "The Recent Bombay Incidents" on March 16, 1993 in the Institute.

The Public Viva Voce Examination of Mr. V. Chandrasekara Naidu on his Ph.D. thesis "Economic Processes and the Weaker Sections: A Comparative Study of Two Villages in Tamil Nadu" was held on April 12, 1993 in the Institute. Dr. S.S. Sivakumar, Reader, Dept. of Economics, University of Madras, External Examiner and Prof. C.T. Kurien, Internal Examiner and Supervisor, conducted the viva voce examination which was attended by scholars from the Institute and neighbouring institutions.

March Seminar

SOME COMMENTS ON TAMIL NADU: AN ECONOMIC APPRAISAL - 1991

Malcolm S Adiseshiah

Prolegomena

THE document, Tamil Nadu - An Economic Appraisal 1991 contains many plus points, the most important of which is the advancement of the date of its publication and release by over six months compared to the last year and more than that in relation to the years before that. This year's Appraisal went to press on the 28th December 1992 and has been sent to the Institute on 20th February 1993. The most memorable aspect of the earlier release of this important publication is that it is made available a month before the budget presentation on March 12 in both English and Tamil so that all members of the legislature can take advantage of this facility and study the Appraisal document carefully, review the macro status and achievements as well as the negative facets, and even more important, the micro picture presented by the state. The other notable feature of the Appraisal this year is that it presents micro data on the basis of the 15 districts in Tamilnadu and also in some cases it goes

down to the taluk level. This is rather important because it means that we now have the basis for really decentralised planning, that is planning at the district and block level. The Appraisal document continues to be faced by problems which too are important. The first problem is that unlike the Economic Survey, the Appraisal of the state has no other data source to supplement what has been presented in the document after laboriously gathering the data from various departments and agencies in the state, whose reliability cannot be cross checked. Every department of government should be required to make available a report for the year under review, which can then be used in the Appraisal Document. A second problem which is probably even more serious is that the state's Economic Appraisal is dated; its analysis is really for the year 1990-91, though in the title page it refers to 1991. While some of the analysis refers to the calendar year 1991, most of the

data refers to the fiscal year ending March 1991. We are now in March 1993 which means that the Appraisal is a full two years behind. It makes no effort, unlike the Economic Survey, to deal with the current year 1992-93 even in broad outlines. Commenting on the Appraisal, the pattern followed in this document will also be adhered to. The first section of every part will start with the Appraisal for the financial year 1990-91, followed in outline form by the forecast for 1991-92. The Appraisal document is also supplemented by some material from the Centre for Monitoring Indian Economy, Vol. II, referring to the states published in September 1992, and the continuing reports on the economy by the Bulletin.

Agriculture and Allied Activities 1990-91

Overall

The agricultural performance in 1990-91 was disappointing. It was in part caused

by the rainfall, both Southwest and North East which were in deficit, and yet the food grains production was +5.72 per cent against the average annual growth rate of 4.80 per cent during the 80s. In fact taking the drought years, it is found that in the 7th Plan, in 1986-87, a drought year, agriculture declined only by 3.5 per cent, while in the 6th plan in the drought year, 1982-83, it declined by 6.7 per cent. This means that agriculture in Tamil Nadu has acquired a measure of resilience and the document attributes the resilience to the government mainly. I think that government's task is formulating agricultural policy and advice and making available certain inputs, while it is the farmers who successfully tackle the drought conditions, adapting their farming practices to the shortages of water. The problem is that the major part of the agricultural crop land at 52 per cent, which is dryland, still continues to be neglected by the large and medium farmers and the government, so that its contribution to the total foodgrain and output production is far less than its share in the state agricultural farming land, as Table shows.

Table 1 : Dry Farming: Performance of Select Crops, 1990-91

Crop	Area covered (Average) (Lakh hectares)		Production (Average) (Lakh tonnes)	
Cholam	6.05	(90)	4.70	(80)
Cumbu	2.65	(87)	2.11	(71)
Ragi	1.24	(67)	1.42	(49)
Cotton	1.28	(56)	0.92	(25)
Groundnut	6.57	(72)	6.02	(58)

Note : Figures in brackets indicate percentage to the total in each case.

Source: Department of Agriculture, Government of Tamil Nadu.

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In 1990-91 the agricultural performance was unsatisfactory due to the failure of the Southwest and Northeast monsoons, leading to the reduced land use which was more than compensated by the use of high yielding varieties, particularly those adapted to drought conditions. The decline in the year was rather sharp with regard to paddy and millet, with a marginal increase in pulses. Rice production fell from 60.6 lakh tonnes

in 1989-90 to 57.8 lakh tonnes in 1990-91, millets from 15.2 lakh tonnes to 13.8 lakh tonnes, but the pulses increased from 3.34 lakh tonnes to 3.60 lakh tonnes, a small increase really against the state's need of 17 lakh tonnes of pulses.

The targets set by government are in every case wide of the achievements as Table 2 shows:

Table 2: Foodgrains Production: Targets and Achievements

Year	Target	Actual Production	Shortfall (Per cent)
	(in lakh tonnes)		
1985-86	88.50	72.70	17.85
1986-87	92.00	71.81	21.95
1987-88	97.00	74.80	22.89
1988-89	83.00	73.29	11.91
1989-90	81.50	79.17	2.86
1990-91	80.50	74.96	6.88

Source: Department of Statistics, Government of Tamilnadu.

These targets are set on the basis of three criteria: demand for food increases, per capita income increases, and the rainfall conditions for the year. In view of the record of the wide and increasing gap between the target and actuals, the question arises as to whether the target setting should also be related to the previous year's production and not simply to the demands for foodgrains.

Individual Crops

Turning now to the individual crops, starting with paddy which is grown in three seasons,

kuruvai, samba, and thaladi, the contributions of the three seasons were 17:74:9, the 1990-91 contribution is 10:70:19 which shows a declining trend of the kuruvai cultivation and production, due mainly to the poor storage of the major reservoirs, resulting in the disturbing decline in kuruvai and the pressure to grow more samba crops.

Sugarcane cultivation during the year 1990-91 reached an all-time high of 2.3 lakh hectares, as Table 3 shows:

Table 3: Area, Yield and Production of Sugarcane

Year	Area		Yield		Production		
	Target	Actual	In Cane*	In Gur*	In Gur**	In Cane	
	(lakh hectares)				Target (in lakh tonnes)	Actual	
1989-90	2.00	2.22	104	11277	24.20	25.07	230.86
1990-91	2.00	2.33	101	10403	24.00	24.23	234.80
Highest:	2.33 lakh hectares in 1990-91		110 tonnes of cane/hectare in 1986-87		12000 kgs of gur/hectare in 1978-79	25.07 lakh tonnes of gur in 1989-90	237.49 lakh tonnes of cane in 1988-89
Lowest :	0.46 lakh hectares in 1952-53 1959-60		55 tonnes of cane/hectare in 1951-52		6500 kgs of gur/hectare in 1952-53	2.01 lakh tonnes of gur in 1952-53	17.41 lakh tonnes of cane in 1952-53

Note: * in tonnes/hectare ** in kgs/hectare

Source: Directorate of Agriculture, Government of Tamilnadu

The production figures are influenced, somewhat distorted, by the minimum prices set by the central government and the state advisory prices set by the Tamil Nadu government. The wide gap between the two prices should be corrected. This is urgent, in order to restore some degree of stability to sugarcane production.

Cotton was grown over 2.09 lakh hectares during the year, 45 per cent on irrigated and 55 per cent on unirrigated land. The production in the state was good at 5.50 lakh bales. The state's requirement for cotton, however, is 30 lakh bales and so, there is a case for an increase of cotton

production by all means, preferably through the irrigated component.

The groundnut crop is the state's main oil seed crop which in 1990-91 because of deficient and ill-distributed rains, resulted in a low production and an increase in the unirrigated area by 72 per cent of the total groundnut growing area.

Inputs

Looking at the seeds, their certification, improved varieties, the seed supply, and seed replacement, the important develop-

ment which needs to be further probed is with regard to high yielding varieties where

the gap between the targets and actuals is on the increase as Table 4 shows.

Table 4: High Yielding Varieties: Area Covered

Year	(Lakh hectares)					
	Paddy		Millets		Total	
	Target	Actual	Target	Actual	Target	Actual
1989-90	22.80	18.63	10.00	8.84	32.80	27.47
1990-91	22.80	18.61	10.00	10.00	32.80	28.61

Source: Directorate of Statistics, Government of Tamilnadu.

The raising of HYV seeds for rice, cumbu, cholam and maize for Tamilnadu's principal foodcrops should be pursued relentlessly.

On fertilisers, because of the extended area under HYV, fertiliser consumption in the state went up by 5 per cent and 7.93 lakh tonnes. One interesting factor is that the fertilisers in the state are mainly distributed by private outlets to the extent of 73-76 per cent. Some attention, however, should be given to the deleterious effect of chemical fertilisers and their intensive use on soil fertility, and land properties. Tamil Nadu is the third highest fertiliser consumer in the country after Punjab and Andhra Pradesh, and therefore, there should be an examination of the consequences of their increased use.

Similar considerations refer to pesticides which were used in 1990-91 over 84.08 lakh hectares, which was 1.56 lakh hectares higher than that of the previous year. Here again the effect of the use of pesticides needs probing, particularly their adverse results in building up resistance by the pests, in the contamination of the agro-eco-system, and the fruits and vegetables which are made available to the consumers, the long term elimination of predators

and parasites, the environmental pollution and health hazards both to humans and to animals. These should lead to more reliance on bio-fertilisers for which I believe the state is getting ready with all the research being conducted in the universities.

A brief word on agricultural credit which is made available mainly by the cooperative banks and the regional rural banks, which in 1990-91 amounted to Rs.1322.97 crores. The major users were the paddy farmers and the sugarcane growers. In this case the targets set are far below the actuals used, and therefore, there is need for some upward revision of the target. For 1990-91 the target was Rs.830.98 crores, and the actual use by the farmers was Rs.973.58 crores. Crop insurance is in a limited way covering 9.8 lakh farmers who are cultivating 14.43 lakh hectares and are insured for Rs.335.6 crores. This is still a very small start and should be rapidly expanded. In the area of marketing, two important issues should be highlighted. First there are 270 regulated markets in 1990-91 under the control of 14 Market Committees. They have increased their marketed farm production yields from 3.59 lakh tonnes in the previous year to 5.38 lakh tonnes

during 1990-91, using the 34 agmark grading laboratories and 102 commercial grading centres. Cooperative marketing is increasing slowly from Rs 0.54 lakh in the previous year to Rs.0.59 lakhs in 1990. In this connection the cumulative storage capacity by the cooperatives is 6.87 lakh tonnes but has been around that figure during the latter part of the VI Plan and for all of the VII Plan. This is an inadequate amount and should be raised speedily.

Similarly the total number of fair price shops remains around 21,000 since 1985, and is still mainly urban, the rural areas not being fully covered.

The VII Plan's share of allocation to agriculture, which was a small 6.6 per cent, is however, increased to 7.47 per cent in 1990-91 but needs to be further increased.

Allied activities

The allied activities of animal husbandry, forestry and fishery are important because along with agriculture they account for 62 per cent of the workforce employed and they are the essential ingredients for improving the nutrition in the state. In the area of animal husbandry, there is a deceleration in all areas, with meat production at 125 grams, which means 3 grams per capita against the ICMR recommended minimum of 125 grams. In milk where there is a decline from 7.6 per cent, the per capita availability of 169 gram should be set against the ICMR recommended nutritional norm of 284 grams. This points to the need for developing rapidly our cattle through various cross breeding techniques and improved veterinary services. Egg production has declined from 13 per cent in the previous year to 10 per cent in 1990-91, and to 46 per capita against the recommended minimum of 183. There seems to be no excuse for not rapidly improving and increasing our poultry

population which is a domestic industry. On fish production, there is a decline of 8 per cent to 6.54 kilograms per capita. Increasing inland fishing ought to be a domestic occupation for most farmers, as well as an increase in marine fishing for which further capital investment is needed.

Turning to forestry, its many qualities should be noted for the protection of land's capacity to absorb and retain water, to arrest soil erosion, to contribute to correcting the imbalance in the eco-system. The forest policy lays down that 33 per cent of the geographical area should be under forest cover, but the actual is 17.47 per cent. Even this is not certain because of the varying definitions of forest cover. Remote sensing agencies report about 30 per cent less of forest cover than what the forestry survey shows. Tamil Nadu is one of the states which has a low 17.5 per cent forest cover which is well below the All India level, and so there is need to protect the natural forests, restore and upgrade degraded forests and improve and increase the cover over forests. In this, reliance should be placed on the Social Forestry Scheme, which should be made a peoples scheme.

1991-92 (Summary forecast)

In the year 1991-92 there was a good monsoon, both the Southwest monsoon and the Northeast monsoon, which were plentiful, the excess rainfall making possible an increase both in the area and the volume of production in agriculture. The food target of 100 lakh tonnes for the year looks like being achieved which should be a big jump from last year's 71 lakh tonnes. Rice would go up from 58 lakh tonnes to 75 lakh tonnes. Millets from 14 lakh tonnes to 20 lakh tonnes and so too will all other items. In other words, agriculture has begun looking up in 1991-92 and when the final data is in, this is likely to be satisfying.

Irrigation

1990-91

Irrigation in 1990-91 recorded serious shortfalls because of the deficit monsoon, the deficit being about 23 per cent compared to the normal receipts. The delayed monsoon caused an unsatisfactory storage position in all the reservoirs and it was particularly felt in regard to the Mettur reservoir on which the entire kuruvai harvest in Thanjavur and the Cauvery valley is dependent. The repeated plea to Karnataka to release water did not produce any results. This unsatisfactory storage position therefore led to a serious decline in the area under production. The net area irrigated in the state was of the order of 23.7 lakh hectares comprising canals which served 7.69 lakh hectares, tanks 5.31 lakh hectares, and wells 10.5 lakh hectares. Of the three sources it is only tanks which recorded a slight increase over the area of the previous year. The net area irrigated by these three major sources are set forth in detail by each of the 15 districts in the appraisal document which is useful information on which to build further action in irrigation. It shows that the overall net area irrigated had declined in the 1970s from 37 lakh hectares to 25 lakh hectares in the 1980s due to diversion of irrigated lands to non-agricultural uses, failure to adhere to the cropping pattern that the project is intended to serve, lack of proper conveyance system, disproportionate drawal of water by those of the upper reaches, the siltation of tanks, and the absence of field channels. On the whole, the irrigation system is age old and suffers from lack of maintenance. Sharing of inter-state waters has become a very serious problem referred to earlier, particularly the Cauvery waters. The state government has tried in the 1970s and 1980s for some solution to this problem appealing to the Karnataka government for negotiations on the agreement, to the central government for adjudicating between the

two states, but all this has not resulted in anything positive. Early in 1991-92 the water tribunal set up by the central government made an interim award in order to settle this problem which the Karnataka government has still not accepted. Fortunately, the last two years had very good monsoons, leading to adequate flows from the Cauvery into Mettur. But the problem is there and on its resolution depends the position of agriculture, particularly paddy farming in the Cauvery valley area. The impact of irrigation on production is seen in the growing gap between irrigated yield and unirrigated yield except for cotton. The impact is set forth in Table 5.

This impact of irrigation results from the investment in irrigation of which the major part is on major and medium irrigation and only a relatively small amount is on minor irrigation. Of the total investment in 1990-91 of Rs. 160.62 crores, Rs. 126.40 crores was on major and medium irrigation and Rs. 34.22 crores on minor works, which is regretted because it is the minor irrigation which pays immediate results and benefits the farming community quickly. Use of groundwater holds the key for increasing the area under irrigation. The area benefitting from tapping ground water was 15521 hectares in 1991 due to 9293 new wells and 6426 revitalised ones. The groundwater irrigation potential continues to be under utilised. There is some question as to whether the traditional measure of use of irrigation potential and potential tapped is satisfactory. Preference would be for the actual number of wellings received by each farmer as a means of testing the utilisation of irrigation. The official figures show a growing gap between potential created and potential utilised. The potential used is 70 per cent for wells, 65 per cent for canals and 58 per cent for tanks. Wells again have a head start. In this water scarce state, surface water potential is the real danger that irrigation faces, and that o

Table 5: Impact of Irrigation on Crop Yield: Select Crops
(Annual Averages)

Crop	Irrigated Yield		Unirrigated Yield		Differential yield rate between irrigated and unirrigated yield	
	Sixth Plan	Seventh Plan	Sixth Plan	Seventh Plan	Sixth Plan	Seventh Plan
Cholam	1444	2067	616	939	828	1128
Cumbu	2066	2313	681	922	1385	1391
Ragi	2118	2690	934	1354	1184	1336
Cotton	464	463	75	157	389	306
Groundnut	1585	1795	808	1007	777	788
Gingelly	495	535	292	303	203	232

Source: Directorate of Statistics, Government of Tamilnadu.

the surface flow has been declining over the years due to uncertainties of rainfall, the old age of the surface irrigation systems, the lack of maintenance which was already mentioned, and the catchment areas of at least three major irrigation systems - the Cauvery, Parambikulam Aliyar and Periyar being tied up with the neighbouring states. The overall irrigation situation for the state is thus not bright. Hence, the importance of conservation, management and efficiency in utilisation of water is of vital significance for the existing levels of irrigated cropping, leave alone its expansion. From this point of view, the promotion of sprinkler and drip irrigation methods, water harvesting techniques and a system of communication with the farmers that keeps them informed about the changing fortunes in irrigation becomes essential.

1991-92

The 1991-92 picture was very much more satisfactory as far as irrigation is concerned.

The rainfall was +2 per cent, 330.1 mm, against the normal 307.6 mm. Canal and irrigation systems therefore had full flows as noted earlier, in spite of the water tribunal award not being executed by Karnataka. The good monsoon enabled the flow into all the reservoirs, enabling the filling up of all of them, particularly the Mettur through the flows from the Cauvery from Karnataka. But the problem is that the Cauvery issue needs some attention and resolution to safeguard the production potential of the state.

Industry

1990-91

The year is one of industrial deceleration in the state from 6.1 per cent in the previous year to 2.8 per cent in 1991-92. The fact that there was even greater deceleration for All India according to the Economic Survey is no consolation to the state. The decline in industrial growth was due to

several factors including the power cut which was raised from 20 to 30 per cent on high tension industries during the first eight months of the year, the inadequate utilisation of incentive packages and concessions made to medium and small industries, the absence of a stable medium term tax policy, poor performance of agriculture in the year 1990-91 which has lowered the inputs for a number of agro-industries like textiles, sugar, and the serious incidence of industrial sickness. 1990-91 also

saw the index number of industrial production for Tamil Nadu shift from the wholesale series based on 1970 to the new series based on 1981-82. The most important part of this change is not only shifting of the base year, but also the change in the weighting pattern where the manufacturing sector increased sharply while mining and electricity declined. Table 6 gives the index number of industrial production for the old and new series showing this:

Table 6: Index Numbers of Industrial Production: Old and New Series: Composition

Industry Group	1970 Base		1981-82 Base	
	Number of Commodities	Weight	Number of Commodities	Weight (Provisional)
Mining	14	3.52	4	1.67
Manufacturing	226	81.03	192	90.43
Electricity	1	15.45	1	7.90
Total	241	100.00	197	100.00

Source: Directorate of Statistics, Government of Tamil Nadu.

An examination of the performance of the major industrial sub-groups show that three out of sixteen sub-groups performed very badly, namely, rubber, plastics and petroleum products, with a very heavy weightage of 17.429 per cent up from the 1970 weightage of 4.813 per cent followed by food products with the weightage of 10.552 per cent rising from 7.263 per cent in 1970, and chemical and chemical products with a weightage of 7.718 per cent against 4.366 per cent in 1970.

The State went in for a new industrial policy announced in January 1992 to promote large and medium industries, stimulate small scale industries, and tiny sector units and cottage industries. The policy gives the highest priority to infrastructure develop-

ment and for this created the Tamil Nadu Corporation for Industrial Infrastructural Development (TACID). Another innovation is the entry of the private sector in power development where the first private sector was the joint project integrated with mining and thermal power plant at Jayamkondam, Tiruchy. Similarly private participation is permitted in a number of micro hydel projects. Also, the new policy emphasises getting rapid clearance of the following important central sector projects, namely, aromatic project, southern gas grid, expansion of Madras Refineries, satellite port at Ennore, Third mine cut at Neyvelli, and offshore oil and gas exploration. With regard to public sector undertakings, the policy states that loss making public sector undertakings in the state will be restruc-

tured and if they still continue to make losses they will be sold. In the promotion of small scale sector, the major thrust will be to counter the incidence of sickness which is growing rapidly there. The government have identified 13 thrust areas which include leather, textiles, electronics and software, auto components, drugs and pharmaceuticals, petro-chemicals, industrial alcohol based organic chemicals, agro-food processing, engineering goods and export oriented units. This is a good and much needed thrust from the overall state point of view but this macro promotion of industry must be undergirded by micro action to correct the ills of the industries in various sectors like food, rubber, chemicals, transport, etc. One of the important developments in the year is that out of 170 taluks in the state 105 have been declared backward by the government of India and become eligible for various incentives. This 63 per cent of the total number of taluks being backward it is hoped will receive special attention. There are some districts particularly Kamarajar, Nilgiri, Coimbatore, Salem, and of course Madras which are progressive in not having backward or having few backward taluks.

Turning to the major industrial groups in the state and their performance in 1990-91, we should begin with first the textile sector comprising the mill sub-sector, handloom sub-sector and powerloom sub-sector. Of the three, the mill sector is going down in quantitative terms, the handlooms are rather stagnant with the heavy subsidisation by the central and state governments through the Coopex and the subsidised yarn made available to them. It is the powerloom sector which is booming. It produces 70 per cent of the textiles in the states. A powerloom census which was conducted in 1989 by the central government showed that there were 1.55 lakh powerlooms operated in the state, with unregistered powerlooms at a high 47,000, that is 30 per cent of the total.

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Turning to the Sugar industry, under the price support from the centre and the state for increasing sugarcane production referred to earlier, with 31 sugar mills in the state in 1991 March, 14 in the cooperative, three in the public and 14 in the private sector, the industry is doing well. Even with a capacity utilisation of 88.60 per cent, in 1990-91 it produced a record 11.83 lakh tonnes which will be surpassed next year, with improved capacity use. The problem of the use of our scarce water resources for growing sugarcane, and the increase in number of sugar factories, is an issue that we need to think over for a water scarce, water starved state like Tamil Nadu.

With regard to fertilisers with no change in pricing, the fertiliser industry is passing through a crisis in this state and in every other state, due mainly to, the hike in the prices of potassium products and the higher cost of production. During the year there was an increase of the three phosphatic plants production and an improved utilisation recorded.

The cement industry has been doing well in the state with a withdrawal of price and distribution controls from March 1989 at the All India level. The performance of the industry in 1990-91 in the private sector was good, with the six private sector plants using capacity nearing 100 per cent (in the case of the Dalmia plant, 116 per cent). They produced a total of 29 lakh tonnes, while the two public sector plants at Alangolam and Ariyolur did not do so well with their lower production at 6.5 lakh tonnes compared to the previous year.

Turning to the small-scale industries of which the state has 1.13 lakh in 1990-91 which was an increase of 13,500 over the previous year, their productive capital increased by Rs. 355 crores to touch the large sum of Rs. 3333 crores, the value of their production rose by Rs. 745 crores to reach Rs. 7996 crores, their employment increased by 1.80

lakhs to reach 13.74 lakh. The main groups in the small-scale sector were food and food products, hosiery, paper and paper products, chemical and chemical products, metal products and parts, and machinery and parts. The small industries received help from the District Industries Centres which have registered 63,000 small scale units, providing them with technical and financial support under a single window. Small scale industries include also Khadi and Village industries with the Khadi Industry operating 82 production centres plus 22 silk production centres and 694 rural textile centres. In terms of production Khadi yarn in 1990-91 was 389.63 lakh metres, valued at Rs. 592.46 lakhs, Khadi cloth production was 23.05 lakh meters valued at Rs. 12.25 crores, Khadi silk production was 8.04 lakh meters valued at Rs. 804 lakh rupees, Khadi sales record for the year was Rs. 2484 lakhs. Village industries also achieved an all-round progress in 1990-91 with over 12,421 persons employed by departmental units, 7.1 lakhs employed by industrial cooperative societies, and 23 lakhs individual artisans, all responsible for producing Rs. 25159.136 lakhs of goods selling for Rs. 28077.28 lakhs.

The problem of industrial sickness characterises the large, medium and small scale industries in the state. The large and medium units which are sick are reported to be 130 in September 1989 which have locked up bank credits amounting to Rs. 267.22 crores. In the small scale sector 1105 units are reported sick, with Rs. 213.9 crores overdue. The large and medium industries which are sick are reported to BFIR which has so far been ineffective in finding a cure: it is sickness in the small scale industries that is worrisome, because they cannot be referred to BFIR (given their numbers) but must be attended to by the government, by the banks, and by the co-operatives to help revive and restructure them. This is urgent to restore a measure

of stability for SSI units which are the employment generating agency in the state.

1991-92

The major development in the industrial area in 1991-92 was the new industrial policy which had been launched in 1992 and which was beginning to be implemented, but only beginning. The package

of incentives was improved to make it attractive to large and medium industries and attract entrepreneurs from outside the state. A stable and firm taxation policy which has been promised is also looked forward to. Action on the thrust areas is awaited from the industries themselves, because the government, according to the new industrial policy, is no longer in the business of actually operating industries which is a very good development. This is part of the liberalisation of trade and industrial economic policies which have created short term problems along with the import compression and high interest rates which it is hoped would be eased next year.

Power

1990-91

In general though power generation and power availability in the state was rising steadily during the VI Plan; in 1990-91, the problem of the gap between the availability of power at 20793 MU and the power requirements at 21979 MU which was a gap of 5.4 per cent was serious. Reference has been made earlier to the power cut in the state during the year following from the poor inflows into the hydel reservoirs due to the inadequate southwest monsoon and the inadequate coal supply to the thermal stations between July and September of the year. The future has some good expectations from two sources. First the

opening up of the sector to private enterprises where a beginning was made with the joint sector Lignite Mining and Power generation project at Jayamkondam, Tiruchy. There are many applications from the private sector, both Indian and foreign which are waiting for study and approval by the Tamil Nadu Electricity Board and the state and central governments. The second source for the future is the opening up of wind power, which has already proved its value through the two wind farms in the state, and a third one being developed along the national highway between Nalainpudur and Kayathar. In addition, the other non-conventional energy source, namely, solar energy, which is plentifully available in the state is also beginning to be exploited and is an important prospect for the future.

1991-92

In 1991-92 with the good monsoons that the state received, the hydel reservoirs were filled, similarly the thermal stations were also facing less problems with the coal supply though there was still the shortage of coal from time to time. But the hydel power generation, was able to make up for the slow down in thermal power generation which also was aimed at conserving the limited coal stocks in the state. Further the 14 wind farms which were started in the previous year and run by the Tamil Nadu Electricity Board contributed power on a modest scale. Thus the power situation in 1991-92 is much better and can feed less inadequately the three demands from, industry, agriculture, and rural areas and home consumption.

Prices

1991

The price level in 1991 calendar year imposed difficulties, increasing by 14.4 per

cent according to the index number of wholesale prices. Wholesale prices in the state have averaged annually 7.7 per cent in the five years 1982-86 and 10 per cent in the five year 1987-91. The price behaviour in the state shows a sharp increase in the prices of primary articles and a decrease in the prices of manufactured products. For the state, primary articles in 1991 rose by 52 per cent, food articles by 39.2 per cent and non-food articles by 12 per cent. The sharp rise in food and primary necessities bore heavily on the poor majority, who have to spend most of their meagre resources on purchasing food and clothing. The Table on individual commodities prices in the Appraisal document gives some important information on the comparative rise of prices in 1991 over 1990. The price of chillies went up by 164.4 per cent, turmeric by 95.4 per cent, coconut oil by 43.2 per cent, pulses by 29.9 per cent, rice by 10.9 per cent, sugar by 3.8 per cent, and coffee by 17.0 per cent, which shows the burden borne by the consumer. A new series of consumer price index number was introduced from October 1988, with the base year 1982. This index number is constructed for five centres in the state, namely, Coimbatore, Coonoor, Madras, Salem and Tiruchy. The 12 month average in 1991 for the five centres show a rise to 207 against 185 for the previous year. The price index, which is the terms of trade in the state of the farmer is not computed for 1990 or 1991, because of the shift in the base year. I look forward to its revision which is now underway.

1992

Prices in 1992 continued to rise but at a lower rate, reflecting the slow down of the rate of increase of prices at the All India level.

Human Resources Development

The Human Resource Development in Tamil Nadu refers to the four items, education, science and technology, health, and employment.

Under education, primary education in 1990-91 is recorded at over 100 per cent in terms of enrolment. New data is being collected of completors at lower primary which is I to V Standard and upper primary which is the VI and VII standard, and will be available hopefully from next year which will show the real state of the promise made at both the All India level and the state level of 100 per cent primary/elementary education. What is holding back the 100 per cent achievement, is the drop out rate from the various levels, primary, upper primary, secondary and higher. The drop out rate keeps increasing as the levels increase, the most serious being the drop outs in the primary, lower and upper, because this is where illiteracy terminates. The state claims that the level of dropouts has decreased to near 20 per cent because of the midday meal programme attracting children to school. The studies by research agencies, however, show the dropout rates still above 35-40 per cent at the primary level which is lower than what it was in 1980s, and to that extent it is true that the midday meal scheme has had a beneficial effect. At the secondary level, the state's programme of vocationalisation continues to attract over 20 per cent of those who are enrolled at class XI, which is the highest record in the country. The problem faced in the vocationalised higher secondary, scheme is with regard to first, the equipment for the schools, for their industrial and agricultural specialities and secondly, trained vocational teachers. These are being slowly and gradually attended to particularly with the credit made available by the World Bank for vocationalisation of secondary education. At the higher education level the problem is of

the increasing number of colleges and increasing number of universities. In the case of universities, it is by splitting the present large universities of Madras and Madurai that the new universities at Coimbatore, Tiruchy, Karaikudi, etc., have been started. The problem now is for some kind of coordination with regard to their curricular and study programmes as well as the finances of the 15 universities in the state. It is expected that in 1993 the State Council of Higher Education will be set up as recommended by the National Policy on Education voted by Parliament in 1986. In the area of literacy the state has made good progress in 1991, by the adoption of the Total Literacy Programme, under which one district of Pudukottai has been declared totally literate, and some seven other districts are operating on this programme. Here the literacy programmes are planned and operated by the illiterates, the newly formed literates and the educated who volunteer their services and who spend almost a year first of all in motivating the people towards literacy. This is the secret of the success of the literacy programmes, which completes the first stage, the acquiring of the three Rs, reading, writing and arithmetic, during the period of six months. This is the model successfully set up by Kerala which with certain adaptations is being followed in the state.

In Science and Technology the university departments of science and the Central Science laboratories located in the state and the few state laboratories alongside of the Tamil Nadu State Council for Science and Technology have helped the development of both agricultural and industrial research. In the agricultural area the major contribution has been through the Tamil Nadu Agricultural University and its various centres and the department run research programmes, through which every month a number of improved varieties of agricultural products, foodgrains and non-food grains as well as means of controlling pests

and diseases are being made available to the farmers. This has certainly contributed to improved and increased foodgrain and non-foodgrain production in the state. In the area of water, the research into the development of pure drinking water and the identification of the sources of pollution has been of help to the rural areas and the urban slums, where water supply is both limited and in some cases polluted. In the industrial field the various engineering universities like Anna University, the PSG University of Engineering, the Regional College of Engineering, Tiruchy, together with the various laboratories referred to, of the centre and the state, assisted by the Tamil Nadu State Council work on problems of energy conservation and fertilisers use and some important industrial processes relating both to textiles and machine tools which are of importance to the state. In addition closer links between these science bodies and industry are being promoted. With regard to health the 1990 data is that the birth rate for the state has fallen from 25.5 per thousand in the previous year to 22.8 in 1990, the death rate has fallen from 9.9 to 8.9 per thousand between the two years, and most important, the infant mortality rate has fallen from 74 per thousand live births in 1988 to 67 in 1990. The total fertility rate has declined to 2.7 for women between the ages of 15-49. The family planning performance for the state shows that in relation to the targets set, sterilisations crossed the target to reach 104.1 per cent, IUDs at 95.8 per cent, conventional contraceptives again at 102.7 per cent, and oral pills at 156.2 per cent. This is a good record which in part is accounted for by the fact that the number of registered medical practitioners has increased for the year to 40,023, and the thousand persons per doctor has also risen from 1.41 for the previous period to 1.31. The primary health centres have increased to 1386 as on 1.4.90, the total health expenditure has continuously risen and stands at Rs.369 crores for 1990.

Turning to employment, the sources for this important human resources development component continues to be the Employment Market Information, or the census, or the National Sample Survey which is conducted every five years. The data from these sources show that employment in the organised sector in the state increased from 22.62 lakhs in March 1990 to 22.89 lakhs in March 1991. This is a 1.35 per cent growth, and is a slow down in relation to the 2.38 per cent employment growth of the previous five year period. The cause for the deceleration was the public sector where the increased employment declined from some 2.25 lakhs to 1.36 lakhs. In the private sector on the other hand though the actual number was much smaller, there is no decline because it was 12,900 compared to 12,500. The major source of employment generation in the organised sector, was manufacturing, and transport services. In the public sector, the main employment was in government by - 800 in central government offices and undertakings and by - 4500 in the state government. There was an increase in employment in the state supported undertakings and in local bodies together by 21,600 in 1991. In the private sector the main employment was in manufacturing which increased by 15,400, along with some decline in trade and commerce and services by 3300. The 42 employment exchanges in the state record that in 1991 job seekers were 6.3 lakhs, making the total number of the unemployed on the live register at 32.44 lakhs as of March 1991. Of this, it is disturbing to note that 21.71 lakhs (67 per cent of all job seekers) are educated, in the sense that they are at the level of matriculation and above. The number of educated male job seekers was over two and a half times that of the educated female job seekers. Not all those who are registered as job seekers are necessarily unemployed. Some 30 per cent of those who are registered as job seekers are really wanting to change

their jobs and are in employment. Further, a number of them, over 70 per cent, are without any vocational training. It is this group that should be given priority in the training programmes being run in the state. A break up of the educated job seekers shows that 52 per cent are matriculates, 17 per cent are graduates, 2 per cent diploma holders, and 2 per cent postgraduates. In terms of numbers, in December 1991 the SSLC and equivalent qualifications amount to 10.5 lakhs, those with higher secondary qualifications amount to 5.6 lakhs, diploma holders to 50,000, graduates to 3.4 lakhs and postgraduates 39,250. This is serious and means that both the economy and the educational system need some restructuring. The economy is not providing enough jobs for people who are trained and this requires attention, because there is waste of human resources in educated unemployment. The educational system is training people for jobs which do not exist and therefore there should be a better linking between the demands for various qualified persons and the various educational and training programmes run by the universities. The present mismatch is contributing to the educated job seekers. The result of the 1991 Census shows that the work participation rate in the state is increasing. In 1991 the total population number 5.56 crores, 44.13 per cent were workers, increasing from 41.73 per cent in the previous 1981 Census. The proportion of main workers to the total population has increased from 39.31 to 41.29 per cent. Tamil Nadu accounts for the second highest proportion of main workers to the total population as it also account for the second largest number of educated unemployed. The 43rd round of NSS shows that of the 17.10 million employed in 1987-88 in rural Tamil Nadu, 7.44 million, that is 43.51 per cent, are self employed, 1.97 million, that is 11.52 per cent are regular paid employees and a very large 7.69 million or 44.97 per cent are casual labour. In the urban areas self employed are much smaller at 35.35

per cent and numbering 2.51 million, the regular paid employees are very large at 3.15 million or 44.37 per cent, and casual labour smaller at 1.44 million or 20.28 per cent. The casual labour is a large component in both rural and urban areas compared to the equivalent all India data, and reduces the significance of the high work participation rate that the Census reports for the state. In the employment area, it is important for industry to develop, particularly the small industries and the new industries agro processing, horticulture and aquaculture in order to generate employment and decrease the number of unemployed. It is necessary for the very large number of educated unemployed, second only to Kerala, to decrease because this is a case of both human resources and of financial resources being wasted. The State education system should aim at training people for self employment, because no economy faced with a very large number of workers, and a high work participation rate like ours, can provide for all or even a majority, paid employment or wage labour. What is necessary, as in other countries, is for the education system to generate the spirit of enterprise and self employment. It is in that direction that the future development of the state in education and employment lies.

State Income and Problems of Poverty and Inequality

The economic activities reviewed from agriculture down to human resources development in the state is aimed at improving people's living levels which requires an increase in both the state income and the per capita income. In 1990-91 the record on both is regrettably low. The state income fell from +7.8 per cent in 1989-90 to -0.21 per cent in 1990-91. This is the continuation of the somewhat sharp deceleration of the rate of growth of the

state income during the VII Plan at 4.14 per cent per annum, which is lower than the targetted 5 per cent, and the VI Plan record of 6.02 per cent. The deceleration, the decrease in state income in 1990-91 is due to the loss caused by the agriculture sector, the primary sector which has been reviewed earlier, which is also the continuation of the VII Plan period's slow down

both in agriculture, the primary sector and industry, the secondary sector. It is only the tertiary sector which registered an acceleration in that plan period, and has saved in a sense the overall growth performance from registering an even more unimpressive record for the state. The sectoral composition of the state income for the VI and VII Plan is given in Table 7.

Table 7: Sectoral Composition of NSDP/NDP.

(in percentage)

Sector	NSDP		NDP	
	VI Plan Period	VII Plan Period	VI Plan Period	VII Plan Period
Primary	27.09	24.93	40.37	35.80
Secondary	32.68	30.56	23.68	25.19
Tertiary	40.23	44.51	35.95	39.01
NSDP/NDP	100.00	100.00	100.00	100.00

Source: Directorate of Statistics, Government of Tamil Nadu.

Also a decelerating performance as seen in the per capita income of the state from Rs.1995 in 1989-90 to Rs.1965 in 1990-91 should be noted. This low per capita income record is unfavourable for the state in relation to the All India per capita income, and what is more serious is that it has been continuing during the VII Plan period as the Table 4 of the Appraisal document (in page 15) makes abundantly clear.

Effect on Poverty

The Appraisal document refers to Tamil Nadu being below the poverty line for 32.80 per cent of its population compared to the lower 29.23 per cent at the All India level. It attributes this higher poverty ratio for

Tamil Nadu to the fact that the state has a very high percentage of casual labour in both rural and urban areas, one of the highest in the country. But I think that this itself is a reflection of the low per capita income which has been recorded and its continuing decline over the five year period (see Table 8). The minister of state for planning reported in the Rajya Sabha on March 3 that as against Punjab, Himachal Pradesh, and Haryana which are the top three states with people living above the poverty line, Punjab at 92.8 per cent, HP at 90.8 per cent and Haryana at 89.4 per cent, Tamil Nadu has the lowest percentage of persons living above the poverty line among the four southern states at 67.2 per cent (my own studies and that of the World Bank show that less than

Table 8: Per Capita Income

Year	State Per Capita Income		National Per Capita Income	
	(in Rupees)			
	At Current Prices	At Constant Prices	At Current Prices	At Constant Prices
1980-81	1498	1498	1630	1630
1981-82	1776	1640	1856	1688
1982-83	1777	1527	2001	1688
1983-84	2024	1582	2300	1787
1984-85	2341	1758	2504	1811
Sixth Plan	1883	1601	2058	1721
Average	—	—	—	—
1985-86	2620	1798	2726	1842
1986-87	2885	1755	2954	1866
1987-88	3379	1837	3286	1903
1988-89	3581	1887	3875	2078
1989-90(RE)	4148	1995	4291	2148
Seventh Plan	3323	1854	3426	1967
Average	—	—	—	—

Source: Directorate of Statistics, Government of Tamil Nadu; and Central Statistical Organisation.

60 per cent are above the poverty line); for the other southern states, Kerala has a very high percentage 83 per cent of people living above the poverty line, AP 68.3 per cent and Karnataka 67.9 per cent. All this data is based on the 43rd NSS round that is for 1986-87, with no more recent official data on poverty available; and for this we will have to wait for the next NSS round, now under preparation for 1992-93.

The data on inequality, that is the gap between the rich and the poor, the well to do and the ill to do, is even more dated

in terms of information available. One piece of information is the 43rd NSS round which brings up to date the average size of operational holdings in Tamil Nadu. In 1970-71 it was 1.45 hectares, in 1976-77 it was 1.25 hectares, in 1980-81 it was 1.08 hectares and in 1985-86 it was 1.01 hectares. This raises the question whether economic growth calls for inequality of incomes and assets, whether there is a conflict between growth and equality in the initial stages of economic growth, as set forth by Kuznetsov, which will create inequality in both income and wealth. The World Bank studies as well as my own show that this

Kuznetsovian theory is not true. The economy can grow alongside with reducing inequality and poverty. On assets ownership, there is a reference made earlier to Tamil Nadu's operational holdings which does not relate to land ownership but how the land is divided among the farming people. According to the latest available information established by the Planning Commission, in 1989 two-thirds of rural households own less than one hectare of land or no land, half of them own less than half a hectare, and households which have an asset holding of less than Rs.6,000 were getting 67-90 per cent of their credit from money lenders, whereas households with asset holdings above Rs.5 lakhs secured 95 per cent of their credits from the banks and cooperative societies. Similarly, the Reserve Bank of India's All India Debt and Investment Survey shows that the poorest 10 per cent in rural areas owned 0.0 per cent of total assets in 1971 and 0.4 per cent in 1981, in urban areas the lowest 10 per cent owned 0.1 per cent of all urban assets in 1981 (there was no urban survey in 1970) while the top 10 per cent in rural

areas owned 50.7 per cent of all rural assets in 1971 and 49.5 per cent in 1981. In urban areas, the top 15 per cent owned 58.4 per cent of all urban assets in 1981. In other words, both in terms of income distribution and in terms of land ownership and asset ownership, the problem of inequality in the state and in the country, like the problem of poverty, is worsening, and unlike the Kuznetsov hypothesis what we find in the state and in the country is that we have neither growth nor alleviation of poverty and improvement in the inequality situation. It is to this that we need to turn our attention both in the state and in the country, to reducing the number of people living in poverty and improving the unequal distribution of land and incomes.

State Finances

The overall Budget revised for 1990-91 and the Budget estimates for 1991-92 as analysed in the Appraisal document is set forth in Table 9.

Table 9: Overall Budget

Head of Account	(Rs.in lakhs)		
	1989-90 (Account)	1990-91 (Rs.)	1991-92 (Rs.)
I Consolidated Fund —			
A. Revenue Account —			
1. Receipts	425157	497565	534734
2. Expenditure	473079	529516	624983
3. Surplus or Deficit	(-)47922	(-)31951	(-)90249
B. Capital Account —			
1. Receipts	232836	211995	211056
2. Disbursements	241652	209642	189600
3. Surplus or Deficit	(-) 8816	2353	21456
C. Consolidated Fund (Net)	(-)56738	(-)29598	(-)68793
II Contingency Fund (Net)	25000	—	—
III Public Account (Net)	32677	9070	11052
IV Total Transanction (Net)	939	(-)20528	(-)57741

Source: 1992-93 Budget, Government of Tamil Nadu.

The overall current deficit of Rs.205.28 crores for 1990-91 continues and worsens in the Budget estimates for 1991-92 at Rs.577.41 crores. Despite this parlous state of the state's finances, there seems to be little coordination between what the Finance Minister announces from time to time and the state government's decisions on development or welfare activities. In the latest statement in mid-January, the minister of Finance forecast a minimum deficit of Rs.800 crores facing the forthcoming budget for 1993-94 due, in his words, to the government spending a huge amount on the supply of free power to the farmer, in reliefs to agriculturists, in payment of subsidies to the poor, among other things. On the other hand, the government also reports with satisfaction that the scheme for the free distribution of sarees and dhoties to nearly three crore persons for the second year running, and similar large scale expenses like renovating the Nehru (Football) stadium for an amount of Rs.40 crores have been incurred and completed. (The state and the country needs this facility to develop sports and games in the country, but the question is that, at this time of inflation and the resources crunch facing the state, whether the project should not have been examined more carefully to economise wherever possible and to make the stadium a multi-sports activity and not solely for football). There are other financial pressures facing the government. Its plan to sell rice at prices much lower than the market prices through the cooperative network which will certainly help the poor sector of the people has been frustrated. Because in late January the union government raised the price for the latest kharif and rabi crops, both the issue price by Rs.60 a quintal and procurement price by Rs.40 a quintal in the case of rice, the state government issued the order raising the price of rice issued through PDS by 0.75 paise for all varieties. The new prices are Rs.2.75 per kg for the common variety raising from the Rs.2 per kg and Rs.3.75 per kg for

the fine and super fine variety from Rs.3 per kg. Even so, the state government will have to increase its rice subsidy by Rs.80 crores which will add to the financial deficit of Rs.800 crores. There is strong opposition in the price increase by all political parties but the increase is the only way of not adding to the deficit. This has not prevented the government from giving to the pressures for lowering the price.

Some Concluding Thoughts

The Tamil Nadu Economic Appraisal is a mine of information, clearly presented and pointing to urgent lines of action which need to be taken in agriculture and allied activities, in irrigation, in industry, in the development of human resources that is, in education, science and technology, health and employment. There is a very brief mention at the end of chapter I to the Physical Quality of Life Index (PQLI). It reports that as of 1989 when the life expectancy in Tamil Nadu was 48.5 years, below that of eight states of India, when the infant mortality rate at 70.5 per thousand live births, placing the state in the 11th position in the country, and when the literacy rate at 54 per cent was the second highest, the overall physical quality of life index (PQLI) indicates that Tamil Nadu stands fourth among the major 15 states. It is a pity that there is not more on this vital index with regard to the welfare and well being of the people as set forth in Tables 2.7 and 2.8 of Part II of the Appraisal document which give select development indicators by districts and as time series from 1990. Part II deals with 16 groups of Statistical Tables. Instead, a great part of Chapter II of the document is wasted on inter-state comparisons of per capita income, state domestic product, comparison between Tamil Nadu and All India, which is also quite useless as far as pointing to ameliorative action as my previous reviews have shown. It is hoped

that in the future this material can be reduced and more analysis devoted to the issues

behind the physical quality of life index.

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THE LINKAGE BETWEEN URBANISATION AND ENVIRONMENT IN INDIA

Paul P. Appasamy
Fellow, MIDS

Trends In Urbanisation

INDIA is gradually changing from a predominantly rural society to one with a substantial urban population. According to the 1991 Census, 217 million out of a total population of 844 million now live in urban areas; the urban population is projected to increase to 300 million by the turn of the century. In other words, one out of every three Indians will be an urban resident in the next decade. Urban Development can no longer be considered a *residual* sector of the economy.

These demographic changes have occurred due to a major *structural transformation* of the Indian economy. Urbanisation is the result of massive shifts of labour and capital from predominantly rural to predominantly urban activities (Mills and Becker 1986). Agriculture which accounted for 55.8% of Gross Domestic Product in 1950-51 has declined to 32.4% in 1990-91 (CMIE 1992, Table 10.6). There has been a steady growth in non-agricultural activities in the rural areas that are close to cities and metropolitan centres. Thus, urbanisation is not a transitory phenomenon - it reflects *permanent* structural changes that have occurred since independence.

The decennial rate of growth of the urban population, however, has *slackened* from 46.1% in 1971-81 to 36.2% in 1981-91, which is in line with the general worldwide pattern of urbanisation. Table 1 provides the level of urbanisation and the average annual growth rates for the last two decades. Most of the states, except Himachal Pradesh and Kerala, had a lower rate of growth in 1981-91 compared to the previous decade, indicating a *deceleration* in the pace of urbanisation. While further research needs to be conducted on the reasons for deceleration, it is clear that the *absorptive capacity* of the urban areas, particularly of the larger cities is reaching its limits. The quality of life and the levels of poverty in urban areas are as bad if not worse than those of the rural areas. There has been a progressive tightening of urban labour markets, and it is not clear if the urban wage in the informal sector is any higher than the rural wage for agricultural labour. Unemployment and underemployment rates are extremely high in many of the urban areas. But, even with reduced rates of migration, the cities and towns continue to grow due to natural increase.

Table 1: Urban Growth in Major States of India

Sl. No.	State	Level of Urbanisation (%)		Average Annual Exponential Growth (Urban)	
		1981	1991	1971-81	1981-91
1	Maharashtra	35.03	38.73	3.36	3.27
2	Gujarat	31.10	34.40	3.47	2.90
3	Tamilnadu	32.95	34.20	2.47	1.76
4	Karnataka	26.89	32.01	4.10	2.55
5	Punjab	27.63	23.72	3.68	2.56
6	West Bengal	26.47	27.59	2.76	2.54
7	Andhra Pradesh	23.32	26.84	3.96	3.55
8	Kerala	18.74	26.44	3.19	4.76
9	Haryana	21.88	24.79	4.67	3.58
10	Jammu & Kashmir	21.05	23.83	NA	NA
11	Madhya Pradesh	20.29	23.21	4.45	3.71
12	Rajasthan	21.05	22.88	4.62	3.31
13	Uttar Pradesh	17.95	19.89	4.74	3.29
14	Orissa	11.79	13.43	5.22	3.08
15	Bihar	12.47	13.17	4.37	2.65
16	Assam	9.88	11.03	3.27	3.27
17	Himachal Pradesh	7.61	8.70	2.98	3.11
	INDIA	23.34	25.72	3.83	3.09

Sources: 1 Census of India, 1991. Series-1, Paper 2 of 1991, Provisional Population Totals: Rural-Urban Distribution, Statement 10.

2 Planning Commission, 1992; The Eighth Five Year Plan (Draft) Vol. II p.351.

Urban Structure

India's urban population is distributed in 3609 cities, but nearly two-thirds (65.2%) live in Class I cities (i.e., urban areas with a population of 1 lakh or more). The distribution of the urban population by size class is given in Table 2. It has been suggested that India has a highly stable structure of settlements: the great majority

of urban settlements now classified as such have exhibited urban characteristics for a very long time. Most of the urban growth is due to the growth of existing towns (from migration and natural increase) rather than the addition of new towns (Mohan and Thottian 1988: 9). Thus, improvements of the urban environment must focus on the existing towns and cities, which are likely to grow, albeit at reduced rates, in the future.

Table 2: Distribution of Urban Population by Size Class

Size Class	Number of Cities		Contribution to India's Total Urban Population(%)		Decadal Growth Rate of population	
	1981	1991	1981	1991	1971-81	1981-91
All Classes	3245	3609	100.00	100.00	46.23	36.09
I > 100,000	216	296	60.42	65.20	54.35	46.87
II 50,000 - 99,999	270	341	11.63	10.95	55.73	28.14
III 20,000 - 49,999	738	927	14.33	13.19	30.85	25.30
IV 10,000 - 19,999	1053	1135	9.54	7.77	27.54	10.72
V 5,000 - 9,999	739	725	3.58	2.60	17.82	-1.27
VI Less than 5000	229	185	0.50	0.29	65.73	-21.70

Source: Census of India, 1991, Series-1, Paper 2 of 1991 Provisional Population Tables: Rural-Urban Distribution: Statements 13 and 14.

Table 2 also indicates that there has been a decline in both the number and the contribution of Class V and VI towns. While the number of Class II, III and IV towns has increased, their contribution to total urban population has declined. On the other hand, the contribution of Class I cities has increased from 60 % to 65 %, and the number of Class I cities has increased from 216 to nearly 300. Thus, there is a clear tendency towards *concentration* even within the urban population in favour of Class cities.

Within the Class I group, there are 23 cities with a population of more than a million (*metros*) of which four are *mega* cities (Bombay, Calcutta, Delhi and Madras) with populations exceeding 5 million (Table 3). The number of million-plus cities has increased dramatically from 12 in 1981 to 23 in 1991, and is projected to increase to 40 by 2001. The focus of this paper is on the *environmental problems* faced by the metropolitan areas of the country.

Environmental Status of the Metropolitan Cities

The number of people living in metropolitan cities of India in 1991 was 70.7 million accounting for a third of the nation's urban population of 217 million. The *urban environment* of the metropolitan cities has been deteriorating due to an influx of population, inadequate infrastructure and services, and weak local institutions that have been unable to regulate and manage urban development. Improvement of the urban environment can be accomplished only through the concerted efforts of government, industry, non-government organisations, and enlightened citizens.

Definition

What exactly do we mean by *urban environmental problems*?

Hardoy and Satterthwaite (1989: 6) who have studied the urban environment of

Table 3: Cities Having Population More Than a Million, 1981-91

Sl. no.	Place	(in million)	
		1981	1991
1	Greater Bombay	8.24	12.57
2	Calcutta	9.19	10.92
3	Delhi	5.73	8.38
4	Madras	4.29	5.36
5	Hyderabad	2.55	4.28
6	Bangalore	2.92	4.09
7	Ahmadabad	2.55	3.30
8	Pune	1.69	2.49
9	Kanpur	1.64	2.11
10	Nagpur	1.30	1.66
11	Lucknow	1.01	1.64
12	Jaipur	1.02	1.51
13	Surat	0.91	1.52
14	Kochi	0.69	1.14
15	Coimbatore	0.92	1.14
16	Vadodara	0.74	1.12
17	Indore	0.83	1.10
18	Patna	0.92	1.10
19	Madurai	0.91	1.09
20	Bhopal	0.67	1.06
21	Visakhapatnam	0.60	1.05
22	Varanasi	0.80	1.03
23	Ludhiana	0.61	1.01
Population of Large Cities		50.72	70.66

Source: Census of India, 1991; Series-1 Paper 2 of 1991, Provisional Population Tables: Rural-Urban Distribution Statement 23.

several developing countries for nearly a decade have provided the following definition:

The presence of pathogens or toxic substances in the human environment which can damage human health or (natural) resources such as forests, fisheries and agricultural lands; or an inadequate supply of a resource essential to human health or urban production.

Resources essential to human health or urban production could include land, water, housing, and energy.

Environmental Problems

The rapid growth of the metropolitan areas has led to various environmental problems:

- High levels of *water pollution* on account of poor waste disposal, inadequate sew-

erage and drainage and improper disposal of industrial effluents.

- High levels of *air pollution* resulting from congested streets, poorly maintained vehicles, fuel burning, and industrial activities.
- *Toxic or hazardous* industrial and commercial wastes disposed of in water bodies and land sites without proper treatment.
- Dumping of *solid waste* (refuse) in low-lying areas contributing to land and ground water pollution.
- High levels of *noise pollution* due to loudspeakers, construction, traffic, industrial operations and aircraft.
- Congested and insanitary dwellings, particularly in *slums*.
- Loss of *fragile ecosystems*, such as mangroves, agricultural land, vegetation, and open space.

Air Pollution

There are four major sources of air pollution: industry; fuels for cooking, heating, and electricity generation; solid waste disposal; and motor vehicles. The scale of the problem and the relative contribution of different sources varies from city to city. Local conditions such as the dispersion characteristics can increase or decrease the severity of the problem. Localized problems occur in and around particular businesses or roads.

Stone quarries and brick making often located near the periphery are major sources of particulate matter. Vehicular emissions consist of carbon monoxide, oxides of nitrogen, lead, hydrocarbons and sus-

pended particulates. Even though the number of vehicles is not very large, a combination of narrow streets and poorly maintained vehicles increases the level of emissions. (Hardoy and Satterthwaite, *op.cit*, pp.31-34).

Table 4 provides the 1990 levels of suspended particulate matter (SPM) in the *residential* areas of metropolitan cities collected by the Central Pollution Control Board. The World Health Organisation guidelines for SPM are 60 - 90 micrograms per cubic metre for the annual mean, and 150 - 230 for the daily average. The levels of suspended particulate in Indian cities are very high - *unacceptably high* in terms of international standards. Levels in industrial and commercial areas are higher than the levels shown in the Table. Nitrogen dioxide levels have also shown an increasing trend over the period 1978-87 in most of the metropolitan cities, indicating high levels of vehicular pollution (Sundaresan, 1991:83).

Noise Pollution

The Environment (Protection) Act, 1986 recognises noise pollution as an offence. A survey in Delhi, Bombay and Calcutta illustrated that the day time noises varied from 60 decibel (dB) in the residential areas to 90 dB in busy localities. During the day the levels exceeded 100 dB at certain peak periods. Near airports, the noise levels were around 85 dB, with increases of 20-25 dB during landings and take-offs. These levels are far in excess of the standards recommended by the World Health Organisation. Exposure to noise levels exceeding 75 dB for more than eight hours daily can impair hearing. Other effects include hypertension, disturbance in sleep, speech interference and stress reactions (Singal 1991: pp.84-85).

Table 4: Suspended Particulate Matter (SPM) Levels in the Residential Areas of Major Indian Cities, 1990

	(in micrograms per cubic metre)
Ahmedabad	357
Bangalore	165
Bombay	228
Calcutta	136
Delhi	383
Hyderabad	136
Jaipur	357
Kanpur	566
Madras	136
Nagpur	130
Pune	247

Source: Central Pollution Control Board, New Delhi.
National Ambient Air Quality Statistics.

Water Pollution

Pollution of the waterbodies - rivers, lakes, streams, etc., results from four different sources: sewage, industrial effluents, storm and urban runoff, and agricultural runoff. The first two are considered to be point sources in the sense that wastes are discharged at the end of a pipe, while the latter are non-point sources of pollution. In metropolitan areas, sewage is collected but often discharged without adequate treatment into the closest river or sea. The capacity of these water bodies to assimilate the wastes is limited. Industrial effluents which contain toxic chemicals or wastes that are not biodegradable can cause severe pollution. In terms of quantities, domestic wastes are substantially greater, but the environmental impact of toxic chemicals cannot be compared with sewage.

Urban runoff contains sullage, garbage and other assorted wastes which find their way into storm drains and nullahs. It is not often recognized that the *first flush* after a storm can deliver pollution loads similar to or

worse than sewage. Agricultural runoff can become an urban problem if the water sources for a metropolitan city are polluted along the way by fertilizers and pesticides.

On the river Ganga alone, 114 towns with 50,000 or more population dump untreated sewage into the river each day. The Hooghly estuary is choked with untreated industrial wastes from sewage which pours into the river continuously from some 360 outfalls (Centre for Science and Environment, 1983, p.23). The Ganga Action Plan has been implemented since 1985 at a cost of Rs. 256 crores to intercept, divert and treat the sewage flowing into the river, and to compel industries to conform to prescribed standards. A National River Action Plan has been proposed in the Eighth Plan (Planning Commission, 1992, p.89).

Water quality monitoring is undertaken on a periodic basis at a number of sites on the major rivers. However, many of the metros are not located in the basins of major rivers. The water pollution problems that they face are more severe, in the sense

that the local water courses have no capacity to assimilate any of the wastes. Lakes have become eutrophic as a result of receiving large volumes of sewage from towns and cities.

Toxic and Hazardous Wastes

Rapid industrialisation has led to the production and use of various inorganic and organic substances that often end up in waste streams. These include heavy metals (lead, mercury, cadmium and chromium), hydrocarbons, polychlorinated biphenyls, cyanide, arsenic, asbestos as well as various organic solvents. These substances are produced by the chemical and petrochemicals industries, primary and fabricating metal industries, pulp and paper, tanning, transport, and electrical equipment industries.

Heavy metals are discharged along with organic wastes into water bodies or land. Elements which are released into the air, are eventually deposited on water or land. Pollution of soil has been on the upward trend with increasing application of fertilizers, insecticides, or dumping of industrial wastes.

In India, the presence of mercury, lead, chromium and manganese in quantities above permissible limits has been reported in some river estuaries located very close to alkali or rayon plants in the Trombay basin, coastal waters adjacent to Bombay and Cochin, in the working area of some welding shops, electroplating and thermal processing plants, and the effluents of chrome tanneries (Krishnamurthi and Vishwanathan 1991: 2).

An Integrated Environmental Programme on Heavy Metals coordinated by Late Prof C.R. Krishnamurthi examined the levels of heavy metals in air, water and food at seven regional centres during 1985-86.

Precautions were taken to avoid areas of known heavy pollution due to mining or industrial activity. The key findings of the study are summarized below:

- 1 Levels in *air* of lead, cadmium, zinc, manganese, nickel, copper and chromium appear to be within limits of safety, although there is indication of a few local pockets of air pollution.
- 2 Levels in *water* of cadmium, lead, zinc, manganese and chromium in a *significant* number of samples were found to be higher than the levels recommended as safe by the World Health Organisation.
- 3 Levels in *food* of cadmium, lead, zinc, manganese and chromium in the majority of samples were higher than those recommended as admissible from the point of view on human health.
- 4 Levels in *human blood* of lead and cadmium suggest trends of increasing environmental exposure to these elements in the urban areas.

The overall conclusion of the study was that the per-capita daily exposure to these metals via inhalation and ingestion calculated for all the states, clearly indicates a trend towards greater health risks faced by the general population. *The exposure to cadmium, lead, chromium, nickel and manganese is high and necessitates the need for formulating and implementing stringent measures to control the levels of these metals in drinking water and food* (Krishnamurthy and Viswanathan, *op.cit.*, pp.241-42, emphasis added).

Causes of Urban Environmental Degradation¹

The environment of the metropolitan cities has been deteriorating for a number of reasons:

The gap between demand and supply of infrastructural services has been continuously widening. Increasing pressure of population, particularly the skewedness of distribution of urban population in mega-cities and metros, and the escalating *per capita* cost of providing urban services, account for the deterioration of infrastructure services and amenities (Planning Commission, 1992:356).

The accumulated backlog in urban housing along with a rapidly increasing population of the urban poor has resulted in the proliferation of slums and squatter settlements. The high incidence of marginal employment and urban poverty implies that the poor cannot afford to pay for housing and urban services, with the result that these services have deteriorated further (Planning Commission, *op.cit.*, p.357).

- 3 The weak financial and organisational base of urban local bodies has led to subsidised and inequitable supply of urban land and services, and to haphazard growth. The lack of effective control of changes in land-use has encouraged unplanned and often illegal urban sprawl, while inadequate control of pollution has led to contamination of the urban environment (Millin and Satterthwaite 1990, pp.43-44).

Infrastructure

The rapid growth of urban areas in terms of population and area has not been matched by a corresponding growth in urban infrastructure. The ageing infrastructure of the metropolitan cities has not been replaced or extended adequately to take account of the swelling population. Smaller cities and towns simply do not have the

infrastructure to meet the needs of urban residents. The urban sector has been systematically *starved* of funds in successive plan allocations. The National Commission on Urbanisation in its Report of 1988 says:

The Commission has noted with deep regret that the three most critical areas relating to urban development (water, sewerage and housing) have been given respectively 1%, 1.36% and 1.6% of the outlay for the Seventh Five Year Plan. Taking the share of the central sector in all three activities combined, it comes to 0.25% of the Plan, with no central assistance for urban water supply and sanitation. This means that even the State governments treat the urban sector as one of *low priority* and do not adhere to the provisions made in the plan (Vol.I, pp.16, emphasis added).

In the metropolitan cities, improvements to infrastructure have been taken up with assistance from the World Bank. But, the backlog in terms of investments is huge, given that the cities had been systematically neglected for nearly thirty years. The National Commission on Urbanisation (1988) has recommended that an *Urban Infrastructure Development Bank* be set up to finance the needed investments (Vol.I, p.7).

The neglect of urban infrastructure has significant *environmental costs*. When industries do not treat their wastes, they transfer these costs to society. Pollution control regulations are imposed to force industry to *internalize* these costs. Similarly, local governments also transfer environmental costs to society when they do not treat the wastes generated in their jurisdictions. When sewage, garbage, and other wastes are not collected, treated and disposed properly, the resulting environmental damage is borne by the people

living in that area. Often the poor bear a disproportionate share of the environmental damage because they live and work in areas which have the worst environmental quality. Thus, starving urban areas badly needed infrastructure may appear to be prudent financial management by Central and State governments, but enormity of the environmental damage caused by such shortsighted policies is only now beginning to emerge. Valuation exercises have yet to be undertaken in urban areas to clearly document the *cost neglect*.

Urban Poor and Slums

About 25 % of India's urban population live in slums (Table 5). The percentage is much higher in the metros. Like infrastructure, the supply of housing for the poor falls far short of the demand.

According to the National Commission on Urbanisation:

More than two lakhs urban households are without any shelter and as many as 45 percent are living in just single room houses, nearly 5 persons to a room, in a state of extreme overcrowding. Adding to their agony is the absence or inadequacy of the basic services. In 1981, 37 % were without electricity, and about 66 % were without a latrine. It is likely that the slum population will increase to 75 million by 2001. Most of the urban poor cannot afford a *pucca* house and the lowest decile cannot afford even a serviced site. Consequently, the emphasis on housing policy has been to increase shelter supply, improving and upgrading slums, and conserving the existing housing stock (Vol.II, p.205-7).

Living in over-crowded, unhygienic conditions exposes the urban poor to water-

borne diseases, infectious diseases like tuberculosis, influenza, meningitis, mumps and measles, and respiratory problems from open fires and inefficient stoves. They are also more susceptible to accidents within the home, and to poisoning by chemicals used in the home or by household industries. Slums are often located on land ill-suited for human habitation, such as banks of rivers and canals, or near dangerous industries, since these are the only affordable and/or available sites in most of the large cities. The largest and most pressing environmental imperative is to improve the housing and living environment of the poor majority of citizens by reducing or eliminating the serious health hazards present within their homes, workplaces, and neighbourhoods (Hardoy and Satterthwaite, *op.cit.*, p.19).

Local Government

The lack of resources available for urban development implies that the government can no longer be the main provider, but it can develop laws, institutions and policies that can support and encourage individuals and communities to build their own shelter. It requires the government, however, to impose controls and regulations in such vital areas as land, water, and rental housing.

Unfortunately, urban local bodies in India have a very poor record of regulating development. The Metropolitan Development Authorities (in the metros) which were created to deal with these issues have not been able to cope.

In the absence of regulation, *haphazard development* occurs. Local governments often lack the enforcement machinery and/or the political will to ensure that development is in conformity to the land-use plan. Vested interests ensure that the plan is on paper, and development occurs to suit the needs of a few. But, haphazard

Table 5: Percentage of Urban Population Living in Slums by States and Union Territories, 1981

State/Union Territory	Percentage of slum population in towns with a population of			
	Less than 100,000	100,000 to 1,000,000	More than 1,000,000	Total
Bihar	37.50	37.48	37.51	37.50
Maharashtra	22.50	32.49	37.50	32.62
West Bengal	17.49	27.48	37.49	31.53
Andhra Pradesh	32.50	32.50	22.51	30.47
Punjab	22.49	27.48	37.49	31.53
Gujarat	17.49	17.82	22.50	18.84
Tamil Nadu	12.49	15.00	32.50	18.75
Orissa	17.45	19.95	NAP	18.49
Assam	NA	NA	NAP	17.46
Haryana	7.47	22.49	NAP	15.98
Uttar Pradesh	7.49	17.49	40.63	15.76
Madhya Pradesh	17.50	12.50	NAP	15.15
Karnataka	14.43	12.49	10.43	14.43
Rajasthan	9.98	14.95	27.50	14.06
Kerala	7.49	9.98	NAP	8.81
Delhi	NAP	NAP	47.50	47.50
Chandigarh	NAP	12.47	NAP	12.47
India	10.66	18.93	30.78	23.00

Note: NA = Not Available; NAP = Not Applicable.

Source: Task Force on Housing and Urban Development, Planning Commission, New Delhi, 1983.

development has substantial *environmental costs*. Prime agricultural land, wetlands, beaches and other natural features of the landscape are lost. The pattern and density of development is too dispersed to allow for cost-effective provision of infrastructure. In the absence of infrastructure, the quality of the environment gradually deteriorates. Suburbanisation and *urban sprawl* have become the norm in most Indian cities. *The regulatory structure must be strengthened to ensure the sustainable use of natural resources such as land, water, and vege-*

tation of the urban areas (Mitlin and Satterthwaite, *op.cit.*, p.11). The organisations responsible for the delivery of urban services such as water supply, sewerage, drainage, solid waste management and health also need to be upgraded and put on a financially sound basis. They need to recoup their costs of operation and maintenance from those who can afford to pay. Urban services have been subsidised and priced below marginal cost, while many urban consumers have demonstrated their willingness-to-pay for

services such as water supply and garbage collection when these are provided by the private sector. *It is necessary to have an effective pricing structure which ensures that those who benefit most from publicly funded infrastructure and services pay a realistic price for them* (Mitlin and Satterthwaite, *op.cit.*, p.11).

The lack of effective control of effluents from industries, transportation, and municipal wastes has led to the pollution of air, water and land. Of particular concern, are toxic and hazardous wastes which are disposed indiscriminately. The infrastructure (transport, treatment and disposal) to handle industrial and municipal wastes needs to be developed and regulated. Exposure to toxic substances in the workplace as well as vulnerability to accidents remains a serious concern. *It is necessary to have a regulatory framework that penalizes polluters and protects the human environment from contamination* (Mitlin and Satterthwaite, *op.cit.*, p.11).

Urban growth and its attendant problems are well known. But the *ecological* aspects of urbanisation, and particularly the *economic costs* of environmental degradation have not been adequately documented in the Indian context. The preponderance of urban literature is sectoral - housing, water supply, sanitation, transportation, solid waste management -, dealing the problems and prospects of each sector. The government's response has been the formulation of programmes in each sector to alleviate these problems. There have been only a few attempts in India to provide a *unified* approach to *urban environmental management* at the city or metropolitan level.

The Policy Framework

Urban environmental management is affected by the policies and programmes

of governments at Central, State, and local levels. Relevant legislation at the Central level includes: the Water Pollution Act, the Air Pollution Act, the Environment Protection Act, the Factories Act, the Motor Vehicles Act, the Consumer Protection Act, the Urban Land Ceiling Act, and the Slum Areas Act. State legislation in respect of urban development, water supply and sanitation, and local ordinances regulating public health, solid waste management, etc., are also of importance. The plethora of legislation and regulations indicate that the *regulatory framework* for dealing with urban environmental problems is largely in place. The emphasis must, therefore, shift from legislation *per se* (except where some refinements or changes are warranted) to implementation of the legislation. In particular, the identification and coordination of the key actors government agencies, NGO organisations, citizen groups, research and educational institutions - and the roles that each must play, the financial and manpower resources that will be needed, and the training and equipping of personnel, are clearly the environmental priorities for the 1990s.

There is also a body of environmental law that is emerging from pronouncements/decisions handed down by the courts. This body of case law is important in understanding the interpretation by the judiciary of the existing legislation. Unfortunately, this information has not been widely disseminated, with the result that most environmental professionals are unaware of the positions taken by the courts, except in mega-cases like the Bhopal Gas Disaster.

The Environmental (Protection) Act for example, allows citizen groups to file suits after giving sufficient notice to the State Pollution Control Boards or the relevant authority. The success or failure of NGOs who have already used this provision is clearly of interest in any future litigation.

In the case of urban environmental management, the option of taking a municipal agency to court is crucial, if citizens or NGOs wish to pressure the local government to take necessary action. Court decisions relating to such suits would be of prime importance. There have also been discussions on the setting up of environmental courts to deal with some of these issues.

Building Institutional Expertise

Urban environmental management requires institutions at the local level which have *environmental planning* expertise. Specifically, it may be a small multidisciplinary group within the Urban Development Authority consisting of an ecologist, an engineer, an economist, and a demographer/planner - who have all had training in the urban environment at the post-graduate level. It may also be useful for some of the larger cities to have an Environmental Department in the Municipal Corporation which can deal with pollution, environmental health, solid waste management and related problems. The Department must also have the technical capability to carry out air and water quality monitoring.

The first priority in urban environmental planning is to have adequate data. UNEP/UNCHS/World Bank have devised a set of *urban environmental indicators* in sectors such as demography, health, housing, transport, energy, land-use, pollution and natural environment. Involvement of local institutions is indispensable, since information has to be gathered from a variety of agencies in the city/metropolitan area. The environmental indicators could then be used to prepare an *environmental profile* of the city. The profile provides additional qualitative information about the city, identifies the key issues in each sector which have environmental implications, and

also provides a management/policy framework to deal with the issues raised. The World Bank and other donor agencies have recommended the preparation of an environmental profile as a preliminary document for projects relating to environmental management. Environmental profiles could be prepared for each of the metropolitan centres, since most of them are likely to seek funding in the foreseeable future for environment related projects.

Virtually all the metropolitan cities have land-use planners who prepare master plans and administer development control programmes. Environmental planning is a necessary input for any such activity. Furthermore, the local institution must have the capacity to prepare or monitor environmental impact assessments of proposed projects relating to industry, power, transport, waste disposal, etc., in the metropolitan area. Decisions on trade-offs must be made at the local level, by involving citizens, NGOs, industry and other interest groups in the planning process. The process itself must be *transparent*, with full participation by various interest groups.

Role of NGOs/Private Sector

The weak financial and organisational base of local governments coupled with the small financial commitments by the Central and State governments indicate the need for NGOs to take an active role in urban environmental management. While physical infrastructure could be financed through World Bank/UNDP or other funding agencies, the management of services and establishing viable local level institutions requires the participation of NGOs and citizens. Citizens groups have sprung up all over the country in urban and rural settings. School and college students are also expressing interest in the environmental problems of their neighbourhood or city. There is great potential to forge partner-

ships between local governments and local community organisations, where control of some services rests largely with representatives of the consumers of that service. An example of such a partnership is the *Exnora Movement* in Madras, where an NGO decided to work with the Madras Corporation in the field of garbage collection.² Privatisation of some services to business organisation is also possible. However, care must be taken to ensure that a) the poor are not discriminated against; and b) the local government monitors and regulates the price and the quality of service provided.

The development of local institutions is a prerequisite for environmental management programmes at the metropolitan level. The Proposed *Sustainable Cities Programme* in Madras and the *Metropolitan Environmental Improvement Programme* in Bombay are pioneering attempts to build such capability.

Notes

This paper is an abridged version of a report prepared for the Ministry of Environment and Forests, Government of India on *Urban Environmental Management* for the preparation of National Environmental Action Programmes for India, funded by the United Nations Development Programme.

- 1 This section draws heavily on two reports of the United Nations Centre on Human Settlements (UNCHS) on *Urbanisation and Sustainable Development*.
- 2 An analysis of the *Exnora Movement* in Madras prepared by Ajit Menon appeared in the January 1993 issue of the *MIDS Bulletin*.

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Book Review

CHANGING PARADIGMS OF ENVIRONMENTAL MANAGEMENT

Ajit Menon

This Fissured Land: An Ecological History of India, by Madhav Gadgil and Ramachandra Guha, Oxford University Press, New Delhi, 1992, pp. xiv + 274, Rs 290.

DESPITE the diversity of resources available in the Indian economy, the vast majority still depend on the country's renewable resources. From forest-based communities in the northeast to fishing communities in the southwest, soil, water, plants and animal life remain central to their livelihood. With increasing pressure on these resources and an accelerating rate of depletion, the need for adopting sustainable strategies has become imperative. The book under review is a timely contribution to the debate on natural resource management.

The authors of this book have attempted to draw up an ecological history of India highlighting the changing interactions of humans with their living resources, an area relatively unexplored by historians but one which is useful not only for its historical content but also for its policy development. Gadgil and Guha in *This Fissured Land: An Ecological History of India* have four main aims: (1) to understand the conditions in which humans manage their natural resources prudently, (2) to investigate the "hardware" (forces and relations of pro-

duction) and "software" (belief systems) which govern different historical periods, (3) to analyze the forms of social conflict over natural resource use, and (4) to examine the impact of changing patterns of resource use on living resources.

With these aims in mind, the authors have set out to break new ground, tracing the linkages between economic development and ecological destruction. Methodologically, they introduce the concept of mode of resource use to supplement the mode of production. Then using this concept they present an ecological interpretation of caste to explain environmental prudence prior to the arrival of the British. Their argument is that with the advent of the British, "profligacy" replaced "prudence" and a watershed of environmental destruction began.

In Part I of the book, Gadgil and Guha elaborate on the mode of resource use concept. They argue that previous historiography does not adequately explain the linkages between people and their envi-

ronment and the changing relationship over time. While admitting that the mode of resource use is at best an "ideal" type, the authors argue that it provides a better framework in which to understand the history of non-western cultures. In a critique of the mode of production framework, they suggest somewhat ironically, that it is not materialistic enough. They are correct in arguing that much of the modes of production literature pays insufficient attention to ecology, focusing rather on land ownership and labour relations. In addition to this critique, they also argue that the modes of production model is of little use in understanding the religious, cultural and ideological attributes of different societies - all of which are central to the mode of resource use concept.

Instead, therefore, of using Marxist categories of primitive communism, slavery, feudalism and capitalism, the authors divide history into gathering (including shifting cultivation), nomadic pastoralism, settled cultivation and industry. Each of these modes of resource use have identifiable features with regard to technology, economy, social organization and ideology. They then ask the question what is the impact of these modes on the environment?

The point being made is that as human societies move from gathering to pastoralism to agriculture to industry, there is an increasing intensity of resource use and exploitation. Moreover, resource flows spread over larger geographical areas as a result of expanding economic and political interests. Not only has this resulted in greater levels of ecological destruction but also in inequalities regarding access and control of resources. The authors suggest that the transition from one mode of resource use to another witnesses inter-modal conflict/social strife over the control of productive resources. Also when a new mode of resource use sets in, it is accompanied by an ideology legitimizing it.

In Part II of this book, the authors present a cultural ecological interpretation of pre-modern India. Though they do not go as far as suggesting that patterns of resource use in "pre-modern" (pre-British) societies were inherently superior, they do argue that societies had adapted themselves, through trial and error, to their physical environment. Going as far back as 70,000 years ago, they cite examples of hunter-gatherer societies in areas as distinct as Mizoram and Orissa which had regulatory mechanisms such as distinct sacred groves or quotas on wood collection. Though with the onset of the neolithic revolution and the arrival of agricultural-pastoral communities, belief systems did change, these new systems of production also incorporated a strong element of conservation.

One full chapter is spent on the ecological interpretation of caste. Whereas in hunter-gatherer societies, the authors argue that nature was perceived of as beyond human control and therefore venerated, in agricultural societies a more rational approach to the management of resources was advocated. Endogamous caste groups were both units of production as well as of resource management. Individual caste groups developed institutions to regulate the use of living resources. In the authors's language, caste groups had their own "ecological niche" or environmental space. The authors draw on numerous examples both of religious and social sanctions which governed the use of natural resources. An example from Maharashtra of the Mahar caste serving as village guards to prevent unauthorized cutting of wood from village common lands is just one of many examples of devices used to monitor resource management. For those who believe in the "scientific" management of forests, many lessons can be learned. By highlighting indigenous practices a reminder is served both of the importance of traditional knowledge systems and village-based resource management.

But the authors go even further by arguing that the caste system was essentially an inclusive rather than an exclusive system. They say that the caste system allowed not only for the continuation of other modes of resource use such as gathering but also for the inclusion of all caste groups in the sharing of the pie. Though the authors admit things were far from being egalitarian, they don't attempt to discuss these inequalities. Instead, they focus on the importance of village councils in regulating inter-caste conflict.

The final part of the book is by far the most comprehensive. Gadgil and Guha analyze the process of ecological change and social conflict in modern India. As mentioned earlier, the central thesis put forward, is that British colonialism and industrialization irreversibly altered existing patterns of resource use. The technological advances during the Industrial Revolution made it possible to commoditize natural resources. As a result, less emphasis was placed on resource gathering for subsistence purposes and more on the marketable potential of resources. The "software" or belief systems were altered with respect to the environment.

This process of ecological change has been examined using the example of India's forests. Using both archival material and secondary studies, an excellent review of forest policy in colonial and post-colonial India has been provided. They argue that the movement away from community management of forests for subsistence purposes to state-centred management for commercial purposes was primarily responsible for the rapid decline of forest cover. The 1878 Forest Act, they argue, was the first of many acts which gave the state the right to exploit forests for commercial purposes under the pretense of protecting them. For example the forests of the Garhwal and the Western Ghats were being cut down first to build rail roads to expand

British hegemony in the subcontinent and later to boost their world war efforts. In addition to state interests, the expansion of private wood-based industries was significant. Data has been provided to show the relationship between revenue generation and deforestation. The authors have also done a fine job in reviewing forest policy after independence. India's forest policy has been examined in terms of its continuity from colonial days. Myths about the scientific nature of forest management have been dispelled. In a detailed account of forest management, the authors argue that the main goal has been to make biomass available at subsidized prices to industry. Thus the orientation has been towards revenue generation, and industries such as the paper industry have assumed an omnipotent role. National interest has become synonymous with industrial interest.

It is the implications of colonial and post colonial forest policy that the authors are most concerned about. First they argue that the demand for commercial timber has meant that indigenous species have been substituted for by fast growing commercial ones. Second, the rights of access to forests of village communities has been progressively eroded. And most importantly, traditional practices of conservation have been replaced by scientific ones which the authors argue are not scientific at all. The rapid decline of forest cover is testimony to this.

Village communities must not be seen as passive spectators in the process of ecological destruction. This book goes a long way in describing the fight for the forest highlighting both militant responses such as the Santhal uprising in the 20th century against the timber trade in Midnapur district of Bengal Presidency as well every day defiance of Forest Department regulations such as in the Jaunsar Bawar forests of U.P. In the last chapter of the book,

the authors argue that after independence, the profile of forest conflict has taken a turn. The centrality of the commons and the importance of common property resources have been highlighted. Community-based management systems such as the famous Chipko model have been offered as alternatives to state-centred forestry initiatives.

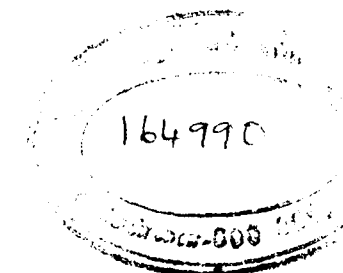
While the authors have done an excellent job in tracing the linkages between economic development and environmental destruction, the book has a series of shortcomings. By looking at different historical stages only in terms of resource use are the authors not guilty of oversimplifying their analysis? Thus while the caste system might have been environmentally prudent, was it not socially and economically divisive? By glossing over the socio-economic dimension of caste, caste as a concept is somewhat romanticized. Furthermore, in their defence of caste-based resource management, the authors suggest that all caste groups were guaranteed their own ecological niche. This however does not mean that all castes were party to determining what their niche was. In feudal societies, a contractual system existed in which serfs had certain rights - however does that mean feudalism was a good thing? The authors do not attempt to ask these questions.

By not asking these questions, the authors end up seeing historical change mostly as a result of inter-modal conflict and not intra-modal. Most notably, the authors focus on the impact of industrialization on the peasantry and peasant struggles against British colonialism. Not

enough attention is paid to intra-modal sources of conflict such as conflicts between agricultural labourers and landlords. By not giving sufficient attention to intra-modal conflict, one is left to believe that these conflicts over resource use were minimal. An attempt should have been made to discuss the relations of production in pre-colonial India in a more detailed manner as it is something which has not been covered well.

The strength of the book is definitely the colonial and post-colonial section. Though an ecological analysis of pre-colonial India has been undertaken, it is not as thorough as the rest of the book. Due to the huge time frame covered by the authors, the study of pre-colonial India is limited to examples of prudent natural resource use and not to an analysis of the socio-economic ramifications of these systems.

Despite some shortcomings, this book is a must for historians, sociologists, environmentalists, economists and others interested in understanding the important relationship between village communities and their resource base. It offers useful insights into traditional forms of resource management and the erosion of these systems. The attention given to voices of protest helps destroy the myth that village communities sit by silently allowing history to run its course and instead indicates that alternative village based models are still viable. All in all this ecological interpretation of history though perhaps not comprehensive at times provides an useful point of departure for similar future undertakings.



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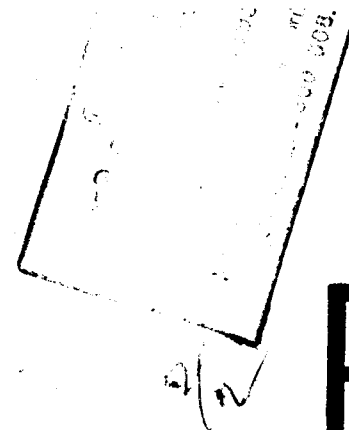
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BULLETIN

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Accountability of Public Sector Banks

Fertilisers in Indian Agriculture

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EDITORIAL HIGHLIGHTS

Introduction

IN this May/June issue of the Bulletin, the Editorial covers the two months March and April. Because the Editor has been unwell, it is rather brief. It covers the **state** where the emphasis is on the 1993-94 budget, presented by the Government in the Assembly and the urgent problems of drinking water, faced by the state. This is followed by the **National** level where the review refers to the completion of the budget process for 1993-94 whose introduction was reported in the last issue. There is also a brief reference to the further liberalisation measures taken by the government and its effect on the plan. This is followed by the examination of the Balance of Payment problems and the steps being taken to face them. Next section deals with **International** events under three headings, the World Economy as reported by

the World Bank, IMF and OECD, World Trade on the basis of data from GATT, World Food Supply and the World Employment situation. The next section deals with some of the important developments with which MIDS is connected. It concludes with two articles, one for the seminar and the other a general exposure. There is also in this double issue, the computerised Annual Survey of social sciences research.

State

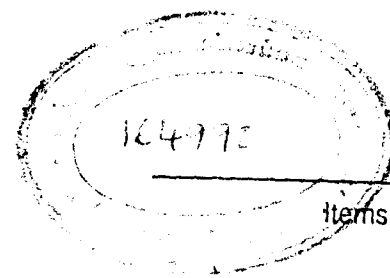
The Budget for 1993-94

The state budget for 1993-94 as presented to the legislature, is considered below in a summary form. The abstract of the budget is as follows:

ABSTRACT

Items	1991-92 Accounts	1992-93 Budget Estimate	1992-93 Revised Estimate	1993-94 Budget Estimate
(1)	(2)	(3)	(4)	(5)
(Rupees in crores)				
I CONSOLIDATED FUND - I	67,75.66	64,46.54	66,61.20	69,89.89
Revenue Receipts				
Expenditure met from Revenue	# 86,79.52	72,55.27	76,69.82	83,00.87

Regi



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Items	1991-92 Accounts	1992-93 Budget Estimate	1992-93 Revised Estimate	1993-94 Budget Estimate
(1)	(2)	(3)	(4)	(5)
(Rupees in crores)				
Surplus or Deficit on Revenue	(-) 19,03.86	(-) 8,08.73	(-) 10,88.62	(-) 13,10.98
Capital Receipts	30,55.59	27,23.83	27,84.06	28,64.44
Expenditure met from Capital including Loans and Advances (Net)	* 16,52.28	22,52.72	23,51.97	24,38.41
Deficit or Surplus on Capital Account	(+) 14,03.31	(+) 4,71.11	(+) 4,32.09	(+) 4,26.03
Total consolidated Fund (Net)	(-) 5,00.55	(-) 3,37.62	(-) 5,76.53	(-) 8,84.95
II Contingency Fund (Net)	(+) 78.59	...	...	...
III Public Account (Net)	(+) 1,82.21	(+) 1,20.00	(+) 5,42.00	(+) 5,25.00
Total Transaction (I+II+III)	(-) 2,39.75	(-) 2,17.62	(-) 34.53	(-) 3,59.95
Opening Balance	** (-) 1.66	(-) 4,01.47	(-) 2,41.41	(-) 2,75.94
Closing Balance	*** (-) 2,41.41	(-) 6,19.09	(-) 2,75.94	(-) 6,35.89

! Includes an amount of Rs.7,24.11 crores due from Tamil Nadu Electricity Board adjustment by way of Interest and Electricity duty.

Includes arrears of Tariff compensation due to Tamil Nadu Electricity Board amounting to Rs.17,69.10 crores.

* The Revenue deficit excluding the Electricity Board adjustment will be Rs.(-)8,58.87 crores.

* Includes adjustment towards 'Ways and Means Advance' due from Tamil Nadu Electricity Board to the extent of Rs.10,44.99 crores.

**Taking into account the adjusted cash balance for 1990-91 with Reserve Bank of India of Rs.2,10,95.89 thousands, the adjusted opening cash balance will be Rs.2,10,95.89 thousands.

***The adjusted Closing Cash balance for 1991-92 with Reserve Bank of India gives the adjusted opening cash balance for 1992-93 of Rs.(-)1,93,91.32 thousands.

Edit

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The highlights of the above budget include:

The regrouping of the goods for sales tax purposes from seventeen rates into just nine tax rates:

Tax on household goods reduced:

Rates reduced on drugs, medicines and dry cells:

Rates cut on industrial products:

Tax increased on luxury goods:

Entry Tax Reform

Entry tax rates, revised:

Agricultural income tax exemption ceiling raised:

Tax on omnibuses raised:

Profession Tax relief to lawyers, doctors, etc:

Partnership firms to be taxed.

The above brief summary, which set the course of the fiscal policy for the coming year, has the usual pluses and minuses. On the plus side is the simplification of the sale tax structure and the small increase in revenue that will be accruing to the government during the period. On the minus side, the revenue raised is inadequate to meet the growing state expenditure, on which there is no plan for reduction. The result is an uncovered initial deficit of Rs.555.89 crores which is bound to increase during the year.

Water

As many as 19 districts are facing drinking water shortage, including in particular Madras city. The major water deficit districts are Dharmapuri, Tiruvannamalai, South Arcot, Chinglepet-MGR, Chidambaram, Pasumpon Thevar, Pudukottai and Trichy.

To meet the situation both short term and medium term measures are contemplated. In the short term a crash programme is to drill 1000 bore wells in the above districts plus 3500 bore wells under the Tamil Nadu Agriculture Development Project, being implemented with World Bank aid.

There is also an immediate conveyance of water from Neyveli, Coleroon and Erode to the extent of 0.7 million gallons for Madras. These short-term measures are necessary but are not meeting the urgent drinking water needs of the city. For the districts, the bore wells programme seems to be the only hope. In the medium term, water to Madras city is to be supplied by the Krishna Water projects which is expected to be available from 1995 and possibly a revived Veeranam Project. There is also a plan to develop a Water Policy for Tamil Nadu on the lines of the Central Water Policy to help in the effective preservation and utilisation of the state water resources.

Agriculture

The record on the agriculture front is not unsatisfactory through the kuruvaipaddy crop which recorded last year 18.35 lakh tonnes. The state's rice stock is now adequate. It is supported by the monthly allotment of 70,000 tonnes of rice from the Centre.

This period's agricultural research reports, numbering over 92, cover all the main fields with some evidence of their use by the farmers, particularly in the case of paddy and other cereals, fruits and vegetables and animal husbandry.

Industry

The government reports that it has taken steps to attract Rs.20,000/- crores of investments. It has also cleared new projects worth Rs.171.60 crores in March. In March

and April, there are a number of important industrial initiatives in the state. The one negative feature is the flight of certain amount of capital particularly to the neighbouring Union territory of Pondicherry. Industrialists state that this is due to the innumerable obstacles and clearances that have to be obtained for starting or expanding an industry in Tamil Nadu. The government should urgently examine this issue and bring about the needed changes.

National

The Budget

The budget for 1993-94 was examined under eight/nine demands, after which the guillotine was introduced as at the end of April. In his reply to the budget debate, the Finance Minister has promised that there will be some incentives for savings which are to be introduced when the Finance Bill is taken up early during next month of May. One disturbing aspect of the 1992-93 budget is that the deficit is ballooning by 50 to 75 per cent because of over calculation of income and some manipulation of some expenditure items. An important and possibly revolutionary development is the setting up of seventeen parliamentary committees covering all departments of government. The committees range from Agriculture, Industry, Commerce and Foreign Trade to Health and Family Welfare. These committees will work whenever parliament is in recess and will cover in each area the government bills, CAG reports, parliamentary resolutions but most important of all the annual budgets and its various constituent parts. This could give new life and impetus to the functioning of parliament and particularly its review and approval of every section of the budget. The extent to which this can be carried out by the committee and its constituent members of parliament will

depend on the research facilities, made available to each member of the committee, the provision of research and clerical assistance, and the support of non governmental agencies who should be given full access for placing their views and make their contribution in evidence before each committee. The setting up of the committee system in parliament is an important step. Whether it will be a milestone and contribute to a full and real review of the various initiatives of government as set forth in the budget and other documents will depend upon the above facilities being made available to each member of the committee.

A further liberalisation

In March, the government announced a series of liberalisation steps. This involved complete delicensing of motor cars, white goods, (refrigerators, air conditioners, washing machines, etc.) and some leather products. The procedures for obtaining licenses were also simplified. The effect of this added liberalisation policy could be very serious on our established producers of motor cars and white goods. The government downplays this possibility but the experience with Maruti shows that the market could be flooded by multi national imports or from their local manufactures. This dose of liberalisation was insisted on by IMF and the World Bank as a condition for further loans. This means that the only way that our industry can be protected and allowed to grow is to stop obtaining further loans from the World Bank and International Monetary Fund.

As part of the ongoing liberalisation process, the government in early March dereserved 13 natural minerals for exploration and exploitation by the private sector. The dereserved minerals include iron-ore, gold, diamond, copper, tungsten and nickel. These minerals which were hitherto reserved for the Public Sector exclusively are now

thrown open to the private sector. The new policy also increases foreign equity limit from 40 per cent to 50 per cent. This increased limit applies also to the public sector mining companies.

Security Scam

The fourth report of the Janakiraman Committee on the Security Scam does not reveal any new area. The examination of the Minister of Finance and the Minister of Health also did not provide any additional information. However, two points are to be noted. The Fourth report shows that the gross scam is Rs.4024.48 crores compared the earlier estimate of Rs.3542.79 crores. Second, the report also brings out in full the involvement of 3 foreign banks in the scam, viz., the Standard Chartered, ANZ Grindlays and Citi Bank. The Comptroller and Auditor General reports the shocking fact that Public Sector Units used Rs. 9000 crores for speculations.

Agriculture

There are four important developments during this period in regard to agriculture. First, thanks to the good south-west monsoon, the foodgrains production is likely to be 176.7 million tonnes against the target of 183.0 million tonnes. This is the second year when the yield misses both the kharif and rabi targets. Similar good performances are recorded in other crops. Second, due to the improved procurement of foodgrains in 1992-93, the buffer stock is increasing, rather than decreasing. The offtake of wheat is 9.5 million tonnes and rice 10 million tonnes against procurement of 10.2 million tonnes of wheat and 11 million tonnes of rice. This nett improvement in buffer stock position (by some 1.7 million tonnes) rules out the needs of importing wheat or other cereals in 1993-94. The trends of procurement of wheat and the growth in food credit in the coming months, will be a sound indicator of how well the

agricultural sector is performing. Third, the draft agricultural policy has at long last been presented to the conference of agricultural ministers of the states who are directly concerned with it. It received their endorsement broadly with a few minor additions and changes suggested. Fourth, the Dunkel draft and its effect on agriculture of the country continues to divide the agricultural community. The group, led by Sarat Joshi favours the draft while that led by Tikait is sharply opposed.

Plantation crops

UPASI reports a normal coffee crop for the year with the problem of exports still facing the coffee industry. In regard to tea, there is a decline of around 2 per cent in the yield, due to bad weather, particularly in the South. With regard to rubber, UPASI which pleads generally for decontrol and free marketing in tea and coffee, has advised the government to go slow in applying this policy to rubber, because it does not want industry entering the rubber growing area which is mostly grown by small growers. Any move to the contrary will not only destabilise the rubber industry but also in user industry, particularly in the medium and small scale industry. This is a plea for governmental protection for natural rubber growing and marketing which, is against the current liberalisation policy.

Industry

The major development on the industrial front, viz, the further liberalisation, had been referred to earlier. Its effect on the Planning Commission and its regulatory and allocative functions will be such as to make the Planning Commission somewhat peripheral to the ongoing economy, as the market will be the main regulator and allocator. For industrial growth, 4.3 per cent growth was recorded in November 1992, making the average

index of industrial production for the first eight months of the current year 3.9 per cent as against 0.7 per cent during the corresponding period of the previous year. The manufacturing sector registered a growth of 3.9 per cent during April to November, the last 3 months ending November 1992, showing an impressive growth of 5.7 per cent. However, the production performance is quite varying for the various industries. For those accounting for 54 per cent of the total weight, industrial growth records a low growth of 1.2 per cent during November. While the non ferrous metals recorded a growth rate in the thirties and PTA by over 57 per cent, minus growth rate were recorded in pig iron (minus 13.6), heavy vehicles and three wheelers (minus 16 to 17.6 per cent), cotton blended fabrics (minus 14.2 per cent) and crude oil (minus 10.8 per cent). It is only the heavy chemical industry plus soda ash production which have recorded high growth rates.

Balance of Payments

For the period April 1992 to February 1993, exports increased by 2.81 per cent to \$16.500 million, while imports increased by 13.4 per cent to \$19.950 million. The trade deficit during this 11 months period was thus \$3.5 billion. The government reports the building up of its foreign exchange reserve to near \$6 billion at the end of this period and states that its aim is to maintain its foreign exchange reserve at over \$5 billion. It should be noted that the weakness in this policy is that the foreign exchange reserve being built up, not from export earnings but from borrowings from international financial institutions. Hence the government announced at the end of March further liberalisation of the Export-Import Policy with special emphasis in pushing forward agriculture and allied sectors, such as aquaculture, animal husbandry, floriculture, horticulture, pisciculture, poultry and seri culture. Similarly

the Export Promotion Capital Goods Scheme is expected to increase its earnings by 15 to 20 per cent. Such a development is urgent if the country does not sink into an international debtor with the World Bank and IMF.

Human Resources Development

The main factor to note in the education field is the introspection taking place with regard to higher education. Here meetings of vice chancellors, UGC and other educationists are examining the quality of higher education and its cost. There is a frank admission that the higher education quality is falling and that steps should be taken rather urgently for its improvement through higher quality teachers, using teaching technologies and learning methodologies, increased and improved library holdings. Examination reform is also an important input for improving the future quality of higher education.

Science

In science research, the use of biotechnology, particularly with regard to agriculture production, is being successfully and relentlessly pursued. Further, the INSAT series is now complete. So, the scientists can make full use of its facility.

Health

In the programme of Health for All, particular attention is being given to providing health care for infants, mothers and women generally. This has involved extension of the system of sub centres in rural areas. Thus the provision for the primary health care for the poor in rural areas is being augmented.

Employment

The employment situation is worrying as seen in the massive increase in the

number of job applicants in the Employment Exchanges. The numbers registered for employment now exceeds 15 million. Of this, about half are educated unemployed. This represents a serious waste of human resources. The annual average rates of unemployment are high in Kerala, Tamil Nadu, Maharashtra and Gujarat, according to the data recorded by the Employment Information services.

INTERNATIONAL

The World Economy

The World Bank foresees a higher world growth rate at 4.7 per cent for next year. This optimistic outlook is not shared by OECD which states that due to the pressures of the financial market, growth will be slow. It is also pointed out that the major challenge is of ensuring the growth of developing economies for this. The World Bank and IMF have one major prescription in the Programme of Economic Reform and Stabilisation.

International Trade

GATT report that trade in the global economy is moving at a rather slow pace. The result is that foreign capital investment needs to be more widespread and not concentrated only in China, Korea, Taiwan and Argentina.

World Food

FAO forecasts some decrease in cereal supplies, during the current year. If there are good monsoons and appropriate weather conditions, this could be made up next year.

World Employment

Data from the International Labour Organisation shows that the slave labour

conditions cover millions of people. This includes children, working in dangerous and degrading conditions around the world. Its survey shows that India, Pakistan and Brazil are the centres of child labour. Here children are working for 17 to 18 hours a day and average six to seven years in age. This ILO report on child labour calls for urgent international and national action.

OTHER ITEMS

TNSC for Higher Education

In mid March, the Tamil Nadu State Council for Higher Education was inaugurated by the Chief Minister with a call to concentrate on the improving the quality of higher education and effecting closer coordination between the states universities. This was followed a week later by the first meeting of the council when its main decision was to constitute a committee of all the vice chancellors in the state. This committee will discuss and recommend to the council all substantive matters, concerning curricula, training of college professors, admission regulations, examination reform, etc. The council also approved the budget for the last 3 months of 1992-93 and the draft budget for 1993-94.

Madras Christian College Consultation and United Writers Association

In the third week of March, there was a consultation of some senior alumni and existing department heads of the Madras Christian College to plan the steps to be envisaged for making two or three departments of the college, areas of excellence. Two areas, Rural Development and Statistics, were identified and their move to become centres of excellence, will have to be supported by a certain degree of financial independence. The

ideas thrown out at the consultation are to be pursued by the staff on a consensus basis. A seminar organised by the United Writers Association was devoted to a panel discussion and an analysis of the developments in the new economic policy. Some of the distortions in the course of the past 18 months in the policy were identified such as the effects of the drastic reduction in the fiscal deficit, the growing depression in industry, particularly the automobile industry, the increase in imports without a parallel increase in exports, etc. Corrections for these distortions were also suggested.

SRC-TNBCE

The bi-monthly meeting of the SRC Governing Board concentrated on a review of the total literacy programme districts which has now increased to nine. Some of the problems faced by them, such as the delays in the receipt of literature and booklets for the neo literates and the problems of the teacher volunteers were faced and solutions found. This was followed by the Executive Committee meeting of the TNBCE which received reports of the projects, being executed by its agencies. Here the problems faced by them and the solutions to them which had been suggested by the annual conference of voluntary agencies was recalled and action by both the state and the centre urged.

IIC

In the 2 months March and April, there were a series of events, connected with the India International Centre. At the end of March, there was the annual meeting of the General Assembly when the current programme and events were reviewed. The many problems faced by the members, because of limited accommodation and even more limited parking space, were stressed. The audited statement of accounts for 1991-92 were approved on the basis of the recommendations of the Executive Commit-

tee. This meeting was preceded by a meeting of the Board of Trustees where apart from preparing for the Assembly, the main discussion was a detailed review of the need and of the problems arising and of their solutions as envisaged in the extension of the centre being thought of. Because of the importance and complexity of the issue, it was decided to return to this question at future Board meetings. In March there was also a panel discussion on the budget for 1993-94 when its pluses and minuses were fully debated. It was noted that these two sides are somewhat evenly balanced. In April, there was a panel discussion on problems of foreign trade, concentrating on seasons for the growing trade deficit and the need to stimulate and push forward exports both visible and invisible. This was followed by a seminar on "Sustainable Development" when the importance of using renewable inputs in agriculture was stressed.

Company Secretaries and Madras Craft Foundation

There was at the end of March, a meeting of the company secretaries for discussion and the review of 1993-94 Union Budget. There was agreement that the budget had not provided any incentives to the Corporate Sector. It was also slack in promoting savings, both by individuals and companies. It was suggested that these defects and these shortcomings should be remedied during the course of the year. The Madras Craft Foundation organised in Hotel Trident (near the airport) a brief video show of the Foundation site at Mamallapuram and the first building for housing some of the artwork. This was followed by an exhibition of Indian costumes from all over the country.

Industrial Economist, and M.S.S.R.C. Founder's Day

The completion of the 25th year of the Industrial Economist was celebrated at the

end of March. Its contribution for the industrial development of the state and the south generally was seen as an outstanding effort by its editor. For its future, his plans for expansion and diversification into the foreign trade field was noted and welcomed. And an important new science research facility was created at the Founder's Day celebration at the M.S. Swaminathan Research Centre, Taramani. Its concentration on agriculture and sustainable rural development is a much needed programme for the state and the country. An innovation introduced by the Foundation is the creation of a Gene Bank of Dying and Disappearing Plants. This would give new life to this area of agriculture.

First article

The paper for the April seminar "Accountability of Public Sector Banks" by Era. Sezhiyan appears as the first article.

Second Article

A review of "Fertilisers in Indian Agriculture" by A. Vaidyanathan appears as the second article.

Book Review

A review of "Liberalisation - Its Impact on the Indian Economy" by S. Neelakantan appears in the book review section.

Twenty third Census of Social Science Research In Southern States

The Twenty third census, because of new format which is computerised, runs into over 100 pages. Hence it has been decided to break it into two parts. Part I which deals with ongoing research projects appears in this May-June issue, and Part II which deals with completed research projects will appear in the July 1993 issue.

MIDS News

The Annual Meeting of the Ph.D Scholars and Guides under the sponsorship of the Indian Council of Social Science Research was held from April 16-19, 1993. The Department of Economics of Annamalai University was the venue. It is to be noted that for the first time, the meeting was held outside our Institute. 42 Ph.D Scholars and 12 Guides attended the meeting. The resource persons were Prof. Charles Koil Pillai and Dr. S. Varadharajan. Prof. Charles Koil Pillai, Professor of Economics, Lakehead University, Canada gave three lectures on "writing a research paper" and Dr. S. Varadharajan, Professor of Agricultural Economics, Tamilnadu Agricultural University, Madurai gave one lecture on "sample selection". In addition to the regular sessions of discussion of scholars' proposals, there was also a panel discussion on the final day about the experiences of research supervisors.

Dr. S. Neelakantan participated in the Platinum Jubilee Conference of Indian Economic Association held at Indore between May 1 and May 3, 1993 and presented the keynote paper on "Globalisation in Indian Economy" on May 1, 1993.

Dr. Ms. Padmini Swaminathan participated as a Resource Person in a refresher course entitled 'Integrating Feminist Perspectives in Social Work and Social Science Disciplines' held at the Tata Institute of Social Sciences, Bombay, between April 22 to May 12, 1993. Conducted a session at this workshop on "Womens Work: Issues in the Indian Context", on May 3, 1993.

Dr. Ms. R. Hema gave guest lectures in Mathematical Economics for the post graduate students of Mahatma Gandhi Government Arts College at Mahe, Pondicherry, for 3 weeks from April 5-26, 1993. Attended the Ford Foundation Post Doctoral Fellows' Conference at NIPFP, New Delhi on May 10, 1993.

Mr. S. Guhan participated in: (i) Seminar on 'Social Security in Asian Developing Countries' organised by the Social Security Association of India, New Delhi, April 21-23, 1993; (ii) Gave a talk on Cauvery River Dispute at seminar organised by Kaviri Kapper Kuzhu, Madras, May 22, 1993; (iii) Seminar organised by the UNDP on the Human Development Report, 1993 at New Delhi, May 24-25, 1993; (iv) Gave a talk on 'Economic Reforms and Federalism', Rotary Club, Madras on June 1, 1993.

April Seminar

ACCOUNTABILITY OF PUBLIC SECTOR BANKS

Era. Sezhiyan

IN a Parliamentary system of government, it is fundamental that the executive should have the approval of the legislature before it levies a tax or makes an expenditure from public monies. Equally fundamental is that the executive is accountable to the legislature for the monies it handles. As a corollary to this concept, public enterprises financed from public funds must function within the confines of public accountability.

Though obliged to exercise control over the government and the public enterprises, the Parliament finds it difficult to exercise such a control directly, due to paucity of time and enormous volume of financial, administrative and technical operations involved. To fulfil its basic responsibility in this regard, Parliament in India, as in the case of similar institutions abroad, has developed a control system. In respect of the public sector banks, the important control agencies are:

- i) Parliamentary Committees
- ii) Government
- iii) Comptroller and Auditor General
- iv) Reserve Bank of India
- v) Other agencies

Parliamentary Committee

A Committee of Parliament may be a Standing Committee or an Ad hoc Committee. The well-known standing committees are the Public Accounts Committee, the Estimates Committee and the Public Undertakings Committee; the standing committees function on regular basis, being reconstituted every year or from time to time, as per the rules of procedure of the House. An Ad hoc Committee is formed by the House to consider the report on a specific matter and becomes *functus officio* as soon as it completes the work assigned to it. The Joint Parliamentary Committee set up to inquire into the securities scam is an ad hoc committee.

The Committee on Public Undertakings (COPU), was formed for the first time in 1964 to ensure "parliamentary accountability of public undertakings". Though the committee is called the Committee on Public Undertakings, not all public enterprises have been brought within the purview of this Committee. As per the Fourth Schedule of the Lok Sabha Rules, the Committee of Public Undertakings can undertake examination of only the following categories of public enterprises:

- i) Public undertakings formed by Government under Companies Act the reports of which are placed before the Houses of Parliament, excluding Hindustan Aircraft, Bharat Electronics, Mazagaon Docks and Garden Reach which are wholly concerned with production purposes of defence.
- ii) Some public undertakings established by central acts like DVC, IFC, IAC, Air India, LIC, CWC, ONGC, FCI, IAAI, IDBI and DTC.

It may be noted that the Government did not include in the Fourth Schedule some of the public institutions of considerable importance like Reserve Bank of India (1934), State Bank of India (1955) and 7 SB Subsidiaries (1959). These were taken over by the Government earlier to the formation of the Committee on Public Undertakings.

When fourteen banks were nationalised in 1970 and six more in 1980, the Government did not agree to the demands from several Members of Parliament, from Opposition as well from Ruling Party, for bringing all the public sector banks under the purview of the Parliamentary Committee. This position remains unaltered till date. In his introductory remarks of the Eighth Report of COPU (August 1992), its Chairman Mr. A.R. Antulay has stated:

The matter regarding bringing the public sector banks and other financial institutions has been hanging fire since 1968-69. The Ministry of Finance has been opposing this move persistently on one pretext or the other despite the then Finance Minister's (Madhu Dandavate) clear assertion in Rajya Sabha on August 28, 1990 that to have effective control over the banking system the public sector banks should be brought within purview of the Parliamentary Committees.

Thus the public sector banks do not come under the purview of the Committee on Public Undertakings.

Comptroller and Auditor General

The institution of Comptroller and Auditor General is part of the basic structure of the Constitution of India. Functioning of the CAG was considered, by Dr. B.R. Ambedkar, as "far more important than the duties even of the judiciary". (Constituent Assembly Debates 30 May 1949).

The audit conducted by the CAG covers a wider field than that of a statutory or internal auditor. It is not mere a voucher audit; the function of the CAG is to examine "not only that every expenditure has been incurred as per rules, regulations and laws, but also that it has been incurred with faithfulness, wisdom and economy."

Audit Reports and assistance with detailed notes from the CAG form the basis of investigation for the Parliamentary Committees.

Regarding audit of the public sector undertakings, the Public Accounts Committee of the First Lok Sabha declared that "the Comptroller and Auditor General should have the right to audit the expenditure of the State-sponsored concerns by whatever name they may be called because they are financed from the Consolidated Fund".

But in practice when large number of public enterprises were being established after the Industrial Policy Resolution of 1956, the government invariably adopted the strategy of entrusting audit to private firms of auditors relegating the CAG to perform secondary audit. Further deterioration took place when insurance and banks were nationalised and enacting statutes were such as to keep audit of these financial institutions outside the purview of the Comptroller and Auditor General.

Regarding audit of the banks, Sec. 10 of the Banking Companies (Acquisition and Transfer of Undertakings) Act, 1970 stipulates that every nationalised bank "shall appoint, with previous approval of the Reserve Bank auditors for audit of its accounts".

The annual reports of the public sector banks are placed before the Houses of Parliament. Beyond some questions or discussions raised on the floor of the House on stray instances of malfunctioning of the banks, no regular investigation by a Parliamentary committee was made possible.

Even in the audit by private auditors, the public sector banks are having a preferential treatment. In respect of a bank in private sector, accounts of each branch office are to be audited by the statutory or qualified auditors whereas there is no mandatory provision for branch audit for nationalised banks. However the Reserve Bank in consultation with government have given guidelines to have audit of the branches in a selective manner to cover all branches at least once in three years.

For State Bank and its subsidiaries, there had been no such guidelines issued till 1983 and they were not having the branch audit by rotation as in the case of the 20 nationalised banks. In respect of the State Bank having over 6000 branches, the accounts of 12 main offices and 6 branches were only audited by the statutory auditors and the rest dealt with on the basis of the certificates issued by the branch managers; for Subsidiaries of the State Bank, the accounts of the head office alone were subject to the external audit.

When the propriety and rationale of this discrimination was questioned by the COPLOT Committee of Rajya Sabha, the Reserve Bank gave the explanation that the State Bank of India had such a good and historical system of inspection and

internal audit that "it was not found necessary not to have proper audit".

The Eighth Report of COPLOT of Rajya Sabha (August 1983) stated: "The Committee finds no plausible reason why the audit of the public sector banks should not be brought under the Comptroller and Auditor General while a large number of financial credit institutions, State Financial Corporations and a commercial bank of a State are already under his jurisdiction".

In its reply, the Finance Ministry contended that the CAG was being consulted in appointment of statutory auditors and that "as far as handling of Government transactions is concerned, the audit of these transactions is now being carried out by the Comptroller and Auditor General of India. This selective audit by CAG of government transactions handled by the public sector banks is considered adequate. It is therefore not proposed to entrust the entire audit of public sector banks to the CAG".

If this logic were to be extended, it would mean exclusion of public audit in number of public enterprises with which the government has some transactions or other. The COPLOT, not accepting this specious plea reiterated its recommendation for audit by Comptroller and Auditor General. But the Government did not accept the recommendation.

House-keeping of Public Sector Banks

For the first time in 1982, a break-through was made by the Committee on Papers Laid on Table (COPLOT) of Rajya Sabha with which I had the honour to be associated at its Chairman. The Rajya Sabha Committee took up scrutiny of the Annual Reports of the 28 public sector banks and found large accumulated arrears in reconciliation of accounts. For all the public sector banks, the total of unreconciled/unadjusted entries under the head of account "Inter-branch Accounts" alone stood at

Rs. 2,00,169 crores as on 31 March 1982. Topping the list was the State Bank (Rs. 86,442 crore) with others following as Punjab National Bank (Rs. 37,617 crore), Central Bank of India (Rs. 25,735 crores), State Bank of Patiala (Rs. 14,906 crores). The arrears had been there accumulated over a decade or so.

Dangerous implications of keeping such mind-boggling arrears cannot be exaggerated. The COPLOT gave a warning in its Twenty Sixth Report of November 1986:

The Committee strongly feels that keeping unreconciled and unaccounted entries for years together provides a lever to unscrupulous elements to commit mischief with public funds. In such situation mischief will remain undetected and the person responsible therefor would go unpunished. In the recent past there has been a spurt of cases of malpractices involving a sizeable number of bank officials swindling crores of public funds.

In spite of assurances given by the Finance Ministry that they had made time-bound programmes to liquidate all arrears and not to allow the current work to fall in arrears, the state of house-keeping of the public sector banks does not appear to have improved at all. The Annual Reports of the public sector banks for the year April 1991-March 1992 presented to the Parliament last year present a dismal picture of the state of their house-keeping.

The Notes to Accounts appended to the Audit Reports indicate that large number of account heads remain unreconciled/unadjusted. The Notes continue to be indeterminate and nebulous without any reference to the extent and period of arrears in reconciliation.

Take for example the Report of the New Bank of India which contains the Note to Accounts as:

- i) Inter-office adjustments includes items affecting Assets/Liabilities and of revenue nature in transactions between Head Office, branches, clearing cells and branches inter-se comprising a large number of entries and differences of substantial amount, awaiting clearance/adjustment.
- ii) In a few branches (including a certain large ones), certain balance books, subsidiary ledgers, and/or balances in respect of certain ledgers of deposits, borrowings, loans and advances, fixed assets (including Head Office), acceptances, demand drafts, cash orders, suspense, sundries, and clearing differences have not been reconciled with general ledger balances. In certain branches, balances of subsidiary records have not been extracted.
- iii) Suspense and Sundry accounts include old items relating to capital and revenue. These are pending for the scrutiny and adjustment.
- iv) In some branches, balances with Banks (including Reserve Bank of India and State Bank of India) have not been reconciled and in some old entries which continue to be pending for scrutiny and adjustments.

In this regard, one cannot comprehend the number of branches involved, the volume and value of entries remaining unmatched/unreconciled/unadjusted. The information given in the Balance Sheet will not reveal the true state of affairs. For example, the Inter-Branch transactions which are not reconciled are given as "Inter-Office Adjustments (Net)". The 'Net' figure is the difference between the credit and debit entries. Unreconciled account in Net (debit) of Rs. 1 crore may be the outcome of

balancing of entries of Rs. 2 crore in debit and Rs. 1 crore in credit whereas the same 'net' amount in Debtor of Rs. 1 crore can be caused by Debit of Rs. 100 crore and credit of Rs. 99 crore; in the former case the total of the unreconciled entries is Rs. 3 crore whereas in the latter case the total will be Rs. 199 crores.

The 1991-92 Annual Reports give the Inter-Branch Adjustments (Net) for some banks as State Bank (Rs. 6,677 crores), Allahabad Bank (Rs. 522 crores) etc. Only a thorough examination of the books will reveal the extent of the arrears in unmatched/unreconciled entries accumulated over the years by each bank.

The Banking Commission Report (1972) observed that "delays in tracing of unmatched entries and follow-up with concerned branches are potentially dangerous and several frauds have been perpetrated in banks by manipulation in inter-branch accounts".

The COPLOT Report (April 1984) that "occurrence of malpractices in such large measure in public sector banks as revealed by the Reports of the Central Vigilance Commission is largely due to the prevailing conditions of accounting system where large number of items remain unreconciled".

The Estimates Committee (1983-84) in its Eighty Fourth Report referred to an evidence given to it that "reconciliation of accounts was left in arrears deliberately" and that there was "vested interests in keeping the work in arrears to cover up frauds".

While delivering a lecture in Pune in September 1984, the Reserve Bank Governor himself admitted that "poor house-keeping increases scope for malpractices such as frauds".

In 1983-84 the Governor of Reserve Bank was none other than Dr. Manmohan

Singh and decade later he was to express concern on the "failure of the system" leading to a shameful fraud, worst ever to happen in Indian economy.

The Second Report of the Janakiraman Committee has estimated that during the scam period of 14 months from April 1991 to May 1992, the aggregate value of the securities transacted to be Rs. 9,06,192 crore (face value) by the reporting banks and out of this, the Committee has found unmatched entries in the banks to be at Rs. 2,75,108 crores. Thus 30 per cent of the securities transactions remain unmatched/unadjusted.

Role of Reserve Bank of India

The Reserve Bank of India is the central bank to regulate flow of money and credit and to control the functioning of the entire banking industry in the country. Under the Reserve Bank of India Act and the Banking Companies Act, enormous powers have been vested in the Reserve Bank to control and supervise the activities of the commercial banks. Reserve Bank can at any time cause inspection to be carried out by its officers of any bank and its books of accounts; if mismanagement is detected, it has powers to rectify accounts; if mismanagement is detected, it has powers to rectify defects, to appoint additional directors, to withdraw banking license and to effect mergers. Nationalisation of banks in 1970 and 1980 put additional responsibilities on the Reserve Bank towards realisation of social and economic objectives of nationalisation.

Whenever deficiencies and mal-functioning of the public sector banks were pointed out in the Parliament or in the Committee reports, the Finance Ministry relied on the supervisory skill of the Reserve Bank and internal inspection and audit system to take care of the situation. Though Finance Minister put on brave face to defend

the Reserve Bank and its Governor on their inept role in the bank scam, he has to concede to the Parliament: "Questions have also been raised whether RBI which is responsible for supervision of the banks, could have been more vigilant. In retrospect, it is clear that the RBI's supervisory function was not effective as it should have been".

Regarding the internal audit system, the Second Report of the Janakiraman Committee states:

"No doubt, internal auditors were appointed to look into some of these aspects but unfortunately they have not brought put any deficiencies to the attention of the management on which basis remedial action could have been taken".

Thus the supervisory skill of the Reserve Bank and the internal audit system had not been effective to prevent the fraudulent transactions of the banks.

Even the system of routine management appears to have been neglected by the Reserve Bank. For instance, the National Housing Bank is a 100 per cent subsidiary of the RBI. It was established in 1988 "to operate as a principal agency to promote housing finance institutions". Under the Act, the Government in consultation with the Reserve Bank has to form the Board of Directors; but from its inception in July 1988 to April 1992, no Board was constituted for the NHB, which means that the Reserve Bank was in full responsibility of managing the affairs of NHB. It is that during this period of April 1991 to April 1992, the Bank scam took place and the NHB was found to have indulged in transactions to the tune of Rs. 26,400 crores, mostly on ready forward basis which had been specifically prohibited by the RBI guidelines. Thus the NHB, functioning under the direct management of the RBI, had been blatantly violating directions issued by the RBI itself.

Functioning of the Reserve Bank has never been a subject matter of examination by a Parliamentary Committee. An official of the Finance Ministry told the COPU in August 1992 that "Parliament does not have any control over RBI". What he told the Committee is truly blunt and bluntly true.

Importance of Public Audit

Importance of public audit over the public financial institutions has been stressed by the Fourth Seminar of the Asian Organization of Supreme Audit Institutions held in May 1991 in its declaration:

Considering the indispensable role of the Public Financial Institutions and Public Insurance Companies in economic development and social welfare, it is imperative that the Supreme Audit Institutions must have a clear and complete mandate for performance audit of these organizations. It is in the national interest that these organizations work to standards of highest efficiency and any weakness need to be identified by SAIs for corrective action.

In Australia, public financial institutions like Commonwealth Bank, Commonwealth Development Bank, Australian Industry Development Corporation and Housing Loans Insurance Company are covered fully by the Australian National Audit Office.

In Korea, public audit of the Board of Audit and Inspection conducts performance audit of the public financial enterprises such as the Bank of Korea, Korean Development Bank, Citizens National Bank, Korea Housing Bank, etc.

The Central Bank of Malaysia is audited by the Auditor General of that country.

Needless to say India played leading role in framing such guidelines in international fora; but at home, it has been keeping nationalised banks, life insurance and other public financial institutions out

of purview of the Comptroller and Auditor General and it is paying a heavy price for the lapse. In the name of autonomy, anarchy and abuse of authority prevail here.

The public sector banks occupy commanding heights in mobilising financial resources. The volume of working capital with the public sector banks as on March 31, 1992 was Rs. 3,01,707 crores which accounted for 88.5 per cent of the total for all the scheduled banks in India.

The first and foremost step towards effective parliamentary control should be to have all financial institutions including RBI, SBI and nationalised banks brought under the purview of the public audit. It will be difficult for Parliament or for a Parliamentary Committee to conduct any meaningful investigation without public audit and regular scrutiny.

The executive and the public sector owe accountability to the Parliament and the Parliament owes accountability to the public.

FERTILISERS IN INDIAN AGRICULTURE*

A. Vaidyanathan

THE importance of fertilisers in Indian Agriculture is in part due to its topical interest (in the context of the controversies surrounding fertiliser subsidies) but more importantly to place the role of fertilisers in Indian agricultural development in a wider perspective. There is excessive preoccupation with prices and hardly any attention to questions concerning productivity of fertilisers, the dangers of excessive and careless use of synthetic fertilisers, the necessity to pay more serious attention to exploiting the considerable potential for organic manure, (in the interests of both economy and environment), and the problems involved in ensuring that fertilisers are produced and supplied at the lowest feasible cost.

Growth of Fertiliser Use

Rapid growth in the use of chemical fertilisers is among the striking features of the transformation of Indian agriculture in recent decades. In the early fifties the total annual consumption (in terms of nutrients) was barely 100,000 tonnes (less than 1 kg per hectare of crop area); it rose to around 450,000 tonnes (3 kg per ha) by the early sixties, 2.6 million tonnes (15-16 kg/ha) by early seventies and over 10 million tons (58 kg/ha) by the latter half of the eighties.

*Prof.L.S.Venkataramanan Memorial Lecture delivered at ISEC, Bangalore.

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Salient features:

We know very little about the extent of fertiliser use by regions and crops during the fifties and sixties. But there is reason to believe that initially it was mostly confined to plantations and to a few non-plantation crops like sugarcane, tobacco and vegetables. The proportion of area fertilised (the diffusion rate) and the quantum used per unit of fertilised area (intensity) on field crops must have been quite low in most parts of the country. "It seems safe to say that by the mid fifties fertiliser use had not spread to more than 5 per cent of Indian's 147 million hectares of gross cropped area" (Desai G.:1982)

Even by 1970, when the National Sample Survey conducted the first comprehensive survey of fertiliser use, the overall diffusion rate was barely 25 per cent, with each hectare of fertilised area getting around 40 kg of nutrients on the average¹. Six years later another survey by the National Council of Applied Economic Research showed only a marginally higher diffusion rate (29 per cent) but a much higher intensity (76 kg). The latest survey, again conducted by NCAER, shows that in 1988-9 nearly threefourths of the country's crop area was using fertilisers (an increase of nearly two

and a half times compared to 1975-77) even as the intensity of use rose by barely 30 per cent. Given the problem of comparability of design and concept, and the problems of getting accurate data through structured interviews, these (and other figures) which are cited extensively in this lecture, should be taken as indicative rather than precise.

In 1970-71 about 65 per cent of irrigated crop area is estimated to have used fertilisers, compared to a mere 11-12 per cent of unirrigated crops. The average dose was

also higher on irrigated areas, the difference being much narrower than in the diffusion index. Fertiliser use has since become more widespread on both categories of land, the extent of increase being considerably faster on unirrigated areas. The NCAER survey estimates the overall diffusion index in 1988-9 at 89 per cent for irrigated and 54 per cent for unirrigated lands. Subject to caveats on comparability of the surveys, it would however seem that intensity of use has grown much more rapidly on irrigated areas. (Table 1)

Table 1 : Diffusion and Intensity of Fertiliser use in India

	1970-71 ¹		1975-77 ¹		1988-89 ²	
	Diffusion Rate	Intensity	Diffusion Rate	Intensity	Diffusion Rate	Intensity
Overall	26	40	29	76	75	102
Irrigated areas	65	44	67	86	87	129
Unirrigated areas	11	31	19	44	51	63

Note: Diffusion rate : percentage of total crop area in each category on which fertilisers were used.

Intensity : quantum of nutrients (in kg) per hectare of fertilised area.

Source: 1. Desai 1982. A number of problems concerning the concepts and coverage of the data are discussed by Desai.

2. NCAER 1991.

That fertilisers are more widely used on irrigated areas is not surprising: Irrigated crops, generally, get larger and more assured supply of water relative to their needs than rainfed lands; their yield response to fertilisers therefore tends to be larger, and more certain. Even among irrigated crops, fertiliser use was initially concentrated on crops like sugarcane, paddy, wheat and similar high value crops.

On crops like coarse cereals, pulses and groundnut - which are of lower value, tend to be grown with poorer quality of irrigation and are therefore more risky - the spread of fertiliser has been slower. The diffusion of fertilisers among wholly rainfed crops, whose yield response to fertilisers is even lower and less certain, has taken much longer and remains much below that of their irrigated counterparts. (Table 2).

Table 2 : Diffusion and Intensity (per fertilised ha) by major crops

	Diffusion Rate									Intensity								
	1970-1			1975-7			1988-90			1970-1			1975-7			1988-89		
	I	U	T	I	U	T	I	U	T	I	U	T	I	U	T	I	U	T
Rice	71	18	37	71	22	44	94	56	79	47	29	42	91	46	79	116	57	108
Wheat	59	11	44	72	10	55	98	61	93	55	35	54	77	34	75	135	54	128
Jowar	24	5	6	44	14	18	83	63	66	72	27	37	72	45	54	67	57	59
Bajra	26	6	8	20	11	14	81	48	55	47	34	44	41	29	35	60	43	48
Maize	37	15	21	54	16	35	85	73	84	65	34	49	48	30	44	83	52	69
S.cane	62	24	54	72	30	67	98	68	97	110	64	104	158	63	152	168	129	167
Cotton	54	11	18	75	28	43	98	75	85	71	41	56	96	70	85	123	69	102
Groundnut	48	19	21	55	33	35	82	80	80	59	52	53	61	31	38	95	73	79

Source: Desai 1982
NCAER 1991
I : Irrigated area
U : Unirrigated area
T : Total area

All the available surveys of fertiliser use show that irrigated crops in general are more intensively fertilised than their rainfed counterparts. Again this is to be expected because irrigation increases the scope for and returns to fertilisers. There are however, significant inter-crop differences in the intensity of fertiliser use with long duration crops like sugarcane and other relatively high value crops like paddy, wheat and cotton using more per ha than others. The average level of application for HYV is also considerably higher than for local varieties.

The significant differences between irrigated and rainfed crop patterns - water intensive and high value crops needing more nutrients being more prominent on irrigated land - tend to raise the overall average intensity of fertiliser use on irrigated areas. Altogether, therefore, the share of irrigated areas in total fertiliser consumption is much higher than their share in crop area. While the relatively more rapid spread

of fertilisers on rainfed crops has increased the latter's share in fertiliser use (from an estimated 15 per cent in 1975-77 to 31 per cent in 1988-9), the fact remains that irrigated areas which constitute perhaps 30 per cent of crop area still account for 69 per cent of total fertiliser consumption. Also to be noted is the fact that despite the faster spread of fertilisers among coarse cereals, pulses, oilseeds and such other crops, about 60 per cent of total fertiliser used in the country is accounted by rice and wheat; the share showing practically no change between 1975-77 and 1988-89. (Table 3)

Contributory factors

Several factors have contributed to this rapid spread and growth of fertiliser use in Indian agriculture. Unquestionably, the state has played the leading role in the process: Massive public investments have had to a near doubling of the proportion of cropped area which is irrigated. Rural

Table 3 Shares of irrigated areas and various crops in fast consumption
(percent)

Crops	1975-77	1988-9
Rice	36.6	31.8
Wheat	22.8	26.6
Jowar	2.8	3.0
Bajra	0.9	1.8
Maize	2.0	2.2
Sugarcane	7.4	3.7
Cotton	6.3	4.8
Groundnut	2.1	4.2
other	19.1	21.9
Total	100.0	100.0
share of irrigated areas	85.3	68.8

Source: Desai 1982
NCAER 1991

electrification combined with liberal financial assistance to farmers has facilitated the rapid spread of irrigation by wells and tube wells both as sole source and in conjunction with surface water. This has been reinforced by the spread of new varieties which, under conditions of assured water supply, are known to absorb a larger quantum of nutrients, and use them more effectively. For example, the average incremental response of HYV rice at 120 kg of Nitrogen per ha is about 33 per cent higher in Kharif and 20 per cent higher in Rabi than that of local improved varieties. The response of HYV and local improved varieties at 120 kg of Nitrogen is seen to be higher than for traditional local varieties at 40 kg. Similar differences in the response to phosphatic fertilisers are noticeable between improved and traditional varieties (Leelavathi et al 1986).

The state has also helped to promote fertiliser use - through fertiliser demonstrations on farmers' fields, extension advice regarding the recommended doses for various crops and regions, the expansion

and improvement of rural transport networks, the increase in the number of fertiliser distribution outlets close to villages, and the phenomenal growth of cooperative and commercial bank credit at relatively low rates of interest.

At the same time, the progressive diffusion of fertiliser - a relatively new input in Indian agriculture - itself means that farmers have been acquiring more and more first hand information (from their own experience and that of other farmers) about yield response to fertilisers, a relatively new input, thereby enabling them to better judge the magnitude of response as well as the risks involved. The impact of this on the diffusion of fertilisers is likely to have been significant during the last 2-3 decades.

Some preliminary analysis of NCAER survey data (Bhide 1991) confirms the importance of HYV, irrigation, and irrigation type on fertiliser use. Interestingly - and this bears out the importance of learning - the current level usage had a significant

positive relation to the length of time for which the individual has been using fertilisers. The analysis further suggests that, controlling for other influences (environmental, technological and those related to agrarian structure), institutional credit as percentage of the value of fertiliser used has a significant impact on the spatial variations in level of fertiliser use per ha; and in some cases the greater the distance from distribution outlet, the smaller seems to be the level of usage. The impact of differences in infrastructure on the dynamics of fertiliser use however remains to be properly investigated. It would be instructive to see if the rate of growth of fertiliser use differs significantly across districts which are otherwise similar, but differ markedly in the base level of infrastructure and credit supply and/or the rate of their improvement.

Technology and infrastructure are not the only determinants: one must also consider institutional and economic factors. Among the institutional factors, tenancy and farm size have attracted a great deal of attention. The impact of tenancy on fertiliser use depends a great deal on the nature of the tenancy contract: Those under fixed rent and full cost sharing contracts should find it profitable to use fertilisers at the same level of intensity as owners. But where costs are not shared, the optimum dose for the tenant will be lower than for an owner. No generalisation is therefore possible. As for farm size, it was long held that smaller farmers would tend to use less fertilisers because they cannot get the necessary credit or can get it only at a much higher cost than larger farmers and also because they are likely to get a lower price for their output. In the early phases of the HYV, there was indeed a substantial difference in adoption rates of HYV and fertiliser use as between large and small farms. But these differences have progressively narrowed and currently, according to the recent NCAER Survey,

there is not much of a difference between farm size for classes either in the proportion of area fertilised (which increases with farm size) or in the intensity of fertiliser application (which declines with farm size)².

The principal economic variables affecting fertiliser use are the prices of fertilisers and of output. For a given crop variety in a specific soil moisture environment, profit-maximising farmers are expected to use fertilisers upto the point at which incremental costs are equal to incremental returns. Therefore, lower the price of fertilizers relative to output, the higher will be the consumption of fertilisers. Attempts to analyse the role of non-price factors and prices in accounting for the spatial and temporal variations in fertiliser consumption, however, suggest non-price factors to be dominant. They do not consistently or strongly corroborate the expected inverse relation between fertiliser-crop price ratio and fertiliser use per hectare (see Nagaraj, 1980).

This may be due in part to incomplete and/or defective specification the underlying relation. For instance, none of the studies take explicit account of costs of credit, transport and application of fertilisers. The implicit assumption that these costs vary in the same proportion as the fertiliser price is not sustainable over time and space. It is also difficult to control effectively for all non price factors, especially those involving technological change, institutional factors and the effect of infrastructural improvements. Perhaps too the role of prices cannot be captured when the analysis is done at the level of the country, or even of states, for all crops! Response functions vary across crops and regions and with irrigation status and varieties used. All these, as well as their mixes, change over time. Nor is it reasonable to suppose, especially during a period when the process of learning and diffusion of knowledge was still underway, that all farmers operate on the representative curve.

Role of manures

Moreover, it is not only the price of fertilizers relative to that of output that affects fertiliser demand. Chemical fertilisers are not the only source of plant nutrients; farm yard manures are the other important source. Though reliable estimates of the latter's magnitude are not available - measurement is inherently difficult - rough estimates (Desai, A.V.:1979) suggest that the country used 50-60 million tonnes of animal dung (dry weight) as manure in 1963-4 and 67-75 million tonnes in 1973-74. The total nutrient content (N, P₂O₅ and K₂O) of this, on a conservative reckoning, would be around 0.75 million tonnes and 1 million tonnes respectively⁴. This compares with the total fertiliser consumption (in terms of plant nutrients) of around 600,000 tons a year during the early 1960's and 2.5 million tonnes a year in the early 1970's.

The output of straw and crop residues (which are the main sources of animal feed) has probably risen by around 2 per cent per annum⁵. It is reasonable to suppose total dung output to be growing at roughly the same rate. However, not all the dung is collected; and what is collected can be used as domestic fuel or as manure. The allocation between different uses depends on the relative value of dung in these uses and the unit cost of nutrient obtained from manures relative to that of fertilisers.

The demand for domestic fuel for cooking and heating must be growing at least as fast as population. The spread of Kerosene and electricity has not made a significant dent in the dependence on non-commercial sources of energy in rural areas. Firewood and dung cakes remain the main non-commercial energy sources. The supply of firewood is clearly not keeping pace with demand. The price of firewood has risen much faster than the overall consumer price index⁶ thereby increasing the value of dung as a source of fuel.

At the same time, the cost of farm yard manure - which consists mostly of the labour involved in collection of the dung, making the compost, transporting and applying it on the field - has risen steeply because of the rise in wage rates. Farm yard manure has a very low nutrient content compared to fertilisers. On the average ordinary compost has only 1.5 to 4 per cent nutrients, compared 16 per cent in superphosphates to 40 per cent in the case of urea and even more in Diammonium Phosphate (DAP). The volume of material to be handled in order to furnish one unit of nutrient through manure is thus much higher than for fertilisers. Being labour intensive, trends in the cost of FYM are largely a function of the agricultural wage rates which have risen considerably faster than the unit cost of nutrients from fertilisers over the same period⁷. One would expect the sharp rise in the value of dung as domestic fuel to divert more of the available supply of dung from farm yard manure to fuel⁸. The sharp rise in the cost of labour relative to cost of fertiliser provides a strong inducement for farmers to substitute manures with fertilisers. This in turn should be reflected in a relatively faster growth of fertiliser consumption. These changes may also have induced farmers to be more careful to collect dung and develop better techniques of composting to increase the nutrient content of manures. But we have little hard evidence of any of these issues.

Available data - mainly from the cost of cultivation surveys do not show any general absolute decline in use of FYM (GOI, 1991). The pattern is not uniform across states. In the case of rice, some states show a rise while others show a fall; the use of FYM on sugarcane has declined everywhere. Punjab and Haryana report a steep reduction in FYM use on wheat, cotton and bajra, but some other states show a rise. Be that as it may, there is no doubt that the relative importance of FYM has declined steeply. Analyses of

demand for fertilisers which do not take into account the availability and costs of manure are therefore incomplete.

Contribution of fertilisers to Production

Trends in fertiliser use are not important in themselves. What is relevant is their impact on the growth of production. That the spread of fertiliser use is a major source of increments in agricultural output is hardly in doubt. A rough estimate for food grains suggests that the contribution of increase in area, changes due to shift in the allocation

of area among different grains and the spread of irrigation to increments in food grain output fell from around 70 per cent of the increase in the sixties to around 45 per cent during the seventies. During the eighties the net contribution of these factors was negligible. The share in incremental output attributable to fertilisers has thus progressively increased. Fertilisers are now the dominant source of additional production. The quantum of increase on this account is, however, not commensurate with the increase in the fertiliser consumption. (Table 4)

Table 4 : Estimated contribution of Selected Inputs to Increase in foodgrain production

Period	Increments in			Estimated contribution of changes in				
	Area 10 ⁶	Irrigated 10 ⁶ ha	fertilisers area 10 ⁶ t	Total 10 ⁶ t	area 10 ⁶ t	Irrigated area 10 ⁶ t	crop pattern 10 ⁶ t	fertilisers 10 ⁶ t
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
1960-63 to 1970-73	5.2	8.	1.5	21.9	3.6	4.	5.8	8.6
1970-73 to 1980-83	4.9	8.2	2.6	27.3	3.4	4.1	4.8	15.
1980-83 to 1987-90	(-)3.3	3.4	4.5	17.1	(-)2.3	1.7	(-)1.	18.7

1. 75% of total consumption assured to be on food grains.
2. Col (5) less sum of columns (6) (7) (8)

Several studies have shown that the potential output of foodgrains obtainable from observed levels of area, irrigation and fertiliser use (using official yardsticks of fertiliser response and assuming that the incremental effect of each on output has

remained constant) is consistently larger than the actual output and that this gap has progressively widened. (Vaidyanathan 1977; Sharma and Roy 1979; Mellor 1988)9 The implication is that the incremental output attributable to fertilisers is lower than official

"yardsticks" (around 10 kg of grain per kg of nutrient) derived from field trials on farmers' fields and that too using older varieties.

The actual increments in output (net of the contribution of area, irrigation and crop pattern changes) per unit of incremental nutrients works out to 5.7 in the sixties, and the seventies and 4.1 in the eighties. This is about half the official yardstick for older varieties. Not only is the overall response low, but it seems to have declined significantly in the 1980's. The latter trend is particularly significant in as much as the past 25 years have witnessed a number of developments which should have resulted in a sustained and significant *improvement* in yield response to fertilisers.

In the first place, this was the period when the high yielding cereal varieties were introduced and diffused widely. The HYVs are known to be both more fertiliser responsive (implying a much higher biomass to nutrient ratio at comparable levels of fertilisation and soil moisture) compared to traditional or even local improved varieties; also, being capable of absorbing a larger volume of nutrients, the phase of diminishing marginal productivity in their case operates at much higher dose than with older varieties.

Second, being a period of progressive diffusion of both new varieties and fertilisers, lack of knowledge of the practices appropriate to specific local conditions is likely to result in less-than-optimal performance of varieties and fertilisers in the initial stages of adoption. But both knowledge and skills improve with experience leading to better use of these inputs. We should expect this phenomenon to have been especially important during the last 3 decades, so that fertiliser responses and yield levels should have been brought progressively closer to the technological potential.

Thirdly, the quality of irrigation, which has a significant bearing on the level and variability of yield response to fertilisers, has markedly improved especially since the mid sixties. Apart from the diminishing importance of traditional sources of small, essentially local, surface irrigation works, the greatly expanded role of groundwater irrigation both as a sole source and in conjunction with surface water points to better control of water over a wider area. This again should have improved the efficiency of nutrient use by crops.

Fourthly, there is clear evidence that the relative proportions in which the three principal nutrients are used, - though still not in the desirable proportion - has become progressively more balanced. In the early sixties, the country used 3.7 kg of nitrogen for every kg of P₂O₅ and 8 kgs of nitrogen for every kg of K₂O; by the late 1980's these ratios had come down to 2.6 and 6.6 respectively. In so far as more balanced use of nutrients improves the yield response to fertiliser again one expects an overall improvement in the productivity.

It may be argued that computations of such aggregated nature are not particularly useful or meaningful in the context of enormous diversity of crops and their growing conditions. It will be pointed out that, in any case, with the spread of fertilisers to rainfed and poorer quality irrigated land, and the rise in the intensity of fertiliser use, one must expect a decline in marginal productivity. This would be aggravated by the reported trend for micro nutrient deficiencies to become more widespread. (Tandon 1988) If shortages of domestic fuel and rising costs of farm yard manure has resulted in a reduction in the quantum of manures used, the increase in overall nutrient availability would be less than the increase in fertilisers alone. Conceivably, the responses obtained on farmers' yield trials may not be reliable indicators of response obtained on the average under

widespread mass application (Vaidyanathan 1977). The fact that the extension service is not capable of providing advice on correct levels and mixes suited to conditions of particular regions and farms may also depress response under mass application. And governments' "cheap fertiliser policy has undoubtedly weakened incentives for efficient use.

While these are valid points calling for much more careful and disaggregated analysis of fertiliser use and yield response, the available indications of the low level of overall yield response to fertiliser and its near stagnation need to be taken seriously. The efficiency question is of particular relevance in the current context of the debate on fertiliser subsidies.

Fertiliser use efficiency

Reduction of fertiliser subsidies is one of the major ingredients of the reform package initiated last year in an attempt to bring down the fiscal deficit of the central government. Even after considerable dilution of the original package, the average prices farmers have to pay per unit of nutrients has increased appreciably. At the same time the relative price of different nutrients have also changed significantly.

The increase in fertiliser prices has attracted great deal of debate. Practically all concerned - the farmers, the fertiliser producers, the government and the media - seem to take it for granted that the resulting increase in price will cause an equivalent increase in the unit costs of production. This would happen only if nutrients use per unit of output is fixed and if the nutrients are being managed with maximum efficiency technically feasible with available know how. Neither supposition is valid. In point of fact there is considerable scope for both improving the efficiency of fertiliser use per se and shifting from synthetic fertilisers (which are intensive in

the use of capital and foreign exchange) to organic manures.

Agronomists have long recognised that fertiliser use management in India leaves much room for improvement. As early as 1981, the Fertiliser Association of India noted that "Apart from the efforts towards stimulating fertiliser consumption, an equally important aspect for serious consideration is fertiliser use efficiency because of the rising costs of fertilisers." With the twin object of avoiding waste of an expensive input and for improving farmers profitability from its use ... " a special national seminar was organised to consider strategies for cropping fertiliser use efficiency. (FAI 1982) A number of papers presented at the seminar discussed various sources of waste and ineffective use of nutrients; reviewed the state of knowledge and came up with an agenda for research and action. The subject was again discussed at least one other seminar organised by FAI in 1985.

Fertiliser use efficiency is determined by a complex of factors including agro-climatic conditions, the quality of soil and water management, the level and nutrient composition of fertiliser applied, quality of seed and the standard of weed and pest management. Some of these (e.g. the agro-climatic environment) cannot be changed easily, while others (especially soil and water management) call for substantial resources and improvements in management which will take time. These efforts, along with research to evolve better seed varieties and cropping systems, and measures to ensure supply of seed of good quality, must be part of any long term strategy to make more effective use of fertilisers.

But there are, by all expert accounts, a number of ways in which sufficient gains can be achieved in a relatively short time by getting farmers to adopt a more balanced mix of nutrients, locating and rectifying micro nutrient deficiencies in different parts of

the country; encouraging farmers to pay more attention to proper timing and placement of fertilisers; strengthening the facilities for soil testing and advising farmers on the mix of fertilisers suited their specific conditions. (See for example Tandon 1989, Fertiliser Association of India, 1985) Some estimates place the potential gains in efficiency from these measures at as much as 30-50 percent.¹⁰

One would have thought that the government strategy for coping with the consequences of reducing fertiliser subsidies would have emphasised the scope for efficiency improvement and taken vigorous steps to exploit this potential. Any improvement in efficiency will mitigate the impact of the rise in fertiliser prices on the cost per unit of output and could have been used as an effective counter to the argument that the increase in fertiliser prices will necessarily mean an equivalent rise in costs. It is also very much in the long term interests of conserving the use of an input which absorbs large amounts of scarce capital and foreign exchange, and of containing the growing risks of ground water pollution and soil degradation.

A credible action programme to promote more efficient fertiliser use requires a clear and strong directive (backed by necessary reallocation of existing resources and such additional resources as may be needed) (a) to the extension agencies to focus on demonstrating and disseminating knowledge on fertiliser conservation practices; (b) to the ICAR and its affiliates to review in a detailed, region specific manner, the available research on the effects of different nutrient mixes, different timing and methods of placement, different types of fertilisers and micro nutrient deficiencies on fertiliser response for transmission to extension services and to organise a sustained programme of research to fill the gaps; and (c) take steps to strengthen the

facilities (and expertise) to advise farmers on fertiliser packages appropriate to specific local conditions.

Instead the government's measures to assuage farmers are in part window dressing and in large part shortsighted and wasteful. Concessions in import duty on certain types of fertilisers, lower price of gas and freight - recommended by the Joint Parliamentary Committee and partly accepted by Government - in effect shift the burden of unrecovered costs on account of fertilisers to other departments/enterprises. "Special support" to complex fertilisers (like DAP) and special allocations to help small marginal farmers are poorly concealed hand-outs which could be put to far better and more effective use on a positive programme to promote efficient fertiliser use.

These measures are also likely to distort the pattern of fertiliser consumption. They have resulted in a steep rise in the price of phosphates and potash relative to nitrogen and that of complex fertilisers relative to urea. This will almost certainly result in a reduction of the demand for phosphate and potash relative to that of nitrogen thereby aggravating the problem of imbalance between nutrients 11. If the differential pricing of complex fertilisers (like DAP) and urea persist, the demand for the former (which is one way of getting a more balanced use of nutrients) will suffer. This will also compromise the effectiveness of research and extension efforts to promote a more balanced mixture of nutrients.

Altogether, a more or less uniform scaling down of subsidies on different fertilisers combined with an active programme (backed by necessary resources) to promote their more efficient use would have been far more appropriate, and better served the long term interests of Indian agriculture than the package now in place.

Organic manures

The other area of long term policy which acquires greater importance in the present context is the promotion of organic manures. The dangers of indiscriminate and careless use of chemical fertilisers for the health of the soil and the quality of ground water are now widely recognised. It is also recognised that the interests of sustainable, high productivity agriculture consistent with a healthy ecological environment would be better served by promoting fuller, more efficient exploitation of crop residues, animal and human wastes as sources of manure.

Crop residues are not used to any significant extent in India for manuring; they are used to feed animals and this will continue to be the case for the foreseeable future. Animal wastes currently most important some of manure - are only partially used for this purpose. A sizeable part is not collected; and another sizeable part is used for domestic fuel. The portion used as manure is indifferently prepared and consequently has a low nutrient content. Substantial improvements in the quality of farm yard manures and their nutrient content is known to be feasible through better techniques of compost preparation. That the overall nutrient content of FYM varies between 1.4 and 4.2% (Roy et al 1980) is indicative of the large scope for improvement. A recent study (Goldenberg et al 1988) estimates the nitrogen content of FYM as currently used at 0.5 percent which is about one fourth of the nitrogen content of biogas plant slurries. Use of dung for biogas not only increases the nutrient content, but practically all the nutrient content of dung currently used for fuel can be recovered for use by crops. Both would bring down the cost per unit of nutrient from manures and provide a stronger incentive to shift from chemical fertilisers. Any increase in the rate of collection will further augment the potential.

The potential contribution (in terms of the 3 major plant nutrients) at the current level of production (150 million tonnes dry weight) is around 2 to 6 million tonnes (depending on the efficiency) and will almost certainly increase over the next decade or so. If even half the potential for enlarging the quantum and improving quality of farm yard manures exploited in the course of the coming decade, we can save some 2 million tonnes (nutrients) in the requirement of fertilisers a year. More efficient use of fertilisers - by say 10 per cent in the course of the next decade - would save another 2 million tons. The potential saving works out to about a third of the present level of consumption. Besides substantial savings of capital and foreign exchange, this would make for greater balance in the way of nutrients are provided and in a manner which is more desirable from the environmental view point.

This potential however cannot be exploited with the kind of limited and subsidy-oriented programmes for developing rural and urban compost. The centre piece of the programme has to be on accelerating the pace of biogas generation in rural areas. So far an estimated 1.4 million biogas plants - for the most part individually owned - have been set up; and the target is to add another 750,000 in the course of the eighth plan. At this rate, less than 5 per cent of the country's cultivating households would be covered by the end of the eighth plan.

Accelerated spread of biogas plants is highly desirable but cannot be achieved unless defects in design, the predominance of individual against community gas plants lack of repair and servicing facilities and other deficiencies are overcome. A systematic expert assessment of the operating experience of different designs in different regions (in terms of gas output per unit of input, capacity utilisation, capital costs, frequency of break downs and other

relevant dimensions) is an essential first step to identify the more significant sources of inefficiency and high costs. This should be the basis for programmes (including research and design) to bring down costs.

One obvious way to cut costs is to encourage community plants and take advantage of scale economies: larger plants cost less in terms of investment per unit capacity. But this requires setting up workable collective arrangements for pooling dung and distributing the gas and slurry. An important part of the arrangement is to work out acceptable rules for the sharing of costs and benefits among members, and to enforce these rules in a fair manner. This cannot be accomplished through subsidies.

Community or groups will be accepted only if their costs are significantly lower and/or their benefits substantially higher than in the case of individual plants. It is therefore important to study actual experience of the successful and the non-so-successful bio-gas plants of different scales and design, identify the source of cost differences and learn from the successful ones ways of reducing collection processing and handling costs. At the same time, users should be made aware of the magnitude of direct and indirect benefits (in terms of reduced costs, savings from substitution of wood fuel by gas and from the augmentation of nutrients for crops) from group/community gas plants. Workable cost and benefit sharing arrangements are more difficult but not impossible. Experiments like the one at Ungra village in Karnataka need to be properly documented and made widely known as possible models for adoption on a wider scale. Perhaps it is desirable not to insist on village wide plants with a strong emphasis on a particular pattern of "equitable" benefit distribution. Government policy should give room for trying out different types of

arrangements (including groups and even private ownership) to exploit scale economics and promote more efficient ways of recycling animal and human wastes.

In so far as measures to encourage use of manures and improve fertiliser use efficiency are successful, the rate of growth of demand for fertiliser will be dampened. This is as it should be. There is nothing inherently important about the level of consumption of fertilisers; what is relevant is the outcome in terms of output. And if a given level of output can be achieved with a smaller quantum of nutrients, it would be the most telling index of the success of the policy. Obviously, one cannot expect dramatic or early results. In any case, given the necessity for sustained agricultural growth to meet rising demand, one must expect the requirements of chemical fertilisers to remain large and also to grow, though perhaps at a moderate rate than before¹². Ensuring that the requisite supplies are available in the most economical manner therefore remains an important issue.

Efficiency in Fertiliser Production

Domestically manufactured fertilisers are brought from the producers at prices (which vary between factories) which are supposed to cover costs and yield a specified return on investment. The pooled supplies are distributed to farmers through the trade and cooperative network at a uniform retail price all over the country. After the oil shock of the early 1970's and the consequent rise in costs, the government decided to subsidise the farmers. The retail prices have hardly changed even as costs were rising, and consequently the magnitude of subsidies rose at a phenomenal rate reaching Rs.6500 crores by 1990-1. The bulk of the increase was on account of domestically produced fertilisers.

Like much of Indian industry, indigenous fertiliser manufacture has grown under

a regime of protection, control over location scale and technology of factories and a system of administered prices for both key inputs and outputs. A sizeable part of the capacity is in public sector plants. Most of the industry's requirements of phosphatic and potassic nutrients are imported and a substantial part of the naphta for nitrogenous fertilisers is derived from imported crude.

Domestic production costs have been higher than international prices and the difference has been rising during the last 2 decades. A major and increasing part of the fertiliser subsidies during the past 2 decades is accounted by this difference which is taken by some as a measure of subsidy to compensate for inefficiency of domestic manufactures. (Gulati, 1992) This is a reasonable interpretation if one accepts international (border) prices as the norm for judging efficiency of domestic industry. However, this is an arguable point in as much as world market prices of fertilisers are volatile and India accounts for a sizeable share of world trade in the commodity.

While it is generally conceded that domestic costs are high, there is considerable difference in the assessment of underlying reasons. Over capitalisation (in part encouraged by the guaranteed return on equity without any check on the investment base and mode of financing), low capacity use, high energy consumption and high costs of storage and distribution are emphasised by some; while others (and in particular industry interests) tend to blame high costs on high price of equipment and raw materials. In point of fact, imported equipment and materials for fertiliser industry are taxed at a much lower rate than for other industries and domestically produced naphta and fuel oil are supplied to the fertiliser manufactures at much lower rates than for other petrochemical industries. The criticism about gas - which has emerged as the principal feed stock - being

high priced is hardly tenable because gas prices in India barely cover the costs of production which tend to be high because of unfavourable geological factors and high investment costs of production and distribution. While there is indeed room for rationalising the pricing of fertiliser feed stock, it has to be done in the context of an overall restructuring of energy pricing by source and use. Keeping fertiliser prices low at the cost of distorting the economic viability of the oil industry is hardly prudent.

As far as the fertiliser industry is concerned, any long term policy must recognise that (a) it will continue to depend primarily on imported material or products in the case of phosphates and potash; (b) nitrogenous fertiliser production will depend directly or indirectly on imports for feed stock derived from petroleum; (c) domestic oil and gas reserves are strictly limited and naphta, fuel oil and gas have alternative uses; (d) since costs of domestic oil industry must be fully recovered, the scope for subsidising one segment of users at the cost of others is necessarily limited. Joint ventures and/or long term purchase agreements with countries which are well endowed with the necessary material (eg. the oil countries with an abundance of associated gas) are also options to be considered¹³.

A proper evaluation of these alternatives must of course explore the various options from the economic view point but with due regard to the uncertainties arising from inadequate knowledge about resources and technologies; the fact that India's presence is, and will remain, significant in the world fertiliser market; and the risks of significant import dependence from relatively few sources for a strategically important commodity. At the same time, we also need to make necessary changes in pricing policies and in the management of public enterprises to create an environ-

ment in which there are strong incentives for plants to operate efficiently. These issues have to be addressed and resolved if the Indian farmer is to be assured of adequate fertiliser supplies at the lowest

feasible cost. This is the real stuff of structural reform, but regrettably we do not see much of a sign of the government or the industry getting to grips with such basic long term issues.

Notes

- 1 This is an estimate based in NSS data with some adjustments (Desai, 1982).
- 2 The NCAER's estimates (for 1988-9) of diffusion and intensity of fertiliser use by size class of farm for the country as a whole are.

	Marginal farms	Small farms	Large farms
Diffusion rate (percent)			
Kharif	67	73	74
Rabi	74	79	82
Intensity (kg/ha of fertilised area)			
Kharif	69	65	60
Rabi	103	93	90

- 3 This seems much higher than the estimate of FYM are derived by Desai A.V. from NSS. 147 million tonnes in 1963-4 and 168 million tons in 1973-4.

NCAER's recent (1988-9) survey shows that 85% of the Kharif area and 72% of the Rabi area use farm yard manure, the quantum applied being around 12-13 quintals per hectare giving a total of 200 million tons.

Note however, that FYM is not standardised and includes a lot of material other than dung while the A.V. Desai estimate cited in the text relates to dry weight of dung used for manure.

- 4 Assuming the nutrient content of farm yard manure to be at the lower end of the range (See Roy R, Seetharaman S and Biswas BL., Hand book on Fertiliser Usage, Fertilisers of India 1980) namely 0.5 to 1.5% N, 0.4 to 0.8% P₂O₅ to 1.9% K₂O (see also ICAR handbook of Agriculture 1980: 215).

A.V. Desai's paper is one of the few, if not the only, systematic treatments of the subject. It is certainly the most comprehensive and highlights the fuzziness of concept, incomplete and inadequate coverage and inconsistencies in the available data.

- 5 See Vaidyanathan 1988 for estimates of the growth of crop residues by state over the period 1951 to 1972 A.V. Desai (1979) estimates the growth during 1963-1973 at a much lower figure.

- 6 The price index for fuel wood in 41 urban centres is reported to have increased more than ninefold (9.24 times) between 1960 and 1986; This increase is 1.86

times that of the overall consumer price index. Cited in R D Sharma 1992, Economics of Fuel Wood Production in Wastelands, Concept, New Delhi.

- 7 Between 1970-1 and 1984-5, the average daily wage rates of male agricultural labourers rose by more than 3 tons in all major states for which the data are available; and by more than 3.5 tonnes in 9 out of 15 states. (Jose 1988) By comparison, the wholesale price index for chemical fertilisers (1970-1 = 100) in 1980-5 was 288.
- 8 AKN Reddy, in personal discussion, disputes this interpretation on the ground that the trends in urban fuelwood prices do not reflect the trend in rural areas; that firewood used in the latter consist mostly of twigs and shrubs and that the spread of the "Presopis Grilliflora" has been a significant source of additional fuel supply in rural India. There are however impression rather than evidence from a representative cross section of rural India.
- 9 The following table reconstructed from Mellor 1988 illustrates the point.

Potential and actual output of foodgrains All India
(million tonnes)

	1950-54	1960-64	1970-74	1979-83
1. Actual output	63.1	83.1	103.	131.9
2. Estimated potential based on inputs	64.6	84.	112.8	169.2
3. (2) on (1)	102.	101.	110.	128.

- 10 The precise magnitude of gains from more efficient use is necessarily conjectural; one needs more data to assess the potential gains, the extra costs which may have to be incurred to exploit them and the economic viability of the measures proposed.

It may however be noted that one of the papers presented at the FAI 1981 seminar, presents experimental evidence indicating that better weeding improves the incremental output of maize per kg. of nutrients by 40 to 80%; timing of application made a difference of upto 16 percent and method of application around 10 per cent in the case of wheat; and a package of improved practices (covering spacing, plant population and weeding) makes a difference of 30 to nearly 100 per cent in the response ratio for Bajra (Prasad and De, in FAI 1982). Tandon (1989) cites data to show that in the case of wheat, the yield response per kg of nutrient with only nitrogen is about a third of that obtained when all these 3 nutrients are used in a balanced manner. Method of application, addition of micro nutrients, and weed control are also shown to make a substantial difference to yield. These seem to be based on experimental data rather than trials under representative conditions. A systematic compilation of the available experimental data on this aspect is a necessary prelude to organising a more broad based experiment-cum-demonstration programme.

- 11 For an overview of various viewpoints see papers prescribed at the National Consultation on Fertiliser Pricing held at the Institute of Development Studies, Jaipur, in 1991. See especially the papers by Gunvant Desai, Pratap Narain and Satish Chandran. See also Gulati (1990).
- 12 The Planning Commission projects the demand to grow from 13.5 million tonnes in 1991-2 currently to 18 million tonnes by the end of the eighth plan. i.e., about 6 per cent per annum. At this rate the adjustment in 2000AD will be 23 million tonnes. If supply of nutrients from organic manures is increased by 2 million tonnes a year and there is a 10% increase in efficiency of fertiliser use, the requirements of chemical fertilisers in 2000AD will be Re.19 million tonnes implying an average annual growth of around 3.5 per cent a year.
- 13 According to detailed study by the World Bank (conducted in 1987) domestic production of urea would be viable - in the sense that it can compete with imports - provided the appropriate scale and technology are chosen, steps taken to bring down the capital costs, (which seem to be 20-25 higher than comparable plants elsewhere), and operate the plants at full capacity without interruption.

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Book Review

"LIBERALISATION: ITS IMPACT ON THE INDIAN ECONOMY" -

(ed.) by S.Gupta, Macmillan India Ltd., Delhi 1993 pp.x + 240 Rs.

S. Neelakantan

THE book under review contains 12 papers presented at a seminar organised jointly by Indian Council for Research on International Economic Relations and Ford Foundation in Delhi in 1992 with a Preface and an Editorial Introduction by Dr.S.P. Gupta. A seven page summary of the seminar recommendations and two annexures, the first, a two page abstract from Dr. Raja Chelliah's inaugural address and the second, a two page summary of panel discussion by five eminent economists, forms the concluding part of the book. In the seminar

"(A)ccording to general consensus, at present, no constructive debate should centre around fundamentals, on the need for economic reforms but should explore all alternative reform packages within the broad norms set by the major donors, to help the country reach the desired goal faster but at the same time, limiting the adjustment costs to a socially tolerable level"(p.230)

is the recommended general strategy. Stated differently, the papers are sympathetic to the key message that the primary development objective is maximising growth by allocating funds based on the criteria of highest money rates of return when prices

and factors will reflect their respective scarcity values not only in the domestic, but also in the global context. That liberalisation and globalisation are the only right policies to be adopted and pursued by the Government at the present juncture is accepted as a matter of faith.

In his introduction, Dr.S.P. Gupta refers to the development policy letter submitted by the Government of India to the World Bank as the only place where integrated reform policy announcements of the government are completely available. He has summarised and analysed the industrial, trade, financial, fiscal, monetary and safety-net provisions of the reform packages employing the conclusions of the paper writers. He then proceeds to make an assessment of the package itself.

In a highly informative paper Tarun Kanti Das traces the evolution and rationale of (a) macro stabilisation policies, i.e. fiscal, money and credit, exchange rate adjustment and wage/income policies and (b) structural adjustment policies i.e. trade reforms, industrial, public sector reforms, factor market reforms, tariff policy reforms and administered price policy reforms. He concludes that the medium term outlook for the Indian situation is somewhat different from many Latin American and some Asian

countries where stabilisation policies and structural reforms had failed. He is confident that the reform package in India will enable the country to achieve the path of sustainable non-inflationary growth with viable balance of payment situation.

S.P. Gupta and A.K. Sarkar's paper, while analysing the impact of liberalisation policies during the eighties, clearly reveals that the Import Intensity rates of most industry groups as well as the direct cost of technology imports have increased in the post liberalisation era. The overall growth was encouraging in the eighties, but the pattern of financing had become unsustainable. The impact of liberalisation was more favourable to the secondary sector; but even there production of basic goods and intermediate goods recorded a decelerating trend whereas the growth of consumer durable was faster than that of consumer non-durables, indicating a shift towards luxurious consumption. They have reviewed the current phase of the liberalisation package and conclude that the social cost of this transition phase is likely to be high.

Saroj Gupta's paper on 'Privatisation in India' gives a brief account of the international experience in privatisation and then proceeds to look into the specific socio-economic factors in India that could influence privatisation strategy such as (a) private sector's preparedness for takeover, (b) availability of capital, (c) availability of managerial and technical talent, (d) risks associated with privatisation and (e) socio-political environment. She has developed an option matrix using six indicators including total factor productivity to analyse the efficiency of public and private sector enterprises in steel, heavy engineering, textiles and tourism sectors. From the analysis of matrix results, the private sector does NOT emerge as a uniformly more efficient sector. But the author still recommends transfer of ownership to private

sector "due to the inflexibility in the approach of the politicians and the bureaucrats and the apprehensions of their continuing influence on management decisions."

Using a static Leontief Input-Output model S.P. Gupta and Padmasini S. Raman investigate the social impact of the structural reform programme. They conclude that after liberalisation the population below poverty line would increase by 10.7 millions with N.S.S. estimates and 6.10 million with C.S.O. estimates. This is based on poverty cut point based on private consumption expenditure only. But structural reform had initiated drastic cuts in many social expenditures targeted to the poor such as health, education, housing and sanitation. So an appropriate medium-term poverty alleviation programme must be adopted; "Otherwise social cost to poor may turn out to be socially, politically and especially, morally unacceptable".

B.K. Pradhan's paper is only marginally related to the theme of the seminar. He has investigated the marginal budget shares by the Linear Expenditure System separately for the rural rich and poor, using the data from NSS 1972-73; 1973-74; 1977-78; 1983 and 1987-88 rounds. He has found a shift in the consumption pattern of the households. In almost all classes, there is a movement away from food related commodities towards non-food commodities. The rural poor allocate 38 per cent of its extra expenditure on cereals, whereas the urban poor allocate only 24.3 percent on cereals. Correspondingly, the budget share of the rural poor for non-food materials is 27 per cent whereas the urban poor's share is 31.8 per cent. But there is not much difference among the rural and urban rich in their budget shares among food and non-food articles.

S.P. Gupta, Minna Bal and Rashmi Shankar attempt to assess the different country experiences of the impact of

liberalisation measures using an International Survey on Structural Economic Reforms conducted by the Centre for International Private Enterprises, U.S.A. 23 policy instruments under nine broad groupings are given individual weights. It is found that during the eighties, the wave of reform process affected different countries differently. India lost its rank from 19 to 25 (for the period before 1989). For the majority of the countries studied, progress in the "turn-around" had not been spectacular. The need for effectively communicating the objectives and likely results of the reform process to all sections of people is stressed.

K.S. Mehra has reviewed and evaluated the changes in trade policy since 1977-78. He also has discussed the short and medium term impacts of recent policy changes. He has found that there had been a marked change in the trade policy since 1985 with greater emphasis on market incentives and indirect policy instruments rather than on direct physical controls. Since 1978-79, there has been a large increase in imports in several sectors. Looking at the recent policy changes, he says that the immediate impact on export performance in 1991-92 had been somewhat dismal because 1991 was one of the worst years for growth in world income. Additionally, there had been the loss of trade with the Soviet block. The industry also did not have time to realign itself to new policy changes. Looking at the prospects of Indian exports for the medium and long term, he holds that it may not be rosy because of constraints both in supply and demand side factors. The growing polarisation of world trading partners and formation of regional trading blocks will cause problems of entry and exit for marginal exporters like India. Growing emphasis on trade in manufactured goods will put a corresponding pressure on the terms of trade for agriculture based exports. India will be at a disadvantage because of the global

shortening of the product life-cycle, since its high cost structure will make it difficult to spend more on R & D. Even though import compression has succeeded in the short run, in the medium and long run, the import GDP elasticity of 1.2 is likely to continue. So the scenario for the short and medium term seems to be mixed.

Changes in the protection to Indian Industries due to the liberalisation since the 1980s is the theme of the paper of Bishnupriya Gupta. The author concludes that the trade policy became more liberal following the publication of Alexander Committee Report in 1978, with a wider use of OGL by actual users. Focussing on Effective Rate of Protection (ERP) purely in terms of tariffs, estimates are made with reference to 1978-79, 1984-85 and 1987-88. Under some heroic assumptions, an index of trade controls is constructed. The results indicate that the nominal as well as effective rates of tariff protection have increased for most sectors between 1978-79 and 1984-85, but have either declined or remained more or less the same between 1984-85 and 1987-88. In the 1980s there was buoyancy in the index of imports. The new, post 1991 regime makes a qualitative change in the degree to which quantitative controls have been replaced by price based controls. This will clearly indicate a more liberal trade regime. But she has indicated that the effective reduction in tariff rates under the partial convertibility regime (as it then was) will be much smaller than the nominal reductions.

The balance of payments perspective of liberalisation policies is the theme of Bibek Deb Roy's paper. He points out that the facts do not support the contention that the import liberalisation of the 1980s was the cause for the balance of payments crisis of 1990s. Throughout the 1980s the current account deficit was in excess of 1 per cent of the GDP, indicating the crisis situation. He has listed the proximate

country, hardly any of them have sent in their entries. A second observation is that practically all institutions that have responded concentrate on just a few areas; not even a single one has research going on in half a dozen areas with just one reporting research in 5 areas. The rest have only 3 or less. Does this mean that

universities in the South are highly specialised when it comes to research, or that only a few departments have bothered to respond to the Census? The latter is the more likely explanation which means that much more work has to be done to make the Census more comprehensive.

Twentythird Census of Social Science Research in Southern States
Subject Classification

Table 1

Sl. no.	Area	Ph.D	M.Phil	Project	Total
1	Adult Education	8	1	10	19
2	Applied Economics	12	5	-	17
3	Anthropology	9	-	15	24
4	Business Admn.	-	-	2	2
5	Commerce	18	3	-	21
6	Commerce & Management Studies	4	7	3	14
7	Economics	31	24	25	80
8	Econometrics	-	-	8	8
9	Education	21	8	12	41
10	Educational Technology	2	12	-	14
11	Futurology	2	1	1	4
12	Geography	23	-	9	32
13	History	10	8	-	18
14	Management Studies	-	-	5	5
15	Psychology	18	2	8	28
16	Political & Pub.Admn.	6	-	-	6
17	Political Science	-	8	3	11
18	Population Studies	3	1	1	5
19	Rural Development	2	-	-	2
20	Sociology	15	-	6	21
21	Social Work	8	3	5	16
22	Women & Child Welfare	-	-	2	2
Total		192	83	115	390

TABLE 2

[illegible]

TABLE 2 (Contd.)

Sl. no.	Name of the Institute/ Department	No. of ongoing M.Phil/Ph.D/Project 1987-1992										
		Agri	Anth	Comm	Econo	Educa	Geogr	Hist	Law	Pol.Sci	Pub. Admn.	Psyc Soc. Work
10	Gulbarga University	{M.Phil {Ph.D {Project			2							
11	Karnatak University	{M.Phil {Ph.D {Project				7 4	5					
12	Kakatiya University	{M.Phil {Ph.D {Project							8 3			
13	Madras Institute of Development Studies	{M.Phil {Ph.D {Project			13					1	1	
14	Madurai Kamaraj Univ	{M.Phil {Ph.D {Project			2 4 16	4 4 8				1 5		
15	Madurai Institute of Social Sciences	{M.Phil {Ph.D {Project								3		
6	Mangalore University	{M.Phil {Ph.D {Project		2								2
7	School of Social Work	{M.Phil {Ph.D {Project								4 3		
8	S K University	{M.Phil {Ph.D {Project			1							1 4 4

TABLE 2 (Contd.)

Sl. no.	Name of the Institute/ Department	No. of ongoing M.Phil/Ph.D/Project 1987-1992										
		Agri	Anth	Comm	Econo	Educa	Geogr	Hist	Law	Pol.Sci	Pub. Admn.	Psyc Soc. Work
19	S V University	{M.Phil {Ph.D {Project							2			1 4 4
20	S V University PG Centre	{M.Phil {Ph.D {Project			1 10	10						1 4
21	University of Hyderabad	{M.Phil {Ph.D {Project							2			
22	University of Calicut	{M.Phil {Ph.D {Project		1	10					6 3		1 6
23	University of Kerala	{M.Phil {Ph.D {Project			2	4						4 1
24	University of Madras	{M.Phil {Ph.D {Project		3 9								4 8
25	University of Mysore	{M.Phil {Ph.D {Project						13 2				

Agri - Agriculture; Anth - Anthropology; Econo - Economics; Educ - Education; Geogr - Geography; Hist - History; Pol.Sci - Political Science; Pub.Admn. - Public Administration; Psyc - Psychology; Soc.Work - Social Work; Socio - Sociology; Pop.Stud - Population Studies; Futuro - Futurology; Mg.Stud - Management Studies; Rural Dev - Rural Development; CMg.Stid - Commerce & Management Studies; Ad.Co.En. - Adult & Continuing Education; Bu.Admn. - Business Administration; Wcw - Women & Child Welfare; Em1 - Econometrics.

S. 6

ANDHRA UNIVERSITY

Sl. no.	Name of the Scholar	Name of the Supervisor	Title of Research Topic	Year of Commencement
Ph.D.: Anthropology				
1	Alok Rath	NA	Palaeo cultures of East coast around north-east A.P. and Orissa	1992
2	Devarapalli Jesurathnam	NA	Ecological study of river Island: An Anthropological Approach	1988
3	J.Prasad	NA	Ecological Adaptations of Tribals in Eastern Ghats	1991
4	Dev Anand Satya Pal	NA	Social Ranking among Tribes: A case study of Tribes in Visakapatnam	1988
5	B.V.Babu	J.M.Naidu	A Bio-Anthropological Study of Mali Sub-Tribes of AP	1990
Ph.D: Politics & Public Administration				
1	Venkatarao Akkabattula	K.Venkateshwaralu	Scheduled Caste Members of AP Legislative Assembly Their programs, problems & attitudes	1976
2	I.Dosagiri Rao	A.Prasannakumar	Social change and political development in East Godavari District 1875-1925	1977
3	P.Arun Kumar	NA	Srikakulam Revolution Movement: An Assessment	1984
4	C.Padmaja	JVKV Pandit	Working of P.R.Institutions in India	1992
5	R.Ramachandra Rao	JVKV Pandit	A comparative study of the urban local bodies in East Godavari district	1992
6	Chiranjeevi	JVKV Pandit	Role of women in rural development in Mandel Proja Parishads	1992
Ph.D: Social Work				
1	Visweswara Rao	B.Devi Prasad	A socio-demographic profile of the aged in rural A.P.	1991
2	S.Haranath	B.Devi Prasad	A study of inmates of Juvenile Home in Visakapatnam	1992
3	R.D.Sampath Kumar	K.V.Ramana	Child abuse in family and work settings A study of child labourers in select work categories in Visakapatnam	1988

S. 7

Research Projects

Sl. no.	Discipline	Title of Research Topic	Year of Commencement	Year of Completion	If the report is already published
1	Anthropology	GEPD and Abamors tribes of AP Malanial Selection	1987	1991	Yes
2	Anthropology	Geneticpoly morphism among Andhra tribes	1989	1992	Yes
3	Anthropology	Anthropological survey of Manne Dora tribe	1989	1990	Yes
4	Anthropology	Demo-genetic studies of Yadava and Vadatalija	1987	1989	Yes
5	Anthropology	Growth and Nutrition of certain populations of Visakhapatnam	1985	1989	No
6	Anthropology	Fertility mortality health and nutrition of women in Visakapatnam	1988	1992	Yes
7	Social Work	Dowry practice in an urban setting: A casual study	1985	1987	Yes
8	Social Work	Trends in Social Work Research: A context analysis of Indian Journal of Social Work	1992	NA	NA

GULBARGA UNIVERSITY

Research Projects

Sl. no.	Discipline	Title of Research Topic	Year of Commencement	Year of Completion	If the report is already published
1	Economics	IRDP in Gulbarga District	1989	1990	
2	Economics	Socio-economic bench mark survey of Kavanta Irrigation project of Bidor District, Karnataka	1990	NA	

KAKATIYA UNIVERSITY

Sl. no.	Name of the Scholar	Name of the Supervisor	Title of Research Topic	Year of Commencement
M.Phil: Political Science				
1	R.Venkateswarlu	B.Venkateswarlu	Ambedkar Yuvajana Sanghams: Role perception and Role performance: A study	1993
2	B.Sanjeeva Reddy	K.Raghu Ram Reddy	Politics of privatisation:- A study of elite perception in Telengana region	1993
3	K.Rajamouli	K.Raghu Ram Reddy	Politics of Teachers Union in Andhra Pradesh: A study	1993
4	G.Yellaiah	K.Raghu Ram Reddy	The politics of protest - A study of Koya Tribe in Warrangal district	1993
5	Sreelakshmi	P.Hussain Khan	Women in Leadership roles: A study of motivational factors in the emergence of women leadership in Warrangal district	1993
6	D.Ramesh	P.Hussain Khan	Politics of arrack: A case study of anti-arrack movement in Andhra Pradesh	1993
7	T.Madhavi	K.Bhaskaramma	Women and feminist ideological perceptive: A comparative study of urban and rural women in Warrangal district	1992
8	S.Govardhan	K.Bhaskaramma	Politics of Agricultural Cooperatives: A case study of single window system in Warrangal district	1992

Research Projects

Sl. no.	Discipline	Title of Research Topic	Year of Commencement	Year of Completion	If the report is already published
1	Political Science	The student political culture - A study of Kakatiya University students	1986	1988	No
2	Political Science	The role of Tribal representatives in the State Assembly and Lok Sabha	1989	1991	No
3	Political Science	Political awareness and political participation of Scheduled Caste women- A case study of Telengana region in Andhra Pradesh	1989	1991	No

SRI KRISHNADEVARAYA UNIVERSITY

Sl. no.	Name of the Scholar	Name of the Supervisor	Title of Research Topic	Year of Commencement
Ph.D.:Economics				
1	Ch.Thandava Krishna	M.Lakshminarasaiiah	Handloom Industry in Andhra Pradesh - A case study of Problems and Prospects of Handloom Sector in Prakasam District.	1990

SRI VENKATESWARA UNIVERSITY POST-GRADUATE CENTRE

Ph.D.:Economics

1	T.Pothuraju	G.Raghava Reddy	Rural Unemployment in Andhra Pradesh with special reference to Prakasam district.	1990
2	K.Sowri Rajan	G.Raghava Reddy	Urban Informal Sector with reference to a selected Centre in A.P.	1989
3	C.Jonathan	G.Raghava Reddy	Urban Informal Labour Market at Kavali town Nellore of A.P.	1990

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Sl. no.	Name of the Scholar	Name of the Supervisor	Title of Research Topic	Year of Commencement
4	C.Venkataramana	G.Raghava Reddy	Monetary planning in India and the U.S.A. since the mid seventies.	1989
5	V.Prabhakar Reddy	G.Raghava Reddy	Tribal Economy in Chittoor district of A.P.	1987
6	P.Sathyanarayana	G.Chandra Sekaran	Centre-State Financial Relations in India.	1989
7	V.Pradeep Kumar	G.Chandra Sekaran	Balance of Payments Problems of Developing countries with special reference to India.	1990
8	Jyothi Dama	G.Chandra Sekar Rao	Female Labour Participation in Urban Informal sector.	NA
9	P.Krishnaiah	G.Chandra Sekar Rao	Poverty Alleviation Programmes in Prakasam District.	1986
10	K.Srinivasulu	G.Chandra Sekar Rao	Structure and growth of Non-Plan Expenditure of the Govt. of India.	1992
Ph.D.:Geography				
1	D.Ramachandra Reddy	M.V.Reddy	Agricultural Typology of Andhra Pradesh	1992
2	Chhabi Nag	M.V.Reddy	Changing pattern of landuse and land values of Tirupati Town	1992
3	P.Murali Krishna	M.V.Reddy	Politico-geonomic study of Vietnam.	1991
4	Suddha Bharathi	M.V.Reddy	The Role of India in the geopolitics of Indian ocean.	1991
5	Diguva-Sadam-Anjineya	P.Narayanamma	Nutritional Resources - Post-Reddy harvest management - A study of Southern Andhra Pradesh.	1992
6	H.Ugandra Raju	P.Narayanamma	Impact of Pilgrims on the Growth and Development of Tirupati- A perspective.	1992
7	Madhu Sudhana Reddy	P.Narayanamma	Sugar industry in A.P.	1992

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Sl. no.	Name of the Scholar	Name of the Supervisor	Title of Research Topic	Year of Commencement
8	R.Hariprakash	N.Nagabhushanam	Integrated Planning for Industrial Development of Rayalaseema A.P.	1988
9	T.Janardhan	N.Nagabhushanam	Study of Slums - A case study of Tirupati, Chittoor, Kalahasti, Madanapalle and Punganur Towns of Chittoor District.	1987
10	S.Vimala	N.Nagabhushanam	An Analysis of Agricultural Activities - A case study of Rayalaseema.	1985
M.Phil: Economics				
1	D.Babu	G.Raghava Reddy	Agricultural Work and Wages in Venkatagiri Mandal: A Case Study of Gottlagunta.	1992

SRI VENKATESWARA UNIVERSITY

Sl. no.	Name of the Scholar	Name of the Supervisor	Title of Research Topic	Year of Commencement
Ph.D.:Adult Education				
1	Ramana Reddy Gongati	P.Vasantha Kumari	An Evaluation of the Total Literacy Campaign in Cuddapah District.	1992
2	G.Vishnu Madhavi Latha	NA	Curriculum designing in Health Education for Rural Adults of Chittoor District.	NA
3	R.B.Sathya Vathi	N.C.R.Reddy	Knowledge, attitude and Practices of Women in Selected Household Technologies.	1990
4	M.C.Obulesu	P.Vasantha Kumari	Reading interest of Participation in Adult Education Centre.	NA
Ph.D: Education				
1	M.Nirmala Jyoti	A.Venkata Rami Reddy	An evaluation of the non-dentention system	1990
2	Y.Sudhakara Reddy	A.Venkata Rami Reddy	Creativity of adolescent boys and girls	1991

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Sl. no.	Name of the Scholar	Name of the Supervisor	Title of Research Topic	Year of Commencement
3	V.Ramamohana Babu	A.Venkata Rami Reddy	A study of job satisfaction, attitude towards teaching, job involvement teacher efficiency and perception of organisation climate of teachers of residential and non-residential schools.	1992
M.Phil: Adult Education				
1	V.Ramachandra	Vasanth Kumari	Reading Proficiency of learners in the Total literacy campaign of Chinnagottigollu Manad.	1992

Research Projects

Sl. no.	Discipline	Title of Research Topic	Year of Commencement	Year of Completion	If the report is already published
1	Adult Education	Spatial Variations of Literacy in Andhra Pradesh	1986	1988	Yes
2	Adult Education	An evaluation of the nondetention system of A.P. from different angles.	NA	1987	NA
3	Adult Education	Agricultural Typology of South India	1990	1992	NA
4	Adult Education	Job satisfaction and attitude towards teaching of teachers of APPEP and Non-APPEP schools (Andhra Pradesh Primary education project)	1992	1992	NA
5	Commerce & Management Studies	Management of Cooperatives 1991	1982	1984	No
6	Geography	Identification and Development of wastelands in Chittoor District of Andhra Pradesh.	1989	1990	NA
7	Geography	Identification and Development of wastelands and some watershed programmes in the western Taluks of Chittoor District.	1992	1992	NA

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UNIVERSITY OF HYDERABAD

Sl. no.	Name of the Scholar	Name of the Supervisor	Title of Research Topic	Year of Commencement
M.Phil: History				
1	G.Sasidhar	Rekha Pande	Virasaivism in early Medieval Andhra from mid 11th century to early 14th century.	NA
2	Lakshmi Katragadda	Rekha Pande	Women in 16th Century: A Study of Toluva Dynasty.	1991

Research Projects

Sl. no.	Discipline	Title of Research Topic	Year of Commencement	Year of Completion	If the report is already published
1	Women & Child Welfare	Organisation of the Creches in the organised and unorganised sectors.	1991	1992	No
2	Women & Child Welfare	Girl child in Telengana.	1992	1993	No

BANGALORE UNIVERSITY

Sl. no.	Name of the Scholar	Name of the Supervisor	Title of Research Topic	Year of Commencement
Ph.D.: Commerce & Management				
1	C.V.Divakar	K.Aswathappa	A study on current practices in Electrical tariff fixation and development of an operationally feasible improved tariff system	1990
2	C.Suresh	K.Aswathappa	Role of financial institutions in Rural Development with special reference to Mandya Kolar, Dharwad and Bijapur districts of Karnataka state	1991
3	Avinash Kumar Srivastav	K.Aswathappa	Study of Organisational climate role stress and coping strategy variables in quality assurance professionals	1990

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Sl. no.	Name of the Scholar	Name of the Supervisor	Title of Research Topic	Year of Commencement
4	Pushpa Bhatt	P.N.Reddy	Quantitative approach to wage and salary administration	1989
Ph.D: Psychology				
1	Shanker Ram	A. Vinoda N.Murthy	Therapeutic effectiveness of drug and behaviour therapy in Alcoholism	1990
2	V.Saraswathi Vinoda	N.Murthy	Behaviour technology for problem behaviour in mental retardation	1991
3	S.N.Nagaraja Reddy	S.Thimmappa	Personality correlates of managerial effectiveness	1990
4	S.K.Poornima Devi	Indira Jai Prakash	Psycho-social correlates of response to legal literacy programmes on Gender justice	1989
5	B.S.Anuradha	G.Mohan Kumar	Organisational factors as related to Human resource effectiveness- A study in the context of integrated child development services scheme	1989
6	Y.B.Bhagavathi	G.Mohan Kumar	Organisational dynamics for the development of women in careers	1989
7	Manjula V.Malimath	G.Mohan Kumar	Dynamics of Power in Organisational effectiveness	1991
8	Sulata Shenoy	G.Mohan Kumar	Psycho-social correlates and facilitators of career development among high school students	1989
9	Achira Sen	Achala Umapathy	Adolescent stress and coping	1990
10	Parvatha Vardhini	Achala Umapathy	Emotional problems of children an ecological and psycho-social perspective	1991
11	Neela Lakshmikanth	Achala Umapathy	Psycho-social correlates of social problem solving skills among pre-adolescents	1989
12	Anjana M.R.	Achala Umapathy	Psycho-social correlates of self construct among pre-adolescents	1990

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Sl. no.	Name of the Scholar	Name of the Supervisor	Title of Research Topic	Year of Commencement
M.Phil:Commerce & Management				
1	D.Shivarudrappa		A study of Rehabilitation of Sick Small Scale Industrial Units in Bangalore	1992
2	C.Shivaramu	P.N.Reddy	The impact of Agricultural Investment credit on the Economic conditions of the beneficiaries.	1992
3	V.Venkataramana		A study of production and marketing of processed granites in Bangalore area	1990
4	M.Muni Raju	K.Aswathappa	Production and Marketing of Moulded Bricks in Bangalore city	1992
5	S.V.Shridhara Murthy	P.N.Reddy	Public Distribution System	1992
6	R.Ravi Shankkar	K.Aswathappa	A study of the growth of advertising agency in Bangalore city	1992
7	M.Lawrence	P.N.Reddy	Working Capital Management	1990
M.Phil: Psychology				
1	Vrinda R.Naik	Vinoda N.Murthy	A survey of jeans of college students	1991
2	Shashikala	K.P. Achala Umpathy	Job stress,social support and burnout: A study of nurses	1992

Research Projects

Sl. no.	Discipline	Title of Research Topic	Year of Commencement	Year of Completion	If the report is already published
1	Psychology	Life cycle changes in aging Indian women	1986	1989	No
2	Psychology	Measures of organisational effectiveness	1989	1990	NA

Sl. no.	Discipline	Title of Research Topic	Year of Commencement	Year of Completion	If the report is already published
3	Psychology	Psycho-social correlates of career-choice among high school students	1992	NA	NA
4	Psychology	Interpersonal cognitive problem solving skills in children	1990	1993	NA
5	Psychology	Sex typing in Indian children and its psycho-social implications	1988	1991	Yes
6	Commerce and Management	Working of IRDP in Selected Village of Bellary District	1987	1988	No

KARNATAK UNIVERSITY

Sl. no.	Name of the Scholar	Name of the Supervisor	Title of Research Topic	Year of Commencement
Ph.D: Education				
1	Francina C.J.P.	Shashikala Deshpande	Effective use of back channeling strategies, on secondary school students achievement and retention in Chemistry	1990
2	Shobha Nilawar	K.Ramachandrachar	Evaluation of in-service programme of Academic Staff colleges in the college teacher performance perspective	1987
3	H.M.Kailasalingam	H.M.Kasinath	An investigation into the factors related to burnout among teacher educators in Karnataka	1989
4	A.M.Ajathaswamy	H.M.Kasinath	Effect of inquiry training model of teaching on the scientific process skills, curiosity and creativity levels of secondary school students	1989
5	Prine N.J.	Kongawad H.M.	Kasinath Psycho-social factors related to academic achievement of students studying in schools for physically handicapped in Karnataka State	1989

Sl. no.	Name of the Scholar	Name of the Supervisor	Title of Research Topic	Year of Commencement
6	Sujatha P.Shanbhag	H.M.Kasinath	A multiple cross-sectional study of logical reasoning among disadvantaged children	1993
7	V.S.Hiremath	H.M.Kasinath	A multiple cross-sectional study of moral reasoning among disadvantaged children	1993

Research Projects

Sl. no.	Discipline	Title of Research Topic	Year of Commencement	Year of Completion	If the report is already published
1	Education	A study of adjustment among migrated Hindi and non-Hindi speaking students studying in Jawahar Navodaya Vidyalaya	1990	1991	yes
2	Education	Evaluation of Teaching - A multi-dimensional approach	1987	1991	
3	Education	A factor analysed study of structure of intellect factor based tests in Kannada for the children of school leaving age	1984	1989	
4	Education	Identifying software dimensions fitting selected regions of tele-media influence	1991	NA	
5	Geography	Levels of Agricultural Development in Bijapur district	NA	1987	
6	Geography	Population growth and Umland of Bellary city	NA	1989	
7	Geography	Landuse Analysis of Hassan Town	NA	1990	
8	Geography	Landuse, Ecology and environment of Managundi village	NA	1991	
9	Geography	Agricultural productivity at grassroot level in Nargund taluk	NA	1992	

MANGALORE UNIVERSITY

Sl. no.	Name of the Scholar	Name of the Supervisor	Title of Research Topic	Year of Commencement
M.Phil: Commerce				
1	H.Halanaik	A.Raghurama	Marketing problems of tiny sector units with special reference to food and beverages - A study in Udupi taluk of Dakshina Kannada district	1992
2	Rajamohan Rao	K. Mustiary	Begum Retail practices in Rural areas A study in Mangalore taluk	1992

Research Projects

Sl. no.	Discipline	Title of Research Topic	Year of Commencement	Year of Completion	If the report is already published
1	Business Administration	Making of Bank services in rural areas - A study in Dakshina Kannada district	NA	NA	NA
2	Business Administration	Financing of Rural-Artisans A study in Dakshina Kannada district	NA	NA	NA

UNIVERSITY OF MYSORE

Sl. no.	Name of the Scholar	Name of the Supervisor	Title of Research Topic	Year of Commencement
Ph.D.:Geography				
1	P.K.Vijayan	P.D.Mahadev	Residential Mobility in Slums of Cochin.	1990
2	V.Aswathanarayan	K.N.Udaya Kumar	Impact of Irrigation on agricultural land use in Manvi taluk of Raichur.	1986
3	Mohamed Jaffar	K.N.Udaya Kumar	Oil milling and processing in Kerala.	1992
4	H.S.Manjunath	K.N.Udaya Kumar	Non paint sources of pollution along Cauvery Basin. 1990	
5	Damodaran Nair	K.N.Udaya Kumar	Transportation and Urban land use pattern of Trivandrum.	1991

Sl. no.	Name of the Scholar	Name of the Supervisor	Title of Research Topic	Year of Commencement
6	Nehruji	Rajashekharasetty	Barriers in the diffusion of Agricultural innovations - A case study of Mysore District.	1989
7	V.M.Chandrashekar	Krishnamurthy	Problems and Prospects of Plantation Crops cultivation - A case study of Coorg. Dist.	1991
8	B.Chandrashekara	Krishnamurthy	Rural Settlement in Southern Maidan Region.	1991
9	S.Arun Das	Krishnamurthy	Rural-Urban Fringe - A Case Study of Mysore	1992
10	Hanumaiah	P.Jayaramaiah	Dairying in Mysore District	1989
11	Krishnaiah	P.Jayaramaiah	A study of selected tribes in Mysore district: A geographic Analysis	1990
12	Venkataramu	P.Jayaramaiah	Geonomics of sheep rearing and marketing in Karnataka	1989
13	M.Mariswamy	P.Jayaramaiah	Agricultural Land use pattern in Mysore District: A geographic analysis	1992

Research Projects

Sl. no.	Discipline	Title of Research Topic	Year of Commencement	Year of Completion	If the report is already published
1	Geography	Impact of Irrigation on Settlements, landuse and Population in Tungabhadra Command area (Raichur District) - Primary Survey	1986	1990	Yes
2	Geography	Non-Paint sources of Pollution along Cauvery in Kaveri Basin (Karnataka) - Primary Survey	1989	1991	No

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SCHOOL OF SOCIAL WORK - MANGALORE

Sl. no.	Name of the Scholar	Name of the Supervisor	Title of Research Topic	Year of Commencement
Ph.D. Social Work				
1	Ramachandra Rao G	R.Krishnamurthy	Human Resource range in National Bank	1989
2	Vijayan	G.R.Krishnamurthy	Stress in nursing profession	1992
3	Paul	G.R.Krishnamurthy	HRR practices in Banks	1992
4	Audrey S.Pinto	NA	The Therapeutic role of life review in enhancing the quality of life of the elderly	1989

Research Projects

Sl. no.	Discipline	Title of Research Topic	Year of Commencement	Year of Completion	If the report is already published
1	Social Work	Socio-Economic study of the families to be displaced by Mangalore Super Thermal Power Project	1990	1991	No
2	Social Work	Evaluation of Akshara-Tunga Literacy Programme in Shimoga District	1992	1993	No
3	Social Work	Survey of the Working and living conditions of girls and women employed in fish processing industry	1993	NA	NA

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COCHIN UNIVERSITY OF SCIENCE & TECHNOLOGY

Sl. no.	Name of the Scholar	Name of the Supervisor	Title of Research Topic	Year of Commencement
M.Phil: Applied Economics				
1	Alice Manzooran	M.K.Sukumaran Nair	Labour Market Situations in Udayamperoor village	1992
2	Chacko Jose P.	NA	Rural Energy	1992
3	Celinkutty Mathew	K.C.Sankaranarayanan	Consumption Expenditure pattern in a rural setup	1992

Research Projects

Sl. no.	Discipline	Title of Research Topic	Year of Commencement	Year of Completion	If the report is already published
1	Management Studies	A study of the Management practices in Rubber plantation Industry in India	1989	1993	No
2	Management Studies	A study of the Management of rubber small holdings in Asian countries	NA	NA	NA
3	Management Studies	Export development: Process and potential: A study with reference to the marine products industry in India	1987	1991	Yes
4	Management Studies	A study of the co-operative banking system in Kerala	1984	1987	Yes
5	Management Studies	Co-operative banking in India	1988	NA	No

UNIVERSITY OF CALICUT

Sl. no.	Name of the Scholar	Name of the Supervisor	Title of Research Topic	Year of Commencement
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Ph.D: Anthropology

1	Babu Ambala Parambath	B.Ananda Bhanu	The Cultural Adaptation and techno-economic development among the Uralikuruman of Kerala	1992
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Ph.D.:Commerce

1	P.Mohanan	K.C.Vijayakumar	Stock Price Behaviour in India	1992
2	S.Kannan	K.C.Vijayakumar	Consumer Product Marketing - A Study of Marketing Practices and Control Systems of Selected Companies in India.	1988
3	V.M.Xaviour	K.C.Vijayakumar	Entrepreneurship in Small Scale Industries in Trichur Twon and its Environs.	1988
4	T.Asokan	K.C.Vijayakumar	A study with reference to the Industries sponsored by the Kerala Khadi and Village Industries Board.	1987
5	T.P.Basheer	K.C.Vijayakumar	Impact of I.T.D.P.on the Economic Development of Tribes with special reference to Attappady Region.	1988
6	V.K.Janardhanan	K.C.Vijayakumar	A Study of Financial and Marketing Problems of Match Industry in Kerala.	1987
7	K.K.Mohamed	K.C.Vijayakumar	Financial Management of Textile Mills in Kerala with special reference to to Co-operative Units.	1992
8	K.Sudhakaran	K.C.Vijayakumar	Performance Evaluation of Urban Co-operative Banks	1990
9	A.K.Sarada	K.C.Vijayakumar	Delegation of Authority in Selected Public and Private industries in Kerala.	1983
10	E.K.Satheesh	K.C.Vijayakumar	A Study on New Trends in Merchant Banking in India.	1992

Sl. no.	Name of the Scholar	Name of the Supervisor	Title of Research Topic	Year of Commencement
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Psychology

1	Varghese Paul,	K. P.N.O.Tharakan	Personality characteristics of cancer patients in relation to life change events, locus of control, and stress indicators	1989
2	M.A.Roy	C.B.Asha	Achievement motivation in relation to personality characteristics	NA
3	Aboobaker	T.V.P. C.B.Asha	Job satisfaction among college teachers	1991
4	M.K.Rema	Anita Ravindran	A Personality study of patients with certain psychostatic illness	1988
5	Basheer Kutty	Anita Ravindran	Clinical Psychology	1989
6	Dakshina Moorthy	K.S Anita Ravindran	Interaction of Life events social support system, and personality-A comparative study among normals,reactive depressive patients and endoz-herous, depressed patients	1989

Research Projects

Sl. no.	Discipline	Title of Research Topic	Year of Commencement	Year of Completion	If the report is already published
1	Commerce & Management Studies	Management of Cooperatives	1982	1984	No
2	Psychology	Calicut Socio-Economic Status Scale	1990	1992	Yes
3	Psychology	Occupational stress research among working women	NA	NA	Yes
4	Psychology	Effectiveness of Bender visual motor Gestalt-test in the differential diagnosis of functional and organic disorders	1990	NA	No

UNIVERSITY OF KERALA

Sl. no.	Name of the Scholar	Name of the Supervisor	Title of Research Topic	Year of Commencement
Ph.D.:Education				
1	Vijayakumari Amma	K.Sivadasan Pillai	Wastage in Teacher Preparation programmes at secondary level.	1984
2	C.Narayana Pillai	K.Sivadasan Pillai	Preparing Criteria for neo-literate books	1989
3	A.R.Supriya	K.Sivadasan Pillai	Involvement of College Teachers in Adult Literacy Programmes.	1990
4	C.K.Mohandas	K.Sivadasan Pillai	Training Programmes of Rural Development	1993
Ph.D.: Sociology				
1	Sudha Krishnan	G.Ramachandran	Migration and Social Change	1989
2	S.Jayasree	G.Ramachandran	Women in Unorganised sector (Study on Coir Workers in Kerala)	1989
3	Rohini	G.Ramachandran	Development - Welfare Programme and Tribal Life Pattern.	1991
4	Bigi Mol Joseph	G.Ramachandran	Role adjustment of professional women in Kerala.	1992
M.Phil: Economics				
1	Betty C.Sebastian	G.Karunakaran	Regional Rural Banks and Rural Pillai Development	1991
2	Sandhya Sukumaran	G.Karunakaran Pillai	A study of professional and technical unemployment in Kerala	1991

Research Projects

Sl. no.	Discipline	Title of Research Topic	Year of Commencement	Year of Completion	If the report is already published
1	Adult Education	Evaluation of Adult Education Programmes in seven Southern districts of Kerala.	1989	1990	Yes
2	Adult Education	Oru Poo Virizunnu - TV Programme Evaluation Kendra.	1988	1989	Yes
3	Adult Education	Ammayum Kunjuni Radio Programme - Evaluation	1987	1987	Yes
4	Adult Education	Media efficiency	1991	1991	Yes
5	Adult Education	Effectiveness of Training Programmes in Tribal Literacy Campaigns.	1991	1992	No
6	Adult Education	Research/Field study reports of 35 PM Dept. students and 5 Institutional researches.	NA	NA	NA
7	Sociology	Women in Grass Roots Democracy.	1991	1992	No

ANNAMALAI UNIVERSITY

Sl. no.	Name of the Scholar	Name of the Supervisor	Title of Research Topic	Year of Commencement
Ph.D.:Commerce				
1	S.Suresh	K.N.Ramanujam	Job Satisfaction and Job involvement of Engines in N L C.	1992
2	B.Suresh Kumar	T.Aranganathan	Household Savings and Investment of Salaried Class in Pondicherry	1993
3	A.Jeyakumari Marial	Janet T.Aranganathan	Inventory Management in Hospitals	1992
Ph.D.:Education				
1	P.N.Nataraj	M.Andal	School effectiveness in relation to organizational climate	1986
2	T.Thilagavathy	M.Andal	A study of academic achievement of adolescents in relation to their cognitive style, locus of control, Mental health and self esteem	1990
3	P.Natarajan	M.Andal	Impact of Literacy efforts in Tamilnadu	1990
Ph.D:History				
1	Sankari, K.	P.E.Mohan	National Movement in the South Arcot District-Tamilnadu	1988
2	P.Rajan	S.Govindaraju	Lord Muruga in Art and Literature A study	1991
3	S.Anuradha	S.Govindaraju	Sri Sattanathaswamy Temple at Sirkali- A Study	1989
4	C.Shyamala	NA	A study of Tamilnadu welfare legislations with special reference to women	1991
5	P Sridhar	NA	Communal representation in Indian Parliament with special reference to Tamilnadu from 1952	

Sl. no.	Name of the Scholar	Name of the Supervisor	Title of Research Topic	Year of Commencement
6	A Thennarasu	NA	Reservation Policy in Tamilnadu A study in socio-economic development of backward communities and weaker sections	1991
7	S Radhakrishnan	NA	History of the Sivaganga Kingdom	NA
8	G.John Peter	NA	The work of Pondicherry Mission with special reference to social upliftment of backward communities	NA
9	M.Samathanam	NA	Status of women in Madras Presidency under British rule.	NA
10	A Thennarasu	NA	Reservation policy in Tamilnadu: A study in socio-economic development of backward communities weaker sections	NA
M.Phil: Commerce				
1	M.Sekar	B.Rajagopalan	Financing of Biogas plants by Indian Overseas Bank	1991
M.Phil:Education				
1	M.Soundararajan	T.Padmanabhan	A study of values of the students at Annamalai university in relation to high community status	NA
2	K.Loganathan	B.Ellakakumar	Vocational preference and socio-economic status of Higher Secondary students	1992
3	M.Valarmathi	B.Ellakakumar	Higher secondary students perception of their Economics teacher, their attitude towards the study of Economics and their achievement in it.	1992
4	T.Murugeswari	M.Andal	A study of creativity in relation to home environment and academic self-image of higher secondary course	1992

Sl. no.	Name of the Scholar	Name of the Supervisor	Title of Research Topic	Year of Commencement
M.Phil:History				
1	S.P.R.Venkatasubramanian	NA	Communal representation - special reference to Tamilnadu Legislature	1992
2	M.Rajendran	M.Deenadayalan	Communist Movement in East Tanjore - A study	1992
3	K.Sakthivel	K.S.Ramaswamy	History in Tiruvannamalai A.D. 900-1565	1992
4	B.Sheela	S.Govindaraju	A study of Thirukkamisvarar temple at Villiyannallur in the union territory of Pondichery	1992
5	N.Sundararajan	P.E.Menon	Thirumanikuli Vamana Puriswara Temple - A Historical study	1992
6	M.Jothi	N.Alagappan	Chidambaram Temple Descriptions A Study	1992

BHARATHIAR UNIVERSITY

Sl. no.	Name of the Scholar	Name of the Supervisor	Title of Research Topic	Year of Commencement
Ph.D: Commerce				
1	E.Meera	M.Manickam	Portfolio analysis in Indian industries	1991
2	N.Ramu	M.Manickam	A study of money supply and stock prices	1986
3	K.Balasubramani	M.Manickam	Equity price behaviour in Bombay, London & Newyork stock exchanges	1990
4	P.Bruntha	M.Manickam	A study of Dividends, right and bonus issues and stock prices	1993
5	K.Ramasami	M.Manickam	Financial forecasting and modelling - A study of State Road Transport Corporation	1990

Ph.D.: Economics

Sl. no.	Name of the Scholar	Name of the Supervisor	Title of Research Topic	Year of Commencement
1	S.Manickavasagam	S.Perumalsamy	Economics of Leather industry pollution	1990
2	R.Sarojini	S.Perumalsamy	Rural financial markets	1990
3	N.Sasikala Devi	R.S.Dhananjayan	Pattern of industrialisation and structural change: A comparative study of growth, productivity, and factor substitution, technical change industrial exports and employment in developed and developing nations during 1973-74 to 1987-88	1991
4	N.Santhamani	R.S.Dhananjayan	Capital inventory behaviour portfolio and factor shares of income in Indian corporate sector: 1965-66 to 1988-89	1991
5	R.Prema	B.Muniyandi	Production and marketing spices in Periyar district	1992
6	R.Nagarajan	P.Arumugam	A study of labour market segmentation	1991
7	A.Sangamithra	P.Arugmugam	Who gets what from govt. expenditures	1991
8	M.Madhavan	R.S.Dhananjayan	Capacity utilisation, industrial diversification and price cost margin	1992
9	P.S.Shanthi	R.S.Dhananjayan	Inter-industry structural change of manufacturing employment, technology and income share during 1975-76 to 1988-89	1992
10	Santhamani N.	R.S.Dhananjayan	Capital, inventory, portfolio and factor shares of income in Indian Corporate sector, during 1969-70 to 1988-89	1991
11	N.Damodaran	R.S.Dhananjayan	A study of industrial growth and industrial exports during 1970-71 to 1989-90	1991

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Sl. no.	Name of the Scholar	Name of the Supervisor	Title of Research Topic	Year of Commencement
12	M.Madhavan	R.S.Dhananjayan	Capacity, utilisation, industrial diversification and price-cost margin: A study of non-traditional sector industries at three digit disaggregation during 1973-74 to 1986-87	1992
13	P.S.Shanthi	R.S.Dhananjayan	Inter-industry structural change of manufacturing employment, technology and income shares in Indian manufacturing industries: 1973-74 to 1988-89	1992
Ph.D: Population Studies				
1	R.Nagarajan	P.M.Kulkarni	Landholdings and fertility among Kongu Vellalas: A study in rural Dharapuram	1990
2	N.Thenmozhi	N.Audinarayana	Status and role of women on fertility behaviour	1991
3	I.K.Padmini	S.Krishnamoorthy	Effect of family and primary kin on fertility behaviour	1993
M.Phil: Economics				
1	P.Thenmozhi	NA	Performance for primary agricultural co-operative societies in Coimbatore district	1992
2	K.Sneka	B.Muniyandi	Study on production-consumption and export of coffee	1992
3	G.Kothainayaki	P.Arumugam	Elasticity of State Taxes with special reference to Tamilnadu	1993
4	N.M.Palanisamy	B.Muniyandi	Economics of Irrigation	1992
5	S.Latha	B.Muniyandi	Production and marketing of handloom products by weavers co-operative societies	1992

Sl. no.	Name of the Scholar	Name of the Supervisor	Title of Research Topic	Year of Commencement
6	T.Lavanya	R.S.Dhananjayan	Inter-industry study of factor proportions, productivity and cost functions: An analysis of select manufacturing industries 1973-74 to 1987-88	1992
7	B.Rajeswari	R.S.Dhananjayan	Inter-sectoral characteristics of industrial growth technical change, factor substitution and sources of output growth in Indian consumer goods industries, 1973-74 to 1984-85	1991
8	Jayanthi	R.S.Dhananjayan	Industrial growth in southern states: A study of structure output growth, factor substitution and wages share in value added during 1979-80 to 1987-88	1991
9	R.Theivasamy	R.S.Dhananjayan	A study of growth and structure of corporate capital, inventory and determinants of wages share and profitability in Indian large and medium private ltd. companies 1970-71 to 1980-81	1991
M.Phil: Population Studies				
1	B.Thiru	N.Audinarayana	The effect of education on fertility in an urban setting of Tamilnadu	1991

Research Projects

Sl. no.	Discipline	Title of Research Topic	Year of Commencement	Year of Completion	If the report is already published
1	Economics	An economic analysis of yield gap in major cereal crops - A case study of Coimbatore district in Tamilnadu	1992	NA	NA

Sl. no.	Discipline	Title of Research Topic	Year of Commencement	Year of Completion	If the report is already published
2	Economics	Growth, economics of scale and technical change 'MM Group Industries: A study of Coimbatore and Madras districts in Tamilnadu: 1975-76 to 1984-85	1992	NA	NA
3	Population Studies	Women's status and fertility in an urban setting of Tamilnadu	1990	1993	NA

BHARATHIDASAN UNIVERSITY

Sl. no.	Name of the Scholar	Name of the Supervisor	Title of Research Topic	Year of Commencement
Ph.D: Economics				
1	R.Karhikeyan	S.Lakshmi	Techno-Economic Appraisal of Bio Gas Plants in Thanjavur District	1991
2	P.S.Vijayalakshmi	S.Lakshmi	Marketing practices and problems of small scale industries	1991
3	N.Vijayalakshmi	C.Thangamuthu	Industrial development of Tamilnadu (A study in growth, structure, location)	1987
Ph.D: Educational Technology				
1	S.Ragul Mohideen	S.Purushothaman	Evaluating the effectiveness of multi-media on developing teaching competency of student-teacher	1991
	I.Muthuchamy	S.Purushothaman	Effectiveness of video assisted instruction with special reference to adult learners	1992
Ph.D: Futurology				
1	S.Santhana Lakshmi	R.Shankar	Futuristic vision of Beedi industry in Tiruchirapalli	1990

Sl. no.	Name of the Scholar	Name of the Supervisor	Title of Research Topic	Year of Commencement
2	R.Rajkumar	Chellam Bala-sundaram	Community health future: A comparative forecasting (2025 AD) in urban and rural A case study	1993
Ph.D: Sociology				
1	P.Devanesan	R.Shankar	The dynamics of inequality and educational opportunity in Tamilnadu	1989
2	A.Lalitha	R.Shankar	Education and socio-economic changes in rural areas of Tiruchirapalli taluk	1990
3	S.Martin Selvaraj	M.Thavamani	Social organisation of canal irrigation in Panguni channel of Tiruchirapalli	1991
4	P.Balasubramaniam	M.Thavamani	Farmers participation in managing irrigation systems	1991
5	N.Radha	S.Palaniswamy	Problems of women construction workers in Trichy district	1990
6	Joseph Irudayaraj	S.Palaniswamy	Impact of mass communication on the village life in Trichy rural district	1991
7	Godwin Premsingh	R.Shankar	Organisational behaviour and industrial climate in Trichy industries	1992
8	G.Christopher	S.Palaniswamy	An effect of deforestation among Kurumba Tribes in Nilgiris district	1992
9	T.Dhanakodi	S.Palaniswamy	The role of voluntary agencies and rural development in Tiruchirapalli district	1993
M.Phil: Futurology				
1	M.Chitra	N.Rajendran	Cauvery river water issue and its agricultural impacts (paddy production in Tanjore district	1992

Sl. no.	Name of the Scholar	Name of the Supervisor	Title of Research Topic	Year of Commencement
M.Phil: Educational Technology				
1	G.Kalaiyaran	S.Purushothaman	A study the interaction analysis of Botany teacher at Hr.Sec.School level in Thanavur district	1991
2	K.Kamaraj	T.K.Swatantra	Evaluating media effectiveness Devi teaching chemist at higher secondary level	1992
3	V.Rajagopalan	T.K.Swatantra	Education Technology Environ-Devi ment problem	1992
4	J.Herbert Absalom	T.K.Swatantra	Teaching of Phonetics to the Selvi Devi Hr.Sec.Students through video assisted instruction	1992
5	P.Jayaraman	T.K.Swatantra	Impact on application of Devi educational technology of situational teachings in English for secondary school students	1993
6	D.Arul Samy	T.K.Swatantra Devi	Teaching of phonetics through VAI to the teacher trainees	1992
7	S.Vincent De Paul	S.Devanathan	Effectiveness of VAI in teaching chemistry	NA
8	P.Suguna	S.Devanathan	Effectiveness of video-assisted instruction on the achievement of low achievers in teaching of English	1992
9	S.Thirugnanasambandam	S.Devanathan	Educational technology and teaching and learning of Botony at Hr.Secondary level	1992
10	R.Subramanian	S.Devanathan	Use of media in teaching zoology at Hr.secondary level	1992
11	V.Subburaj	S.Devanathan	Impact of CAI on socially useful productive worn	1992
12	T Sampath	S.Devanathan	Video education for 8th std. students	1992

Sl. no.	Name of the Scholar	Name of the Supervisor	Title of Research Topic	Year of Commencement
M.Phil: Economics				
1	M.Ramadevi	C.Thangamuthu	A study on the economic aspects cement industry in Tamilnadu	1987
2	Mini M Nair	S.Lakshmi	Cropping pattern in Pudukottai District	1992
3	S.A.Prabhakaran	S.Lakshmi	Role of Sericulture promotional agency in Kungalur village	1992
4	S.Sekaran	M.Ravichandran	A study of Economic prospects of livestock in Tiruchirapalli district	1992
5	R.Juliet	S.Iyyampillai	State income in Tamilnadu	1992
6	J.Roseline Sulochana	M.Ravichandran	A study of social forestry programme in Thanjavur district	1992
7	S.Dhanaraju	M.Ravichandran	A study of Industrial pollution control with reference to Cauvery Sugars and Chemicals (P)Ltd. Pettavalthalai-Trichy District	1992
8	P.Panneerselvam	C.Thangamuthu	Coir industry with special reference to Pattukkottai taluk, Tanjore district	1992
9	S. Chellappa	C.Thangamuthu	Economic aspect of enturepreneurship	1992
10	R.Kunjammal	S.Lakshmi	Economics of sugarcane cultivation in Pudukkottai district	1992
11	R.Manimohan	S.Lakshmi	Foodgrains price behaviour and its impacts on economy	1992
12	M.Ramadasu	S.Lakshmi	Bore-well water market and its impact on cropping pattern and yield	1992
13	V.Mahalakshmi	S.Iyyampillai	Agricultural marketing in Pudukkottai district	1992

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Sl. no.	Name of the Scholar	Name of the Supervisor	Title of Research Topic	Year of Commencement
14	A.Shahabudeen	S.Iyyampillai	Economics of government assistance to fishermen community in Adhiramapatinam	1992
15	R.Poongodi	M.Ravichandran	Power consumption in Tanjavur district	1992

Research Projects

Sl. no.	Discipline	Title of Research Topic	Year of Commencement	Year of Completion	If the report is already published
1	Economics	Status of Social Sciences	1986	1987	No
2	Economics	Industrial promotional agencies and entrepreneurship development in two backward districts of Tamilnadu	1989	1990	No
3	Economics	Social forestry monitoring project	1990	1991	No
4	Economics	Status of Social Sciences	1992	1993	No
5	Economics	Winrock International project	1988	1990	No
6	Futurology	Fish culture in Rainfed pond	1993	NA	No

GANDHIGRAM RURAL UNIVERSITY

Sl. no.	Name of the Scholar	Name of the Supervisor	Title of Research Topic	Year of Commencement
Ph.D.:Rural Development				
1	R.Mani	R.Murugesan	Employment Generation through Watershed	1991
2	S.Pandimurugach	R.Murugesan	Block Planning for Rural Development in Keerupalayam Union	1993

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MADURAI-KAMARAJ UNIVERSITY

Sl. no.	Name of the Scholar	Name of the Supervisor	Title of Research Topic	Year of Commencement
Ph.D:Economics				
1	A.Solucis Santhapparaj	R.Sankara	Economics of migration in Ramalingam Madurai city	1989
2	S.Mookiah	G.Velan	A study on working and living conditions of Beedi workers belonging to Scheduled Castes in Tirunelveli Kattabomman district	1989
Ph.D:Education				
1	P.Rajasekaran	G.Subramanian	Instructional designing among college teachers	1991
2	R.Charles William	J.P.Gabriel	The media behavioural patterns of Graduate students	1992
3	K.Krishnamoorthy	K.Krishnan	A critical study of the Engineering trades of ITIs in Tamilnadu	1992
4	V.Rajagopalan	J.P.Gabriel	Remedial education in Chemistry for socially backward graduates	1991
Ph.D:Sociology				
1	K.R.Murugan	L.Tharabhai	Changing patterns of social institutions in Mauritius- A study among the population of Indian descent 1	990
M.Phil: Education				
1	Benedicto Ongoto Mwancha	P.N.Muthiah	A Comparative Study of Extension Education in Kenya and India	NA
2	Clement Veda Nayagam	G.Subramanian	Effectiveness of audio cassettes in learning Biology among blind students	1992
3	K Dolarose Mary	NA	Women's attitude towards voluntary agencies in preventing female infanticide	NA
4	Sankaran Namboodiri	K.Krishnan	Socio-cultural economic variance in relation to spread of education among Adivasis of Wynad	1992

RESEARCH PROJECTS

Sl. no.	Discipline	Title of Research Topic	Year of Commencement	Year of Completion	If the report is already published
1	Economics	Department Research Support	1991	1994	NA
2	Economics	Credit Facilities to women in Tamilnadu	1992	1992	NA
3	Economics	A study of Entrepreneurship in Madurai district	1989	1990	NA
4	Economics	A study on cost of cultivation, yield gap and economic efficiency in Indian agriculture: A case study of irrigated cotton	1985	1987	NA
5	Economics	Economics of fertiliser use in rice production: A case study	1989	1991	NA
6	Economics	Income, savings and investment of the household sector in Madurai district	1987	1989	NA
7	Economics	Socio-economic conditions of small fishermen in Thanjavur district	1986	1987	NA
8	Economics	Entrepreneurship in Madurai district	1988	1989	NA
9	Economics	A study of environmental pollution in Tamilnadu	1988	1990	NA
10	Economics	Productivity performance of public enterprises	1985	1987	NA
11	Economics	Textile industry in Madurai district	1992	NA	NA
12	Economics	Credit facilities to women in Tamilnadu: Accessibility and Availability and utilisation	1992	NA	NA
13	Economics	Identification of units and estimation of labour employment	1986	1987	NA
14	Economics	Income, saving and investment of the household sector	1987	1989	NA
15	Economics	Additional resource mobilisation efforts of Tamilnadu through taxation	1987	1990	NA

Sl. no.	Discipline	Title of Research Topic	Year of Commencement	Year of Completion	If the report is already published
16	Economics	Economics of rural transportation with special reference to Passenger Road Transport in Madurai district	1992	NA	NA
17	Education	Management of Educational Technology	1988	1992	NA
18	Education	Vocational Education for disabled students in Tamilnadu	1986	1988	NA
19	Education	Science Game on DNA Biochemistry	NA	NA	NA
20	Education	Computer assisted instructional package on Photosyn thesis	NA	NA	NA
21	Education	Protein Game in 'C' Language	NA	NA	NA
22	Education	"Biology" Text-book +1	NA	NA	NA
23	Education	Higher Secondary vocational course pass-holders: a follow-up study	1987	1991	NA
24	Education	Adequacy of the staff development programme for secondary education	1986	1993	NA
25	Sociology	Women foresters of southern United States	1989	1990	Yes
26	Sociology	Sociological ambivalence of University Teachers and Doctors	1987	1989	NA
27	Sociology	Intellectual community and its reorientation	1988	1990	NA
28	Sociology	Television advertisements and the viewer's perception- A sociological study in communication process	1987	1989	NA
29	Sociology	Social impact of regional television: A comparative study of Tamilnadu and Andhra Pradesh	1986	1988	NA

MADURAI INSTITUTE OF SOCIAL SCIENCES

Sl. no.	Name of the Scholar	Name of the Supervisor	Title of Research Topic	Year of Commencement
M.Phil: Social Work				
1	M.Kannan	D.V.P.Raja	College Student Volunteers' knowledge about Sexually Transmitted Diseases (STD) & AIDS, and attitude towards STD and AIDS patients.	1992
2	S.Koodalingam	D.V.P.Raja	Peoples Participation in Integrated & Child Development Services.	1990
3	W.Samuel Soundra	D.V.P.Raja	People's Participation in the Pandian Development Programmes of Non-Governmental Organisations	1992

MADRAS INSTITUTE OF DEVELOPMENT STUDIES

Sl. no.	Name of the Scholar	Name of the Supervisor	Title of Research Topic	Year of Commencement
Ph.D.:Economics				
1	Ajit Menon	Paul P.Appasamy	Common Property Resources and Joint Forest Management	1993
2	L.Venkatachalam Paul	P.Appasamy	Regional Natural Resource Accounting	1992
3	T.Albin	Nasir Tyabji	Govt. Policy and Domestic Technological capability building in capital Goods Sector: A case of Machine Tool Industry in India.	1993
4	Millie Nihila	Padmini Swaminathan	Industrialisation and Health: A study of Leather Tanning Industry in Tamilnadu.	1989
5	M.Udayakumar	A.Vaidyanathan	Regional Variations in Agricultural growth: a study on Tamil Nadu.	1986
6	C.Annadurai	C.T.Kurien	The Economic Impact and Social implications of the public distribution system in Tamilnadu	1984
7	M.S.Edwin Innocent	C.T.Kurien	The Millet Economy of Tamilnadu	1984

Sl. no.	Name of the Scholar	Name of the Supervisor	Title of Research Topic	Year of Commencement
8	R.Vidyasagar	A.Vaidyanathan	Temples, tenants and agrarian relations	1986
9	George Mathew	A.Vaidyanathan	Bovine Economy of Tamilnadu	1987
10	Rukmani Ramani	K.Nagaraj	Urbanisation of Tamilnadu 1901-81	1987
11	P.Anbahagan	A.Vaidyanathan	Conjunctive use of surface and ground water in Tamilnadu agriculture	1988
12	S.Thirumalai Velayutham	C.T.Kurien	Land Market (sales) in the villages of Tamilnadu	1988
13	K.Sivasubramaniyan	A.Vaidyanathan	Historical development of Tank irrigation in Tamilnadu	1988

Ph.D: Sociology

1	R Akila	P.Radhakrishnan	The educational status of women in India, with special reference to Tamilnadu.	1990
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Ph.D:Social Work

1	G.Suchitra Rao	P.Radhakrishnan	Reproductive Rights of Women with special reference to women in Tamilnadu.	1992
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UNIVERSITY OF MADRAS

Sl. no.	Name of the Scholar	Name of the Supervisor	Title of Research Topic	Year of Commencement
Ph.D.:Anthropology				
1	Xavier Raj	V.Sudarsen	Culture, Population and Resources of Malayali of Javadhi hills in Tamilnadu.	1986
2	P.Thamizoli	V.Sudarsen	Development Communication Agro-husbandary Practices among the Irulas of Nilgiris, Tamilnadu.	NA
3	B.Selvaraj	V.Sudarsen	Temporal and Spatial Commonalities: A study among the marine Communities of East Coast of India.	1992

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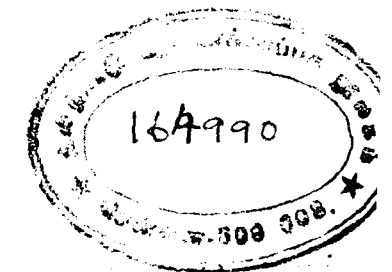
Sl. no.	Name of the Scholar	Name of the Supervisor	Title of Research Topic	Year of Commencement
Ph.D.:Adult Education				
1	S.Anbazhagan	R.Jayagopal	A Study to Assess the Retention of Literacy Skills of the Neo-Literate in some of the selected centres in Tamilnadu.	1989
2	C.Villi	R.Jayagopal	Profile of Women learners who had dropped out of the Open Learning System.	1990
3	V.P.Matheswaran	R.Jayagopal	A Study on Attitude of Distance Learners towards Open University System with special reference to Indira Gandhi National Open University.	1991
4	S.Nithya	R.Jayagopal	An Evaluative Study of Family Welfare Programme in the villages of Chinglepet M.G.R. District.	1991

Research Projects

Sl. no.	Discipline	Title of Research Topic	Year of Commencement	Year of Completion	If the report is already published
1	Anthropology	Anthropological study of conversion of Harijans to Islam in Tamilnadu (Joint)	1986	1987	No
2	Anthropology	Availability and utilization of Food Resources: Anthropo-ecological study of Andamans (Joint)	1984	1988	No
3	Anthropology	People of India - Tamil Nadu	1987	1988	No
4	Anthropology	Immuno-Genetic Study of some tribes of TN (Joint)	1988	1991	No
5	Anthropology	Indegenous Traditions of Navigation in the Indian Ocean.	1991	Ongoing	
6	Anthropology	Study on the Anthropological and genetic polymorphisms in the hill tribes of Shaveroy & Nilgiris, Tamilnadu.	1988	1990	No

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Sl. no.	Discipline	Title of Research Topic	Year of Commencement	Year of Completion	If the report is already published
7	Anthropology	Social supports, needs and life satisfaction of the elderly in India.	1992	1993	No
8	Anthropology	Ethnological Survey of Tribal Communities in Tamilnadu.	1992	1993	No
9	Anthropology	History of Maratha Brahmins' in Tamilnadu	1993	1994	No
10	Econometrics	Uncertainty and Farm Production Decisions	1987	1988	No
11	Econometrics	Input-Output Model, Tamilnadu	1988	1989	No
12	Econometrics	Telecom Tariff	1989	1991	No
13	Econometrics	Takemi Research	1987	1988	No
14	Econometrics	Family, Dowry & Bride Price	1986	1989	No
15	Econometrics	Public Programs and Household Behaviour	1989	1992	No
16	Econometrics	Economics of Female Headed Households - Incidence, characteristics and level of living - A Comparative Study between Tamilnadu and Kerala.	1991	1992	No
17	Econometrics	A Case Study of Rural employment programmes for women by voluntary organisations.	1992	1993	No



Publications of the Institute consist

1 Publications brought out by Messrs Sangam
of a series of monographs mainly relating to Ru.
brought out between 1972 & 1980. Detailed list in
request from the Programme Coordinator of MIDS. (Sangam Publishers, 11, Sunkurama Chetty Street, Ma

2 Cyclostyled Publications : These consist of Working Papers, Digest Series, Data Series, Popular Series, Interns Reports and Offprint Series brought out since 1978. Detailed list available on request from the Programme Coordinator of MIDS.

3 Occasional Publications of the Institute Include :

- a) *A Manual of Sources of Data on Tamil Nadu Economy* (1979) published by MIDS, pp. 92, priced at Rs. 10/- per copy and Rs. 6.50/- for bonafide research scholars.
- b) *Area Studies Bibliography Tamil Nadu* (1984) published by MIDS, pp. 226 Rs. 30/-for paper cover and Rs. 40/- for bound volume.
- c) *Social Science Research in South Indian Universities—Listing and Review of Ph D. Dissertations* (1989) Published by MIDS and ICSSR, SRC, pp. 260, Rs. 20/-
a), b) and c) obtainable from the Programme Coordinator of MIDS.

4 Special Publications*

- a) *Poverty — An Interdisciplinary Approach* edited by B. Sarveswara Rao and V. N. Deshpande (1982) & published for MIDS by M/s Somaiya Publishers Pvt. Ltd., Bombay, pp. 296, Rs. 125/-
- b) *Guide to Research Economics*, edited by C.T. Kurien (second edition) (1985) & Published for MIDS by M/s. Rainbow Publishers, Coimbatore, pp. 390 Rs. 100/-
- c) *Some thoughts on the Seventh Plan* by Dr. Malcolm S. Adiseshiah (1985) and published for MIDS by M/s Dialogue Publishers, New Delhi, pp. 136, Rs. 70/-
- d) *Shaping National Events* by Dr. Malcolm S. Adiseshiah (1985) and published for MIDS by M/s Dialogue Publishers, New Delhi, pp. 335, Rs. 180/-
- e) *Tamil Nadu Economy : Performances and Issues* by MIDS (1988) and Published for MIDS by Oxford and IBH Publishing Co. Pvt. Ltd., Delhi, Rs. 60/-

* These publications may be ordered directly from the respective publishers.

**MADRAS INSTITUTE
OF
DEVELOPMENT STUDIES
(MIDS)**

The Institute was founded by Dr. Malcolm S. Adiseshiah in 1971 and was reconstituted in 1977 as a National Research Institute within the framework of the Indian Council of Social Science Research, New Delhi.

The aim of the Institute is to contribute to the economic and social development in Tamil Nadu and India.

The activities of the Institute are:

- Research leading to Ph.D. Degree
- Studies and action-oriented research in micro-development problems
- Documentation and library service in development problems
- Exchange and dialogue at the State, National and International levels on development issues
- Publication of papers and results of the Institute

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