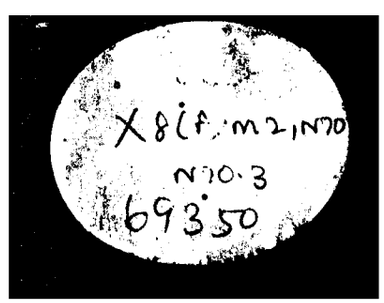
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INDUSTRIAL ECONOMIST

ANNUAL NUMBER 1970

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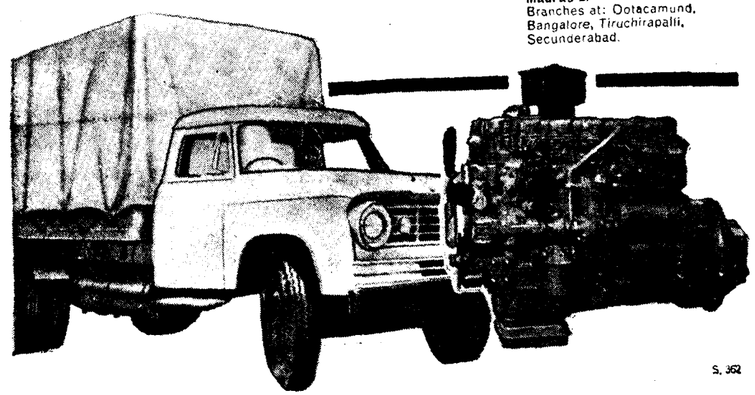

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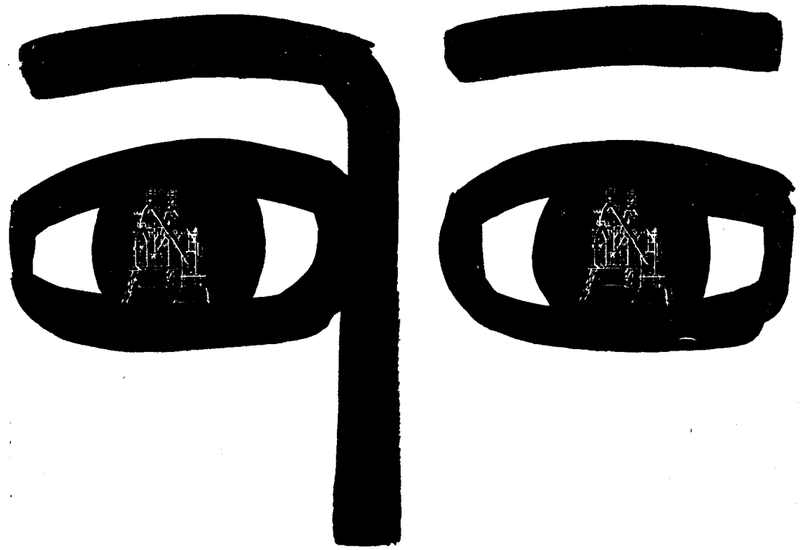

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INTO THE 'SEVENTIES—TOWARDS SELF-SUFFICIENCY

THERE WERE MANY important developments in the political and economic spheres of the country in the last fifteen months. The nationalisation of 14 major banks, the break-up of the Congress, the formation of coalition governments in a number of States which were unstable during their existence and fell into pieces ultimately and the abolition of privy purses were among the major developments in the political arena. For quite some time it appeared that the Government of Mrs. Indira Gandhi might not survive for long and that it might be necessary to order mid-term elections. In this period Prime Minister Gandhi emerged as the most powerful national leader who managed to provide a stable government at the Centre.

More significant developments had taken place in the economic front. Thanks to another year of bumper harvests, the availability of foodgrains eased considerably. It was interesting that the economy could absorb the high production of one hundred million tonnes of foodgrains for the third year in succession.

Industrial production increased significantly though the rate of increase in basic industries declined from 11.3 per cent in the previous year to 7.8 per cent during 1969-70. The national income is estimated to have increased by 5 to 5½ per cent during 1969-70 over that of the previous year.

The recovery in the agricultural and industrial production has contributed to spectacular improvements in foreign trade; there was a steep decline in the quantum of imports and a significant increase in exports, particularly of engineering and other non-traditional items. This has led to a much improved balance of payments position, though one would like to have these ruling at much higher levels. Our imports and exports should increase atleast three-fold within the next decade.

Shortages have emerged rather suddenly in a number of major industrial goods, particularly iron and steel. Thanks to the pick-up in industrial production, the demand for steel has increased rapidly with the result that attempts at exports of iron and steel made in the earlier two years had to be curtailed. In fact the increase in demand has been so fast that the Government had to decide on the establishment of three new steel projects at Hospet, Salem and Visakhapatnam. Shortages are bound to emerge and persist to a greater part of the 'seventies till the Bokaro steel plant is established with its expanded capacity and all the three new units are set up to their full capacity.

We have taken up the theme of the Annual as the 'sixties and the 'seventies. This year marks an important water-shed in the industrial development of the country. Nearly two decades of planning have created sizable capacities in a number of basic, heavy engineering and consumer industries.

The 'sixties in particular were eventful. The nation has marched ahead towards self-sufficiency, despite two calamitous wars and successive droughts in the second half of the decade. The era of massive food imports from benevolent, friendly countries appears to have ended with the agricultural revolution. Great strides have been taken in power generation, oil refining, output of steel, fertilizer production and in a variety of engineering industries. Exports are growing, in volume and content. If only the rate of increase in population was checked the results of planned development would have been much more impressive.

The 'sixties also saw the public sector assuming a preponderant and dynamic role in a number of important sectors like iron and steel, power generating equipment, electronics, machine tools and fertilizers, to mention only a few. A number of units also crossed over their gestation and started making handsome profits. In the 'seventies a larger number of these heavily invested projects can be expected to show good results.

The 'seventies have started under more favourable conditions. In a number of industries expansion is possible with indigenous capabilities. More interesting and dynamic developments are in store in the sophisticated electronics industry, nuclear technology...

We have attempted to present in this Annual a detailed survey of the spectacular changes that have taken place in the various sectors of the economy in the last two decades with a look into what is in store for the 'seventies.

NATIONAL ECONOMY BRIGHTENS UP

THE RISING TREND of wholesale prices, the accentuation of shortages and indecisive export and import policies, all these factors are affecting economic growth. No wonder that the Planning Commission at its recent meeting called for urgent measures to revitalise the public sector and even preparing an addendum for the Fourth Plan which will be helpful in creating new job opportunities at the district level and assure employment for at least one member of each family. It has not been spelt out, however, how additional employment for unskilled and semi-skilled workers in the rural areas is to be created and how the extra outlay needed for this purpose would be met. A resolution on this subject moved at the Patna A.I.C.C. session of the Ruling Congress Party estimated that fresh employment on the lines indicated above can be created with an additional expenditure of Rs. 60 crores annually. If job-oriented schemes can be formulated at this cost there can be no objection for taking up these schemes later on.

Fall in Targets

The Deputy Chairman of the Planning Commission, Dr. D. R. Gadgil, has stated that the size of the Plan may not undergo any significant change. At best there would be only a reallocation of resources already available and possibly a transfer of resources from the private to the public sector to an extent greater than contemplated earlier. However, there is reason to believe that the public sector is already experiencing difficulty in raising the tempo of expenditure on Plan schemes and the outlay in 1970-71 may again fall short of the target for the second year in succession.

While the problem of the Centre is related to the utilisation of the resources allotted, the States are short of funds and it is apprehended that in spite of the liberal assistance extended by the Central Government to many erring State Governments there would be large uncovered gaps. The Planning Commission has actually indicated that six States have failed to raise the required resources and Plan outlays will fall considerably short of estimates if the existing state of affairs was allowed to continue. If the Centre found it difficult to increase expenditure due to the existing machinery being unequal to the task and the State Governments cannot proceed with the work due to lack of resources, a new situation might arise where it would be necessary to transfer larger resources to the States or provide new incentives for the private sector to help it march ahead at a faster rate. If the proposed district-level schemes have to be implemented, only the States can take up additional responsibilities.

Inflationary Pressures

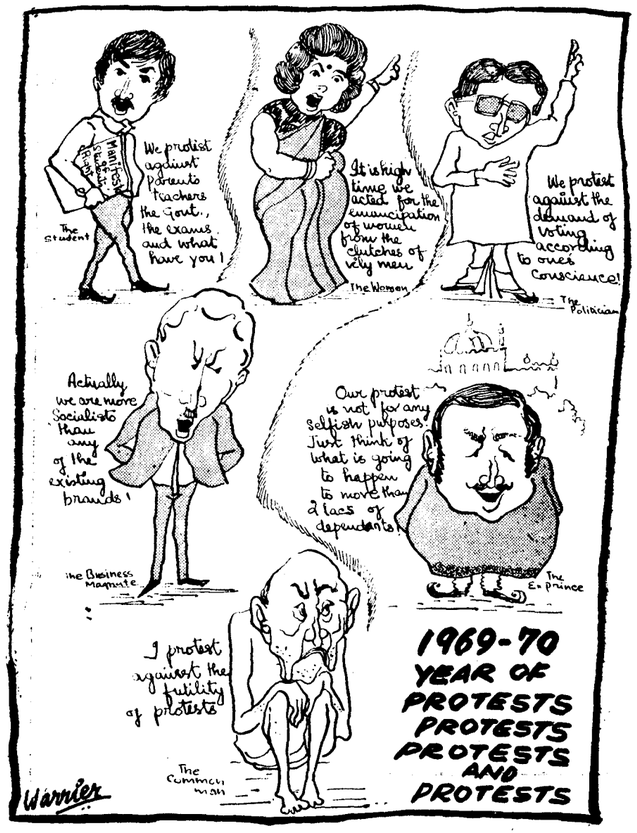
What is most disturbing in the present context is the emergence of inflationary pressures in a form different from that experienced in the Second and Third Plans. In 1956-66, there was undue emphasis on the development of heavy industries and a serious neglect of agriculture. With the shortage of agricultural commodities consequent on the unprecedented droughts there was a galloping rise in prices. The position is now different as the availability of foodgrains is on a scale which has not been witnessed in recent years. The output of cash crops too has not been unsatisfactory though the country is in need of much larger yields and the sharp rise in wholesale price indices has been mainly due to the shortage of raw cotton, edible oils and many other essential articles of consumption. With the prospects of good crops for the fourth year in succession, there will be a further increase in demand for consumer and durable goods and there will be a

sharp rise in prices for manufactured items.

The Planning Commission is certainly right in observing that there has been a slack in the growth of industrial production and earlier expectations in this regard have not materialised. It has been critical of the performance of the public sector undertakings and is also worried about the slower increase in industrial production in the private sector and the absence of fresh investment on the desired scale. It is, therefore, felt that expansion of credit by the banking system may accentuate inflationary pressures. The Reserve Bank too has expressed concern over the re-emergence of an upward trend in prices since November last year despite a higher level of agricultural production.

Economy Has Basic Vitality

It has, however, been clearly established that the economy has basic vitality. As such the correct course would be to eliminate the factors that stand in the way of a sustained growth in industrial production and create a climate in which investment on the desired scale can take place in the private sector. The public sector has nothing to worry about the availability of resources as it has large allocations at its disposal. If anything, its worry will relate to the use of these allocations fully and effectively. The increase in industrial production in 1969 was quite satisfactory being 6.2 per cent against 6.4 per cent in 1968. But in the nine-month period, July 1969 to March 1970 the growth rate was lower



at 5.8 per cent against 7.4 per cent in the corresponding period in 1968-69. This is not surprising as there has been an acute shortage of raw materials in many directions and the man-days lost on account of labour trouble in 1969-70 was staggeringly high at 16.68 million against the annual average of 5.8 million during 1961-65. Some method will have to be devised by which there can be industrial truce for a period of five years and everyone paid serious attention to maximisation of production while the remaining weaknesses in the agricultural economy could be rectified.

Liberalisation of Imports

It should be possible to stimulate production with a strategic liberalisation of imports. There is no dearth of export orders for engineering industries, but they are unable to execute these because of shortage of raw materials and steel. With the satisfactory balance of payments position and the scope for pruning imports in some directions, particularly fertilizers, the Government can afford to allocate larger sums in foreign exchange for purchase of non-ferrous metals, steel and intermediate products which cannot be obtained from indigenous sources. In 1969-70 foreign exchange reserves rose by $278 million against $118 million in 1968-69 after servicing foreign obligations and repaying debt instalments. This was possible because there was a sharp decline in imports in 1969 to Rs. 1,563 crores from Rs. 1,826 crores in 1968. Exports improved to Rs. 1,398 crores from Rs. 1,350 crores resulting in a sharp contraction in the trade deficit to Rs. 165.20 crores from Rs. 476.50 crores. With the likelihood of a further contraction in the trade deficit in 1970-71 as a result of a larger output of oilseeds and raw cotton and a slashing of imports of fertilizers, the Government should have no hesitation to issue import licences for critical raw materials and components as an easier supply situation will be helpful in not only boosting production of engineering units which have no labour problems but also in keeping down prices which have risen in some cases out of all proportion due to shortages.

Drop in Commodity Prices Likely

With the prospects for kharif crops in 1970-71 bright, there is a likelihood of a drop in prices for agricultural commodities. There are already indications that a larger wheat and rice output will be reflected in lower prices while the Rajasthan Government has been obliged to remove all restrictions in the movement of coarse cereals and pulses from its region to outside areas. There has already been a decline in prices for groundnut oil and other edible oils. There may also be a drop in raw cotton prices which would suggest that the shortages in some agricultural commodities which were responsible for a sky-rocketing of prices and an increase in the wholesale indices may be minimised or even eliminated and the concern expressed by the Reserve Bank in its Annual Report for 1969-70 may prove to be exaggerated by subsequent developments.

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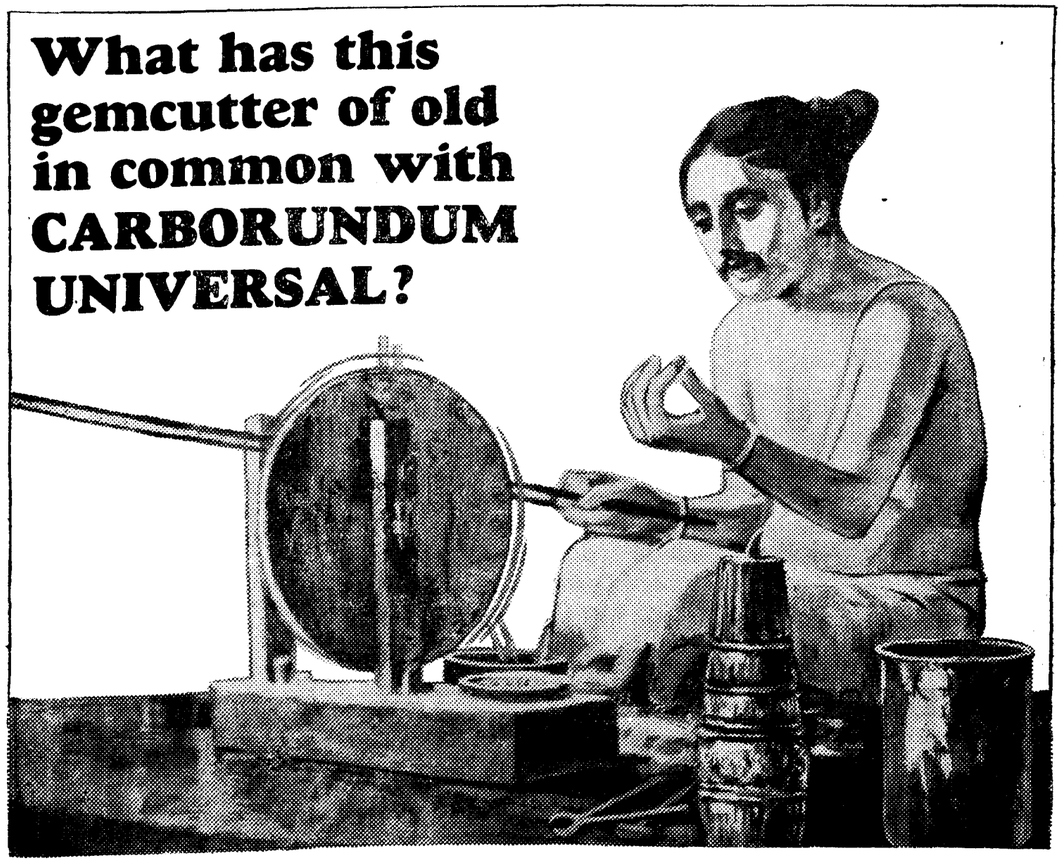

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LIVING STANDARDS AND POPULATION GROWTH

By P. R. SRINIVAS

NATIONAL INCOME STATISTICS have been clothed with increasing importance in recent years, all the world over. Though the failure to compile them and make the data more comprehensive and reliable would be a grievous omission, misconceptions about their significance or unfair use of the figures for political or other purposes would be a grave danger.

It should also be possible and useful to estimate the contribution which each sector of the economy makes from year to year to the total national income. But the distribution of the national income among the different sectors, groups or classes is a more ticklish matter, particularly if the aim is to adjudge the social justice of such distribution or the extent to which it should be changed by governmental or legislative action. For, comparability is the Achilles' heel of national income statistics. For whatever refinements there may be in their compilation or their interpretation, it is generally recognised that they are not strictly comparable as between one period of time and another or between any two countries.

Comparison in Broad Terms

But whatever the differences in time and space, comparisons in broad terms would be not only valid but also useful and necessary. It cannot be a matter of indifference to the Government or people of a country that, whatever the level of the total national income which is related to the size of the country, the *per capita* is among the lowest even among the developing countries and that the prospects of an increase in it sufficient to raise the general standard of living are poor in-

deed. Since it is the recorded experience of the past that the increase in the national income did not lead to an increase in *per capita* income because of the former being offset by the increase in population, national income studies have to be closely related to the study of demographic trends and prospects.

Mirror of Social Justice

It would be tempting to regard national income statistics as the faithful mirror of social injustices and to find in them a valid cause for radical changes in the distributive policies. But it cannot be overlooked that the bulk of the unemployed and the underemployed are among the rural population and that the share of agriculture in the national income cannot in the nature of things be proportionate to its contribution to the national income.

National Income Figures

With these conditions in mind one may note that the gross national product at 1960--61 prices moved up from Rs. 14,044 crores in that year to 17,622 crores in 1967-68, the corresponding figures of net national product being Rs. 13,208 crores and Rs. 16,525 crores respectively. The provisional figure of net national product for 1968-69 is Rs. 16,830 crores and the *per capita* figure is Rs. 319.3 against Rs. 306.7 in 1960-61. The most notable feature of this period is the drop in the value of the net national product from Rs. 15,945 crores in 1964-65 to Rs. 15,945 crores in 1965-66 from which it moved up in the year following to only Rs. 15,173 crores. The changes in the *per capita* national product are even more depressing. While it rose from Rs. 306.7 in 1960-61 to Rs. 333.6 in 1964-65, it dropped thereafter to as low as Rs. 320.4 in 1966-67 and rose to only Rs. 321.3 in 1967-68 and Rs. 319.3 in 1968-69. The contribution of agriculture, animal husbandry and ancillary activities which stood at 49.1 per cent in 1948-49 came down to 38.4 per cent in 1966-67 and rose to 41.6 per cent in 1967-68. It is noteworthy in this context that according to the Report for 1968-69 though there was a growth of industrial production of 6.2 per cent there was a shortfall in the realisation of the target for national income due mainly to the setback in agricultural production, following adverse weather conditions. The Report states that real national income rose by 1.8 per cent only, as against the plan objective of 5 per cent. For 1969-70, however, the growth of real national income, it is said, is likely to reach the target of 5.5 per cent.

Disconcerting Fact

The Fourth Plan records the disconcerting fact that "despite a remarkable spurt in agriculture after the abnormal decline of 1965-66 and 1966-67 and the recent revival of industrial growth, net national product at 1960-61 prices, though 11 per cent higher than in 1966-67 is estimated to be only 6 per cent more than in 1964-65. The aggregate real income was less than what it should have been on the basis of the growth envisaged in the "Third Plan". The projection of real income in 1973-74 in the Fourth Five Year Plan is appreciably below that assumed in the long term projections outlined in the Third Plan which, along with the Second Plan envisaged a doubling of per capita real income in the course of nearly twenty years. On the basis of production targets for various sectors, the economy is expected to achieve an average annual increase of 5.5 per cent in total production during the Fourth Plan. On the basis of a growth rate of 6.2 per cent for the Fifth Plan, the net domestic product would reach Rs. 58,200 crores by 1980-81, the *per capita* output would rise over 1968-69 level by only 5.3 per cent, though the net domestic product would be twice that of 1968-69.

Need to Check Population Growth

Without a successful effort at limiting population growth, "it would be difficult to achieve the degree of acceleration in improvement of living standards implied in the projections for this period." A reduction in the rate of population growth to 1.7 per cent by 1980-81 and to 1.0 by the end of the century would mean that there would be in 2,000 A.D. 260 millions less to feed than there would be if the present growth rate continues unchanged. The link between national income and population growth should be brought home to politicians and people alike.

CHARITY BEGINS AT HOME

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"Thank you Sir, Thank you very much daddy", replied the recipient of this encomium.

—*Rajat*

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The Branch Manager sent to the Head Office a detailed letter describing the advertisement tactics employed by a rival firm, enclosing a cutting of their latest ad. To his surprise, he received a reply requesting him to send immediately the next issue of the magazine that carried the advertisement.

The curiosity of the Branch Manager was quenched only when he found that the other side of the advertisement carried an article that ended as, "Liz Taylor said—quite often Richard Burton used to wake me in the mid-night and... (cont'd.).

—*Rajat*

FOURTH PLAN OF Rs. 24,882 CRORES OUTLAY

A TOTAL OUTLAY of Rs. 24,882 crores is envisaged for the Fourth Plan (1969-74). Of the aggregate outlay Rs. 15,902 crores is for the public sector and Rs. 8,980 crores for the private sector programmes. In the public sector Rs. 13,655 crores have been provided for investment and Rs. 2,247 crores for current outlay. The total investment for the creation of productive assets aggregates to Rs. 22,635 crores.

The total public sector outlay includes Rs. 8090 crores for Central schemes, Rs. 781 crores for Centrally sponsored schemes, Rs. 6,606 crores for State schemes and Rs. 425 crores for schemes in the Union Territories. The State Plan outlays will be supplemented by the outlay for Centrally sponsored schemes which are mainly under agriculture, health, family planning and welfare of backward classes. On the basis of the programme of investment proposed for the Fourth Plan and the level of outputs expected to be reached in different sectors by 1973-74, it is estimated that the overall rate of growth during the Fourth Plan will be about five and a half per cent a year.

The distribution of the public and private sector Fourth Plan outlays by major heads of development is given in Table I.

The plan document points out that the outlay under agriculture does not fully reflect the anticipated step up inasmuch as it does not take into account the substantial investment to be financed in this sector by some of the financial institutions, namely, agro-industries corporations, land development banks and Central co-operative banks.

The investment in agriculture to be financed by these institutions from resources other than Plan outlays would amount to Rs. 950 crores. The Rural Electrification Corporation will make a supporting investment of Rs. 150 crores.

TABLE I

FOURTH PLAN OUTLAY AND INVESTMENT: PUBLIC AND PRIVATE SECTORS

(Rs. crores)

Head of Development	Public Sector			Public and Private Sectors		
	Current outlay	Investment	Private Investment	Total investment	Total outlay	% Distribution of total outlay (Col. 6)
(1)	(2)	(3)	(4)	(5)	(6)	(7)
Agriculture and allied sectors	610	2118	1600	3718	4323	17.4
Irrigation and Flood Control	14	1073	—	1073	1087	4.4
Power	—	2448	75	2523	2523	10.1
Village and Small Industries	107	186	560	746	853	3.4
Industry and Minerals	40	3298	2000	5298	5338	21.4
Transport & Communications	40	3197	920	4117	4157	16.7
Education	545	278	50	328	873	3.5
Scientific Research	45	95	—	95	140	0.6
Health	303	132	—	132	435	1.7
Family Planning	262	53	—	53	315	1.3
Water Supply and Sanitation	2	404	—	404	406	1.6
Housing, Urban and Regional Development	2	235	2175	2410	2412	9.7
Welfare of Backward Classes	142	—	—	—	442	0.6
Social Welfare	41	—	—	—	41	0.2
Labour Welfare and Craftsmen Training	20	20	—	20	40	0.2
Other Programmes	74	118	—	118	192	0.8
Inventories	—	—	1600	1600	1600	6.4
Total	2247	13655	8980	22635	24882	100.0

Net National Product to Double in a Decade

In a study of long-term perspective for 1980-81, the Fourth Plan document says that on the basis of production targets for various sectors, judged feasible after careful examination, the economy is expected to achieve an average annual increase of about 5.5 per cent in total production during the Fourth Plan 1969-74.

The long term projections are based on a careful assessment of the demographic prospects, feasible growth in agricultural production, mobilisation of internal savings, efficiency of investment, growth of exports and import substitution. Taking these considerations into account, a target of growth of around 6.2 per cent per annum for the Fifth Plan and upto 1980-81 is considered feasible. On this basis, net domestic product (valued at 1968-69 prices) would reach Rs. 58,200 crores by 1980-81, that is, double the level attained in 1968-69. Since population would, in the meantime, have risen by about a third, per capita output of Rs. 844 in 1980-81 would be 53 per cent higher than the per capita output of Rs. 552 in 1968-69.

Macro-Economic Projections

A few selected macro-economic projections for the Fourth Plan are given in Table II.

The projected evolution of the economy over the next 12 years since 1968-69, viewed in terms of broad aggregates, as indicated in the plan document, are given in Table III.

TABLE II

SELECTED MACRO-ECONOMIC PROJECTIONS

Item	Unit	1968-69	1973-74
National Income	Rs. crores at 1968-69 prices	28,800	37,900
Population (Mid year October 1)	Million	527	596
Per capita income	Rupees	546	636
Domestic savings as percentage of National Income	Per cent	9.0	13.2
Net investment as percentage of National Income	Per cent	11.3	14.5

TABLE III

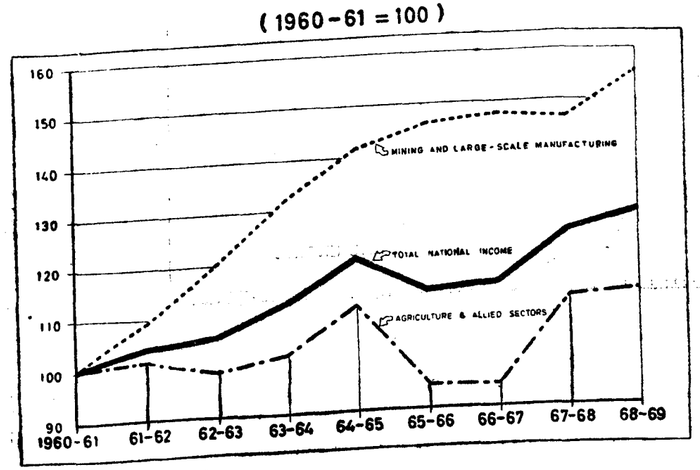
PROJECTED EVOLUTION OF THE ECONOMY

(Rs. 100 crores at 1968-69 prices)

Item	1968-69	1973-74	1978-79	1980-81	Index of growth 1980-81 over 1968-69
Net domestic product at factor cost	290.7	383.1	517.0	582.2	200
Net domestic product at market prices	317.6	418.6	571.0	644.4	203
Net imports of goods and services	3.1	2.3	(—)1.0	(—)2.0	
Net domestic expenditure	320.7	420.9	570.0	642.4	200
of which: net investment	32.3	55.0	86.2	102.5	317
government consumption	31.0	41.0	55.0	62.0	200
private consumption	257.4	324.9	428.8	477.9	186
Per capita private consumption (Rs.)	488	545	644	693	142
Per capita net domestic product (Rs.)	552	643	776	844	153
Projected mid-year population (in million)	527	596	666	690	131

NATIONAL INCOME

(1960-61 = 100)



In order to reach the target level of income in 1980-81 and sustain a growth rate of at least 6.5 per cent per annum beyond that year, it is essential to raise the ratio of net investment to net national product from the current level of 11.2 per cent and the planned 14.5 per cent in 1973-74 to 17.18 per cent by 1980-81.

With savings rising considerably faster than income, aggregate consumption necessarily has to increase at a relatively slow rate. Aggregate consumption in 1980-81 is estimated to be 87 per cent higher than in 1968-69, implying a rate of growth of 5.3 per cent per year compared to a 6 per cent growth rate of aggregate income. The public consumption expenditure is estimated to rise somewhat faster than private consumption. A rapid growth

of public expenditure on education, health and social services is one of the most effective instruments open for improving the productivity and earning capacity of the less privileged sections of the population.

Resources for the Fourth Plan

The assessment of resources for the Fourth Five Year Plan 1969-74 has taken into account the Award of the Fifth Finance Commission, the nationalisation of 14 major commercial banks, acceleration in their branch expansion and desposit mobilisation, particularly in rural areas; reorientation of investment policies of the Life Insurance Corporation and the Employees' Provident Fund; and the more recent trends in receipts and expenditures of public authorities. The total resources for the Fourth Plan are expected to amount to Rs. 24,882 crores, of which Rs. 15,902 crores would be available for financing the public sector Plan and Rs. 8,980 crores for financing private investment.

The share of domestic budgetary resources in total resources mobilisation for the public sector Plan has been raised to about 78 per cent, as compared to 59 per cent in the Third Plan and 54 per cent in the three Annual Plans. External assistance (net of loan repayments but without allowing for interest payments) for the public sector Plan is to go down from 28 per cent in the Third Plan and 36 per cent in the three Annual Plans to nearly 17 per cent of the total resources in the Fourth Plan. Deficit financing is placed at only 5 per cent of the total resources for the Fourth Plan in the public sector, as against 10 per cent in the three Annual Plans and 13 per cent in the Third Five Year Plan.

In the scheme of Plan financing, Central Government and their enterprises will be raising an aggregate of Rs. 12,796 crores. Of this, Rs. 3,500 crores will go to the States as Central assistance, leaving Rs. 9,296 crores for the Central schemes, Centrally sponsored schemes and the Plans for Union Territories.

All the States together will be mobilising resources amounting to Rs. 3,106 crores over the Fourth Plan period. With Central assistance of Rs. 3,500 crores, the total resources available for the State Plans will be Rs. 6,606 crores.

Dispensing with Foreign Aid by 1980

The projected expansion of metals, chemicals and machinery would make an important contribution to import substitution. However, there will still be a number of products for which increased imports will have to be provided. Principal among these are fertilizer materials (rock phosphate and sulphur), non-ferrous metals other than aluminium and crude oil, for which India has neither adequate indigenous resources nor economical indigenous substitutes. Much of the increased requirements will have to be imported. Essentially the same considerations apply to specialised items of industrial raw materials and machinery which cannot yet be produced economically within the country.

Taking these considerations into account, non-food imports over the next decade or so are estimated to grow at around 45.5 per cent per annum. A broad picture of the projected composition of imports upto 1980-81 and the comparative adjusted figures for 1968-69 (the latest year for which complete data are available) are given in Table V.

As for exports, India's share in world exports is less than 1 per cent. Even with the growth of exports envisaged in 1980-81 India's share in world trade will not be significantly higher. The implied rate of growth of export earnings is 7 per cent per year over the entire period of 10-12 years. This rate cannot be considered as too high. To sustain it over a long period, would require a bold approach, a considerable diversification of our exports and concern for quality and price competitiveness. The projected pattern of ex-

TABLE IV

DISTRIBUTION OF STATE OUTLAYS

(Rs. crores)

States 1	States' Resources 2	Central Assistance 3	Total Outlay 4
Andhra Pradesh	180.50	240.00	420.50
Assam	41.75	220.00	261.75
Bihar	193.28	338.00	531.28
Gujarat	297.00	158.00	455.00
Haryana	146.50	78.50	225.00
Jammu and Kashmir	13.40	145.00	158.40
Kerala	[illegible]3.40	175.00	258.40
Madhya Pra[illegible]h	[illegible]21.00	262.00	383.00
Maharasht[illegible]	[illegible]52.62	245.50	898.12
Mysore	177.00	173.00	350.00
Nagaland	5.00	35.00	40.00
Orissa	62.60	160.00	222.60
Punjab	192.56	101.00	293.56
Rajasthan	82.00	220.00	302.00
Tamil Nadu	[illegible]7.36	202.00	519.36
Uttar Pradesh	[illegible]39.00	526.00	965.00
West Bengal	101.50	221.00	322.50
Total	3,106.47	3,500.00	6,806.47

TABLE V
PROJECTED VALUE OF IMPORTS

(Rs. crores)

Items	1967-68	1968-69	1973-74	1978-79	1980-81
Metals including metalliferous ores and scrap	200	181	355	380	450
Machinery and transport equipment and metal products	517	530	740	1,010	1,080
Crude oil and petroleum products	125	133	180	270	330
Fertilizer and fertilizer raw materials	212	185	310	385	450
Others	514	538	605	635	660
Total non-food imports	1,568	1,567	2,190	2,680	2,950
Foodgrains	518	337	30	—	—
Total imports	2,086	1,904	2,220	2,680	2,950

port growth 1968-69 to 1980-81 (in Rs. crores) is given in Table VI.

The growth of our major traditional exports and, in particular, tea, jute and cotton textiles is likely to be slow. The major direction of future diversification will lie in metals and metal manufactures (including machinery, equipment and engineering goods), iron ore, chemicals, and allied products. The world demand has been growing and will continue to grow at a much faster rate than for most other items. Of the projected increase in commodity exports, nearly two-thirds would be obtained by the expansion of trade in minerals and manufactures. The share of tea and jute manufactures, two of the major traditional export items, is expected to be reduced from about 28 per cent of the total exports in 1968-69 to about 15 per cent in 1980-81. The relatively rapid growth of demand for leather and leather products, fish, fresh and processed fruits and oilcakes in the world market, however, offers a promising avenue for expansion. The scheme of long-term development seeks to eliminate dependence on foreign aid by 1980-81. Given the objective of dispensing with aid after 1980-81 the volume of domestic savings will have to increase from Rs. 2,530 crores in 1968-69 to approximately Rs. 8,600 crores in 1978-79 and Rs. 10,450 crores by 1980-81. This means diverting approximately 28 per cent of the increase in national income for savings throughout the next twelve years. The average rate of savings will rise from about 8.8 per cent in 1968-69 to nearly 13.2 per cent in 1973-74 and to 18 per cent by 1980-81.

TABLE VI
PROJECTED PATTERN OF EXPORTS

(Rs. crores)

Group of commodity	1968-69	1973-74	1978-79	1980-81	Annual rate of growth % 1968-69 to 1980-81
Agriculture and allied products	450	605	850	958	6.5
Tea	156	170	185	190	1.7
Marine products	23	48	98	116	14.4
All other products	271	387	567	652	7.6
Minerals	132	203	273	316	7.6
Iron ore	88	155	215	252	9.2
Other minerals	44	48	58	64	3.2
Manufactures	704	1,010	1,429	1,639	7.3
Cotton textile and jute manufactures	289	333	367	380	2.3
Engineering goods including metals	67	190	360	400	16.1
All other manufactures	348	487	702	859	7.8
Other exports unspecified	74	82	98	107	3.1
Total—All exports	1,360	1,900	2,650	3,020	6.9

Gearing up Industrial Production

The pattern of industrial expansion over the next decade or so should continue to be guided by the necessity of meeting the requirements for domestic production of a wide range of manufactures. Quantitatively the most significant branches of industry which need attention from this view point are fertilisers and fertiliser raw materials, metals, petroleum products and machinery. In all these areas a sizeable proportion of our total requirements is met by imports. It is estimated that in 1968-69, 60 per cent of finished fertilizer requirements, 64 per cent of crude oil, 65 per cent of alloy and special steels and 7 per cent of mild steel, and 74 per cent of copper, and 79 per cent of newsprint were met by imports.

Imports of machinery and components amounted to Rs. 516 crores and represented about 30 per cent of the machinery requirements. Over the next decade, the projected growth of income and investment will increase the requirements of mild and alloy steels at the rate of 10 per cent per annum machinery and equipment more than 10 per cent, nitrogenous fertilizers 15 per cent, phosphatic fertilizers 19 per cent and petroleum products 9 per cent. The dominance of these products in our import trade and the fact that the demand for them is growing rapidly underscores the importance of reducing dependence on import in these areas if the balance of payments objectives were to be met.

Domestic production in all these branches will have to increase faster than the expected growth of internal demand with a view both to reducing the imports and taking advantage of prospective export opportunities.

The requisite level of production of selected agricultural, mineral and manufactured products for 1968-69 to 1980-81 is given in Table VII.

TABLE VII
REQUISITE LEVEL OF PRODUCTION IN SELECTED COMMODITIES

Commodidties	Unit	1968-69	1973-74	1978-79	1980-81
Foodgrains	mill. tonnes	94*	129	155	167
Sugarcane (in terms of gur)	mill. tonnes	12	15	20	22
Oilseeds	mill. tonnes	6.9	10.5	14	15.2
Cotton yarn	thou. tonnes	959	1,150	1,500	1,680
Sugar	thou. tonnes	3,559	4,700	6,500	7,500
Fertilizers-nitrogenous	thou. tonnes nitrogen	541	2,500	5,200	6,400
Fertilizers-phosphatic	thou. tonnes P_2O_5	210	900	2,100	2,500
Coal	mill. tonnes	69.5	93.5	130	145
Petroleum products	mill. tonnes	15.4	26	39	46
Electricity-generation	billion Kwh	51.7	85	148	180
Iron ore	mill. tonnes	28.1	51.4	71	83
Cement	mill. tonnes	12.2	18	27	32
Finished steel	mill. tonnes	4.7	8.1	12.5	15
Alloy and special steel	thou. tonnes	43	220	400	450
Aluminium	thou. tonnes	125.3	220	450	500
Machine tools	Rs. million	247	650	1,000	1,150
Commercial vehicles	thou. nos.	35.6	85	150	175

* Likely production in 1969-70 is estimated at 100 million tonnes.

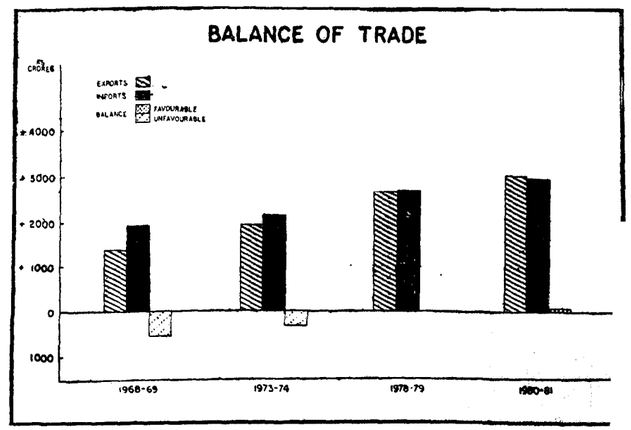
The private sector is expected to provide about Rs. 75 crores, primarily for strengthening their distribution network.

On the basis of this outlay, a net installed capacity of 23 million KW can be achieved allowing for retirement of 0.4 m. KW of old and obsolete plants. A number of hydro and thermal schemes will be under construction towards the end of the Fourth Plan. On completion during the Fifth Plan these will provide an additional capacity of about 3.37 million KW. The provision of Rs. 210 crores in the Central Plan on continuing generation schemes includes Rs. 120 crores on atomic power generation, Rs. 49.25 crores on the Badarpur thermal station and Rs. 38.8 crores on D.V.C. schemes, Rs. 2 crores on the Neyveli thermal station. The first atomic power station at Tarapore of 380 MW capacity has gone into operation in 1960. In the second station at Ranapratap Sagar, the first unit of 200 MW is expected to be commissioned towards the end of 1971, and the second unit about two years later. In the third station at Kalpakkam (400 MW), the first unit (200 MW) is expected to go into operation in 1973-74.

A provision of Rs. 15 crores has been made in the Plan for advance action on a new atomic power station, the location of which has yet to be decided. The ninth thermal unit of 100 MW at Neyveli has gone into operation during 1969-70 and the station has now a total capacity of 600 MW.

Power Programmes . . .

The outlay for power in the public sector in the Plan is Rs. 2,447.57 crores.



The D.V.C. programme includes installation of two thermal sets of 120 MW each at Chandrapura. The Badarpur thermal station of 300 MW installed capacity is expected to have its first unit in operation in 1971-72 and other two units are expected to follow in 1972-73. Three new Central projects — Loktak hydro electric project in Manipur, Siul Bajra hydro electric project in Himachal Pradesh and Salal hydro-electric project in Jammu and Kashmir are included in the Central Plan. Loktak and Siul-Bajra schemes are scheduled to go into operation towards the end of the Plan.

Transport Development . . .

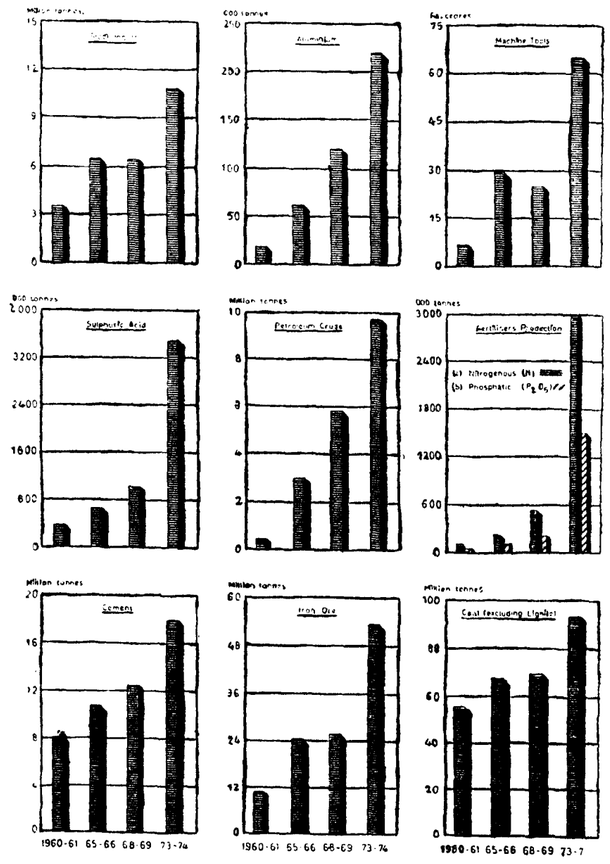
The total outlay on transport and communications in the public sector during the Fourth Plan is reckoned at Rs. 3245 crores including Rs. 2,622 crores in the Central Sector, Rs. 581 crores in the Plans of States and Union Territories, and Rs. 42 crores on Centrally sponsored schemes.

The Fourth Plan provides for an outlay of Rs. 1,000 crores for the railway development programmes, excluding an expenditure of Rs. 525 crores to be met by the Railways from their Depreciation Reserve Fund. In addition, a provision of Rs. 50 crores has been made for metropolitan transport. The programme for acquisition of rolling stock is based entirely on indigenous production. Dieselisation is proposed to be extended from 19,200 routes kilometres to about 22,000 route kilometres in 1973-74. Electric traction will be extended from 2,900 route kilometres to about 4,600 route kilometres in 1973-74. It is proposed to electrify or dieselise fully the high density routes which are at present under mixed traction. Dieselisation will be extended to other sections in an order of priority determined by relative densities of traffic and continuity of diesel traction, preference being given to those sections which are far removed from the coal-fields so as to reduce the burden on the transport system. A techno-economic study on dieselisation of railways is being undertaken, and the programmes for dieselisation will be reviewed in the light of the results of the study. The programme of conversion of metre gauge into broad gauge lines is intended to eliminate delay and damage, particularly at the transhipment points, and improve the economics of railway operation.

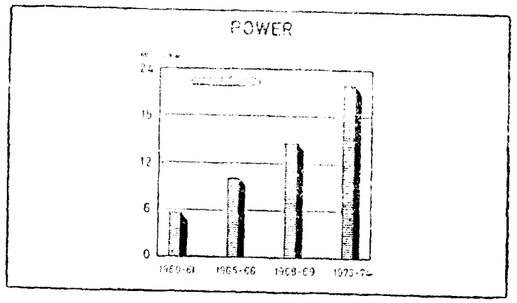
In the Fourth Plan, a programme of converting 1,500 kilometres of metre gauge lines into broad gauge lines will be taken up as part of long-term plan. It is expected that conversion of 750 kilometres of metre gauge lines into broad gauge will be completed during the Fourth Plan period. Doubling of tract is proposed to be provided on 1,800 kilometres.

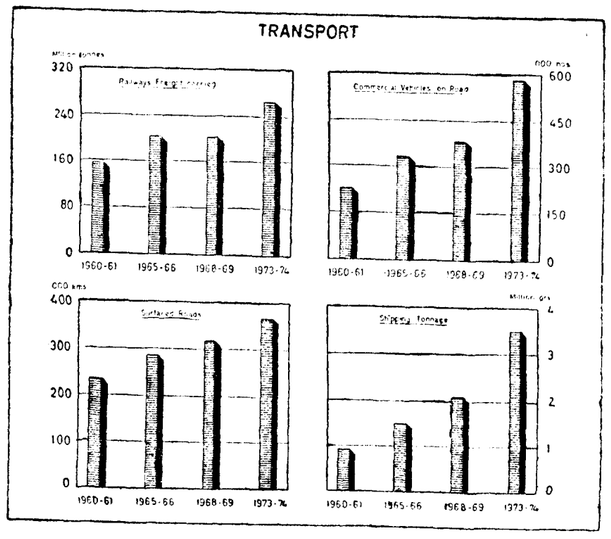
A limited programme of new lines will be taken up, mainly to meet the needs of basic and heavy industries and of the traffic in minerals, like coal and iron ore. In view of heavy investment involved in the construction of new lines, it is proposed to consider the traffic and economic justification of each proposal and take into account

INDUSTRY AND MINERALS
SELECTED TARGETS AND ACHIEVEMENTS



POWER AND TRANSPORT
SELECTED TARGETS AND ACHIEVEMENTS





the relative economics of alternative modes of transport, especially road transport.

A provision of Rs. 418 crores has been made for the road development programme in the Central Sector. To bring about improvements in the existing net work of national highways, it is proposed to complete all the missing road links and improve all the low-grade sections. Of the 17 major missing bridges on the national highway system, 16 will be completed and work on the one remaining will be in progress by the end of the plan. The programme provides for reconstruction of weak bridges and culverts and widening of important sections of the national highways to two lanes. Provision has been made for the completion of the Lateral Road from Bareilly in Uttar Pradesh to Amingaon in Assam. It is proposed to add a limited length of roads to the national highways.

For the road development programmes in States and Union territories, a provision of Rs. 458 crores has been made. Besides completion of the works in progress, priority is given to removal of deficiencies in the existing road systems such as missing links, unbridged river crossings and improvement of low grade sections. Provision has also been made for reconstruction of weak bridges and widening of roads.

The road system will be strengthened to some extent to meet the requirements of metropolitan cities, industrial and mining areas and hilly and backward regions. It should be possible to increase the length of surfaced roads from about 3,25,000 kilometres at the end of 1968-69 to about 3,85,000 kilometres at the end of the Fourth Plan.

Special emphasis is being laid on the development of rural roads. They are necessary for the growth of the rural economy and for increases in agricultural production. State Governments have agreed to set apart about 25 per cent of the total outlay on road development for rural roads. Local resources will also be mobilised. Priority is to be given to roads leading to market towns.

Road Transport

The total goods traffic by road transport is expected to increase from about 40 thousand million tonnes kilometres in 1968-69 to about 84 thousand million tonnes kilometeres in 1973-74. The passenger traffic is expected to increase from about 98 thousand million passenger kilometres in 1968-69 to about 140 thousand million passenger kilometres in 1973-74. In order to cater for the estimated increase in traffic, it is reckoned that the number of trucks on the road will need to be increased from about 3,91,000 in 1968-69 to about 4,70,000 at the end of 1973-74. The number of buses will need to be increased from about 85,000 to about 115,000. The production of commercial vehicles is estimated to increase from 35,000 in 1968-69 to 85,000 in the last year of the Plan.

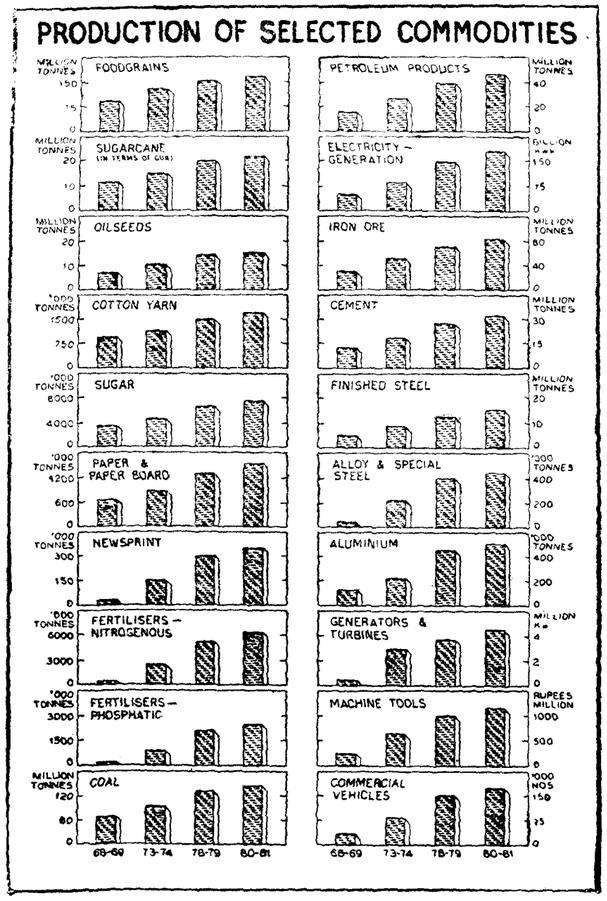
A provision of Rs. 91 crores is proposed for augmenting the services of the nationalised transport undertakings in the States. In addition, a provision of Rs. 10 crores has been included in the Railways' plan for contribution to the capital of State road transport undertakings. A large part of the expansion of road transport is expected to be in the private sector. The investment in road transport in the private sector during the Fourth Plan period is estimated at Rs. 985 crores. As a result of the likely increase in the share of road transport in the total traffic, the share of roads and road transport in the total investment is likely to increase substantially during the Fourth Plan period as compared to the Third Five Year Plan.

A provision of Rs. 40 crores has been made for expansion of broadcasting facilities. The total cost of the programme to be undertaken during the Plan period is estimated at Rs. 45 crores and there will be a spill-over to the extent of Rs. 5 crores beyond 1973-74. The programme aims at extension of medium-wave coverage, development and strengthening of the external services and extension of commercial broadcasting on a regional basis. The programme for the extension of internal coverage has been so drawn up that at the end of the Fourth Plan, nearly 80 per cent of the population in all the States and Union Territories would be covered by medium-wave broadcasts. Under External Services, the Plan makes provision for the completion of the two super-power medium wave transmitters at Calcutta and Rajkot, and the establishment of two new 250 kw short wave transmitters at Aligarh. Commercial broadcasting will be extended on a regional basis with the main centres located at Lucknow, Ahmedabad, Bhopal, Jaipur, Bangalore, Hyderabad, Trivandrum, Jullundur and Srinagar. The programme for television envisages the strengthening of the existing facilities at Delhi and the extension of television to five new centres, namely, Bombay (with relay facilities at Poona), Calcutta, Madras, Kanpur/Lucknow and Srinagar.

Ports & Shipping

The schemes for expansion of port facilities included in the Central Sector will cost about Rs. 300 crores, of which ports are expected to contribute Rs. 100 crores, from their own resources. Rs. 180 crores is allocated in the Plan. There will be a spill-over of Rs. 20 crores beyond 1973-74. This will enable the traffic handled by the major ports to increase from about 55 million tonnes in 1968-69 to about 77 million tonnes in 1973-74.

A provision of Rs. 130 crores has been made for acquisition of ships, and it is expected that by the end of Fourth Plan, the total shipping tonnage will increase to about 3.5 million G.R.T. from 2.14 million G.R.T. by the end of 1968-69. A provision of Rs. 9 crores has been made for inland water transport in the Central Plan. The Farakka Barrage is expected to be completed in the Fourth Plan. It will improve the navigability of the Calcutta port. The total cost of the barrage is estimated at Rs. 156 crores, against which the expenditure incurred up to 1968-69 is about Rs. 77 crores.



Five Per Cent Growth in Farm Production a Must

Nearly 60 per cent of the total household consumption and 85 per cent of

the commodity consumption of households consists of agricultural products or manufactures based principally on agricultural raw materials. Thus, the prospect of achieving the projected growth in incomes under conditions of price stability is almost entirely a function of the prospect of growth of agricultural production.

Data from the National Sample Survey suggest that the overall elasticity of demand for food products is of the order of 0.8. Using this elasticity and the projected growth of population and per capita private consumption, the demand for farm products is estimated to rise at the rate of 4.7 per cent a year.

Production Must be Ahead of Demand

Agricultural production will have to increase a little faster than demand during the Fourth Plan so that the dependence on imported foodgrains may be eliminated. Over the period as a whole agricultural production will have to increase by 5 per cent a year.

Gross cropped area is projected to reach 188 million hectares by 1980-81 compared to 156.6 million hectares in 1966-67. The implied rate of increase of 1.3 per cent per annum is roughly the same as for the first three Plan periods. Some new land can be brought under cultivation with the spread of irrigation in arid areas like the Rajasthan canal tract, reclamation of saline or water-logged lands and culturable waste. The introduction of improved soil and moisture conservation practices, the spread of irrigation and the increased use of chemical fertilizers can be expected to augment net sown area through a reduction of fallows. The major part of additions to cropped area will, however, have to come from multiple cropping. The increase in cropping intensity is largely a function of the expansion and improvement of irrigation combined with development of crop varieties which can be fitted into tight rotations.

It is visualised that gross irrigated area would reach 58 million hectares by 1980-81 and that cropping intensities in irrigated areas would reach 1.5. In unirrigated tracts a slight increase in cropping intensities is projected largely in continuation of observed trends over the first three Plans.

Improvement in Yields Envisaged

With gross cropped area increasing only at 1.2 per cent per annum, the fulfilment of agricultural production targets calls for a sharp increase in the rate of improvement in yields per hectare. There is reason to believe that the recent technological developments and the rapid growth in fertilizer use would permit substantial acceleration in yield increases of cereals.

The major problem-area is in respect of pulses, oilseeds and cotton. The yields of these crops have increased slowly. Nevertheless there is considerable scope for improvement.

The prospects for the animal husbandry sector, the demand for whose products will grow much faster than for other farm products, hinge primarily on the rate at which the supply of fodder and of grains and other concentrate feed will increase. Measures for bringing about significant improvements in breed will take time to give results. The prospects for increasing grain production and ensuring increasing supplies for feed purposes appear reasonably good. Even so there is room for apprehension regarding possible imbalances between supply and demand of animal products.

More for Social Services

The development programmes in social services, consisting of education, health and family planning, regional development, housing and water supply, have been allocated a sum of about Rs. 2,133 crores in the Fourth Plan. Under education, the main emphasis is on universal elementary education. The health programme is mainly directed towards control and eradication of communicable diseases and providing for preventive health services in the rural areas. Regional development is mainly concerned with encouraging house-building activity in rural and semi-urban areas. The bulk of provision for rural water supply has been made for areas where there is acute scarcity of drinking water.

Planning and Social Justice

The basic goal of planning in India is a rapid increase in the standard of living of the people through measures which also promote equality and social justice. Emphasis is placed on the common man, the weaker sections and the less privileged.

Planning should result in greater equality of income and wealth. There should be progressive reduction of concentration of incomes, wealth and economic power, and that the benefits of development should accrue more and more to the relatively less privileged classes of society, and in particular, the scheduled castes and the scheduled tribes, whose economic and educational interests have to be promoted with special care.

Special Programmes for Backward Classes

The special schemes for raising the social, educational and economic standards of the backward classes, and social welfare service specially directed for the handicapped and the destitute, are intended to supplement the general programmes in other sectors of the national economy. These special schemes and welfare services are conceived as only a part of the total effort to be made for promoting the social and economic well-being of the weaker sections of population and accelerating the pace of their advancement. The total outlay in the public sector for the special schemes and welfare services are Rs. 183.76 crores in the Plan.

For Small Farmers and Landless Labour

One of the two main objectives of the Fourth Plan is to extend the benefits of development to the smaller cultivators and the under-privileged sections of the rural population.

A large amount of public investment is proposed for community works such as tanks and tubewells to benefit smaller farmers who would not be individually able to provide themselves with these facilities. Such minor irrigation works may be constructed by the State Governments, panchayati raj institutions or other appropriate authorities. As regards agricultural credit, it is proposed to take a number of steps for reorienting the general loaning policies and procedures of cooperative institutions in favour of the small farmers. It is also envisaged that the Agricultural Refinance Corporation will provide assistance for schemes on an area basis designed to enable the small farmers as well, to take advantage of agricultural, dairying, poultry, and other programmes. The second direction of effort towards assisting the existing small but potentially viable farmers will be in the form of specific projects in about 45 selected districts. It is contemplated that a small farmers' development agency will be set up in each of these districts. The main functions of the Small Farmers' Development Agency will be to identify the problems of the small farmers in its area, prepare appropriate programmes, help to ensure availability of inputs, services and credit and evaluate the progress from time to time.

To the maximum extent possible, this will be sought to be done through the existing institutions—public, co-operative and private as also local authorities such as Zilla parishads. The agency may give assistance to small farmers in respect of other services, such as land levelling, machinery and marketing.

Wherever necessary, the agency may itself undertake certain services for the benefit of small farmers. With a view

to stimulating the flow of cooperative credit to such cultivators, it will provide grants to the central cooperative bank, the agricultural credit societies and the cooperative land development bank in the area and help them build up special funds for covering the risks, if any, apprehended in such financing. In addition, the agency will provide a subsidy to these institutions for strengthening their managerial and supervisory staff for this purpose. It will also draw up model plans for investment and production activities to be undertaken by small farmers operating under different sets of conditions.

Programmes for Landless Labour

As regards the typically non-viable small farmers, the plan document points out that these fall basically into the same category as landless labour. Their sub-marginal holdings do not fully employ the available family labour and hence the potential solution lies elsewhere than merely in crop husbandry.

According to the Census in 1961, there were about 31 million agricultural labourers in the country. In the Fourth Plan, efforts will be made to deal with the problem of sub-marginal cultivators and agricultural labourers by two sets of measures. The first set of measures lies in the sphere of land reforms. The second set of measures is for generation of employment-oriented activities. For the large class of sub-marginal farmers, agricultural labour and landless labour the remedy lies in the provision of supplementary occupations and other employment opportunities. Both occupations and employment have to be integrated into local planning. This is sought to be done in a series of 40 projects located in different districts all over the country. These projects would, as far as possible, be market-based (e.g. centred round towns or other areas of demand) so that there is scope for development of employment-oriented activities, such as poultry and dairy farming.

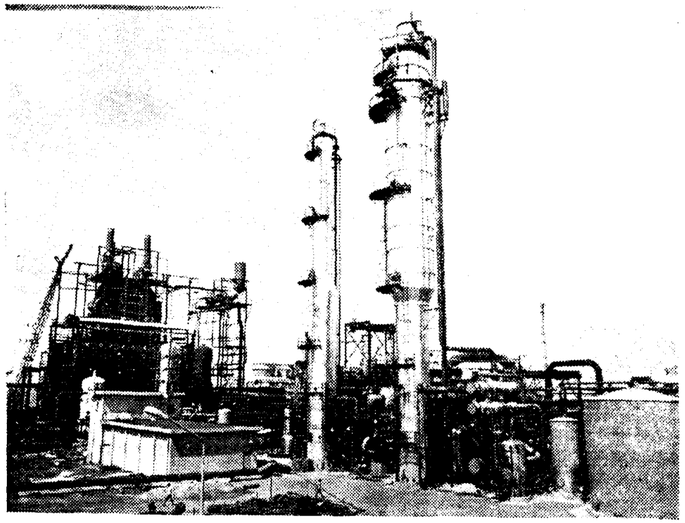
While, for the development of small farmers and agricultural labour, the direct financial support from the plan will be of the order of Rs. 115 crores, it is necessary to stress that these financial provisions are expected to help in attracting to these projects a considerable volume of credit from various institutional sources. On the basis of the small farmers projects approved so far, it is estimated that the total flow of short-term credit under 45 small farmers development projects is likely to be of the order of Rs. 90 crores per annum when all these projects are fully in operation. The long and medium term credit likely to be made available to the project areas during the plan period may be placed approximately at Rs. 170 crores.

According to the plan document the total institutional support for these projects will be Rs. 300 crores.

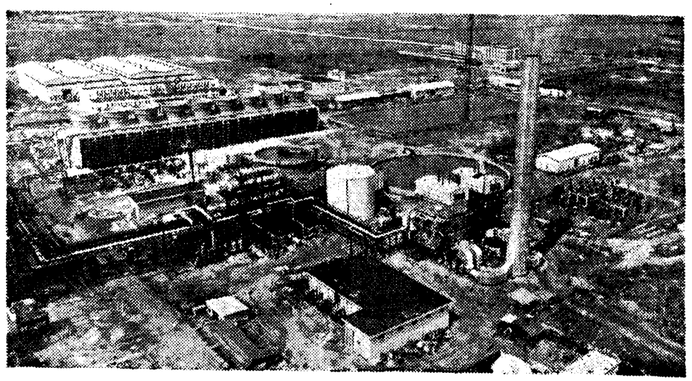
MIGHTY FERTILIZER PLANT NEAR MADRAS

AS AN ADJUNCT to the Madras Refineries at Manali near Madras, a huge fertilizer project, based on the refinery's naphtha as feedstocks, is taking shape.

Estimated to cost over Rs. 55 crores, the fertilizer plant, the first of a host of petro-chemical units in the Manali complex, will be one of the biggest plants in South East Asia with various sections spread in a sprawl of 400 acres adjoining the refinery. It will manufacture solid complex fertilizers containing various ratio of nitrogen, phosphorous and potash — Madras Fertilizers will have a capacity to produce 750 tonnes of ammonia, 885 tonnes of urea and 1,100 tonnes of complex fertilizers per day.

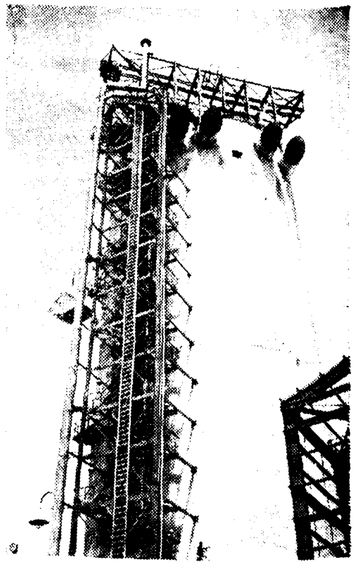


A view of the NPK Plant at MFL



A Bird's eye-view of the Madras Fertilizer Project

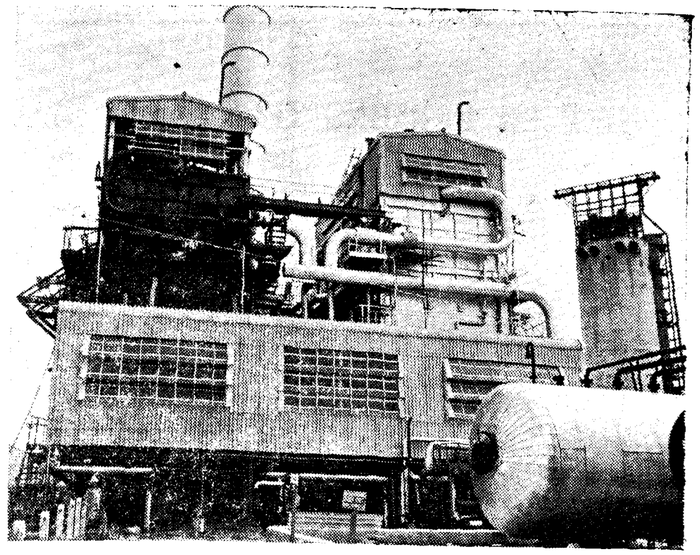
Set up in collaboration with AMOCO, a subsidiary of American International Oil Company, the plant is specialising in products suited to the soils of Southern India. Towards this end a seeding programme is already on hand.



The urea Prill Tower at MFL

The ammonia plant, the urea converter (both imported)—the Urea converter is said to be the tallest structure in Asia—and the boilers (indigenous) have all been erected. A modern water purifying plant is already in operation. The NPK mixing plant has been ready for quite some time. The construction part of the project is expected to be completed by March 1971. Trial production is expected to commence by July next year and by September 1971 the plant is expected to operate to full capacity.

The fertilizer plant involves considerable indigenous component in engineering design, equipment and materials — much larger than those needed for any other plant of similar category in the country. The contract for design engineering and construction of Madras Fertilizers was awarded to Chemical Construction Corporation (CHEMICO of U.S.A.) on July 20, 1967. The foreign exchange components works out to approximately 40 per cent of project cost.



A section of the NPK Plant at MFL

BETTER FARMING TECHNIQUES HAVE COME TO STAY

(By a Special Correspondent)

INDIAN AGRICULTURE HAS essentially been an arduous race, with efforts on food production trying to catch up with increasing population, sometimes against overwhelming odds. With 363.4 million mouths to be fed in 1950-51, the country had in its granary 50.8 million tons of foodgrains. During the 'fifties there was a slow march ahead on the food front but without the tempo of population rise relaxing. Consequently the dawn of the 'sixties saw a food basket of 82.00 million tonnes in 1960-61 matched against 442.7 million of population.

Unrelenting Race

The unrelenting race continued with some exciting and sometimes highly depressing developments in the 'sixties. There were good signs of a breakthrough in the early years with farmers more inclined to use modern inputs and the advantage was exploited well to achieve a steady progress. The 1964-65 figure of 89 million tonnes of foodgrains raised hopes of a real take-off stage. Dramatically however, the next two years saw the most unhelpful monsoon in recent history and the production ebbed to 72.26 million tonnes in 1965-66 and scarcely improved next year when the figure was just 76 million tonnes which was 13 million tonnes lower than the output in 1964-65.

Spectacular Recovery

A spectacular recovery from the slump was staged in 1967-68 when weather conditions turned favourable. The rise in food output was steep recording a harvest of 95.6 million tonnes, exceeding the production in 1964-65 by a good margin. The more important feature was that the achievement was not a fortuitous one brought about by kind weather alone. It was more due to the introduction of high-yield varieties and a new agricultural strategy. It was this technological impact that raised the wheat output to 16.6 million tonnes well above the average for the preceding five years of 11 million tonnes.

Acceptable New Varieties

New varieties of wheat were introduced in the country in 1963 with the help of the Rockefeller Foundation. But these failed to impress the farmers and the efforts of Indian crop breeders in the Indian Agricultural Research Institute and Agricultural Universities in Punjab and U.P., brought to the farmer acceptable varieties with amber-coloured grains. A number of improved wheat types were released and were well-received

Multiple cropping Sunn hemp—inter-cropped in sugarcane, for fibre

not only in the conventional wheat areas of the North but also in many parts of the South. Similar success was achieved with millets, particularly bajra, which in some areas "threatened to drive cotton out of production." Maize also received adequate attention and came to be looked upon a better substitute to sugarcane in many areas in the north. In rice however, the progress was quite slow and only recently a few varieties, which could enthuse the farmers at large have been released, one of which is the miracle rice from Philippines, I.R.-8. New varieties which were claimed to outdo this most cosmopolitan exotic high-yielder failed to fulfil the expectations. It will be the task for scientists in the 'seventies to introduce on large scale rice varieties which could equal I.R.-8 in yield but prove superior to it in grain quality and consequently in easy marketability.

Multiplication of Seeds

The technological breakthrough in the 'sixties was well supported by efforts on multiplication of the seeds of high-yielding varieties and their distribution. Progressive farmers found a lucrative proposition in growing seed crops of hybrid, maize, bajra and jowar. The National Seeds Corporation came into existence to promote and supervise seed production and organise distribution of the seeds. Farmers became well aware of the potentialities of the new varieties and also the problems in raising them. This resulted in an overall improvement in the standard of awareness about modern trends. It was not unusual for farmers even in remote rural areas to discuss the merits or otherwise of different crop varieties, fertilizers and plant protection chemicals.

Extension of Coverage

The enthusiastic reception to the high-yielding varieties including I.R.-8 in paddy led to a rapid rise in the area covered by them. The area under these varieties which were totally unknown during 1960-61 was initially 4.6 million acres in 1966-67. By 1968-69 the coverage expanded to 21 million acres and the target of 32 million acres set for 1970-71 was even then considered to be within easy reach. It is now held that the level may even be exceeded. The interesting feature about these varieties, particularly jowar and bajra, was that these were quite popular even during the two bad years of drought and perhaps helped the farmers to hold out during the trying years. It may be even said that they paved the way for the dry-farming programmes about which one hears much today and which will be one of the major programmes in agricultural development in the 'seventies.

Fertilizer Consumption Up

Though the crop production fluctuated highly in the 'sixties, the tempo in fertilizer consumption was steadily increasing. This was also due in a large measure to the high-yielding millet varieties which made it worthwhile for the farmer to invest on fertilizers even during the periods of water scarcity. Along with the increase in the tonnage of the fertilizers consumed there was a slow improvement in the quality of fertilizer application. The balanced use of the three major plant nutrients, nitrogen, phosphorus and potash (N-P-K) gained ground among farmers to some extent.

In 1960-61 the total off-take was 3.12 lakh tonnes of fertilizers including 2.12 lakh tonnes of nitrogen. This figure improved to 7.60 lakh tonnes of NPK fertilizers in 1965-66 which was an unfavourable crop year. This off-take was made up of 5.48 lakh tonnes of nitrogen, 1.50 lakh tonnes of phosphoric acid and 77,746 tonnes of potash. A more impressive use of these nutrients was made in 1967-68 when the high-yielding varieties were just coming to stay and the weather conditions improved. The total off-take was 15.80 lakh tonnes.

Minor Irrigation Programmes

Another factor that contributed to an improvement in overall food output in the 'sixties, inspite of the vagaries of monsoon and facilitated the wide spread of the high-yielding varieties is the increased coverage under minor irrigation programmes. By 1964-65, most of the major rivers have been tapped to command 27.5 million acres out of a total cropped area of 395 million acres. The importance of minor irrigation which only can cater to areas inaccessible to canal irrigation and can be developed from local resources was well realised in this decade. The area fed by minor irrigation sources was 32 million acres in 1950-51, but increased to 47 million acres by the end of 1968-69 comprising 20 million acres from surface water and 27 million acres from groundwater.

Ground Water Resources

The immense scope for exploiting ground water resources was discovered through well-planned exploratory programmes in the 'sixties. The Exploratory Tubewell Organisation investigated 16 different regions covering a total area of 70,000 square miles (44.8 million acres) and located 84 areas covering nearly 24,000 square miles (15.36 million acres) as groundwater-worthy for future development. The ETO followed up by sinking 1,600 borewells, of which, over 1,100 were successful in the drought-ridden areas of the country like Rajasthan. These findings have thrown open the doors for exploiting this hidden wealth and offered scope for development of agro-industrial enterprises to drill the bores and install the pumpsets, on custom-service basis.

Popularity of Pumpsets

The popularity of minor irrigation can be well judged from the increase in the number of pumpsets from 4.22

lakhs in 1960-61 to 14.64 lakhs in 1967-68. As agriculture will be more than ever dependent on minor irrigation there is further scope for improvement in this field. This is more true of tube wells, the number of which has increased from 0.59 lakh in 1960-61 to 2.08 lakhs in 1967-68.

The immediate impact of minor irrigation through wells or borewells on agriculture has always been a diversification of the crop pattern. A natural inclination to use water economically and therefore efficiently followed. This led to production of a variety of crops, creating a climate for ushering in multiple cropping schemes.

Soil Care Practices

With the development of high-yielding and quick-maturing varieties, soil management and irrigation practices which could bring out the full potentialities of these varieties have also been standardised. The progress in this filed has been phenomenal. While in the early 'sixties growing two crops in the same holding over a large area was considered quite a laudable achievement, with the dawn of 'seventies it has been demonstrated that growing four crops in a year in the same holding will be feasible and adequately remunerative. The spread of multiple cropping is likely to be more rapid in the 'seventies though its practibility has been already well proved. Multiple cropping has already been in practice in some areas like the border areas between East and West Godavari districts and areas irrigated by wells in many parts of the country particularly in the south. The target of 63 million acres set for multiple cropping will not only mean more diversified production but also a transition from casual farming to intellectual, planned and efficient agriculture. This improvement in the attitude towards farming will be a great asset to be gained by large scale execution of this programme in the 'seventies. Another advantage of multiple-cropping is its feasibility for the small farmer, who can enhance his farm income by exerting a little more.

A good crop of hybrid bajra

Rearing High Breed Cattle

Another phase of development which, however, was so slow that the impact was almost inconspicuous during the 'sixties, was in the sphere of animal husbandry. The advantages of mixed farming were quite apparent to many farmers particularly in areas where irrigation facilities were scarce but practical difficulties stood in the way of large scale efforts of this nature. Paucity of quality cattle and lack of adequate knowledge about scientific feeding had been the deterrent factors during the 'fifties. The picture changed gradually in the 'sixties. Efforts to fix and breed cross-bred cows for different regions based on the local herd type, effective steps to foster poultry rearing and rapid spread of upgraded murrah buffaloes brought to the farmer better livestock and stimulated his interest. His prejudices against artificial insemination to upgrade his indigenous stock wore out in the face of accumulating evidence to prove their efficacy. He has realised that his prejudices against exotic stock are also unfounded.

In the absence of organised enterprises to manufacture scientific feeds on large scale such genetic improvement of livestock would not have been quite fruitful. The growth of these efforts which helped the farmer in better upkeep of livestock hitherto was not quite satisfactory. Perhaps the slow progress in livestock development was due to the tardy pace at which feed industry moved. Feed cost is 60 per cent of the maintenance expense for livestock and the manufacture of adequate feed of good quality at reasonable price will decide the tempo of the animal food production in the country in the 'seventies.

TABLE 1

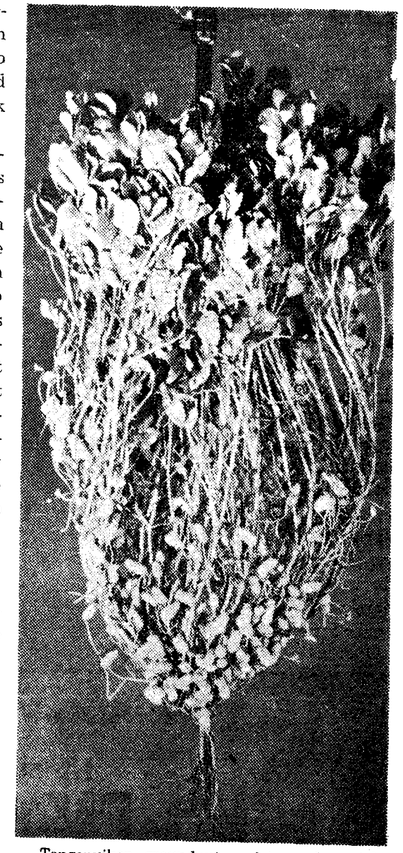
ESTIMATED DEMAND FOR FARM EQUIPMENT INPUTS

S. No.	Item	Brief Specifications	Estimated Population 1965-66	Estimated Annual Demand 1973-74	Application
1.	4-wheel tractor	10-50 DBHP	50,000	52,000	Large irrigated holdings
2.	Power-tillers	3-12 HP	1,200	34,000	Irrigated paddy holdings of 2-10 hectares
3.	Power-sprayers-cum-dusters	Knapsack	4,000	30,000	Cash crop holdings of 16 hectares and above
4.	Pumping sets:				
	(a) Engine	5-10 HP	525,000	8,000	
	(b) Electric	3-5 HP	500,000	200,000	
5.	Power Threshers	5-20 HP	2,000	25,000	Irrigated paddy and wheat holdings of 6 hectares and above
6.	Replacement parts			Rs. 15 crores	
7.	Fuels and oils for Prime-movers			Rs. 192 crores	
8.	Tyres—tractors, power-tillers, trailer & animal-drawn vehicles			7,00,000 tonnes 5,00,000 tonnes	
9.	Steel			5,00,000 tonnes	

Farm Mechanisation

There are over a million of operational holdings of 40 acres and above in size and thus a vast potential exists for mechanisation. One tractor is available in India for 1,250 acres while in West Germany it is available for every 33.3 acres; in U.K., 106.4 acres; in Denmark, 57.1 acres; in Japan 9.6 acres; in France, 104.2 acres; and in U.S., 219.4 acres.

A recent assessment of the Indian Society of Engineers has projected the future demand for some essential items of mechanisation on the basis of the current trends. The current annual demand for tractors is estimated at 25,000 but the production in indigenous industry is about 15,000. It is however,



Tanganyikan groundnut variety under trial at the 'J' Farm near Madras

curious that the licensed capacity for the indigenous industry is twice as much as the current production. Undue insistence on increasing the indigenous content of the components is said to be one of the reasons for this lacuna. It is pointed out that certain components that are hard to get from indigenous sources are vital parts. Again all the needed components are not available in required quantities at a time. Another hardship arises from licensing too many firms for manufacturing tractors which stands against volume production by the existing units and thus chances of reduction in prices. All these industrial problems will have much to do with the spread of mechanisation in the country in the 'seventies and even in the following decades.

These problems pertain to the heavy farm machinery. There is however ample scope for active efforts by small industries in manufacturing better implements and gadgets, which will make farming more efficient and reduce the drudgery. There are 16 research-cum-training centres established by the Indian Council of Agricultural Research which could have helped the small industries sector to manufacture a number of useful gadgets. But the impact so far has not been quite perceptible. The Planning Commissions' estimate of 1,30,600 tonnes of agricultural implements as the requirement for the Fourth Plan period calls for greater participation of the small scale industries sector in support of agriculture and more dynamic field-based research and demonstrations by the official agencies.

Attention of Commercial Crops

In our preoccupations with food production the commercial crops that feed the industries have not received adequate attention. This has resulted in annual drain of foreign exchange for importing cotton, oil and oilseeds. Research to evolve better varieties in these crops has to be relentlessly pursued. The 'seventies will perhaps see success in such ventures and the beginnings of a balanced development of food and commercial crops.

Even upto the end of the Second Plan Period the image of the average Indian farmer was quite unattractive. He was painted as conservative, absolutely impervious to new ideas and devoid of initiative or the spirit of innovation. The 'sixties has done one signal service to Indian Agriculture. It has erased this picture and has shown that, given proper opportunities and incentives the Indian farmer can react to them quite positively. The credit for this should go to the extension personnel in India and foreign collaborators in the agricultural sphere who have formulated extension techniques which could, slowly but effectively draw the farmer out from the chrysalis of traditionalism. The 'seventies will see the fruits of this effort and also further steps taken to make the Indian farmer display dynamism comparable to that of his counterparts in any of the well-developed farming nations.

Unemployment: Conundrums and Cures

By OUR SPECIAL CORRESPONDENT

SINCE THE INCEPTION of planning in India, the stress has ostensibly been on seeking to contain the backlog of unemployment from increasing. Actual results have however, been to the contrary. Mr. D. Sanjivayya, Union Labour Minister, has confessed that the number of unemployed had risen to 15 million by the end of the Third Plan while current computations put the figure at 20 million. President Giri in his book "Jobs for our Millions" quotes the expert committee's findings—the Committee composed of Professors Dantwala, K. N. Raj and D. B. Lahiri—that figures of unemployment vary between 10 and 50 million and of under-employment from 100 to 170 million. The main problem in all this statistical exercise is the unreliability of employment exchange figures which apply only to the small proportion of the total number of unemployed even among whom some keep their names in the register despite their having found some jobs. The major headache is, however, that the vast numbers idling in hunger in the villages are not reckoned correctly in most computations.

Projections Undependable

It is this uncertainty in basic figures that makes most of the projections quite undependable. In fact, uncertainties in this field have been responsible for the Fourth Plan document avoiding such projections unlike as in olden times when meticulous details were filled in. This is not to minimise the significance of the analysis itself inasmuch as it helped indicate a direction and identify the contents of emerging unemployment over the last 20 years. The original draft of the Fourth Plan has a classic chapter on "Employment and Rural Manpower", which is an exercise of no mean merit. According to an expert calculation, between 1957 and 1961, India's labour force grew by 21 million consisting of both agricultural and non-agricultural workers. Employment in non-agricultural sector is said to have increased by 12 million and agricultural employment by 5 million. Backlog in the employment at the end of the Second Plan is estimated as 7 million. Additions to the labour force during the Third Plan is put at 17 million against employment created of 14.5 million—10.5 million in the non-agricultural sector and 4 million in the agricultural sector. On the basis of these calculations the backlog of unemployment at the commencement of the Fourth Plan is 9 to 10 million of which three-fourths are in the rural areas. Table 1 shows net addition to the labour force during 1961-76.

Growing Educated Unemployment

Educated unemployment is said to have grown steeply in recent years, its volume having grown by 13 per cent

TABLE 1

INCREASE IN LABOUR FORCE DURING 1961-76

(Figures in millions)

State	Labour force in 1961	Net addition 1961-66	Net addition 1966-76	Col. 3 as % of Col. 2	Col. 4 as % of Col. 2
Andhra Pradesh	16.13	4.76	3.53	29.51	21.88
Assam	4.67	2.18	1.67	46.68	35.76
Bihar	17.12	7.68	5.93	44.86	34.64
Gujarat	7.75	3.70	2.74	47.74	35.35
Jammu & Kashmir	1.36	0.29	0.20	21.32	14.71
Kerala	5.51	2.95	2.15	53.54	39.02
Madhya Pradesh	14.99	5.20	4.05	34.69	27.02
Tamil Nadu	13.99	4.10	3.00	29.31	21.44
Maharashtra	17.18	6.51	4.81	37.89	28.00
Mysore	9.40	3.75	2.78	39.89	29.57
Orissa	6.86	2.49	1.87	36.30	27.26
Punjab	6.26	4.02	2.96	64.22	47.28
Rajasthan	8.27	3.82	2.83	46.19	34.22
Uttar Pradesh	25.71	10.98	8.26	42.71	32.13
West Bengal	11.29	5.78	4.33	51.20	38.35
Nagaland and Union territories	3.06	1.82	1.38	59.48	45.10
All India	169.55	70.03	52.49	41.30	30.96

during the first half of 1969. According to figures of the live registers of employment exchanges, there were 8.75 lakhs matriculates, 1.86 lakhs graduates and 53,118 engineers in June 1969. Total number of unemployed was 33.93 lakhs in November 1969 against 30.5 lakhs in November 1968. It is estimated that every year, more than 2 lakhs educated young men are added to the ranks of the unemployed. It is embarrassing that no two estimates agree. According to one calculation, a break-down of unemployment figures shows that the number of matriculates has risen to 9,09,686 at the end of 1969 from 5,80,265 at the end of 1965 and the corresponding figures of undergraduates, graduates and post-graduates had respectively increased to 4,01,326 (from 1,75,710) and 2,15,238 (from 86,858). It is to be noted that while the number of matriculates has doubled, that of the graduates and post-graduates has risen by 2½ times.

Spectre of Under-employment

Added to this is the spectre of under-employment. According to canons set by the I.L.O. under-employment may be (1) visible, involving shorter than normal period of work which is characteristic of persons working involuntarily part time and (2) invisible, which is characteristic of persons whose working time is not below normal but whose earnings are abnormally low or whose jobs do not permit full use of their capacities or skills or who are employed in establishments whose productivity is low. President Giri's book has dealt with this in great detail. He uses findings of certain National Sample Surveys in rural and urban under-employment. Persons are described as severely under-employed in rural areas if they work 28 hrs. or less per week or less than 4 hrs. a day; and if they work 29 to 42 hrs. per week they are to be treated to be moderately under-employed. According to this calculation the severely under-employed in rural areas as per the 16th round of N.S.S. worked out to 4.7 per cent of the employed persons. The combined percentage for all persons working less than 42 hrs. per week and reporting availability for additional work comes to 8.23 per cent of the employed persons. The percentage of urban under-employed is put at 2 to 3 per cent of employed persons. The Programme Evaluation Organisation of the Planning Commission has measured disguised unemployment on the basis of man-days per acre on standard farms or output or earning from the same unit and puts it at 46. President Giri says that "the level of under-utilisation of labour on the farm may be expressed as a period of unemployment for male family workers in a day of 8 hours. Out of 365 days in a year, periods of unemployment are 93 days in Uttar Pradesh (1954-55), 117 in Punjab (1956-57) 132 in Tamil Nadu (1956-57), 179 in Andhra Pradesh (1959-60), 216 in Orissa (1958-59) and 236 in West Bengal (1956-57)."

TABLE 2
OUTLAY ON EMPLOYMENT
1965-66—1970-71

Year	Outlay in Rs. crores	Employment potential (lakhs)
1965-66	7.5	3.75
1967-68	12.0	6.00
1968-69	16.0	8.00
1969-70	24.0	12.00
1970-71	30.0	15.00
Total	90.2	

Rural Works Programme

Providing employment in rural areas particularly with a view to reducing unemployment in agricultural slack season has generally been sought through intensification of rural works programmes. The Third Plan conceived of a massive rural works programme capable of providing work for 2.5 millions in terms of 100 days work in a year. In actual practice, against Rs. 150 crores targeted for this, only Rs. 19 crores was made available and in the last year of the Third Plan, expenditure stood at Rs. 8 crores and employment provided was 400,000 in terms of work for 100 days a year. Rural gap in employment in Fourth Plan is estimated at 4 million. The Plan document recognises that employment provided in agricultural slack season is only a stopgap and of partial import. At the same time, even for providing slack season employment, the resources available are clearly

insufficient and only Rs. 95 crores will be available. The tentative phasing of expenditure between 1965-66 to 1970-71 is shown in Table 2.

Imparting Skills to Rural Youth

There is special provision for imparting skills to rural youth in the age-group of 15 to 25 years. It will provide on-the-job training in development projects. This can be done if, in the selection of areas, the stress is on pockets of serious under or unemployment because of serious lags in development or because of the pressure of population and the presence of masses of landless agricultural labourers. Predominantly tribal areas, scarcity affected areas and hill areas will fall within this category. The Planning Commission feels that, while the rural works programme is conceived as a supplementary programme in the areas in which it is to be undertaken in actual implementation, it has to be fully integrated with the programme of development at the block and district levels. It is proposed to continue the existing pattern of rural finance under which the Centre advances one half of the amount as loan and one half as grant, with the panchayat-raj institutions contributing the utmost possible within the resources. The works selected will be minor irrigation, soil conservation, afforestation, rural roads, etc. which should be integrated with the regional development programme. Indeed, the solution of jobless demands more far reaching schemes like the organisation of agro-industries. So far there has not been any clear delineation of these industries, which types will suit which areas best, what the output and profit are likely to be in the immediate future and what would be the degree of labour intensiveness on the basis of which alone could the employment generation be calculated.

TABLE 3

ESTIMATED ADDITIONAL REQUIREMENTS OF AGRICULTURAL AND ALLIED PERSONNEL

		IV Plan	V Plan
Agricultural graduates and post graduates	..	29,000	44,750
Veterinary graduates and post graduates	..	7,800	7,900
Dairy personnel	..	4,000	N.A.
Forestry .. forest officers	..	768	N.A.
forest rangers	..	2,000	N.A.
foresters	..	5,600	N.A.

TABLE 4

PARA MEDICAL PERSONNEL REQUIRED

		Availability in 1965-66	Additions required during IV Plan
Auxiliary nurses	..	35,000	60,000
Health visitors	..	3,500	2,000
Dais	..	30,000	2,50,000
Sanitary inspectors, health inspectors, health assistants	..	48,000	63,000

TABLE 5

PERSONNEL FOR GENERAL EDUCATION PROGRAMMES

		IV Plan	V Plan
Elementary stage	..	8,00,000	12,70,000
Secondary stage	..	2,15,000	3,00,000
University stage	..	30,000	50,000
Total	..	10,45,000	16,20,000

Land Colonisation

President Giri suggests land colonisation through cooperative farming as the ideal solution. According to him, such farming can be on the basis of three types of ownership: ownership of land in a cooperative farm which has been formed by a voluntary association of existing small or medium-sized holders in a village or group of villages; cooperative farms sponsored by the State on lands which formed uncultivated waste land belonging to the State; and cooperative farms allotted on an individual basis to landless labour, Adivasis and Harijans. In the first case joint farming societies of existing owners with ownership rights vesting with those forming the society are to be found. Ownership of waste-land cooperatives are to vest with the society with no individual rights—the colonist enjoying all the benefits of the society and with the State making large investments on his behalf in order to enthuse the members and assuring them of a source of livelihood. In the third category of colonisation the suggestion is that, in future no free allotment of land should be made to people except as members of co-operative societies since, in the existing procedure of distributing pattas of waste land to individual beneficiaries full reclamation and adoption of modern techniques have not been effective at all, if not totally meagre.

As for the educated unemployed, the outturn of engineers from colleges was expected to be 166,000 and that of diploma holders 254,000 by 1970-71.

is also believed that the projected additions to graduates and diploma holders is likely to be just sufficient to meet the five year demand ahead. In the original draft of the Fourth Plan, it was stated that the estimated requirements of engineering personnel in the period of 1971-86 were 166,000 graduates and 254,000 diploma holders in 1971 against an anticipated 520,000 and 1,559,000 respectively in 1986 through 347,000 and 876,000 respectively in 1981. The assumption is that under present levels of intake of the teaching institutions, the growth will be 9 per cent in the Fifth Plan period. There will be no anxiety for jobs by that period.

Present Unemployment

But the rub lies in the massive unemployment in the present and in the immediate future. It is no doubt true that current unemployment is in the nature of a temporary imbalance and it is likely to continue over this period. The recession in the engineering industry and the spate of admission in technical institutions having been in excess of the targets set had their own contributions towards the imbalance. But much of the optimism behind the improvement in job prospects after 1979 inheres in a steady annual growth rate of 5.5 per cent in the economy, in which case there could even be a shortage of 90,000 engineers ultimately. Much depends on admissions being restricted in technical institutions to the levels that obtained in 1968-69.

Stop-gap Gimmicks

If projections based on such assumptions do not go awry, it should not be difficult to manage a good part of current unemployment in technical cadres through extension of apprenticeship periods, enlisting technical graduates for construction activities in government contracts and increasing trainee-placements in industrial units in the public and private sectors. In some parts of the country, Government assisted cooperative firms of engineering consultants manned by the jobless have come into being, while the Indian Oil Corporation has been implementing a scheme of employing engineering graduates as dealers. These remedies have their natural limits. "Self-employed" consultancy firms may not get the business to make them viable because most existing industrial units have their own consultants inside their establishments. Similarly the I.O.C. scheme may not go far enough because dealers require qualities of salesmanship which the raw technical graduates may not at all possess. Yet when it is a question of choice between absolute poverty and some income, some stop-gap gimmicks of these types may have their relevance and usefulness.

Immediate Future Gloomy

The immediate job situation is particularly gloomy in respect of agricultural graduates. The additional jobs likely to become available are put at 13,000 whereas those seeking the jobs will be 24,000. In respect of agricultural engineers, the places available are 350 while the addition to the ranks of this class is 1,240. In regard to veterinary personnel, jobs in the offering are around 2,500 against a demand of 6,000. This is sought to be tackled by readjustments in panchayat block levels where technical persons are to replace village level workers. But the problem is to employ those displaced. On this, no answer has been forthcoming.

Aversion to Self-employment

It is interesting to learn that the Syndicate Bank is putting through a scheme for helping technical persons to be self-employed in South Kanara district. In interviews conducted by the Bank, it became clear, however that out of 2,573 persons called, only 236 were prepared to take to self-employment with bank assistance. The majority preferred a job rather to an independent vocation, which means that the problems of the jobless is not amenable to the remedies like self-employment. It is also clear that, in the case of most people, job placements depend largely on the acquisition of some practical training, outside the type they undergo in their normal educational career. The Government has to ensure this.

A greater problem is what has been highlighted by George B. Baldwin in "Brain-Drain or Overflow". Says Baldwin: "For every less developed country with an overall shortage of professional manpower there are probably two with surpluses, present or impending. The reason is simple. In every country there is an irresistible pressure to expand university education, and so many countries have found it possible to do this. The number of college graduates (including professional graduates) has been rising faster than their economies can absorb them. The last statement is important. If one looks at the pure 'need' of an underdeveloped country for doctors and engineers and lawyers and agricultural extension agents and plant geneticists and economists and science teachers for secondary schools, etc., then it is easy to see shortages. But if you look at the number of unfilled jobs or the number of university graduates who have difficulty in finding what they consider acceptable employment then surpluses often appear. So part of the argument over whether or not a brain drain exists depends on whether one looks at society's 'human needs' or on economy's 'effective demand'. Clearly the latter is the most realistic test to apply; the real question is how rapidly 'effective demand' for high level manpower can be made to grow. To ask this is to ask the riddle of development". Detailed comment on this is not necessary. Will the Government be prepared to reshape its fiscal and industrial policies to ensure that larger volume of effective demand which alone can guarantee the sea-change in our industrial society which is so necessary for creating the resources for paying the salaries to keep the elite brains from flowing out to serve a foreign country rather than India?

SURPLUS CAPACITY IN FERTILIZERS

By S. VASUDEVAN

WILL THE SOUTHERN region face a crisis of surplus of fertilizers after the new giant factories go on stream during the Fourth Plan period ? This is a question that is being currently debated by the fertilizer industry. The plants at Madras and Cochin are expected to go into production more or less simultaneously by the middle of next year. Later, there will be significant additions to the fertilizer output in the South when Cochin and FACT complete expansion plans and new units like Tuticorin Fertilizers are commissioned. In other parts of the country too a number of projects are expected to be completed during this period. At present, there are four units in operation in the South—EID-Parry, Neyveli, Coromandel and FACT.

In this light, two contradictory answers to the poser whether the consumption will keep pace with the production in the Southern region are now current. At one end, there are those who seriously dispute the validity of the demand projections on the basis of which new units have been sanctioned. At the other end are those who, well supported by facts and figures, have made out a strong case against the pessimists.

Target Scaled Down

The original all-India targets for 1973-74 for consumption of fertilizers were 3.7 million tonnes of nitrogen and 1.8 million tonnes of P_2O_5. The figures for South India were 1.04 million tonnes of nitrogen and 0.61 million tonnes of P_2O_5. Subsequently, the original targets for 1973-74 for the whole country have been scaled down to 3.2 million tonnes of nitrogen and 1.4 million tonnes of P_2O_5. On this basis, the target for South India has been estimated at 0.83 million tonnes of nitrogen and 0.47 million tonnes of P_2O_5.

This is based on a number of valid assumptions. The upward curve of fertilizer consumption in the South shows that consumption levels have been rising steadily. Actually, the consumption of all types of fertilizers have been increasing at a rapid rate. In Andhra Pradesh it has gone up from 65,000 tonnes of nitrogenous fertilizers in 1965-66 to 280,000 tonnes in 1969-70, more than a four-fold increase in five years. The same rate of increase has been registered in Kerala where consumption during the period rose from 7,000 tonnes to 30,000 tonnes. Similarly, Mysore and Tamil Nadu have also recorded substantial increases, two to three times in five years.

Consumption will Increase Fast

A look at the agricultural programmes in the States is enough to prove that consumption is bound to increase consideraly. These programmes, as is well known, are for increasing the irrigation facilities, introducing double cropping and changes in the crop pattern likely to occur with irrigation farming. Thanks to the promotional efforts of the Government and the fertilizer companies, the farmers even in the remotest parts of the region have accepted fertilizers as a must for the field. With the completion of the high-yielding programme to cover all fields, the farmers will need higher doses of fertilizers. The demand potential of fertilizer use will jump with the anticipated 100 per cent area coverage for all the major crops over the entire cultivated area.

Fairly reliable data have been collected by a large fertilizer organisation which has made a thorough survey of the demand pattern in the Southern region. The survey, which is the latest, has assumed a slower pace of growth of fertilizer consumption than the rate projected by the Union Ministry of Agriculture. While the Ministry anticipates about 20 per cent rise in the next five years, the review of the fertilizer company assumes a rise of about 15 per cent for 1974-75 and 1975-76 and thereafter at 10 per cent of the 1973-74 base so as to reach 5.8 million tonnes of nitrogen by 1980-81.

Two Years Behind Schedule

According to this calculation, the achievement of the Ministry's target is almost two years behind schedule and therefore, a reasonable reduction in these targets hav to be made. Further, this growth in fertilizer consumption is expected to bring about nearly around 165 million tonnes of foodgrains production by 1980-81, while the Planning Commission hopes to achieve this by 1978-79.

This company's review says that looking into the rate of growth in fertilizer consumption from 1960-61 till 1968-69 and the substantial achievement in introducing high-yielding varieties and new technology and thereby increasing the per acre yield, it is not necessary to attach serious importance to the failure of consumption to the extent of 10 per cent over 1968-69 targets during 1969-70. It should be noted that the rabi of 1970 has again brought back the fertilizer situation under command and the consumption target for the 1973-74 full season has been already scaled down. Further, in the case of P_2O_5 and potash, consumption has been lagging very much and since complex fertilizers would now form the greater part of P_2O_5 and potash, the utilisation of complex fertilizers will also, to some extent, augment nitrogen consumption.

Increase in Output Due to Fertilizers

All the estimates assume that the recent increase in foodgrains output is basically due to the application of fertilizers. The consumption of fertilizers in 1966-67 was around 730,000 tonnes and this rose to 1.2 million tonnes by 1968-69. In other words, during a two year period covering four main seasons an additional 593,000 tonnes of nutrient has gone into the soil and increased the food output by 20 million tonnes. This is attributed mainly to fertilizer application which has become the true nutrient for hybrids and high-yielding varieties.

The survey points out that by not increasing the nutrient content of the soil we cannot even maintain the original yield. It is, therefore, necessary to maintain the complement of fertilizer nutrients to the extent of what the crops have taken out of the soil. We cannot continue to get another 45 million tonnes of rice and wheat achieved in 1960-61 due to very good natural conditions as well as extension work, if we maintain the same dosage of fertilizers or even if we increase the irrigation potential, because the crops would remove from the soil every year more nutrients and the complement to maintain this would grow continuously. Over and above this, the additional soil nutrition required will have to be considered and it is, therefore, very reasonable to consider that the additional production in foodgrain upto 100 million tonnes during 1969-70 was basically due to the application of fertilizers of about 600,000 tonnes of nitrogen, part of which has gone for maintenance of the soil as soil maintenance requirements increase rapidly on the basis of the increased yield obtained and has a cumulative effect.

Therefore, to gain another 25 million tonnes of foodgrains, it would be essential to compute the additional requirement of nutrients on the basis of crop yield, soil depletion records and fertilizer consumption components. Thus, fertilizer requirements for incremental growth will be more than before. Lack of off-take during last

COCHIN FERTILIZERS TAKES SHAPE

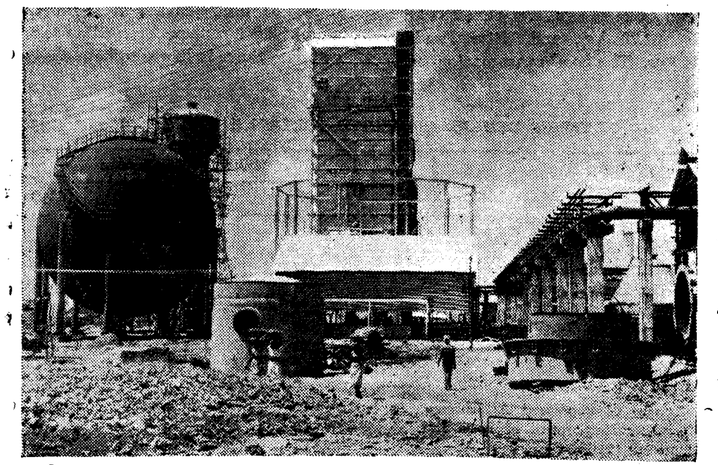
The Rs. 450 million giant Fertilizer Project being set up by FACT at Ambalamedu, near the Cochin Refineries, is expected to be on stream in 1971. The factory, designed to produce 3,30,000 tonnes of urea per year, utilises the latest technology. The synthesis gas section has been designed by FACT in collaboration with the Power-Gas Corporation of England.

The 600 tonne a day Ammonia Plant based on Fauser Montecatini process is in single stream. Centrifugal compressors are used for compressing the synthesis gas. The 1,000 tonne a day urea plant based on the Fauser Montecatini total liquid recycle process is designed by the Planning and Development Unit of the Fertilizer Corporation of India in collaboration with Montecatini Edison of Italy. The urea synthesis section is in two streams and the rest in single stream.

The process water requirements of the project will be met from a water reservoir of five months storage capacity formed by building an earthen dam. The power requirement is about 22 mega watts. Fourteen mega watts will be generated in the project in a back pressure turbine connected to the process steam unit.

A modern township with all amenities like shopping centre, hostels, recreation facilities, etc. has also been planned.

Work on the project is progressing at a rapid pace. Meanwhile a project report has been drawn up for the Phase II expansion of the project, for the production of phosphatic fertilizers. This again is estimated to cost Rs. 450 million. The proposal is now under the consideration of the Government.



A view of the Urea Prilling Tower in Cochin Fertilizer Project

year due to drought or lower rainfall and other calamitous factors cannot be attributed to a scaling down of fertilizer consumption or lack of farmer appreciation.

Consciousness Greater in South

With the increase in the tempo of high-yielding varieties programme and with the assured flow of bank finance for purchase of agricultural inputs and the promotional efforts planned by the various fertilizer units, it is safe to conclude that the rate of projected consumption will be maintained in the years to come. Thus, even in South India where the average consumption is 9.8 tonnes of nitrogen and 2.13 tonnes of P_2O_5, there is scope for a substantial increase in the demand for fertilizers. It may be mentioned that the South has a higher fertilizer use per unit than the other regions of the country. For instance, in 1968-69 the per unit area of Andhra Pradesh was 7.5 kgs. of nitrogen, Kerala 11.33 kgs., Mysore 8.22 kgs. and Tamil Nadu 12.45 kgs. Except for the Punjab and Delhi the average for North India has been very low as compared to the Southern region. The Western India average was 4.08 kgs. and Northern India 9.01 kgs. in spite of the fact that the Punjab consumed 24.84 kgs., Haryana 9.27 kgs., Delhi 22.70 kg., and Uttar Pradesh 12.16 kgs. The good consumption areas in the nitrogen consuming States have had an average of 60 kgs., and there is no reason why this cannot be aimed at for a larger acreage in the future. The Food Ministry's decision to bring 30 million acres under the high-yielding varieties during the next two years would also go a long way to augment fertilizer consumption.

Taking into consideration all these factors, the consumption of fertilizers in the South by 1974-75 is estimated at 9,55,000 tonnes against the anticipated production of 10,33,000 tonnes of nitrogen, thus leaving a surplus of about 78,000 tonnes. According to this estimate there is likely to be a production of 3,20,000 tonnes of P_2O_5 against a consumption of 5,41,000 tonnes, thus leaving a deficit of 2,20,000 tonnes.

FACT and some others have also independently done exercises and the results more or less tally with the estimate that by 1974-75 the South will have a surplus of about 100,000 tonnes of nitrogen. This need not deter entrepreneurs as the surplus fertilizer will always find a market in other regions which are likely to face a marginal deficit even by 1974-75.

But the enormous quantities of fertilizers which will be pumped into the market will throw up tremendous marketing and distribution problems. Even though there is a reasonable assurance that the bulk of the output turned out by the various units in the South will be utilised, there will still be keen competition among them in view of the fact that the units are located within a distance of 300 to 400 miles. This means that each producer must accept full responsibility for organising a perfect distribution system besides launching on an intensive promotional campaign, a job which was hitherto being looked after mainly by the Government.

With a dynamic promotion campaign, a well thought-out marketing strategy and a flawless distribution system, it should not be difficult to reach the consumption targets.

TABLE II

FERTILIZER CONSUMPTION AND PRODUCTION TARGETS FOR 1974-75

State	N			P_2O_5		
	(in '000 tonnes)					
	Production	Consumption	+Surplus / −Deficit	Production	Consumption	+Surplus / −Deficit
Andhra Pradesh	286.3	368.00	− 81.7	185.15	195.00	− 9.85
Kerala	227.9	86.25	+ 141.6	30.30	46.00	− 15.70
Mysore	196.4	181.70	+ 75.3	..	103.50	−103.50
Tamil Nadu (including Pondicherry, Andamans and Minicoy)	443.17	315.10 + 4.07	+ 93.17	165.41	194.35 + 2.71	− 91.82
Total Southern region	1,033.77	955.12	+ 77.77	320.89	541.56	−220.87
All India total	3,616.23	3,680.00	− 64.00	878.93	1,680.00	−790.00

TABLE I

NUTRIENT DEMAND PROJECTED FOR 1970-71 AND 1980-81

Source	Million metric tonnes		
	N	P_2O_5	K_2O
for 1970-71			
Roy L. Donahue	2.67	1.80	0.83
USAID Study Team (IFFCO)	2.68	1.88	1.03
William Holst Study	2.17	0.89	0.44
Committee on Fertilizers	2.40	1.00	0.70
Fourth Plan Working Group	2.00	1.00	0.35
for 1980-81			
Ministry of Food and Agriculture	8.00	4.00	2.50
Fertilizer Corporation of India Ltd.	6.00	3.00	1.00
Planning Commission	5.86	2.95	1.47
Study Team (IFFCO)	5.43	4.29	3.10
William Holst Study	5.27	2.65	1.33

THE ROLE OF A REGIONAL BANK

By P. SEETHAPATHI RAO

IT IS AXIOMATIC that the economic development of an area is dependent not only upon the infrastructural facilities available but also on the presence of a credit agency, which by virtue of its long association has the advantage of having an intimate knowledge of the region and its problems and can be expected to gear itself up fully in meeting the various developmental needs of the region.

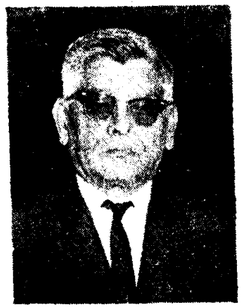
The State Bank of Hyderabad provides an interesting case study in this regard for more than one reason. It came into existence at a time when the erstwhile Hyderabad State was in the process of transforming itself from a traditionally feudal economy to a modern State, the bank being established to provide facilities for the first time to all parts of the State. The progress of the Bank in subsequent years is, in a sense, reflective of the process of economic development in the state and finally the continuance of its area of operation even after trifurcation of the State is a unique instance of its regional character being accepted on grounds other than political.

Serving the Rural Needs

A unique feature of the expansion programme of the Bank has been that the bias has been in favour of rural areas so that the Bank has today 179 branches in rural and semi-urban areas, with only 32 offices in urban areas. While in terms of business potential and profitability the Bank like other commercial banks has not been in an advantageous position, the fact remains that our coverage of unbanked areas has always been in alignment with the policy of expansion which is presently being pursued with vigour. The Bank has also successfully launched a programme of opening many 'one-man' offices.

Satellite Offices

As an experimental measure, the Bank has also finalised arrangements to open very shortly what are called 'satellite offices' at shandy villages. Such offices located in the villages will function only on market days and will be an effective instrument for taking banking to a very large number of villagers at relatively cheaper cost apart from preparing the ground for full time offices in future. The Bank has also taken care to ensure that no developmental activity is hampered for want of banking facilities on the spot itself. Wherever feasible its branches were opened within the factory premises of large industries.



Mr. P. SEETHAPATHI RAO

Industrial Financing

It is only in the 'sixties the Bank could make a debut in industrial finance and not only took over the finance of the industries which had survived the intervening years but also took a leading role in rendering financial assistance to the new industries which had come up as a result of the vigorous programme launched by the Government for the industrial development of the State. Today the Bank's advances to industries sector including Small Scale Industrial units accounts for 60 per cent of the total advances, indicating in no uncertain terms a shift in Bank's policies in favour of productive activities.

Technocrat Scheme

With the avowed objective of helping small scale units in every possible way, the inherent weaknesses in these industries have been examined and a flexible and very liberal approach has been taken by the Bank. Its policies have been reoriented and the scheme simplified from time to time so as to gear them to the requirements of the Five Year Plans. Apart from Medium Term loans for the purchase of machinery and acquisition of factory sites/sheds, working capital finance is provided against raw materials and/or finished goods either on pledge or hypothecation of stocks; although security is important, integrity of the borrower and his ability to make progress are given primary consideration and special relaxations have been made in norms and procedures to give them the utmost encouragement. The State Bank Group has gone a step forward in introducing the Technocrat Scheme under which qualified entrepreneurs who have the technical competence and ability but for lack of finance are not able to implement any project are provided with the total cost of the scheme, with no investment of their own, to the extent of Rs. 1.00 lakh going upto Rs. 3.00 lakhs if two or more such entrepreneurs join together. Besides, special concessionary rates of interest are given. At the end of 1959 there were only 13 units with limits aggregating to Rs. 13.08 lakhs whereas, as on the 31st May 1970, the number increased to commendable figure of 2,839 units with limits aggregating to Rs. 1,500.74 lakh. Of these units, 10 units are run by technocrats, while 37 are engaged in road transportation which also comes within the purview of small scale industries.

After the nationalisation of banks, the Bank has also intensified its assistance to small business and self-employed persons with the primary objective of replacing non-institutional finance obtained at a very high rate of interest by bank finance. In respect of rural credit, the Bank has been fully responsive to the needs of the agriculturists and entered the field of direct finance in a large way in the year 1968. While the assistance is largely by way of crop loans and instalment credit for purchase of farm equipment, the Bank has also helped for land development and minor irrigation with the needs of those engaged in grape cultivation, poultry farming, dairy farming, etc. also met.

Village Adoption Programme

The Bank has made an innovation in implementing the village adoption programme in terms of which the credit needs of a village unit are met in an integrated manner, apart from facilitating proper attention and follow-up which is not possible if such advances are spread thinly over a vast area. So far 10 villages have been adopted.

One noteworthy scheme which deserves being highlighted is the Bank's financing to Mahatma Gandhi Lift Irrigation Scheme at the village Gaddepalli in Nalgonda District of Andhra Pradesh on the right bank canal of Nagarjunasagar Project which will benefit about 1,000 farmers in 7 villages irrigating about 7,500 acres of hitherto dry land.

Another activity of the Bank is its contribution to the development of warehousing habit by granting on very favourable terms advances against Warehouse Receipts of the Central and State Warehousing Corporations.

With the Bank's role as a regional bank having been further consolidated by designating it as a 'Lead Bank' in sixteen out of seventeen districts in its area of operation it will be yet another factor vindicating the role of all regional banks in the country. With the other nationalised banks also sharing in the developmental activities of the region, the Bank will emerge as a pace-setter and is fully equipped to provide the requisite leadership.

SILENT REVOLUTION IN THE BANKING WORLD

THE POLICY OF social control over the banking system initiated three years back and which had culminated in the nationalisation of 14 major banks in July 1969 has ushered in a silent revolution in the development of banking. Indeed, the Planning Commission found it possible to increase the outlay on new schemes in 1969-74 in the public sector mainly due to the revised estimates relating to the growth of bank deposits. These estimates anticipate the aggregate additions to deposits in the current plan period to be of the order of Rs. 3,000 crores. In 1969 and 1970 alone, the mobilisation of deposits may be as much as Rs. 1,500 crores notwithstanding the fact that there was a slowing down in the growth rate in the latter half of 1969 immediately after nationalisation. In the next three years the increase in the resources of the banks can be as much as Rs. 3,800 crores or Rs. 800 crores more than the target for whole Plan period. This may appear to be an exaggeration but after the actual performance in 1969-70 it will not be surprising if the actual growth was of the order of Rs. 5,000 crores in 1973-74.

Unable to Meet Demand for Credit

Despite growth in deposits the banking system is unable to meet the needs of industry and trade, the requirements of borrowers in the priority sector, the increasing demands of the Central and State Governments and public bodies and the large-scale procurement finance required by the Food Corporation of India. For the first time in the history of Indian banking, fresh advances are in excess of fresh deposits. It cannot be said that a deliberate policy of overloaning as practised in Japan in the middle 'fifties to develop its economy at a faster rate, is being adopted by the Reserve Bank of India. But it has been indicated in the Annual Report of RBI issued recently that during the year ended June 30, 1970 fresh advances of scheduled commercial banks increased by Rs. 628.80 crores against Rs. 495 crores in 1968-69 while deposits rose by only Rs 594 crores and Rs. 677 crores respectively. The position would not have been so bad if there had been no slowing down in the growh of deposits. But even if deposits had risen by Rs. 700 crores there would not have been any large surplus left for investment in government securities. Actually it has been complained that the major banks have not achieved much by way of extending assistance to small borrowers and the unexpected growth in demand for funds last year has upset all calculations.

Contradictions in Credit Policies

There is now the curious spectacle of contradictions in credit policies. On the one side, Dr. Hazari, Deputy Governor of the Reserve Bank recently indicated that the authorities were keen on making available to the Central and State Governments and public bodies a larger share of the resources of the banking system for implementing plan schemes and that was why the liquidity ratio was increased to 33 per cent from 30 per cent. On the other hand, it has been complained that after the nationalisaion of major banks credit has not been expanded adequately for meeting the needs of small borrowers and there has actually been a slowing down of activity in new directions because of the paucity of resources. The Central Government has also been soaking the banking system to a significant extent by resorting to heavy borrowing for financing the procurement operaions of the Food Corporation of India. The cumulative effect of all these developments has been reflected in a comparatively small increase in investments of scheduled banks and a big rise in borrowings from the Central Banking Institution. Against the increase in deposits by Rs. 737 crores in the twelve months ended October 2, 1970, investments rose by only Rs. 87 crores or roughly by 12 per cent.

If the Reserve Bank continues to maintain the liquidity ratio at the high level of 33 per cent during the 1970-71 busy season too and refinance facilities were not liberalised it would be difficult to meet the needs of industry and trade and new classes of borrowers. Along with the necessity to invest larger amounts in government securities there will also be pressure to expand credit for procurement purposes. With larger food and cash crops, heavier imports and rising sugar stocks the banking system will have a hard time to meet the requirements of all constituents. The Central Government can probably ease the situation to some extent by taking over some part of the liability of the Food Corporation of India through the creation of buffer stocks and financing them on its own.

In 1971 there will be an unexpected rise in deposits as new branches have been opened in large number of underbanked and unbanked areas in rural and semi-urban centres. The Reserve

Bank had drawn up in December 1969 a fresh programme of branch expansion under which 22 public sector banks and 8 private sector banks were required to open during the year 1970, 1,350 offices of which 1,186 offices had to be at unbanked centres. The 22 public sector banks were required to open 1,300 offices out of the total of 1,350 offices. A total number of 600 offices was to be opened in the first half of 1970. The banks have actually exceeded the target by opening 875 offices upto the end of June 1970 of which 741 are at unbanked centres. This phenomenal progress has not been achieved at any time in the past and there were nearly 10,000 offices by June this year against only 5,727 offices in June 1965 and 4,250 offices in June 1961. (These data relate to scheduled commercial banks). While it can be confidently stated that new records would be established in respect of deposits in the coming years it is difficult to predict at this stage the extent of additional responsibility that would devolve on the banking system as a result of increasing monetisation of economy. The growth rate in deposits can easily be 20 per cent for some years though there may be a slower rate of increase thereafter for sometime until the economy gets integrated and reaches the stage of self-sustaining growth.

—*Meenam*

PROGRESS OF COMMERCIAL BANKING IN 1961–1970

(As on the last Friday of June)

(Rupees Crores)

	1961	1966	1967	1968	1969	1970
I. Number of Banks						
(i) Scheduled Banks	85	76	74	73	73	72
(ii) Non-Scheduled Banks	249	31	24	19	16	14
II. Number of Offices						
(i) Scheduled Banks	4,250	6,139	6,620	7,044	8,045	9,938
(ii) Non-Scheduled Banks	776	240	216	203	217	193
III. Aggregate Deposits						
(i) Scheduled Banks	1,775.8	3,123.2	3,517.0	3,969.1	4,645.8	5,239.8
(ii) Non-Scheduled Banks	43.4	25.0	24.5	26.2	28.0	23.5
IV. Demand Deposits						
(i) Scheduled Banks	725.3	1,477.3	1,664.6	1,874.8	2,103.5	2,307.3
(ii) Non-Scheduled Banks	12.6	9.1	9.1	10.2	,11.7	10.6
V. Time Deposits						
(i) Scheduled Banks	1,050.5	1,645.9	1,852.4	2,094.3	2,542.3	2,932.5
(ii) Non-Scheduled Banks	30.8	15.9	15.4	16.0	16.3	12.9
VI. Deposits as percentage of National Income	12.6	14.4	14.6	14.1	15.2@	16.6@
VII. Total Bank Credit						
(i) Scheduled Banks	1,282.8	2,271.4	2,631.1	3,102.9	3,598.8	4,227.6
(ii) Non-Scheduled Banks	27.6	15.0	15.1	12.8	16.4	11.3
VIII. Credit Deposit Ratio						
(i) Scheduled Banks	72.2	72.7	74.8	78.2	77.5	80.7
(ii) Non-Scheduled Banks	63.6	60.0	61.6	48.9	58.6	48.1
IX. Investment in Government Securities						
(i) Scheduled Banks	548.8	918.8	922.6	975.6	1,126.3	1,187.6
(ii) Non-Scheduled Banks	11.0	5.6	5.4	6.6	6.7	6.0
X. Investment Deposit Ratio						
(i) Scheduled Banks	30.9	29.4	26.2	24.6	24.2	22.7
(ii) Non-Scheduled Banks	25.3	22.4	22.0	25.2	23.9	25.5
XI. Cash and Balances with RBI						
(i) Scheduled Banks	144.6	195.3	258.8	269.5	380.3	340.8
(ii) Non-Scheduled Banks	3.2	1.7	1.9	2.1	2.5	2.0
XII. Cash Deposit Ratio						
(i) Scheduled Banks	8.1	6.3	7.4	6.8	8.2	6.5
(ii) Non-Scheduled Banks	7.4	6.8	7.8	8.0	8.9	8.5

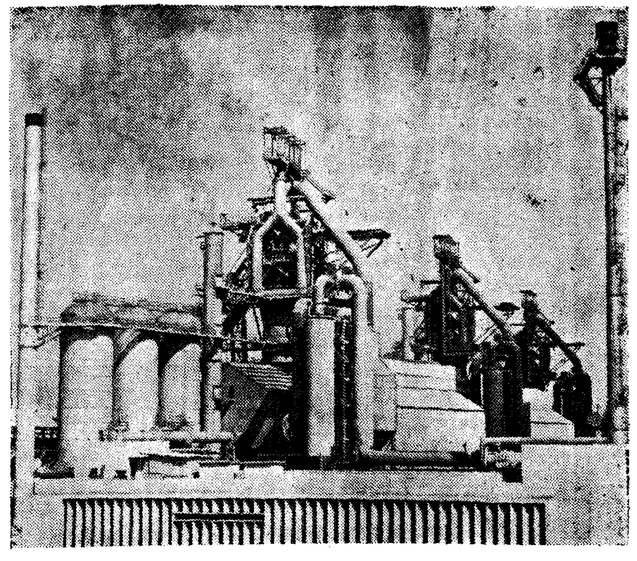
Notes: 1. The figures for 1961 relate to scheduled banks.
2. The figures for Non-Scheduled Banks in the last column relate to October, 1969.
3. The figures for June, 1970 are provisional.
@ Based on National Income at current prices (estimated).

STEEL INDUSTRY NEEDS PRAGMATIC POLICY

THE DEVELOPMENT OF the steel industry in the Fourth Plan period will take place in a haphazard manner. Even before the ink on the Plan document became dry all its estimates have gone awry. It is felt that internal demand may be as much as 6 million tonnes with the exports of engineering goods alone accounting for 5 million tonnes. As over 5 lakh tonnes of raw steel is being exported, it is not clear how the shortage in the next three years can be overcome without a re-casting of the existing schemes and larger allocations for the expansion of the existing capacity in the public and private sectors.

Renovation Programme

As some thinking has gone into the creation of new facilities of Bhilai, immediate arrangements have to be made stepping up production to 4.2 million tonnes from 2.5 million tonnes. The private sector units too should be helped in a big way to implement the schemes. With an outlay of Rs. 250 crores both Indian Iron and Steel Company and Tata Iron & Steel Company can add even 2½ million tonnes to their capacity. Mr. J. R. D. Tata, Chairman of TISCO, indicated recently that a modernisation and renovation programme was being contemplated which will cost Rs. 106 crores in five years. It is not expected that there will be any difficulty in mobilising the resources required for this programme as internal resources alone will account for nearly Rs. 90 crores while it is proposed to raise Rs. 29 crores by way of debentures. There will also be a foreign exchange loan from the Industrial Credit & Investment Corporation by importing plant and machinery. The new programme indicated by Mr. J. R. D. Tata will require an outlay of Rs. 100 to Rs. 150 crores. The details in this regard are being worked out and a blueprint may be submitted to the government by the end of the year. The addition to capacity can be easily 7.5 lakh tonnes and the profitability is expected to be good. The re-organisation of facilities will be so conceived that the ultimate capacity of Jamshedpur Plant can be raised economically to even 8 million tonnes. The availability of steel in the current plan period can be increased only with a pragmatic policy on the part of the government towards the two major units in the private sector. If TISCO was allowed to implement its new scheme and IISCO completes its expansion scheme, there can be an additional capacity for one million tonnes of steel ingots in the next three or four years. The Rourkela and Bhilai Plants can also give a better account of themselves. It will have to be examined whether there can be an improvement in operating efficiency in both the plants with the installation of additional rolling capacity which will



A view of the blast furnaces at Durgapur Steel Works

lead to a better use of the capacity for producing pig iron and ingots. The imbalance in rolling capacity and the lack of demand for rails, sleepers, heavy structurals, steel pipes and other items from indigenous consumers have necessitated exports.

Need for Sound Steel Planning

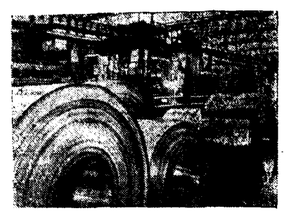
The developments on the economic front in the past three years has clearly demonstrated the need to have long range schemes for ensuring steady growth of steel output which may have to increase substantially. It is here that the planners have failed to assess clearly new needs. There is as yet no proper appreciation of the difficult situation that will arise in the first two years of the fifth plan period. It will now be readily admitted that the earlier decisions to embark on the mammoth Bokaro Project has been costly from the country's angle as the expenditure of Rs. 1,000 crores would have been usefully utilised for constructing three medium-sized plants capable of being developed into units with a capacity of 2.5 million tonnes ultimately. This mistake cannot be rectified now except by implementing expeditiously the first and second stages of Bokaro, so that the plant can produce 4 million tonnes by 1976 or 1977.

Southern Plants Need Speedy Execution

The steel units at Salem, Hospet and Visakhapatnam will also have to be accorded a high priority as these can be usefully completed in 6-8 years, stepping up output to 3 million tonnes of steel ingot between Hospet and Visakhapatnam and 2.5 lakh tonnes of mild steel and 2.5 lakh tonnes of special steels from Salem. The Salem project is capable of being brought into existence in 4-6 years. The mines can be easily developed, railway facilities readily expanded and the area suitably laid out for expediting construction of buildings and erection of plant and machinery. For the Visakhapatnam and Hospet plant also there is no problem of getting iron ore as the mines at Bailadilla and Hospet have been already well developed. Only capacity is to be developed and methods to mechanise mining operations adopted. If the arrangements relating to water availability and coal movements could also be completed the two big-sized units can be got ready in about 6 years. But for achieving this objective there will have to be a big increase in the allocation in the current plan period. The outlay of Rs. 110 crores will have to be trebled. Otherwise these projects may not take shape before the end of the Fifth Plan period.

A Formidable Task

If it is visualised that by the end of the current Plan period steel consumption might increase to 10 million tonnes and there may be a doubling of this consumption by 1980, the capacity of the industry will have to be 30 million tonnes of steel ingots by that time. Against this it is anticipated that the capacity will increase to 12 million tonnes by 1973-74 which means that 18 million tonnes of additional capacity will have to be created in the Fifth Plan period—a formidable task indeed. Against this quota, Bokaro will be contributing 1½ million tonns. It is being assumed that 2.5 million tonnes of capacity will come into being in the current Plan period from this source. The three Southern steel plants can make initial contribution of 3.25 million tonnes and a subsequent contribution of 2.5 million tonnes which will make a total of 5.75 million tonnes. Thus even if the expeditious implementation of the Bokaro project in all it stages and the completion of the three steel units along with the first stage of the expansion, steel capacity may raise to only 18.50 million tonnes. Thus there will be a gap of more than 10 million tonnes between anticipated consumption and capacity.



Rourkela Steel Plant: A view of the Electrolytic Tinning Line

Need to Generate Fresh Capacity

Planning of new capacity has to be carried out in a manner which will ensure the regular addition to capacity. It will be necessary to examine whether the expansion schemes can be expedited with the import of plant and machinery and whether the World Bank can be approached for the development of capacity of the Rourkela and Durgapur projects. The World Bank may not have any objection for financing the schemes of Tata Iron & Steel and Indian Iron & Steel. If these units can add 4 million tonnes to their capacity and if the two public sector units increase their capacity by two to three million tonnes the growing demand for steel can be met. There will, of course, have to be a further broad-basing of the steel industry with probably a second plant in Orissa, a new plant at Bailadilla and another probably at Goa. If there is dynamic growth in agricultural and industrial production, steel consumption will have to increase by leaps and bounds and any serious shortage of this basic raw material may hold up the progress of plan schemes in many directions. The importance of proper steel planning should therefore be appreciated and with the mobilisation of required resources in rupees and foreign exchange the aggregate capacity should be stepped up substantially.

ALUMINIUM HELPS TO OVERCOME SHORTAGE IN COPPER AND ZINC

THE PRODUCTION OF non-ferrous metals has been accorded high priority in the Fourth Plan. The non-availability of strategic metals like copper, lead and zinc in the required volume can hold up the operations of vital engineering units. With a revival in economic activity there has naturally been a big increase in the demand for aluminium for manufacturing conductors, copper for fabrication of electrical equipment, zinc for galvanising purposes and lead for production of storage batteries and for soldering and other purposes.

Cutting Down Copper Imports...

So far no significant success has attended the efforts of the Central Government to raise the output of zinc and copper subsantially. For a long time copper has been produced only by one unit in the private sector and the output was static around 8,000 tonnes. Now expansion schemes are being implemented and a new refinery has also been established for producing electrolytic copper. The increase in output, even marginally, is useful at a time of rising demand. But a net decline in these imports can be effected only when the Khetri project in Rajasthan starts functioning. But recent reports suggest that it may take quite sometime for this project to take full shape—unexpected difficulties in mining have been encountered and there is also a feeling that the grade of ore is such that there will be difficulty in achieving the targeted production of 31,000 tonnes per annum. The expansion scheme of the private sector unit may, of course, fructify. Assuming that about 25,000 tonnes will be produced internally, there will be a large gap and it is hard to visualise any net reduction from the present level of imports. It will be possible to reduce the dependence on imports only if the special difficulties encountered in the execution of the Khetri project were overcome and prospecting in the Agnigundala area was carried out expeditiously and arrangements were made without delay for establishing a smelter.

Raising the Output of Zinc

The schemes to raise the output of zinc and lead have not also yielded impressive results, though the two smelters, one in the public and another in the private sector, have been producing nearly 26,300 tonnes against practically no output in 1960-61. If the mining of ore could be effected in larger quantities at Udaipur, the smelter can use its capacity fully. In the earlier stages it was stated that it could even exceed its rated output because there were accumulated quantities of zinc ore. But with the slower rate of mining and poorer recovery it has been found necessary to keep the smelter going with imported concentrates. The unit at Alwaye in the private sector is, of course, using imported zinc concentrates. There are proposals for expanding the capacity of these two smelters to 36,000 and 40,000 tonnes respectively. An old smelter at Tundoo in Bihar is to be reconditioned while there is a proposal for establishing a new smelter at Visakhapatnam for processing imported concentrates. In spite of the special emphasis laid on the development of copper and zinc mines, there may thus be no significant elimination of imports, and the weaknesses in this sector can be overcome only if there is an intensive prospecting.

Self-sufficient in Aluminium

The story relating to aluminium is, however, different. As a result of the implemention of ambitious expansion schemes by all the four units in the private sector, particularly by the two major units, the country is almost self-sufficient in regard to its requirements of aluminium. Fresh bauxite deposits have also been established enabling the location of new integrated units in these areas. In Tamil Nadu, besides the Sheveroy hills, bauxite deposits have been found in the Palani and Kodaikanal hills. With fairly high grade ore available in sizable quantities also in Bihar and Madhya Pradesh, as well as discovery of new bauxite sites in Mysore and in Karur, the aluminium industry can take care of the country's needs and step up output substantially in the coming years. A good base is also being laid so that the much higher level of consumption that may be expected to take place in the Fifth Plan can be easily met from indigenous sources.

Capacity for 1.7 Lakh Tonnes

The creditable achievement in the past two years is mainly due to the activities of three major units in the private sector though Hindustan Aluminium has stolen a march over the earlier entrants in the field—its output for 1970 can be easily 80,000 tonnes.

The second stage of the expansion scheme to raise capacity to 1.20 lakh tonnes from 80,000 tonnes will be implemented now as the necessary clearance from Government has been obtained. The management of HINDALCO does not apprehend any difficulty in raising additional resources in foreign exchange and rupee for raising capacity by 40,000 tonnes: The U.S. Ex-Im bank will be providing the necessary foreign exchange while the rupee funds will become available out of the Cooley funds.

Indian Aluminium Company Limited is the next important producer to make a significant contribution to total production. The existing smelters may be in a position to produce over 42,000 tonnes; the new smelter at Belgaum in Mysore State which was commissioned in the last quarter of 1969 will be able to raise output to rated capacity of 30,000 tonnes in the current year. As between HINDALCO and INDAL there can be an output of 150,000 tonnes and the other two units, Madras Aluminium and the Aluminium Corporation will be accounting for another 20,000 tonnes taking the total production to 1.7 lakh tonnes.

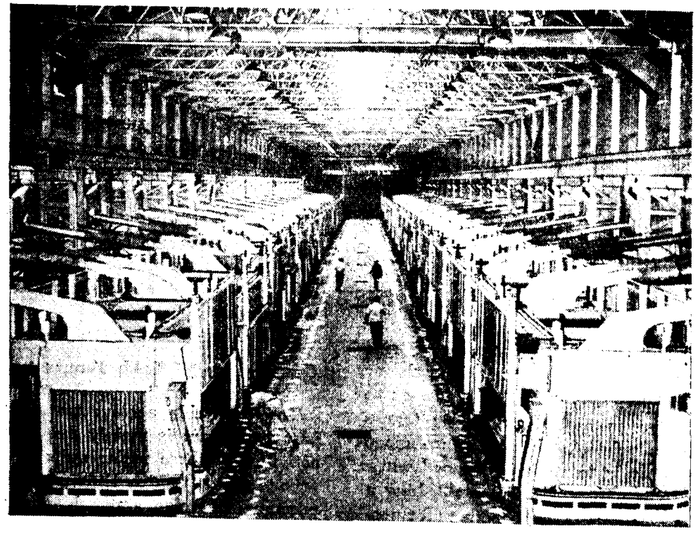
The Belgaum Complex

The Belgaum integrated complex of Indian Aluminium has been designed to have an ultimate capacity of one lakh tonnes and the chairman of the company, Mr. H. V. R. Iengar recently indicated that the government should help this basic industry to raise the output substantially. It is to be hoped that the second stage of the expansion of the Belgaum project will be taken up without avoidable delay as power will be available in plenty from Sharavathi and there will be no problem of alumina supplies. Belgaum can grow in importance like Renukoot in Uttar Pradesh. If need be the capacity of this project should be raised to 1.2 lakh tonnes or even more in the light of new developments.

The Mettur unit of Madras Aluminium Company Limited is presently engaged in implementing a scheme for raising output to 18,000 tonnes from 12,500 tonnes and thence to 25,000 tonnes. The current project is expected to be completed by the end of next year and the doubling programme may be accomplished before the current plan period. There will be no shortage of power in Tamil Nadu as new capacity is being created on a large-scale. But the management is worried about the cost of power and a further expansion of capacity may be thought of only if power could be secured on a competitive basis. The expansion programme is being completed with minimum imports as most of the equipment is being fabricated from indigenous sources.

With the completion of the expansion schemes of Hindustan Aluminium, Indian Aluminium and Madras Aluminium, the capacity of 2.3 lakh tonnes target for 1973-74 would be achieved. If the public sector project now under implementation at Korba in Madhya Pradesh also goes on stream there may not be any difficulty in raising output to meet the growing needs. The construction of the Korba unit in collaboration with Hungarian interests in the public sector is proceeding satisfactorily and it is quite likely that the smelter may go on stream in the next two or three years. This unit is designed to produce ultimately one lakh tonnes of virgin metal but initial capacity may be 30,000 tonnes. There is also a proposal for erecting another unit in the Koyna area in Maharashtra in the public sector though much progress has not been recorded in this regard so far.

With a growth in stature of aluminium producers the serious deficiency in non-ferrous metals can be overcome and the expenditure on copper can be minimised with a vigorous substitution of this with aluminium. Even in respect of zinc, there can be aluminisation of steel sheets instead of galvanization though it should not be overlooked that for some industrial applications copper and zinc cannot be displaced. The search for more copper and zinc deposits, therefore, should go on.



A view of the potroom at Indian Aluminium's new smelter

SELF-SUFFICIENCY IN COMMERCIAL EXPLOSIVES

By J. D. DADADEMERY

THE ECONOMIC PROGRESS made by a country can be judged by the extent of commercial explosives produced and used. Such an indicator can express the growing volume of mineral production, irrigation and power installations, expansion of roadways, airfields and other means of communications.

In the twenty three years since Independence, India has become practically self-sufficient in the production of commercial explosives. A very small quantity of specialised items too will, it is hoped, be produced in the country soon. Indian Detonators Limited, Hyderabad, is one of the two factories in India which produces a variety of commercial explosives. The main items of production of commercial explosives produced by IDL at its factory at Hyderabad and its High Explosives Division at Rourkela are: Detonators of various types, detonating fuse, safety fuse and P.E.T.N. (*penta erithritol tetra nitrate*) at Hyderabad and ammonium nitrate/oil based high explosives and slurries at Rourkela. For the production of detonators IDL entered into an agreement with Messrs. Komplex of Hungary, who had over a century of experience in the manufacture of detonators. Collaboration was particularly attractive in that no know-how or royalty fee was paid and all the plant and machinery were obtained against rupee payment. For purposes of setting up the factory a team of Hungarians came over to India and a team of Indians was sent to study the method of production in their factory at Hungary.

In 1965 a company was formed in India under the name SAPEIC (India) Ltd., which was licensed by SAPEIC, Geneva for manufacture of safety fuse. This company was merged with the IDL and its production commenced from July 1967. The company believes in making itself self-sufficient and to this purpose has already started manufacturing PETN, an essential chemical in the manufacture of detonators and detonating fuse. Plans are there for manufacture of styphnic acid and sodium azide. The detonating fuse which is extensively used for blasting of explosives was introduced in 1967 with Yugoslavian collaboration. In this case also the know-how was given without charge and a team of experts from Yugoslavia came over to help and set up the plant.

NONE (NUN) BUT THE BRAVE!

From gun-running to nun-running is quite a jump and the world is clucking its furry tongue over the alleged sale of girls from Kerala to European convents for training as nurses and nuns. Sensational stories about the poor girls are in circulation and I wonder what on earth is happening for heaven's sake! No smoke without fire? Mere scandal-mongering? Anyway the whole stuff makes juicy reading and let the verdict wait until the Father clears none or the nun! Time we had some scandal of international proportions and we have had none since the Profumo affair some years ago. Take away scandals from the printed media, what do you have? Mostly badly written ads. and little else.

—RANDOR GUY

Detonators of all types assembled above are only initiatory explosives and they are to be used in conjunction with high explosives, which are charged into the holes for blasting. In order, therefore, to have a complete range of explosives for massive blasting, the company started manufacturing high explosives of the slurry type at their plant at Rourkela. The know-how for this has been given by Messrs. Atlas Chemical Industries, Wilmington, USA, who are also our partners. The reason for locating this plant at Rourkela is the ready availability of the essential raw materials for the product and the proximity of the mining belt facilitating easy and quick supplies of explosives to large scale customers. The growth of the company is evident from the fact that its authorised capital rose from Rs. 30 lakhs in 1962 to Rs. 100 lakhs in 1969. The authorised capital was further increased to Rs. 300 lakhs and bonus shares of Rs. 50 lakhs were issued to the shareholders, raising the paid up capital to Rs. 150 lakhs in 1969. The company paid a 12 per cent dividend in 1968-69.

Bonus at 20 per cent of the annual gross earnings to all eligible employees has been paid since the inception of the company. The company's sales touched Rs. 381.16 lakhs in 1968-69. The first export shipment of the company was made in 1968. The company's products are being exported to United States of America, Thailand, Singapore, Philippines, Hong Kong and Iran. Exports during 1967-68 were Rs. 7.65 lakhs and during 1968-69 were Rs. 9.68 lakhs.

SUGAR INDUSTRY IN BITTER PREDICAMENT

By N. MAHALINGAM
Chairman, Sakthi Sugars Ltd., Coimbatore

In a year of glorious achievement, with the production of sugar likely to exceed 43 lakh tonnes against the previous record of 35.60 lakh tonnes, the industry is finding itself in a pathetic plight. Many mills have been obliged to continue crushing cane entailing fresh losses. The recovery in the last few months of the season is usually low and there is no prospect of selling sugar so produced because of heavy stocks. The Central and State Governments have not shown any keen awareness of the difficulties endured by the mills. They seem to believe that the rebate in excise duty to the extent of Rs. 8 per quintal, in respect of production in excess of 105 per cent of the output of 1968-69 season, and the additional rebate of Rs. 8 per quintal announced recently, for offsetting any loss sustained by sugar mills in crushing cane of poor quality in the hot months, will give the necessary relief.

The facts, however, are otherwise. The policy of partial decontrol, which was conceived as an emergency measure in 1967-68, outlived its usefulness. In that season, when sugar cultivation was not attractive and there was a diversion of acreage to other crops, high minimum prices had to be fixed. Also, as a result of high prices realised by the industry on its sale of sugar in the open market it was possible to pay to the cane growers prices which were much in excess of the minimum fixed by the Government in order to prevent a diversion of cane for production of gur and khandsari. These payments and the policy of partial decontrol were, however, helpful in preventing only a decline in the output of sugar in 1967-68 compared to 1966-67.

Early Benefits of Partial Decontrol

In 1968-69 there was a sharp increase in the output of cane. The sugar mills raised their production to 35.60 lakh tonnes from 22.17 lakh tonnes in 1967-68. There was a sharp drop in open market prices which was welcome. But the industry was compelled to pay higher prices to cane growers, hoping to make large profits. The developments after February 1969 came about in an entirely unexpected manner. The decision of the Government to levy an *ad valorem* duty of 23 per cent in place of the specific duty on quotas for levy sugar as well as for free sale seriously affected profit margin, especially because of high cane prices.

Bitter Experience in 1969-70

Sugar mills all over the country, with the exception of those in Maharashtra and Mysore, are sure to incur heavy losses in the current season perhaps as a result of the payment of high minimum prices, a sharp decline in open market prices for sugar, higher production costs and the levy of differential and higher excise duties on levy sugar and sugar for free sale. Even mills in Maharashtra and Mysore are unlikely to earn reasonable profits. Continuance of the present conditions will cause serious harm to the cultivators of cane, the shareholders and the further development of the industry.

Stocks Exceed 2 Million Tonnes

The output for the 1969-70 season is likely to exceed 43 lakh tonnes and the total consumption for the entire season would be 33/34 lakh tonnes. Exports in the first nine months were only 75,000 tonnes and the total for the whole season may not be more than 2 lakh tonnes. Thus, at the outside limit the offtake for internal consumption and exports will not be more than 36 lakh tonnes leaving 7/8 lakh tonnes to be added to the carry-over of 13.06 lakh tonnes from the last season. There will thus be heavy accumulated stocks of 2 million tonnes at the end of September this year. The stocks are now at 30 lakh tonnes.

TABLE 1

SEN FORMULA	Rs. Ps.	ACTUAL COST	Rs. Ps.
Cost of cane including taxes, and cess at 8% recovery	100.45	Cost of cane including taxes, and cess at 7.8% recovery	106.00
Manufacturing expenses	24.14	Manufacturing expenses	27.00
Return on employed capital	10.50	Interest charges on excess stocks	3.50
		Return on employed capital	10.50
	135.09		147.00

The heavy accumulation of stocks has posed serious problems in regard to payments to cane growers and cess to the State Governments, the finding of resources for holding stocks and the addition of heavy interest charges to manufacturing costs. On the basis of even a minimum price of Rs. 73.70 per tonne of cane the cost of production of an efficient mill in Tamil Nadu will work out to Rs. 147 per tonne of sugar against a price of Rs. 135.09 fixed by the Government under the Sen formula. The increase in costs is due to lower recovery and higher interest charges. Only a small rise in manufacturing expenses has been assumed though an element of Rs. 2 per quintal has been included for purpose of rehabilitation. This will be clear from the details given in table 1.

In Tamil Nadu, it is assumed that a sugar mill having a crushing capacity of 1,800/2,000 tonnes daily will be able to handle 4.5 lakh tonnes of cane in a season. The interest charges have been calculated in respect of excess stocks. Allowing for the maintenance of base stocks of about 8 lakh tonnes, the actual burden of interest charges will be very much more than the figure indicated above. Due to the inability or refusal of the banking system to extend enough credit against the accumulated stocks of sugar, many mills have been obliged to borrow from outside sources or accept deposits at higher interest rates. With the slump in open market prices for sugar and the levy of a differential *ad valorem* excise duty of 37½ per cent, the producers in Tamil Nadu and elsewhere have been able to realise only a net amount of Rs. 125 per quintal after payment of the excise duty as the open market wholesale price is only around Rs. 175 per tonne. There is thus a loss of Rs. 10 per quintal or Rs. 100 per tonne, which in the case of the typical mill referred to above will result in an aggregate loss of Rs. 11.5 lakhs.

Thus even under the most favourable conditions the net profit, after depreciation and before taxation, on an output of 36,000 tonnes of sugar cannot be more than Rs 26 lakhs. If allowance was made for interest charges on excess stocks gross profits will come down to Rs. 13 lakhs. If it is borne in mind that a loss in profit margin of Rs. 5.50 per quintal (excluding interest charges) is being sustained even on levy sugar, there will be a residual loss of Rs. 6 lakhs. This loss will be more pronounced where the average recovery has come down to 7.5 per cent. It should, therefore, be crystal clear that even with a record output, the different units in Tamil Nadu will be either barely recovering their depreciation charges or incurring heavy losses.

Need for Buffer Stocks

Thus, the Government has to take a quick decision on the question of creating buffer stocks for at least one million tonnes for relieving the industry of the burden of maintaining huge stocks. There will then be a reduction in costs by Rs. 3.50 per quintal because of a saving in interest charges.

Subsidising Exports

In order to prevent a deterioration in the quality of stocks and avoid waste in storage, it would be advisable to step up exports to atleast 5 lakh tonnes through an effective scheme of subsidies. The total foreign exchange earning will be Rs. 36-40 crores. The Exchequer should not have any difficulty in meeting the loss on exports as, on its own reckoning, the proceeds from the basic excise duty on sugar in 1970-71 will be nearly Rs. 100 crores against only *Rs. 55.10 crores in 1960-61*. The estimates for the current financial year, however, are very much on the low side. With the anticipated increase in consumption to 33 lakh tonnes, the receipts can be easily Rs. 110 crores. Even if the subsidy was fully borne by the Government, it would still be realising its estimates of revenue for 1970-71

Change in Supply Position

The decision of the Government to establish State zones and even bifurcate Uttar Pradesh for fixing levy prices for sugar was taken to concede the demands of mills in Tamil Nadu so as to compensate them for the lower recovery of sugar. At present, the State Governments are refusing to lift fully the allotted quotas as a result of the serious disadvantage arising out of heavy freight charges for disposing the huge surplus. There has been a fundamental change in the supply situation. The Maharashtra and Mysore mills are in a position to sell the quotas for free sale at much lower levels. It has so happened in Tamil Nadu that free sale quotas have been sold at a loss while quotas for levy sugar have not been fully lifted. This is estimated roughly at 25 per cent. Some part of the quotas have lapsed and will have to be released again in later months. The increase in stocks of Tamil Nadu mills will be more pronounced than for those in other regions.

Cane Price Policy Needs Revision

If minimum prices can be fixed on the basis of a recovery of 8 per cent, the handicap experienced by mills, particularly in Tamil Nadu, will be removed while those in Uttar Pradesh and other places will not suffer any disability. This will be an important step to eliminate the anomalies in the cost structure now in evidence; suitable adjustments in the excise duty can be effected to compensate for increases in costs, interest charges and wages. This may not come to more than Rs. 8 per quintal.

Modifying the Decontrol System

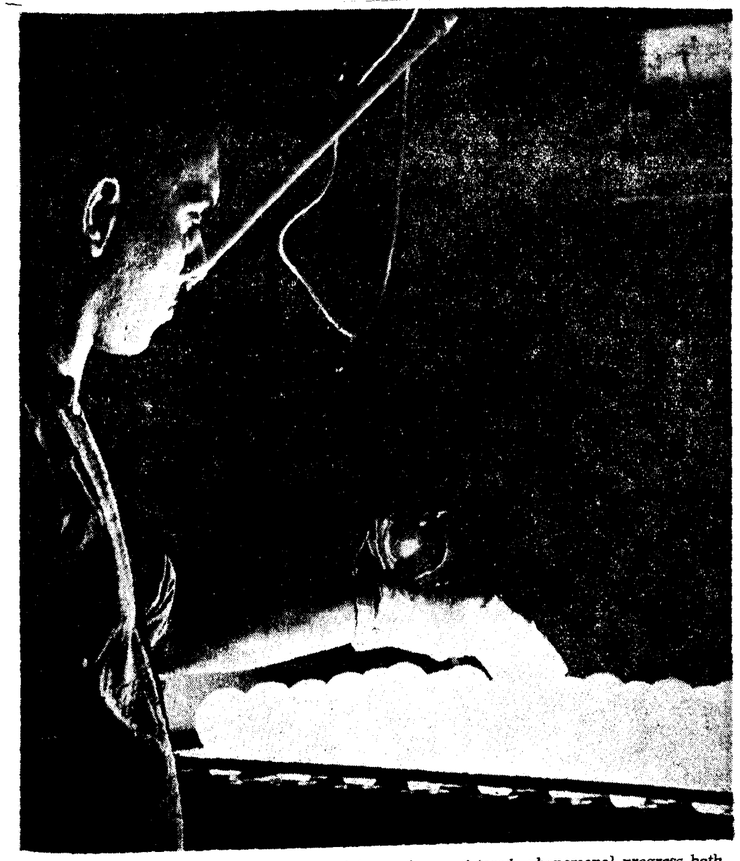
It is necessary to modify the system of partial decontrol. There could be regular releases out of current production and accumulated stocks while mills should be free to dispose of their quotas anywhere in the country as only then the marketing of large quantities of sugar can be briskly effeced and consumption stimulated with the adoption of new techniques. If there is a tendency for prices for sugar in the open market to rise, as a result of decontrol, the Government can release additional quantities and bring down prices.

Hundred Million Lamps a Year....

By V. RAMAMRUTHAM

Marketing Director, Philips India Ltd., Bombay

THE ELECTRIC LAMP industry is one of the oldest in our country having commenced production 38 years ago. Starting with the production of general lighting service lamps upto 100 W. at its inception, the industry has not only reached the stage of near-complete integration with all the components being manufactured indigenously, but has also achieved a high degree of diversification in the range of lamps manufactured.



In the last two decades production of lamps has registered phenomenal progress both in quantity and range. Picture shows the final inspection of incandescent lamps at the factory of Philips India Limited

Remarkable Growth

After the Second World War, the Indian Electric Lamp industry was composed of 9 units with an aggregate capacity of 13 million GLS lamps, and the total production in the country was only 8.1 millions. From this meagre start, we have come a long way and there has been a remarkable growth of the industry during the past three decades as will be seen from the fact that by the end of 1968, 17 units with an aggregate capacity of 92 million produced 89 million lamps. It is estimated that production of lamps would have crossed the 100 million mark in 1969.

According to the Fourth Plan estimates, the aggregate demand for lamps is expected to be about 200 million by 1974-75, taking into account the extensive rural electrification that has been planned. In addition to general lighting service lamps, the industry is producing all types of special lamps such as Pigmy, Candle, Night, Colour decoration and High Wattage lamps, Miniature lamps, Flourescent lamps and Mercury Vapour lamps. The production of fluorescent lamps started in 1952 with one unit only and by the end of 1968, eight units with a total capacity of 10 millions produced 8.5 million pieces. In another four to five years, it is expected to reach the level of 20 million pieces, being the estimated requirement of the country by that time. The phenomenal growth of the production of fluorescent lamps in the country can be gauged from the fact that from a quantity of only eighty thousand pieces

in 1952, production rose to 1.89 millions in 1961, 3 millions in 1965 and in 1969 it has crossed the 10 million mark.

Miniature Lamps Manufacture

Miniature lamps were taken up for production in the country in 1953. The other small series of decoration lamps, for torches, motor cars, radio panels as well as photoflash, neon lamps and other small series of decoration lamps etc. From a level of about 1.72 million lamps in 1953, production of miniature lamps has gone upto 39 millions in 1969. The latest addition to the diversification efforts of the industry is High Pressure Mercury Vapour lamps, the production of which commenced in 1963. Production is now estimated to be in the level of about 1.5 lakhs, although the demand in the country is for a substantially larger quantity.

Large and Small Units

Due to this diversified indigenous production, imports of lamps have sharply declined and are now confined only to a few types of specialised lamps which are not produced in the country and which are required for special applications. One of the most noteworthy features of the lamp industry is the complementary roles that are being played by the large scale organised units and the small scale units. While certain types of lamps meant for mass consumption and application are produced in highly sophisticated automatic machinery by the large units, the small units are mainly engaged in the production of small series of the types of lamps which have a limited demand and are therefore suitable for a higher degree of manual operation. As the demand for these particular types grows and reaches a volume which will justify production in automatic machines, these types are being taken up by large units, resulting in a lowering of costs and a greater degree of integration.

Integrated Production

The manufacture of components for the lamp industry can be said to have begun almost with the commencement of production of lamps. This started with the production of glass shells to a limited extent and later on covered the production of lamp caps as well. However, the real integration in the field of manufacture of components started by about 1964 with the commencement of production, on a large scale, of tungsten filaments and wires for lamps. With this important step, the import content of lamp has been considerably reduced. During 1966, the production of glass tubing commenced, thus bringing down the import content still further. Other components such as Molybdenum wire and Lead-in-Wire for lamps are also under production in the country and with the attempts of a few of the larger units to set up production facilities for coils and lead-in-wires to meet their own requirements, it will be seen that there is an ever increasing vigilance on the part of the industry to reduce the import content of the lamp. In the process of import substitution, there have been efforts for replacement of scarce raw materials such as brass and mention should be made of the wide use of aluminium which has almost replaced brass in the manufacture of lamp caps.

Great care has to be attached to the final product in any mass production method. Picture shows the inspection of coils for lamps

Reduction of Imports

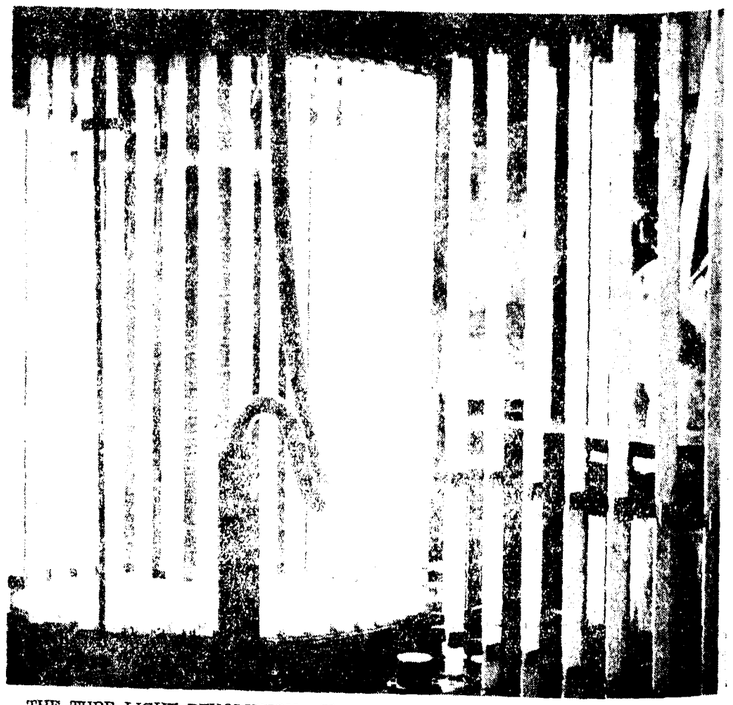
Even in respect of Fluorescent lamps which use a relatively higher proportion of imported components, the dependence on imports has been considerably reduced by the regular local production of such raw materials as Fluorescent Powder, Caps, Filaments and Lead-in-Wires. Thus, it would be seen that the process of integration is growing and it is hoped that the benefit of this integration activity can be extended to other types of lamps as well. In the field of Mercury Vapour Lamp manufacture, the local production of Quartz Discharge Tubes required for these lamps has considerably reduced the import content of these lamps.

Growing Need for Accessories

With the increase in the production of types as well as quantities, there is a growing need for proper accessories for the effective and economic utilisation of lamps. The G.L.S. lamp itself requires such accessories as switches and lampholders and other wiring materials. The advent of Fluorescent and Mercury Vapour Lamps brought with it the accessories industry. Ballasts and starters are essential components for the operation of these highly efficient and modern light sources. The manufacture of accessories such as starters, glowswitches for starters, ballasts, capacitors and lamp and starterholders are being carried out by about eight organised units. Both large and medium scale units are engaged in this activity with the small scale units also playing a significant role.

Exporting Lamps

Mention should be made here of the efforts made by the lamp industry in the field of exports as its contribution to the earning of foreign exchange of the country. Lamps and a certain amount of accessories are already being exported for the past several years. Exports have, in the past, been mainly to Iran, Iraq, Kuwait, Malaysia, South Vietnam and Nepal. Recent experience has shown that there exists an export market for the products of the lamp and lighting industry not only in the countries mentioned above, but also in the middle East countries and even in Europe and Australia. It may be mentioned here that lamp is an article which is highly "brand-oriented" in international markets and it therefore stands to reason that in view of the preference of customers for brands, those who have built up their brand-image in international markets over the past years have a much greater scope in the export field than new entrants.



THE TUBE LIGHT REVOLUTION: The production of fluorescent lamps started only in 1952. In 1968 over 8.5 million pieces were produced in the country. Picture shows the testing of 'TL' fluorescent lamps at the Philips Light Factory at Kalwa, Bombay

Plastics Industry in India—A Perspective

By S. RAMASWAMY

General Manager, Chemicals & Plastics India Ltd., Madras-2

AN INFANT IN the 'sixties and an adolescent in the 'seventies--that is the profile of the plastics industry in India. A survey of the recent developments in the industry, existing and estimated market demands and an extrapolation of the rate of growth reveals a promising trend for the plastics industry in the years to come.

A Post-war Development

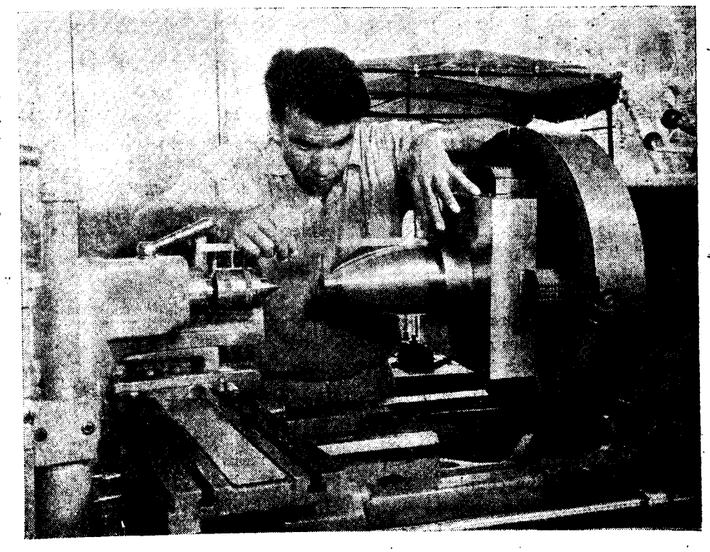
The growth of plastics industry in India is essentially a post-war development. One of the fast growing fields in the industrial structure, the plastics industry occupies a prominent position in the programme for the industrial development of the country. To illustrate, the demand of Polyethylene in 1953 was 180 tonnes and it increased to nearly 10,000 tonnes in 1962. The demand for PVC also increased in almost similar proportions. The total production of different varieties of plastics was of the order of 90,000 tonnes in 1969. This was indeed far short of the requirements and had to be supplemented through imports, which, inspite of its being necessarily on a restricted basis, was to the extent of 40,000 tonnes. These figures provide an indication of the growing popularity and importance of the plastics industry. The range and availability of plastics have expanded and would continue to widen. The production of plastics by the end of Fourth Plan is expected to be of the order of 2,40,000 tonnes.

Major Break-through

The 'sixties have witnessed a major break-through, especially with respect to production of thermoplastics. Of the three major thermoplastics, namely Polyethylene, Polyvinylchloride and Polystyrene, PVC whose production was started as late as 1961 shows the maximum rate of growth.

The plastics consumption in India has increased substantially during the last decade. It has increased very rapidly at the rate of 23 per cent per year. In spite of this rapid growth the plastics consumption is still small on a per-capita basis. It is now less than 0.1 kg. as compared to 29.5 kgs. in U.S.A., 32.8 kgs. in Germany and 16.7 kgs. in Japan. These figures indicate the potential for accelerated growth in the coming years.

The following table depicts a sevenfold rise in the consumption of ma-



The plastics industry has recorded a phenomenal rate of progress, especially during the 'sixties. Much more dynamic growth is in store in the coming years. A specialised institution, the Central Institute of Plastics Engineering & Tools has been set up by the Government of India with assistance from the UNDP and ILO to impart training in designing and moulding with plastics raw materials and also for making intricate toolings for the preparation of moulds. Picture shows the preparation of the mould for a fan canopy at the CIPET

jor thermoplastics over the last decade:

Seven-fold Rise in consumption

Year	Consumption (in tonnes)
1960 ..	10,800
1961 ..	16,700
1962 ..	20,000
1963 ..	21,959
1964 ..	27,580
1965 ..	36,270
1966 ..	35,912
1967 ..	39,943
1968 ..	73,421
1969 ..	72,667

The plastics industry is developing now and it does have a bright future. Plastics has now become a household word and plastic products with their superior appearance and properties vis-a-vis conventional products have made great inroads in the consumer market. Plastics have found application in practically all industries especially electrical, pharmaceutical and building; plastic pipes have now been approved for potable water supply.

Plastics Machinery

Plastics machinery production too did not lag far behind and the processing machinery and equipment in particular witnessed great progress. Blow moulding machines and standard type high capacity injection moulding machines were in great demand. Machines for the manufacture of high density polyethylene woven sacks and also rigid P.V.C. thin film are now being produced in the country. Experiments are also being made to produce flexible P.V.C. blown film for packaging purposes. However, much is to be done in respect of fostering the growth of plastic machinery production and the production of articles of commerce in the down-stream units, which must go hand-in-hand with that of the raw materials sector.

Plastics for Agriculture

Among the low income urban group, plastics are becoming increasingly popular and this sector of the market is expected to grow in geometrical proportions. Another virgin sector awaiting to be exploited is the rural market—both for consumer goods as well as for equipments and ancilliaries that will help increase agricultural production. Price is a very important factor here and to the farmer every paisa spent on something new must justify itself by a manifold return. Credit is also a problem, but if the sale of plastics, implements and ancilliaries is linked up with the sale of fertilizers, improved seeds and pesticides, there is no reason why their use should not spur, bringing gains to the national economy in the shape of increased food production. Plastics have also made deep inroads into such markets as lining materials and piping.

Moderate Progress

The progress of the Indian plastics industry has been moderate so far. In 1967, 16,000 tonnes of Polyethylene was consumed. In this quantity, 65 per cent was used for making films and sheets, 15 per cent for moulding, 8 per cent for pipes, 2 per cent for cables insulation, 3 per cent for bottles and the rest for other items. P.V.C footwear demand is continuously increasing. P.V.C. is also being used increasingly for producing sheets, films, pipes, toys, leather-cloth, etc. Polystyrene is being used for the production of household goods, light fittings, combs, toys, packaging material, etc. There are nine principal units in India producing about 3,000 tonnes of plastic pipes.

It is worth noting that India exported during 1968-69, plastics materials worth 1.27 crores and this figure is expected to improve substantially in the coming years.

Capital Investment

The estimated capital investment in the plastics raw material sector totalled Rs. 800 million, and in the processing sector Rs. 250 million. The plastics industry provides gainful employment to about 1,00,000 persons. There are about 1,800 small scale plastics processing units in the country and this number is growing every year. In an effort to encourage the growth of the small scale processing sector, the Government have reserved production of the following plastic products exclusively for this sector—bottle caps, buttons, lampshades, rods, tubes, polyethylene films (of less than 0.10 millimeter thickness) and bags made from them, containers, spectacle frames, fountain pens, P.V.C. material for shoes, etc.

INDIAN PLASTICS—DEMAND ESTIMATES AND CAPACITY TARGETS

(In tonnes)

	Demand 1968-69	Demand 1973-74	Capacity 1973-74
P.F. moulding powder ..	4,000	7,000	8,750
U.F. moulding powder ..	1,800	4,000	5,000
U.F. resins ..	5,500	8,800	10,000
Phenolic resins ..	4,000	8,500	10,000
Polyester resins ..	300	1,200	1,500
Melamine resins ..	350	1,200	1,500
LDPE ..	25,000	65,000	81,250
HDPE ..	5,000	20,000	25,000
Polystyrene ..	8,000	25,000	31,250
Polystyrene foam ..	700	2,500	3,125
P.V.C. resin ..	20,000	60,000	75,000
Polyurethane foam ..	500	2,500	3,125
Polyvinyl acetate ..	3,000	5,000	6,250
Polypropylene ..	1,500	7,500	8,760
Acrylics ..	2,500	5,000	6,250

Low Cost Plastics Raw Materials

The main feature of the 'seventies will be the Government's emphasis more on the production of low cost plastics raw materials from petrochemicals. The plastics industry has builtup a fairly stable indigenous base, with the production of more and more of the raw materials domestically.

To achieve the production level of 2,35,000 tonnes by 1973-74, the capacity target should be at least 20 per cent more than the anticipated demand; such a demand which will be around 3,00,000 tonnes, will have the break-up shown in the Table on p. 78.

Planning for the petrochemicals in the Fourth Plan envisages sustained growth during the next five years. The expected availability of some of the major thermoplastics by 1973-74 is estimated as follows:

Name of the material	Availability by 1973-74
Low Density Polyethylene ..	70,000 tonnes
High Density „ ..	30,000 „
Polyvinylchloride ..	90,000 „
Polystyrene ..	30,000 „
Polypropylene ..	15,000 to 30,000 tonnes
Total ..	2,35,000 to 2,50,000 tonnes

Marketing Plastic Goods

Besides, other plastic raw materials like methyl methacrylate, styrene copolymers, nylon, etc. are also likely to be available in limited quantities for specialised uses. Thus, it will be seen that the availability of plastic raw materials will increase quite rapidly and the plastic processing industry will have to increase its processing capacity substantially, process these raw materials and find market for plastic articles and goods to about 3 to 4 times the present level.

The increase in the processing capacity would give opportunities for starting a number of new units in the small and medium sector. With the dispersal of industry, job opportunities will be thus available in many areas. For the speedy implementation of the above programme, we will have to plan for a comprehensive programme of plastics processing machinery designing, fabrication and mould manufacture.

CEMENT INDUSTRY SHOULD GROW FAST TO MEET RISING DEMAND

THE OUTLOOK FOR the cement industry has so changed in the past one year that it has put into shade all the heated discussion of early last year about the emergence of surplus in cement production and the desirability of lifting all controls over distribution and prices. For quite sometime it has been argued that the freight pool should be abolished and the cement producers should be allowed to fix the prices they liked after supplying to the Government departments and other designated priority consumers their requirements at a stipulated price. The Government had very nearly taken a decision about the abolition of the freight pool and the lifting of "control" over prices. But vigorous representations from the Punjab, Assam and Tamil Nadu Governments compelled the Government to review its decision.

The willingness of the Government to continue the old arrangement and watch the situation has proved to be sensible. Later events have clearly indicated, that but for equitable supply to all consumers in the country, consumers in the deficit areas would have been held to ransom by those who had cement stocks. Luckily the implementation of expansion and of taking up new schemes by Associated Cement Companies, India Cements, Digvijay Cements, Mysore Cement Co., and others were helpful and the industry is now in a position to meet the needs of the market though it will be difficult to predict the position two, there years hence.

Increased Demand

There had been a sudden increase in demand in 1969 with a revival in economic activity and a larger outlay on Plan schemes. The newly created capacity could thus be effectively utilised. There was a jump in production by 2.2 million tonnes to 13.58 million tonnes while in 1968 the increase in output was of the order of only 1.1 million tonnes. In the current year there may be a further increase in demand by 2.5 million tonnes taking the

STATEWISE DISTRIBUTION OF CAPACITY AND PRODUCTION

(in lakh tonnes)

State	Cement Output		Installed capacity as on 31st March 1970
	1968	1969	
Southern Region			
Tamil Nadu	19.84	22.39	27.29
Andhra Pradesh	11.45	13.69	17.06
Mysore	10.13	12.79	16.99
Kerala	0.37	0.43	0.51
	41.79	49.30	61.85
Western Region			
Maharashtra	1.33	1.60	2.00
Madhya Pradesh	16.12	20.08	26.66
Gujarat	15.04	16.80	20.78
	32.49	38.48	49.44
Eastern Region			
Assam	0.62	0.69	0.83
Bihar	15.95	16.89	20.89
Orissa	5.92	6.55	8.22
West Bengal	—	—	—
	22.49	24.13	29.94
Northern Region			
Rajasthan	13.57	14.72	16.80
Uttar Pradesh	3.45	3.91	6.74
Haryana	5.12	5.22	4.93
Himachal Pradesh	..	—	—
	22.14	23.85	28.47
Grand total	118.91	135.76	169.70

total to 16.1 million tonnes. The rated capacity in March this year was nearly 17 million tonnes and it is expected that there will be a further addition to capacity by half a million tonnes by the end of this year taking the total to 17.5 million tonnes. The industry will have to operate at 95 per cent of capacity if the growing demand is to be fully met. This might be difficult at a time when several plants are in varying stages of construction and some kilns have just been newly commissioned.

The opponents of the freight pool have been completely falsified and the Central Government has been frantically sending instructions to the units in the surplus areas to despatch large quantities of cement to the northern and eastern regions, particularly the northern region. For the next two or three years there is no escape from meeting the requirements of the northern and the eastern regions from the south and there will, probably, have to be an increase in the weighted average of freight charges for overcoming the losses that are now being incurred by the equalisation fund. This aspect of the question is being considered by the Government and it is expected that there will be an increase in cement prices by about Rs. 5 per tonne so that cement can be made available to all consumers on a uniform basis.

South Dominant Producer

The southern region has been a dominant producer and is now accounting for 36.4 per cent of total capacity with Tamil Nadu being the biggest producer for the whole country. The southern region can produce about 5.5 million tonnes in the current year and spare 1.5 million tonnes for other regions. If it became necessary even 2 million tonnes can be exported as one million tonnes of fresh capacity will be created within a short period. It is this surplus of two million tonnes that has been the subject of bitter fight between the producers in the deficit areas and those in the surplus areas.

It has been emphasised by those opposed to the freight pool that colossal sums have been spent on the movement of cement and the industry is not being developed properly because of the continuance of the freight pool. It is true that, annually, about Rs. 10 crores is being spent by way of additional freight charges for moving the surplus cement. But this works out to only about two per cent of the end price to the consumer. As it is likely that there will be a further increase in aggregate production in the western region and northern region, the load in freight charges as a result of the movement of cement over long distances will be even less. This is because the surplus from the southern region is unlikely to increase even with a higher level of output. Tamil Nadu

alone will be able to produce three million tonnes after sometime when the expansion schemes of India Cements, Chettinad Cement Corporation and the second unit of the State-owned unit, Tamilnad Cements at Alangulam, are completed.

Spurt in Consumption

With the new emphasis on residential house-building and the anxiety of the planners to increase the tempo of expenditure in the industrial sector for meeting a growing demand for consumer and durable goods, there will be a sharp spurt in cement consumption by 1973-74 to over 22 million tonnes. This would mean that there should be an installed capacity of atleast 25 million tonnes and even with the implementation of the remaining schemes a capacity of not more than 18.5 million tonnes may be achieved.

It is, therefore, necessary to review the whole situation and decide on what lines further development of the industry should take place. The souhern region need not be worried about its surplus after 1971 as regional demand would have grown up to the level of regional production. The established units in this area are not prepared to embark on fresh expansion schemes unless it was known that there would not be a recurrence of the developments of 1969 and the Government also would adopt a helpful attitude. Unfortunately, even with the revisions in prices and the continuance of the freight pool, fresh investment is not worthwhile. As in the case of the paper industry, a peculiar situation has arisen in which entirely new units cannot be promoted and existing producers also are not keen to embark on new projects in spite of the fact that the demand will increase significantly over a period.

While investment is shy, demand for cement is likely to go up to 33 million tonnes in 1978-79 and 50 million tonnes in 1983-84, if the present consumption trend continues. Even if the proportion of southern region is kept at 25 per cent, there will have to be an installed capacity of 9 million tonnes by 1978-79 which would mean that capacity will have to increase by about 50 per cent from the existing level. But, having regard to the large limestone deposits in this region and the compulsion to create additional capacity for meeting the needs of the western region, the south may have to create additional capacity for 3.8 million tonnes in the next 8 years.

The talk about unbalanced development is meaningless when huge capacity is to be created. There should be dispersed development. But concentration in some regions is unavoidable due to natural factors. What is needed, however, is the adoption of a policy in regard to price fixation as is being done in the case of steel and petroleum products.

MAN-MADE FIBRES MORE IN DEMAND

By C. VEERARAGHAVAN

SIGNIFICANT CHANGES ARE taking place in India's textile industry which is governed by the ever-changing demand for more and more man-made fibre fabrics—pure and blended. Keeping in step with the changing fashions in and outside the country, Indians have shown marked preference for wash and wear and similar fabrics. India imports every year about Rs. 900 million worth of cotton. The import bill would have been much larger, had not a large number of mills started using man-made fibres like rayon staple, nylon and polyester fibre for blending purposes in response to a growing demand for blended fabrics.

Investment in Excess of Rs. 250 Crores

From a small beginning in 1950, the man-made fibre industry has become one of the important and essential industries of the country. More than Rs. 2,500 million have been invested in the industry and it employs directly 40,000 persons including 3,500 graduates in various branches of engineering, science and commerce and indirectly several times more in other industries and trade engaged in converting man-made fibres into finished products and marketing. Currently the annual rate of production of man-made fibres is approximately 135,000 tonnes, comprising 120,000 tonnes cellulosic and 15,000 tonnes of non-cellulosic or synthetic fibres.

Today there are 8 units producing rayon filament yarn, with a total production capacity of 36,000 tonnes per annum, 3 nylon tyre cord plants with a total capacity of 19,800 tonnes per annum, 2 rayon staple fibre producing units with a capacity of 64,000 tonnes per annum, one acetate filament and staple producing unit with a capacity of 5,700 tonnes per annum, and one polyester fibre producing unit with a capacity of 4,700 tonnes per annum and a nylon producing unit with a capacity of 5,700 tonnes per annum. Production of nylon tyre and acrylic fibre has also started in the country.

Gwalior Rayon is at present producing about 65,000 tonnes of rayon grade pulp per year using bamboo, eucalyptus and other suitable wood as the main raw materials. Another plant with a capacity of about 36,000 tonnes per year is being set up in Mysore and is expected to go into commercial production by the end of 1971.

South India Viscose, who are also manufacturing staple fibre, have also set up a pulp plant which had just gone into production. This plant is expected to produce about 21,500 tonnes of rayon grade pulp per year. Two or three rayon filament yarn manufacturers are also planning to set up their pulp plants so that they do not have to depend on import of their basic raw material.

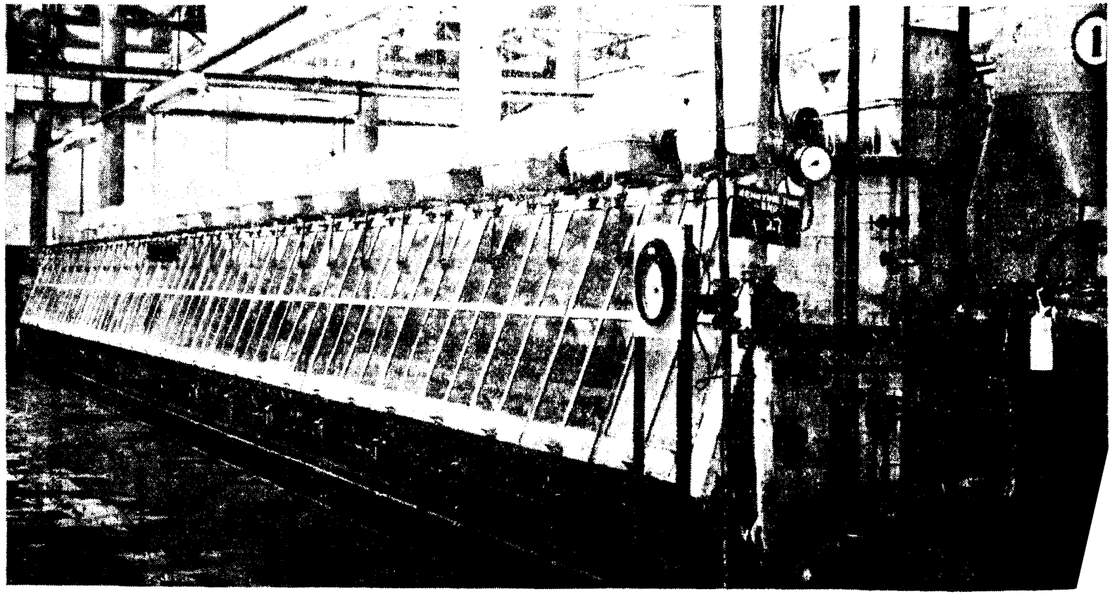
With the setting up and rapidly expanding petro-chemicals units, the availability of synthetic fibres will ease considerably.

For the production of 13,000 tonnes of synthetic fibres last year the main raw materials, caprolactum and DMT were imported at about a cost of about Rs. 80 to 90 million. The Gujarat State Fertilisers Co. Ltd., has a plan to set up a plant for the manufacture of about 20,000 tonnes of caprolactum sufficient for the manufacture of about 17,000 tonnes of nylon. Perhaps this plant may go into operation towards the end of the Fourth Plan (1973-74). The Petro-Chemical Corporation India Ltd. is setting up a plant for the production of about 24,000 tonnes D.M.T. sufficient to make about 22,000 tonnes of polyester fibre, which is expected to go into operation towards the end of the year 1972.

Meeting the Demand for Mixed Fabrics

A large number of mills have started using man-made fibres like rayon staple, nylon and polyester fibre for blending purposes in response to the growing demand for mixed fabrics. The most popular blend is with cotton or viscose 33 per cent and polyester 67 per cent. Polyester wool blend has also become quite popular in India. More than 50 per cent of the Indian woollen industry's exports of woollen cloth are of polyester woollen blended fabrics. The woollen industry of India consumes 3 million lbs. of polyester fibre, amounting to almost 30 per cent of the indigenous production of the fibre in the country.

The man-made fibre industry in India has a bright future ahead of it. There are as many as 103,000 powerlooms with a production capacity of more than 1,000 million metres of man-made fabrics. In the next five years, an additional 40,000 powerlooms have been programmed to be brought into existence. There are nearly 40,000 handlooms using man-made fibres. The man-made fibre industry will thus have a vast scope of development.

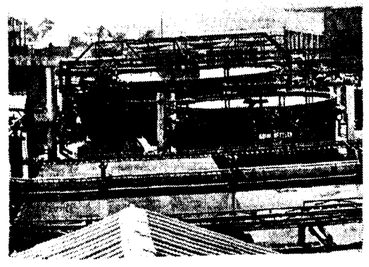


A view of the Rayon Spinning Machine at the factory of South India Viscose Ltd., at Sirumugai, Tamil Nadu. The wood pulp project of S.I. Viscose, set up at a cost of Rs. 12.6 crores was inaugurated during December 1969

A BREAKTHROUGH IN EXPORTS OF INORGANIC CHEMICALS

Caustic Soda Plant

Administrative Office



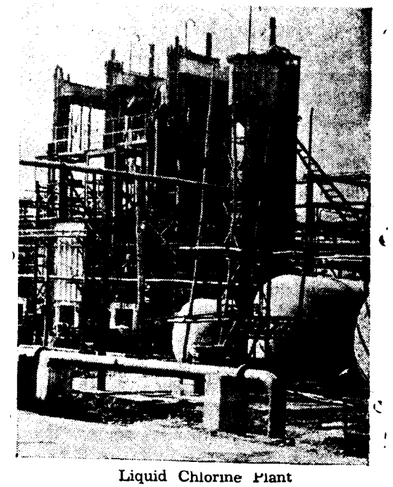
Caustic Potash Plant

IN THE SHORT span of three years of their existence, the Chemicals Division of Standard Mills have ushered in an era of promise in the field of inorganic chemicals exports. They are currently exporting caustic soda, caustic potash and hydrochloric acid to UAR, Indonesia, Australia, Tanzania, Uganda, Kenya, Kuwait, Ceylon, Mauritius and Hong Kong. They have further on hand enquiries from over 20 countries including USA, West Germany, Japan, U.K. and Canada.

The Chemicals Division of Standard Mills, established in 1967, produces at present a number of basic inorganic chemicals such as caustic soda, caustic potash, potassium carbonate, chlorine, hydrochloric acid and a plan of introducing a few chlorinated hydro carbons. Ethyl chloride has already been introduced in the market, which will be followed by carbon tetrachloride and chloroform. These products are obtained from an integrated complex of production facilities with the most recent technology.

Standard Mills, though essentially conceived of as an import substitution unit, has paved the way for a new highlight in India's efforts to augment exports. In 1969, which was their first year of exports, their total exports of all chemicals was valued at Rs. 1,40,276 or about $ 18,700. In the first half of 1970 alone, their exports have reached $ 90,000 primarily consisting of caustic soda. Standard Mills are also planning to export caustic potash and ethyl chloride, apart from indirect exports of hydrochloric acid through Chemco Supply Corporation.

Experiments in Progress



Liquid Chlorine Plant

TRANSPORT SIGHTS OF INDIAN PLANNING

OVER THE FOURTH PLAN period traffic on the roads is expected to increase by 44 billion passenger kilometres against 34 billions on the railways. The total provision for road development in the Central and State sectors for the five year period is Rs. 829 crores. Compare this with £ 1,600 million which the United Kingdom proposes to spend on its 2,000 miles of roadways and the inadequacy of the allocation for a country of India's size with 24,000 kilometres of roadways will become immediately obvious. The central schemes which are to be covered by this modest allocation are as follows:

It is common knowledge that, of the total 24,000 kilometres of national highways, about two-thirds have single lane width and work is yet to be commenced on 400 kilometres of missing links and on 17 missing road bridges. Another slant on the road map made available by the road transport industry indicates that since the commencement of the First Plan 600,000 kilometres of roads have been added to the road system comprising 1,89,164 kms. of surfaced roads and 4,29,079 kms. of unsurfaced roads Though this apparently indicates progress, it falls far short of needs especially because a completely connected national highway system is yet to emerge since, apart from missing links, most of the culverts are weak, a good number of major bridges require to be further strengthened and the State and district roads, which form an integral part of the national road network are naturally poorer than national highways. To quote a transport expert: "Narrow and bumpy, often flooded during the monsoon, they are severely limited in load-carrying capacity and permissible speed. And on the vastly larger net work of village access roads, conditions are generally so poor that motor traffic is impossible."

Facing a Formidable Task

The Fourth Plan document shows complete awareness of the formidable task ahead. Its stress is understandably on seeking to chart the maximum that can be achieved with the minimum of allocation—minimum set by financial constraint—that is proposed to be made available in the next quinquennium. Besides completion of works in progress, priority is to be given to removal of deficiencies in the existing road system such as missing links, unbridged river crossings and improvement of low grade sections. Provision has also been made for reconstruction of weak bridges and widening of roads. The plan programmes to strengthen the road system in and around metropolitan cities, industrial and mining areas and hilly and backward regions. In physical terms, all this will mean an increase in the length of surfaced roads to 367,000 kilometres from 317,000 kilometres between now and 1973-74.

Rural Roads Programme

The Achilles' heel of Indian road system is rural roads. There has been so much talk about the success of the green revolution, though conservative opinion will not concede that the new farm strategy has achieved anything more than a marked pick-up in production in particular agricultural pockets scattered all over the country. Be that as it may, there can still be no denying the spurt in production in crucial farming areas which, by a process of natural emulation coupled with external inducements stemming from the new agricultural policy of the government, would soon make for higher yields and higher levels of agricultural production, in yet larger acreages than have been benefited at present. If the fruits of such prosperity are to be effectively garnered, special attention has to be paid to improving the condition of rural roads linking villages to their markets, roads which, at present, are mud patches washed out after every monsoon. In recognition of the urgency of the problem, a special study of rural roads was made by the Sinha Committee whose recommendations have been forwarded to the State Governments in whose jurisdiction this subject lies. Of course, quite long ago State Governments have agreed that 25 per cent of their road plan allocations should be reserved for construction and betterment of rural roads. There has yet been considerable lacunae in policy inasmuch as there is little co-ordination among the diverse agencies connected with the road plan, selection of projects has not been on the basis of predetermined principles sinning as it does by "*ad hocism*" and there is no guarantee that funds allotted for road construction would not be diverted to other purposes. All the while there is loud talk about the employment-oriented bias of road construction. From President Giri who, in his "Jobs for the Millions" spoke about the employment potential of this programme down to the policy-maker in the middle-bureaucratic level, everyone has been stressing how part of the unemployment of engineers can be rectified by inducting their services to rural and urban road building. But the problem is that the gap between realisation of potential and action to activise it has mostly remained unbridged.

Financial Disability

The most besetting disability of road development is finance. From plan to plan allocations have been increasing. The figures for the First, Second, Third and Fourth Plans are respectively Rs. 134 crores, Rs. 245 crores, Rs. 445 crores and Rs. 829 crores. As compared to total investment in the public sector, the percentage has gone down to 5.5 per cent in the current Plan from 8.6 in the First Plan. As a proportion of net national output, the performance is much more discouraging, being among the lowest in the world. According to a representative of the road transport industry, against Rs. 65 crores which we ought to spend on road building, the amount spent in 1969-70 was Rs. 14.15 crores and the budget estimate for 1970-71 is Rs. 25.62 crores. Even Government spokesmen have conceded that we would require about Rs. 1,600 crores for a proper road plan for the current five year period. But their contention is that in this case as in all similar cases, if

TABLE 1
CENTRAL ROAD SCHEMES

(Rs. crores)

Sl. No.	Item	Carry over schemes	New schemes	Total
1.	Improvement to existing national highways	20	293	328
2.	New national highways		15	
3.	Roads of inter-State econ. importance (centrally sponsored programmes)	10	15	25
4.	Lateral roads	22	..	22
5.	Special roads	8	35	43
6.	Total	60	358	418

wishes were horses, beggars could fly. While the Central fisc is not rich enough, the State fisc which has to bear the brunt of regional development is weaker still. That is why according to the Planning Commission, it is necessary first to improve the functional efficiency of the existing road system through the removal of deficiencies like improvement of substandard structures, before a net expansion can be planned.

Growing Pressure on Roads

But the point is that road development cannot tarry too long at the present level especially when the emerging trends in the transport industry are such as to warrant a progressive increase of the pressure on the road system. Mr. R. Venkataraman, Member of the Planning Commission, has himself stated that the number of commercial vehicles has risen to 386,000 from 116,000 (including buses and trucks) and that goods traffic has increased to 40 billion tonne kilometres from 6 billion in 1950-51, while passenger traffic has grown to 98 billion passenger kilometres from 23 billions in the same period. Traffic by road has indeed expanded faster than that by rail. The share of road transport in total goods traffic carried by road and rail together has increased to 23 per cent from 11 per cent in 1950-51. And if anything, total goods traffic by road transport is expected to double itself from about 40 billion tonne kilometres in 1968-69 to 84 billion in 1973-74 while passenger traffic will rise to 141 billion passenger kms. from 88 billion during the same period. This will call for an increase in the number of trucks to 470,000 in 1973-74 from 309,000 in 1968-69 and of buses to 115,000 from 85,000. But the trouble is that the resources to sustain such increases both in road construction and improvement and in the road transport industry are difficult to obtain.

Multifarious Levies

It is in this context that the complaints of road transport industry to on the existing tax system assumes great relevance. It is the contention of this industry that the levies on them are far in excess of that the industry can bear to expand for meeting the increasing transport needs of the nation. The levies are multifarious: motor vehicle registration fees, motor vehicle taxes, permit fees, licence fees for drivers and conductors, tax on passenger and goods, import duty on spare parts, income tax on profits, bridge tax, octroi duties, property tax and tax on distance. While revenue has doubled over the last five years, expenditure on road development has remained static. And the condition of roads being poor, operators pay a tax directly to the State besides an indirect tax by way of damage to vehicles, delays due to reduced speeds, costs relating to transhipment of freight on weaker links in the highways, etc. Between 1960 and 1969, revenue from road taxes of the Centre and States has risen from Rs. 79.52 crores and Rs. 55.15 crores respectively to Rs. 359.63 crores and Rs. 177.78 crores. Expenditure on development (Central and States) had risen to Rs. 105.23 crores and on maintenance to Rs. 59.05 crores from Rs. 55.22 crores and Rs. 35.43 crores respectively. No special annotation about what could have been spared for road building is called for indeed.

Rationalisation of Tax Structure

It is for relieving the operators of unseemly tax burdens that requests have been made for rationalisation of the tax structure. The proposals include the suggestion to construct a few toll roads as an experimental measure in consultation with private agencies including manufacturers of road materials, cement and vehicles. In intra-State road transport, vehicles of up to 7.5 tonnes payload need to be exempted from the permit system. The argument here is that under existing exchange control and licensing laws, the number of vehicles that will be produced cannot exceed plan targets, and since 90 per cent of the vehicles ply within the States, the permit system is redundant. Its abolition will release the energies of Transport Departments to devote closer attention, as they should, to transport planning. The third proposal is that the ubiquitous nuisance, namely octroi, should be eliminated providing local bodies with alternative income from a surcharge on sales tax for example. The final proposal is that, for making inter-State road transport less of an obstacle race than at present, an arrangement can be worked out to enable the States to receive their share of the inter-State road transport taxation from a small share of the present diesel oil duty. It is, of course, true that for administrative and other reasons, the Centre and the States will not be able to accept all these proposals. Especially elimination of octroi which is the *Kamadhenu* of local bodies will not be a workable proposition. That does not preclude the need to rationalise and lessen current burdens of road taxation.

RAILWAYS IN THE RED

Railways have always been the pet child of the Government in the field of transport. The steady improvements in railway earnings were partly the result of continuous attention bestowed on it growth. At the end of the Third Plan, the originating traffic of the railways was 203 million tonnes. In the next year, the figure fell to 201.6 million tonnes and in the year after to 196.6 million tonnes reflecting the impact of the recession. Traffic has since picked up fast. On the basis of estimates of production of major commodities during the current Plan period it is computed that originating traffic will rise to 280-290 million tonnes in 1973-74. Rail capacity already created and to be added to will prove adequate to meet this pressure but expansion of rolling stock would suffice only for a traffic of 265 million tonnes. By more intense use of rolling a stock and by marginal additions, the balance of outstanding traffic could be taken care of.

So far as bulk outlays on railway development are concerned, against a Third Plan figure of Rs. 1,325 crores, the Fourth plan outlay will be Rs. 1,050 crores, excluding another Rs. 525 crores which will be drawn from the Railways Depreciation Fund. Of this, the major allocations will be Rs. 620 crores for rolling stock, Rs. 315 crores for line capacity works and Rs. 200 crores for track renewal. Among the minor heads, an investment of Rs. 82 crores is envisaged for electrification and Rs. 50 crores for catering to the explosive metropolitan traffic. In fact the railway programme provided for an increase of about 20 per cent in passenger vehicle kilometre for non-suburban traffic and also for specific increases in suburban traffic. The Rs. 50 crores specially provided for the latter purpose is for schemes for mass transit facilities in metropolitan cities of Bombay, Calcutta, Madras and Delhi. It may be recalled in this connection that a study made of metropolitan transport problems by a committee of secretaries of Chambers of Commerce in South India has outlined a pattern of circular railway for Madras city,—an ambitious scheme to have a coastal link between Tiruvottiyur and Thiruvanmiyur.

Modernising Railway System

The growing volume of rail traffic in recent years has been handled by an expansion of assets and by modernisation of equipment, improvements in technology and more intensive utilisation of assets. Even during the three annual plan periods, planning of investment has kept in view the objective of improving the working of certain "bottleneck sections and terminals" to enable them to cope with seasonal surges in transport demands and heavy and sudden long-distance movements of foodgrains, coal, etc. which strain rail transport capacity. During 1968-69 itself new lines totalling about 761 route kilometres were opened to traffic and 351 route kilometres comprising the Nasik Road-Bhusaval section of the Central Railway and the Bauria-Kharagpur section of the South Eastern Railway were energised on the 25 kv. A.C. system. This brought route kms. of electric traction to 3247 (8,430 track kms.). In 1968-69, 61 broad gauge and 20 metre gauge main line diesel locomotives were commissioned and at the end of the year, diesels were operating in over 20,000 route kms. This raised the percentage of net tonne kilometres hauled by diesel and electric traction to 64.3 from 58.6. The interchange of traffic *via* most of the junction points remained fluid. Dieselisation is proposed to be extended to 22,000 route kms. in 1973-74 and electric traction to 4,600 route kms. by the same year. The general emphasis has from the beginning been on dieselising

or electrifying fully the high density routes which are at present under mixed traction.

From Metre to Broad Gauge . . .

Difficulties encountered at break of gauge transhipment points on account of the scarcity of labour are sought to be met immediately by planning for mechanical handling arrangements at some critical points and as a long term measure by conversion of selected metre gauge sections into broad gauge. Surveys were sanctioned during 1969-70 for new lines, conversions from metre gauge to broad gauge totalling 2,838 route kms. Over the entire Fourth Plan a programme of converting 1,500 kms. of metre gauge to broad gauge will be taken up as part of a long term plan. The ultimate aim is to provide broad gauge connection from one end of the country to the other. At the same time to ease bottlenecks in rail transport in high density routes, a phased programme of doubling the track has been undertaken. The proportion of double and multiple track to the total route length and the proportion of the freight train kms. hauled by diesel electric traction on the Indian Railways compares favourably with the position in foreign railways. Double and multiple track is 17.5 per cent of the total on the Indian Railways against 74 per cent in Britain, 42 per cent in France and 41 per cent in West Germany.

Over the Fourth Plan, doubling of track is to be extended to 1,800 kms. As for new lines, only a limited number of schemes is proposed to be taken up to meet the needs of basic and heavy industries and of traffic in minerals like coal and iron ore. In view of heavy investment involved in laying new lines, each proposal will be examined on merits taking into account the economies of alternative modes of transport, especially road transport.

Wagon Utilisation

The moot point about economical operation of railways concerns wagon utilisation. Since 1950-51 there has been an improvement, in wagon utilisation but the same had been adversely affected since the end of the Third Plan period. In 1966-67 and 1967-68, traffic did not come up to the anticipated levels following the economic recession. In addition the dispute in September 1967 regarding the price of coal affected coal loading in 1967-68. There was also some increase in the incidence of empty haulage. In this context it is relevant to point out that the railways were required to make emergency arrangements for the expeditious movement of foodgrains to the drought affected areas in different parts of the country in the last two three years involving considerable empty haulage and even restricting the movement of more paying traffic. With the revival in freight traffic since 1968-69 the indices of utilisation of wagons have also improved and available figures indicate a continuation of this trend in 1969-70 also. Diverse measures of wagon utilisation have been applied. One such is the number of wagons utilised to move one million net tonne kms. per day. On current computations, fewer wagons are now utilised to move the same amount of traffic. Another measure is the net tonne kms. moved per annum per tonne of wagon capacity. This has gone up to 15,083 net tonne kms., per year in 1968-69 from 11,833 in 1950-51 on the broad gauge. The comparative figures on the metre gauge are respectively, 12,079 and 9,021. On making comparisons with foreign countries it is found that the Indian performance has been exceeded only by Japanese railways. As for freight traffic density in Indian railways, it is now more than double of what it was in 1950-51.

TABLE 2

COMPARATIVE POSITION OF FOREIGN AND INDIAN RAILWAYS

		Proportion of double and multiple track to total route length	Proportion of freight train kms. hauled to the total freight train kms.	
			Diesel	Electric
British Railways	1967	74.4	80.5	8.8
Canadian National Railways	1967	3.9	100.0	..
Canadian Pacific Railways	1967	5.8	100.0	..
French National Railways	1967	42.1	21.9	64.7
German Federal Railways	1967	41.0	13.3	55.6
Italian State Railways	1967	29.2	4.9	87.5
Japanese National Railways	1967-68	19.5	5.3	53.9
U.S. Class I Railroads	1967	12.2	99.0	1.0
Indian Railways	1968-69			
Broad gauge		34.2	38.2	18.8
Metre gauge		1.8	26.7	0.6
Whole system including Narrow gauge		17.5	34.6	13.4

Broad Gauge Bears the Brunt

The broad gauge, with a route length of 29,226 kms., is about 49 per cent of the total route length but handles about 84 per cent of the net tonne kms. of goods traffic and 72 per cent of the passenger kms. The metre gauge with a route length of 25,846 kms. and forming 43.4 per cent of the total route length accounts for slightly less than 16 per cent of the net tonne kms. and 27.2 per cent of the passenger kms. The concentration of traffic in different sections of Indian railways varies widely. The density was 10,000 tonnes per day on 13,163 kms. or 22 per cent of total route length and these sections carried 69.4 per cent of the total net tonne kms. of our railways. The highest freight traffic density has been 71,364 tonnes per day on Sone Nagar—Dehri-on-Sone broad gauge section of the Eastern Railway. On the metre gauge, the maximum density of 9,830 tonnes per day has been on the Abu Road—Palanpur section of the Western Railway. The overall average density on the metre gauge is only 2,100 tonnes per day. It should be noted, however, that the average utilisation of the track on the Indian Government railways compares favourably with that on foreign railways. The traffic density in terms of total traffic units on the Indian broad gauge is next only to that on Japanese National Railways where the commuter service accounts for nearly half of the total passenger traffic against only one-sixth in Indian railways. About half of the total train kilometres on the broad gauge and a little over half on the metre gauge are on coaching services. In India the number of suburban passengers is nearly equal to the number of non-suburban passengers, but with its much shorter lead, suburban traffic comes only to 18 per cent of the total passenger kms. Due to the lower level of fares and the heavy concessions in the commuter fares, the earnings from suburban services are less than 10 per cent of the total and so non-suburban passenger services provide the bulk of these earnings.

Attention to Economics

Recent criticism of railway operations has highlighted the fact that operating costs have out-paced earnings despite stiff increases in fares and freights. Among the nationalised railway systems of the world, Indian Railways are among the rare ones which have so far been able to meet their costs and dividend liabilities fully. It is only recently that they have fallen short of the dividend due. Most of this was due to the recession. This is proved by the fact that with the recession of the recession, shortfalls have decreased to Rs. 7.9 crores in 1968-69 from Rs. 31.5 crores in 1967-68. Working expenses in these years have been fully covered. Part of the lags persisting even now can be traced to the havoc caused by floods and breaches, not to overlook the spate of civil disturbances which have interrupted movements and thus causing loss of earnings. Coaching services have been working nevertheless at a loss over the decade because adjustments in fares have lagged behind increases in costs of haulage.

EXPANSION OF AIR TRANSPORT FACILITIES

The country is fast getting air-minded, though the volume of air traffic at present may seem tiny by international comparison. The Fourth Plan states that, in view of important technological changes taking place in the field of air transport, aircraft of much bigger size and with greater speed than at present are expected to be introduced. These will be in operation by about 1971 and by foreign airlines even earlier. A provision of Rs. 202 crores in the Central sector has been made in the Plan comprising Rs. 72 crores for the Civil Aviation Department schemes, Rs. 55 crores for those of Indian Airlines, Rs. 60 crores for Air-India and Rs. 15 crores for India Meteorological Department. The Plan envisages improvement of facilities at the four international airports — Bombay, Delhi, Calcutta and Madras— so as to make them suitable for operation of heavier and larger capacity aircraft like Boeing 747 jets. The Plan also provides for the development of various airports for domestic air services. With the anticipated growth of internal air traffic including tourist traffic and the gradual replacement of Dakotas by larger aircraft, it would be necessary to remodel the runways and to some extent, the terminal facilities.

The available capacity of Indian Airlines is expected to increase from 224 million tonne kilometres in 1968-69 to 392 million tonne kilometres in 1973-74. The Plan provides for an increase in the fleet strength of the Corporation both for trunk and regional routes. The proposed outlay of Rs. 55 crores is expected to be financed to the extent of about Rs. 50 crores from the internal resources of the Corporation. The available capacity of Air-India is expected to increase from 437 million tonne kilometres to 990 million tonne kilometres between 1968-69 and 1973-74. During the Plan period, Air-India is expected to acquire four Boeing 747 jets. The programme of the Corporation is expected to be financed entirely from its internal resources except that it will require Rs. 15 crores from Government to enable it to maintain a proper debt-equity ratio.

STEADY GROWTH IN SHIPPING

The target for shipping at the end of the Fourth Plan (1973-74) is 3.5 million tonnes of gross registered tonnage with another 0.5 million G.R.T. on order. The provision of Rs. 130 crores is expected to be enhanced to Rs. 145 crores. On February 1 last, the number of ships in operation in the overseas and coastal trade was 256 with a total tonnage of 2.28 million G.R.T. In addition 55 ships of about 7.35 lakh G.R.T. are on order. Out of this 38 ships of 5.86 lakhs G.R.T. are under construction in foreign shipyards and 17 ships of 1.49 lakh G.R.T. are under construction in India. At present Indian tonnage is catering to about 15 per cent of the overseas trade. While in the case of liner trade, the share of Indian shipping is about 40 to 45 per cent, the share is less than 10 per cent in the bulk cargo trade. The Fourth Plan target of 3.5 million tonnes covers 3.1 million G.R.T. of overseas tonnage and 0.4 million G.R.T. of coastal tonnage. At the end of the current Plan, Indian shipping would account for 40 per cent of the overseas tonnage.

The bulge in shipping costs is provided by higher port charges. The Commission on Major Ports has commented elaborately on this problem. It says that although there has been a signi-

nicant increase in bulk cargo traffic, adequate facilities for its loading and unloading were lacking. This was particularly clear from the fact that the ports used the general cargo berths for handling bulk cargo which caused delays in clearance of general cargo.

Elimination of "ad hocism"

The most sickening thing about ports is the diversity of port charges. It is of course true that, in view of the multiplicity of commodities and of the individual rates differentiated according to the classification and variations in costs of handling and the services to the vessels, it is not possible to attempt an interport comparison. But the use of different terminology by the ports in regard to wharfage rates is apt to be confusing. It is better to have some uniformity here. Besides, tariffs at major ports have been revised several times since 1947-48 with frequent recourse to imposition of surcharges—the entire process having been on an *ad hoc* basis. Obviously since each port has in respect of traffic an individuality of its own and relies on certain commodities from which the bulk of its revenue is derived a uniform rate for all ports is not feasible. Yet as the Commission points out, the actual rates on commodities could range between two limits, of direct costs (the actual costs of handling the traffic without any provision for depreciation or overheads) and the ability of the traffic to bear. What is important is that fares should be decided on the basis of costs analysis and the weakness for *"ad hocism"* should be eliminated.

Inadequacy of Tonnage

The chief problem of Indian shipping in the 'seventies is going to be the inadequacy of tonnage. If Indian tonnage has not grown as it should, it was because of "the almost negligible foreign exchange resources made available and the unrealistic guidelines prescribed for procurement of foreign exchange loans." There were, according to Mr. Vasant J. Sheth, President of the Indian National Shipowners' Association, frustrating delays in granting sanction to applications for purchase of ships or building them abroad.

If these restraints were removed there was every prospect of Indian tonnage hitting the 10 million-tonne mark by 1980. What is more the Government would do well to ensure that shipbuilding exercises in the public sector prove really viable. What a long time has the Visakhapatnam shipyard taken to achieve its Spartan targets? As for the Cochin shipyard, it is taking an inordinately long time to kick alive. While every effort should be made to make these key shipbuilding projects fulfil their expectations, the Government should not feel shy of extending liberal assistance to private shipowners to improve and expand their fleet.

Serving Four States....

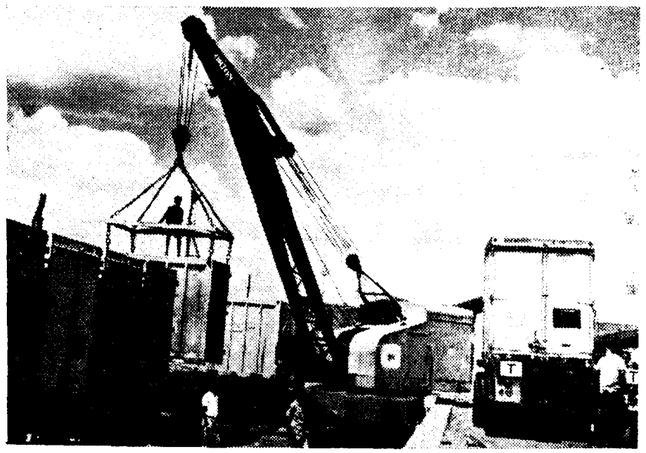
By M. T. LEE
General Manager, South Central Railway

EVERY ZONAL RAILWAY has primarily two very big tasks to perform, *viz.* to serve the region encompassed by it and to provide the vital links for the smooth flow of the traffic for the country as a whole. The pattern of traffic, the priorities of movements, and the nature and extent of facilities provided would certainly differ from railway to railway but in all these diversities there is the unity of purpose.

Mr. M. T. Lee

Serving Four States

The area served by the South Central Railway is varied in many respects. The eastern portion has an agricultural outlook, the central an industrial outlook and the western side is mountainous, full of forests and mineral resources. The Railway itself has almost an equal kilometrate of Metre Gauge and Broad Gauge i.e. about 3183.26 kilometres of metre gauge and 2605.81 kilometres of broad gauge. It serves four States, *viz.* Andhra Pradesh, Mysore, Maharashtra and Goa. The fairs, festivals and attitudes towards life are slightly different as between these four States and it is the proud privilege of this Railway to serve these variegated needs of the different regions



Container-Service in operation

This railway is also the gateway for the traffic from north to south and vice versa. Two of the trunk routes lie on its system viz. Madras—Delhi and Madras—Calcutta. The 'Triveni' for both these routes is Vijayawada, which is an epi-centre of Railway activities of the East Coast line.

Faster and Comfortable Service

Apart from the passenger trains, including Mail and Expresses which run 'through' on this Railway, there are 346 passenger trains originating on the Railway itself, of which 44 are express trains, 218 ordinary passenger trains, 47 suburban trains and the rest mixed trains. The originating passenger traffic is 108.5 millions per annum which works out to about 3 lakhs passengers per day. After the formation of this Railway in October 1966 a direct link between the Twin Cities and New Delhi has been established through the Dakshin Express. The emphasis has been on providing faster and comfortable services. The Ajanta Express, Golconda Express and the Tirumala Express are the fruits of this strain of thought. Apart from this, the run of important trains has been extended/diverted, many suburban trains introduced, all with an eye to dovetail the arrangements to the requirements. There has also been continued emphasis on providing amenities to the users and about Rs. 30 lakhs are being spent annually on this. With the industrialisation of the region, there are bound to be significant changes in the arrangement of passenger trains.

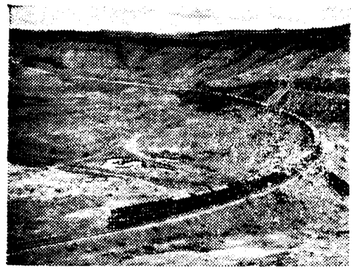
Problems of Movement

There have been appreciable increases in the intake of wagons at the interchange points for the Railway thus signifying an increased movement of goods traffic. Since the formation, the intake at Waltair, Balharshah, Pune, Daund, etc. has increased by more than 50 per cent, of which a major portion is through to the Railway. It has been possible to take such increases due to the greater availability of diesels and also improvement in efficiency. With a separate administrative set up, the problems facing the railway could be given a greater attention and satisfactory solutions evolved, with the result that certain points like Balharshah, Vijayawada, etc. are no longer bottlenecks as they used to be. Coming to the originating traffic, it may be observed that what is lifted from the region is important for the economy as a whole. The only deposits of coal in the South are to be found in Andhra Pradesh. The seams occur in two district sectors *i.e. the* Bhadrachellam Road and Belampalli/Ramagundam, Ramkristopur and Mandamari areas which comprise comparatively new mines with considerable potential for expansion. The collieries operate highly mechanised screening plants where the coal drawn from the pits, called "run of mine" coal, is conveyed on belt conveyer and screened according to its size into what are termed "Round coal", "Separator nut" and "Rough slack". The annual production of the colliery has been of the order of 4 million tonnes, out of which about 3.5 million tonnes are lifted by rail. Almost the entire coal produced by the Singareni Collieries moves to the south.

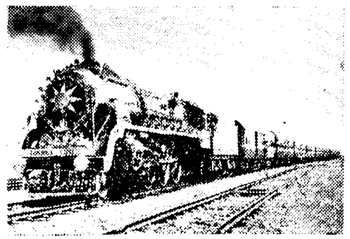
Andhra Pradesh is also rich in limestone deposits. This has given rise to the establishment of a chain of cement industries all along the run of limestone deposits, *i.e.*, from Bagalkot in the West to Vijayawada in the East, there are as many as 9 cement factories. The cement production of these factories has been showing a steady and substantial step up. The movement on the rail is also substantial, *i.e.* about 17.6 lakh tonnes.

Foodgrains Traffic

The East Coast land offers considerable volume of traffic in rice and paddy to the deficit States of Kerala and West Bengal. The despatches are of the order of 6 lakh tonnes on the average per annum. The fertile soil has also encouraged the growing of sugarcane and given rise to the establishment of a number of sugar mills in the area. Apart from the transport of sugar, there is considera-



Carrying the nation's goods...



The Tirumala Express on its maiden journey...

ble movement of jaggery from Anakapalle that shares with Kolhapur the pride of place among the production centres for jaggery in India. The jaggery produced by Anakapalle moves mostly to West Bengal, Bihar and Madhya Pradesh while Kolhapur serves almost exclusively Gujarat and Saurashtra. The movement of jaggery by rail on the average from these two centres amounts to 1,20,000 tonnes.

This region produces most of the high grade tobacco in India. The districts of Krishna and Guntur are famous for tobacco, a large volume of which seeks export from Kakinada and Madras. About half of India's production of chillies is in the district of Guntur, the movement taking place to all parts of the country.

Developing Industrial Complex

An industrial complex has developed around Hyderabad. The industries that have developed in the recent years include the Heavy Electricals, Asbestos Cement Products, Refrigeration Industries, Foundries, etc. This has resulted in a sharp increase in the traffic dealt within Hyderabad/Secunderabad complex.

Moving the Minerals of Mysore

The Mysore State can on the other hand lay claim to some of the best iron ore deposits in India, the iron content being as much as 69 per cent. The deposits occur mostly on the Bellary-Hospet sector and find a ready market in Japan and the East European countries. There is, therefore, considerable transport of iron ore to the ports of Goa, Karwar, Cuddalore, Madras and Kakinada. The movement of ore to Madras is organised on the broad gauge sector of the Southern Railway while the South Central Railway caters for the movement of iron ore to the metre gauge ports.

The Mysore State also possesses some of the best manganese ore in the country. Sandur in Mysore State has acquired international recognition for its excellent manganese ore. The manganese ore mined there is known in the world markets as "Sandur," perpetuating the name of the State. It enjoys a ready market and a high reputation in Western European countries. This traffic moves to Goa for exports.

Movement of Forest Produce

The forest wealth of Andhra Pradesh and Mysore is equally impressive. This has given rise to significant movement of forest produce such as timber, firewood, charcoal and bidi leaves. The extensive bamboo forests of these two States have also encouraged the establishment of paper mills at Rajahmundry. Sirpur, Kagaznagar and Dandeli. These factories draw a large volume of bamboos and limestone and account for considerable transport of the end product of paper.

The area in Maharashtra traversed by the South Central Railway has witnessed an all-round development during the recent years. A chain of sugar mills have come into being with the progressive expansion of the areas under sugarcane cultivation. The industrial complex at Pune is spilling over to Hadapsar and Loni. There are also well established industries at Kirloskarwadi and Ogalwadi.

Future Traffic Prospects

Summing up, the area traversed by the South Central Railway is a representative cross section of the entire country with a considerable loading potential. The extent of originating traffic lifted by the Railway can be seen from the following figures:

Year	Tonnage lifted (in lakhs) B.G.	M.G.	Total
1967-68	67.127	42.332	109.459
1968-69	71.053	43.804	114.857
1969-70	67.789	43.549	111.338

The figures for 1969-70 show a slight drop which was due to extensive damage caused by the cyclones of unprecedented intensity which hit the East Coast in May and November 1969. It will be noticed that the drop in the loading on the broad gauge is the main reason for the total over-all drop. This is but natural as the cyclones gave a severe set back to the agricultural produce and other activities on the East Coast which is mainly served by the broad gauge. The Railway also suffered very badly, the entire operations being thrown completely out of gear for many months. In fact both the region as well as the Railway have not as yet come out of the damage caused by these cyclones. The agitation, relating to the demand of a separate state of Telangana has also had its repercussions on the originating traffic. It is hoped that this year production would be abundant and the traffic will pick up. So far as the financial position is concerned, though the figures would indicate that there has been a steeper rise in the costs the Railway is still earning profits. As stated earlier there has been a less steep rise in the earnings in the year 1969-70 due to cyclones and agitations and it is hoped that this year the Railway would fare better.

STAGNATION IN PRODUCTION OF COMMERCIAL VEHICLES

By S. VISWANATHAN

THERE WAS A ten-fold increase in the output of commercial vehicles in the period 1953-60—production increased in this period from 2754 to 27138. Progressive indigenisation was attempted. With the priority accorded to the production of commercial vehicles in the Third Plan and with liberal availability of IDA loans the manufacturers could think in terms of substantial expansion in output. The high level of demand that was already obtaining, further increased after the Chinese and Pakistani aggressions through larger indents from the defence forces. Thus there was a rapid increase in output after 1961 and the peak was achieved in 1965 with 37299 vehicles produced. Of the different manufacturers, Tata Engineering and Locomotive Co. and Ashok Leyland made full use of the existing facilities. TELCO very nearly doubled its output during 1960-66 when production increased from 9665 to 18900. The fuller benefits of its expansion were realised in the succeeding years and in 1969 it produced a total of 20497 vehicles. Ashok Leyland, manufacturing vehicles in the heavier range, increased its production from 2018 in 1960 to 4278 in 1965 and during last year its output was 4865. It is presently engaged in taking its output to 6,000 vehicles per year. Hindustan Motors and Premier Automobiles also achieved significant increases in the output of the vehicles in the period 1960-65 but in the subsequent years, because of the recession in the economy and reduced orders from the defence, the demand on these vehicles was substantially lower and as a consequence, production had to be restricted to much lower levels. The magnitude of this decline is evident from the performance of these two companies in regard to the output of commercial vehicles. The output of trucks in Hindustan Motors declined from 4855 numbers in 1965 to 1836 in 1969; at the Premier Automobiles it declined from 9086 numbers in 1965 to 3563 in 1969. Obviously these two were the worst hit as a result of the recession. The total output of vehicles declined from 37299 in 1965 to 35242 in 1969. The lowest (31454) was recorded in this period in 1967.

As in the case of cars, steep increases in the taxes and duties contributed to a significant extent to a rapid decline in demand levels. Until about 1965 the

PRODUCTION OF COMMERCIAL VEHICLES: 1960-1969

	1960	1962	1963	1965	1966	1967	1968	1969	Jan./June 1970
Ashok Leyland	2,018	2,835	2,730	4,278	3,857	4,618	4,393	4,865	2,683
Bajaj Tempo	669	850	888	1,681	1,562	1,665	1,641	2,578	1,786
Hindustan Motors	7,079	4,947	5,815	4,855	4,101	1,535	1,981	1,836	655
Mahindra & Mahindra	1,429	679	307	—	982	1,047	1,453	1,482	'565
Premier Automobiles	6,347	5,386	6,316	9,086	4,775	3,076	3,355	3,563	2,341
Standard Motor Products	—	—	—	71	979	373	448	421	156
TELCO	9,665	12,196	12,426	17,328	18,900	19,140	21,669	20,497	11,981
Total	27,138	26,893	28,482	37,299	35,156	31,454	34,940	35,242	20,167
PRODUCTION OF JEEPS									
Mahindra & Mahindra	5,501	7,557	8,104	10,488	9,777	5,561	7,293	7,838	4,542

Assembly of jeeps at the plant of Mahindra & Mahindra Ltd., Bombay

demand for all types of commercial vehicles was ruling high. The big drop in the output of foodgrains in the substquent two years and the recession in industry have contributed to a lower demand for the movement of goods and to consequent slack in demand for commercial vehicles.

The one serious impediment to the growth of the commercial vehicles industry was the increase in quantum of taxes and duties levied by the local, State and Central Governments. An idea of the magnitude of this can be got from the increase in revenues from the road transport in the last two decades: In 1950-51 the revenue from this source stood at Rs. 50 crores; in 1960-61 it increased to Rs. 176 crores. But in the 'sixties the increases have been frequent and far steeper. In the current year revenue from road transport is estimated at around Rs. 650 crores. Thus in two decades there have been a 13-fold increase in the revenue from this one source though there have been a mere four-fold increase in vehicles of all types on the roads of the country. The purchase price itself is so high that there has been little inclination on the part of many private operators either to expand their fleet or to replace old ones. Added to this is the very high level of operating cost. Hence the listlessness in acquiring new vehicles.

Thanks to the revival in economic activity and to the increase in levels of food production the demand for transportation facilities for the movement of goods and hence for vehicles is bound to explode. But this is seriously conditioned by the high initial price and the subsequent heavy operating cost.

The projection of the Planning Commission in regard to demand has gone much awry in the case of commercial vehicles. The Commission fixed a target of production of 60,000 commercial vehicles per year by 1965-66. Even as late as 1969, the output was less than 40,000. In the first six months of the current year a mere 20167 vehicles were produced. Undaunted by this depressing performance, the Planning Commission has gone ahead with the arithmetic of demand with its usual zeal and fixed a target of 85,000 trucks per year for the Fourth Plan. Without any substantial expansion in the output of existing capacity or thinking in terms of any new unit how a doubling in the output of commercial vehicles could be achieved in less than four years is indeed puzzling. As an immediate measure steps must be taken to revive demand to the point where at least existing capacity could be fully utilised. An imaginative rationalisation of the tax burden on the road transport industry can stimulate demand to fascinating levels, without causing any serious inroads to the total revenues to the exchequer. Britain abolished the purchase tax on commercial vehicles which resulted in a spectacular increase in demand and to consequent spurt in the output of commercial vehicles. A whole range of light and medium commercial vehicles cropped up subsequently. The stage has come for this country also to think in similar terms. The problem here may be a bit intractable in that too numerous are the agencies which have a share in the revenues from road transport and so rationalisation and lowering of the burden will be much more difficult if not altogether impossible.

AUTOMOBILE INDUSTRY POISED FOR EXPANSION

Production of automobiles in the country in the last two decades has registered a significant rise, in quantitative and qualitative terms. From a stage of assembling from CKD packs in the early 'fifties the industry has successfully passed through the stages of progressive manufacture of various components and today it is almost self-sufficient in its requirements of ancillary components, tyres, etc.

A total of 2,492 cars were assembled in 1953. In 1959 at the end of the decade 11,993 cars were produced. In the 'fifties there existed facilities to undertake expansion in output, the only inhibiting factor being the capacity of ancillary industries to meet the requirements of the vehicle manufacturers. In the 'sixties there has been a rich growth in the ancillary industries but the production of cars was given a rather low priority. At the beginning of the Third Five Year Plan (1961-66) it was decided to give a high pirority to the output of commercial vehicles, motorcycles and scooters; it was also decided to raise the indigenous content of vehicles to over 90 per cent. The result: There has been impressive increase in the output of commercial vehicles in the succeeding years. Hindustan Motors, by imaginative increases in the indigenous content, could increase the output of cars to higher than its rated capacity. The other two manufacurers, Premier Automobiles and Standard Motor Products of India Ltd., could not proceed that fast: especially Standard Motors experienced difficulty in achieving a faster rise in indigenous content. Unlike the other two car manufacturers it did not have facilities of a big automobile plant producing trucks also. Thus by 1965 the output of cars numbered only 24,790. There have been further increases in the production of cars in the next three years. By 1968 a total of 37,308 cars were produced. This declined to 35,183 in the subsequent year and in the first six months of the current year production stood at 16,933.

Not a Flattering Record . . .

The above record could not be considered flattering. All through the 'sixties fantastic increases have been registered in car production in a number of major developed countries, like Germany and Japan. The Indian manufacturers came out with their plans of expansion from time to time but since these involved the release of sizable quantity of foreign exchange for the importation of capital equipment and since we had a very difficult foreign exchange position all through the decade, these proposals were not considered at all. Understandably the demand for cars has outstripped production. The government helped reduce the pressure of demand not by permitting imaginative increases in output but by the introduction of the Rs. 2,000 deposit scheme for registeration and of course by steep increase in the quantum of excise and taxes. For example in the period 1957-69 the price of a Fiat car in Maharashtra increased from Rs. 10,737 to Rs. 16,817. The difference was wholly accounted for by increased levies. With the low volume of production, any worthwhile saving in costs was not possible. Thus the whole concept of production suffers from a vicious circle—low production levels—steep taxes—high prices—low demand and hence, low production.

What is in Store for 'Seventies ?

The Planning Commission has fixed a target of production of 75,000 cars for the Fourth Plan (1969-74); but it is silent as to how this could be achieved from the low level of output of a mere 35,183 vehicles in 1969. The only method by which this could be realised was by immediate decision approving the expansion schemes of existing manufacturers or by allowing the creation of fresh capacity. But the former was not considered with any amount of seriousness whereas the Commission was totally opposed to the idea of establishing the small car project even as late as July this year. How then could it fix this high target without clearing the way for its realisation?

After debating over the need for sanctioning a project to manufacture a small car for nearly 12 years the Government had atlast decided to set up a plant to produce 50,000 cars per annum in the public sector. The Planning Commission, a staunch opponent of this project for quite sometime, on grounds of lack of resources, has acquiesced in this; but apart from taking a decision a couple of months ago there has been no further progress. It will take a minium of five years to achieve the rated capacity from the time of commencing work on this project. It appears that it will take another year before details relating to collaboration and location are decided. Of course the capacity of the ancillary sector, of alloy and special steels, of tyres and tubes and other connected industries will have to be expanded fast to meet the demand from the vehicle manufacturers. Especially after passing of the Monopolies and Restrictive Trade Practices Act, it is going to be a real problem to expand the capacity of existing ancillary industries. As one of the ancillary manufacturers in Madras put it, the restrictions on expansion are so tight that many of them will not be permitted; certainly a number of these are listless and do not even contemplate applying for expansion.

As if to vindicate its earnestness the Government has also issued letters of intent to two of the 17 applicants who have offered to produce a 100 per cent indigenous car. One of these is Mr. Sanjay Gandhi, the son of the Prime Minister, who has designed a prototype of a two door model with an air-cooled engine of 552 cc. capacity and envisages an output of 50,000 cars per annum. The scheme calls for an investment of Rs. 1.07 crores, in land and building and Rs. 2.6 crores on machinery, etc., which will be completely indigenous. The price is Rs. 6,000 exclusive of dealers' commission, taxes and delivery charges.

Another application was from Mr. Madan Mohan Rao of EM EM Motors Ltd. who has given a scheme to manufacture 75,000 cars with a capital outlay of Rs. 12 crores and working capital of Rs. 11 crores. The ex-factory cost of this car is given at Rs. 8,000.

It will take anything from six to eight years for the new schemes to take full shape. Till then there is going to be a big gap between demand and supply. It would be easier for existing manufacturers to undertake sizeable increase in output with marginal increase in investment.

In the case of the two private parties it will take quite, some months before the technical feasibilities are established. One of these will take a year to finalise the design and the prototype. The financial structure of the proposals is not clear and the outlays and the availability of ancillary components have not been worked with precision. Of course the easier way will be for the Government to delicense automobile production provided it does not require any foreign exchange. Will the Government do it? —(*S.V.*)

CAR PRODUCTION IN THE 'SIXTIES

	1960	1962	1963	1965	1966	1967	1968	1969	Jan./ June 1970
Hindustan Motors	9,217	13,438	8,621	15,558	19,469	20,515	22,687	21,560	10,571
Premier Automobiles	6,516	6,247	3,750	5,673	7,030	10,055	12,276	12,218	5,904
Standard Motor Products of India	3,364	3,641	3,340	3,559	1,098	2,774	2,345	1,405	448
Total	19,097	23,326	15,711	24,790	27,597	33,344	37,308	35,183	16,923

The Drift of Foreign Affairs

By S. NARAYANASWAMY

THERE ARE MANY in India who would prefer to avoid saying anything against the policies of Central Government. While the good-mannered citizen might agree with those who remonstrate against one or another of the bulging number of controversial actions taken by government, they would prefer not to be identified as gad-flies. But even these good citizens feel deeply pained and some of them dumbfounded by the *cul-de-sac* into which the systematic miscarriage of India's foreign policies have driven the country. India's external policy has been recoiling on her economic affairs insidiously heretofore and more manifestly now. Already we find how difficult it is to market India's goods abroad. Despite our meeting the fastidious requirements of quality and improved packaging techniques, there is a certain reluctance in some Western markets to buy from India. This is apart from the disquieting decline in our export market for jute and tea, where improved quality goods have been ironically enough realizing lower prices. It is true that global trade factors, such as competition and local recession in some countries, have something to do with this cold reception accorded to Indian goods. However, our somewhat irrepressible propensity to talk when we are not obliged to; to make pompous pronouncements on remote developments unconnected with India have something to do with impairing the goodwill, which India enjoyed in earlier years.

Illustratively, nothing has more conclusively proved the complicated or involved thinking of the Oriental to many foreign countries than the way we talk about non-alignment and make pompous claims to be a socialist country and all the time, take sides against Israel, which through the simple philosophy of hard work and of minding their own business of building up a national home for the Jews, have converted scrub-bush lands into smiling orchards.

Explaining the Inexplicable . . .

Nowhere did we qualify for a Nobel Prize as when we invited Madam Bihn to India. We talk of dropping bricks, of treading on corns, and of diplomatic miscarriages. Madam Bihn is a self-styled Minister of the so-called Revolutionary Government of South Vietnam. We recognize the existence of an established South Vietnam Government and that country's Ambassador functions in Delhi, alongside of the rest of the diplomatic corps. But Madam Bihn, in accepting the invitation of a former Foreign Minister of India, who presently holds another portfolio, arrives in India and is treated as an honoured guest, representing a notional parallel government in South Vietnam. The South Vietnam Ambassador felt constrained to leave our Capital and his request to arrest Madam Bihn as a person who travelled with a pirate Government's passport, is turned down. The Minister for External Affairs hard put was to explain the inexplicable—to a perplexed but incensed Parliament. This visit of Madam Bihn has cost us the goodwill of South Vietnam Government and has been followed by harassment of peace-loving Indian traders and merchants in South Vietnam.

No Means of Meaningful Retaliation

The attitude of countries towards whom we profess gushing friendship like the newly-emancipated countries of East Africa that have been driving out Indians settled there for several generations remorselessly, is to any shrewd observer obvious; namely, that this attitude which is not confined to any one batch of countries or one continent, is born of the knowledge that India has little means of meaningful retaliation and in any case, is not militarily or economically strong.

One would think in this somewhat disquieting background that we should learn to occupy ourselves with economic development, with producing what we need, with creating enough surpluses for building up exports to repay our foreign loans; and generally, keep off the grass of other countries' affairs.

Pilgrimage to Expo.

In the last three months, we have sent plane-loads of passengers to Japan to see the Expo 70, which would have served a purpose and so would our participation therein—if we can profit by the illustrious example of that modest and industrious country that has compelled the rest of the world to pay it homage. What more conclusive evidence of its calibre can we have than that the mighty United States, which lost an incredible number of ships at Pearl Harbour through Japanese bombing in December 1941, should give Japan all the help to rehabilitate herself and also become her largest single customer among the world's nations? True, we do not have to re-enact a Pearl Harbour as a pre-requisite, but can we not do something to earn the goodwill and respect of nations that we have been so quick to lose over the last ten years.

Hopes and Realities in India's Foreign Trade

By OUR SPECIAL CORRESPONDENT

THE ARENA OF foreign trade has been, of late, the sporting ground of speculation. From the time the Fourth Plan, even at the draft stage, postulated an annual 7 per cent growth in exports, critics had not been lacking to throw down all sorts of wet blankets. For instance considering the fact that the marginal growth in exports in recent times could have been a negative figure, had East Europe not bought as much as it did, the point has been made that India is likely to earn fewer amounts of free foreign currency than usual in the years ahead. Against this the opposite opinion, propagated by official groups, is that the country is fast attaining the ideal situation of its exports paying for its imports as is seen from the narrowing of the trade gap to Rs. 100 crores in 1969-70 against over Rs. 800 crores in 1967-68. In all this discussion, the truth lies in a position somewhere in between and the assertion of Sir Roger De Coverly that much can be said on both sides is nowhere more valid than here.

Lack of Urgency

It cannot be denied that earlier calculations regarding exports have gone wrong because, with the revival of economic activity and the emergence of bottlenecks in raising production in the north-east region of the country, export surpluses have been dwindling. Mr. B. R. Bhagat, while in charge of the Union Ministry for Foreign Trade was never tired of repeating that he was "particularly unhappy over what I consider lack of a sense of urgency on the part of the various Ministries in the matter of exports." This was clear in the absence of adequate recognition in the Ministry of Industrial Development of the need for special boosts to domestic production. Part of the complacency can of course be explained as due to the fact that the recession had resulted in an apparent surplus of production, which at the roots, was not quite real. The concern over shortages in domestic production has been forcefully voiced by Mr. L. N. Birla, in an address before the All India Shippers' Council that met in Madras on July 1. It was his view that existing production capacities were quite inadequate to meet the twin demand of the home and foreign markets. Even the modest nine per cent annual industrial growth projected in the Fourth Plan, according to Mr. Birla, might not be realised as people could hardly save, because of the incidence of high taxation and rising prices. Of course, the deterioration in law and order in different parts of the country was itself a disincentive to new investment. If the 7 per cent export target is to be meaningful at all, there can really be no escape from working for an industrial growth rate of well over nine per cent.

Curbing Domestic Consumption

It is particularly disturbing to note that instead of encouraging such growth, the Union Ministry of Foreign Trade is thinking in terms of curbs on domestic consumption. In its draft export policy resolution submitted to the Cabinet, it has justified "imposition of temporary restraints on home consumption" on the ground that overseas markets once lost cannot be gained again. It is its contention that a part of the production must always be made available to earn needed foreign exchange through restraints on home consumption and the degree of restraint could vary according to the essential nature of the product in question either for industrial or domestic needs. Clearly, this is a case of a stress on stop-gap measures to the exclusion of long term considerations, more so because the susceptibility of the export quantum to boom or burst according to the degree of growth in domestic output (of which exports are a part) is ignored conveniently. Of course, the final export resolution is less reservist but that does not clear it of much of the bane of negativism befogging the export effort.

Just Two Per Cent

One has only to recall the observations of Mr. Manubhai Shah, former Union Minister of Commerce in the Rajya Sabha last May. While world trade was expanding at an annual rate of 10 per cent, India with just a 2 per cent rate could not hope to improve its position. Shah said that the Central Government's barren production policy was the root cause of the very depressing performance of the Ministry of Foreign Trade. The Ministry's claim, day in and day out, of narrowing the country's trade gap was misleading, when the main reason for this was cutting down imports. There was practically no import of machinery on account of the recent recession and import substitution. Scarce raw materials were not also imported with the result the industries were now

starved out and their production affected. The main reason for the export policy not being more dynamic is that, over the last year, the unit value fetched by most items abroad has been going down and internal supplies—of oilseeds, oilcake, and steel, to quote a few examples—have become tighter. With industrial recovery, home demand had been picking up leading to this tightness.

New Export Policy

It is against all this background that the new export policy resolution has to be judged. This 15 page policy resolution is a compendium of current and future trade policies. The highlights of the resolution as presented to the Press are the following: Expansion of the role of the public sector to cover a wider area of foreign trade; creation of new public sector agencies to achieve the above result; creation of a new organisation to provide package assistance to individual enterprises to build up their export potential; adaptation of procedures relating to foreign investments, licensing of creation or expansion of capacity, import of capital goods, etc; scientific exploitation of sea food potential; better exploitation of export potential of forest produce; selective modernisation of exporting or export-oriented textile units; organisation of production of labour-intensive goods; compensations to exports for temporary handicaps; intensified policy of compulsory quality control and pre-shipment inspection; making available part of production for export through temporary restraints on home consumption; introduction of new shipping services and strengthening of existing ones and securing fair foreign treatment for export cargo; early implementation of UNCTAD-II resolution on generalised system of tariff preferences; and promotion of economic co-operation in Asia and strengthening of economic links with African and Latin American countries.

AGGREGATE IMPORTS AND IMPORTS OF SELECT ITEMS (Rs. Crores)

Commodities		January-November		change in 1969
		1969	1968	Percentage
Total imports	..	1,477.0	1,788	— 17.4
Cereals	..	262.3	383.4	— 31.6
Raw cotton	..	71.9	92.0	— 21.8
Minerals, fuels, lubricants, etc.	..	58.6	73.5	— 20.3
Iron and steel	..	71.6	77.7	— 8.0
Machinery and transport equipment	..	381.8	498.4	— 23.4

Primary Exports

Indeed this is a comprehensive document. But the main point of assessment has to be on how far these resolutions can be or will be implemented in actual practice and on how far ideological inhibitions will surely make for or mar progress. It is difficult to have the last word said on these and the only option open to commentators is to examine the potential in respect of goods as well as markets. In respect of both, the latest annual report of the Union Ministry of Foreign Trade has been refreshingly frank and very nearly precise. Recognising the fact that this country, as a typical developing region, has still far to go to be rid of its dependence on primary products on its export list, the report spotlights gaps as offering the clues to make this sector of the export effort more viable. It may be recalled that during the whole of 1969, exports of most primary products such as tea, spices, vegetable oils, oilcakes, sugar, lac, raw jute, manganese ore, raw wool, etc. were indeed smaller than in 1968. The decline was considerable in tea (Rs. 46 crores), sugar (Rs. 14 crores), oilcakes (Rs. 9 crores). The increases were noticeable only in peripheral items such as fruits and vegetables, pulses, raw hides and skins, gums, resins, etc. In plantation products and jute which account for the bulk of the foreign exchange earnings among primaries, there has always been significant awareness of the toil ahead, but till now very little has been done to translate that awareness into practice. Particularly in tea, the setting up of the Indo-Ceylon Consortium is yet to take place despite negotiations having been commenced quite long ago and despite the apparent realisation on both sides that, without such a joint effort, both countries may be losers ultimately, playing into the hands of foreign buyers who are keen to take advantage of the internecine competition between two leading sellers. To some extent, the recent pick up in Indian tea exports seems to have induced a certain degree of complacency. Perhaps, with the establishment of a corporation for the exports of packaged tea, foreign sales could be kept up, but only, temporarily, permanent improvements demanding the commissioning of the bilateral consortium.

VALUE OF INDIA'S EXPORTS OF MAJOR ITEMS (Rs. Crores)

Commodities		January-December		Earlier Record	
		1968	1969	Amount	Year (Jan.-Dec.)
Jute goods	..	212.5	216.0	289.6	1965
Tea	..	166.5	120.5	208.0	1963
Iron ore	..	86.5	88.0	86.5	1968
Cotton piece goods mill made	..	66.0	62.4	83.4	1960
Leather and leather manufactures	..	65.9	81.6	65.9	1968
Cashew kernels	..	57.4	58.5	57.4	1968
Engineering goods	..	59.1	82.0	59.1	1968
Iron and steel	..	71.3	68.4	71.3	1968
Oil cakes	..	51.0	42.0	53.8	1965
Precious and semi-precious stones	..	39.1	46.1	39.1	1968
Raw tobacco	..	33.0	33.3	35.8	1963
Spices	..	28.4	26.9	31.9	1965
Fish	..	20.2	31.2	20.2	1968
Coffee	..	17.6	20.2	21.9	1964
Chemicals	..	15.3	20.1	15.3	1968
Mica	..	14.2	14.5	17.3	1965
Coir yarn and manufactures	..	14.2	12.9	18.5	1964
Mineral fuels	..	11.8	10.7	17.8	1964
Handmade carpets and druggets	..	11.4	11.4	11.4	1968
Cotton yarn	..	11.4	23.7	11.4	1968
Castor oil	..	10.1	3.3	12.8	1960

Jute Exports

In the case of jute, which like tea, is among the top export items, the Government has confessed failure in dealing with the structural problems of the industry. Export of jute carpet backing cloth had received a setback in the U.S. markets because of the recession in that country's carpet industry. And all this apart from the successful competition of Pakistan with all the trimmings of its bonus voucher scheme. With regard to coffee, the stress has to be on improving the volume of marketable surplus without needless deprivations for the domestic consumers. And among minerals, the growth element is clearly discernible in iron ore, thanks to the Indo-Japanese deal. The full fruition of the deal requires of course more co-ordination of the schemes relating to the developments of modernised ore mining, effective mechanical handling at the ports and scrupulous adherence to delivery schedules. It is quite unnecessary to expatiate on the shortcomings in this regard which have been an open book since Japan began looking for ore in India nearly a decade and more ago.

Among the other export items, on the primaries list, spices and cashew require closer attention. With regard to spices, Indian pepper has not been faring well in foreign markets, a fact which cannot be obscured by temporary spurts in foreign buying witnessed every now and then. In most cases of such spurts the cause has been a bad Indonesian crop a prospect which cannot be clung to as a softener for India. Some of the African countries have also begun developing their exports of this item. What has held Indian pepper in the field despite these odds is its superior quality. Even here, the danger is that unless Indian supplies are attuned to changes in tastes abroad for particular blends, their eastern competitors will steal a march over them easily in foreign markets. The position is not so difficult in the case of cardamom. But since 1963, the *katte* disease affecting Indian cardamom has been creating headaches. The action taken so far to control the disease, though more intensive than in

the past, has not been effective enough. In respect of cashew, there has been a steady increase in the Indian acreage under it. But African suppliers of raw nuts are establishing processing factories and the pace of growth of produced output from these factories has been faster than the growth rate in the domestic output of Indian cashew. This underscores the need to push up domestic production in India if the country is not to be caught unawares by a sudden drop in supplies of African raw cashew.

Losing Ground in Textiles

As regards cotton textiles, we seem to be losing grounds in some of our traditional markets where competitors very much lower in the list have secured an edge over us. While certain Asian sellers like Hong Kong and Japan have always been one up against us occasionally, certain European sellers have also been posing an equally powerful challenge. And Britain which has been our major customer is proposing to impose a 15 per cent tariff after 1972 against Indian textiles. The Indian cotton textile industry has been in the doldrums for too long and a breather in the form of a resilient foreign market for its products will emerge only, if through adequate modernisation coupled with efficient market analysis, the competitiveness of our products abroad is improved. Action in this regard has to be taken up on an urgent basis in view of the fact, that, while exports stood at a record figure of Rs. 83.4 crores in 1960, they have now come down to Rs. 66 crores which is Rs. 4 crores less than sales in the previous year, 1968. While exports to Britain, the major buyer, were affected by the British import deposit scheme, certain problems cropped up in the U.S. market also where Indian exports had fulfilled the quotas set. The U.S. Government is reported to have alleged that India had overshipped categories 18/9 and 31 in cotton textiles and an embargo on these imports was therefore imposed. Actual checking up indicated that the categories from India had been misclassified and, as a result of negotiations, the U.S. Government lifted the embargo from December, 29, 1969. In the case of man-made fabrics which have replaced cotton fabrics in domestic and foreign consumption, the main rub lay in the shortage of essential raw material imports. Such fabrics being the products of a new industry the cost inflation inherent in them has not been adequately controlled, leading to mental reservations on the part of the industry as well as the Government. Of course, with the setting up of petro-chemical complexes, synthetic fibres based on olefins will be the easier proposition, in view of the growing shortages in cellulosic materials on which the demands from the paper industry have become more pressing.

Engineering Goods . . .

Among manufactured and semi-manufactured goods, apart from textiles, synthetics, as well as naturals there has been an upward trend in exports of engineering goods (+ Rs. 22.9 crores), leather, leather manufactures and footwear (+ Rs. 15.7 crores), ferro-manganese and alloys (+ Rs. 3.0 crores), plastics and plastics manufactures (+ Rs. 2.6 crores). The Union Foreign Trade Ministry records that the rise in exports of engineering goods was particularly marked. Exports of metal manufactures and non-electric machinery, rose by 60 per cent and 82 per cent respectively. Indian skills behind engineering goods have reached in many cases the standards of the developed countries and with the labour costs of the latter steeply rising, India is steadily developing a competitive advantage in the manufacture of a wide range of industrial products. Another significant thing is the rise in the number of turn-key projects which are being secured by Indian exporters in several developing countries. The main snag in this sphere has been the shortage of steel which has been accentuated as much by growing domestic demand as by the spectacular expansion of sales abroad of our engineering goods.

Rupee Payment Arrangement

While it is a welcome sign of export viability, that Indian sales of all goods have kept their grips in the traditional and new markets, the fact cannot be overlooked that there is a lop-sided growth in favour of the rupee payment area and away from the free currency area. The difficulty with rupee trade is that, though in the initial stages, it had, no doubt, been a factor for the buttressing of our international selling prices in European markets, it is not as useful now. The surpluses accumulating for the East European bloc are becoming difficult of clearance because of the inability of the countries concerned to locate suitable items for purchase from India. It is quite well-known that the Indian debits relate mostly to Soviet-bloc-assisted steel and heavy engineering plants which cannot be paid for adequately and expeditiously so long as India does not have the goods that the Soviet bloc needs. That bloc's reluctance to buy from India may also be because of reasons other than commercial. There is already some talk there that they will have to walk out of their rupee agreement. In view of the fact that the purchases of East Europe from India are but a fraction of their global imports, shedding a nail-end for them may not seem incongruous or significant enough. Yet, since sales to that area are a sizable portion of Indian exports, this country cannot but be seriously concerned over any such development. While no country has the right to compel any other to buy what it does not want, it does not preclude the need to discover an arrangement that will be convenient to both the parties. A tripartite export arrangement as is in vogue among India, Yugoslavia and the United Arab Republic is the solution, though such an arrangement cannot cover all commodities and cannot also assure advantageous terms in every case of sale or exchange.

Trade within ECAFE

In any case, granted the possibility of a stagnation or stiffening of trade between India and the Soviet bloc, there is all the more the reason why India has to explore possibilities for intensifying trade flows with other parts of the world. To the ECAFE region, Indian exports at Rs. 354.5 crores during January-September 1969, were higher by 9.4 per cent compared to 1968. Exports to all the countries excepting Australia, South Korea and Indonesia were higher. Similarly exports to the Middle East were also higher. Sales in Africa rose by 15 per cent over the figure for 1968. Only in Latin America, there has been a drop. While all these support the fact that India is building up its trade with developing countries in tune with the expectation of the richer nations that the poor should learn to trade among themselves better before seeking expansion in their sales in the richer markets, there can be no gainsaying that all intra-trade has its limits set by the high degree of similarity in the economics of growing nations. Consequently, this country has to strive for completing negotiation for a comprehensive trade treaty with the European Economic Community, besides pressing the U.S.A. to relax its quota restrictions against our goods.

Decline in Imports

The import spectrum of Indian trade has also been more encouraging than usual. Recently there has been a huge decline of Rs. 121 crores in India's import of foodgrains and Rs. 116.6 crores in respect of imports of machinery and transport equipment. The fall in food imports has been due to the green revolution, while the dip in respect of the industrial goods has arisen out of import substitution, increase in domestic supplies of certain items and the lagged effect of the recession. Commodity-wise statistics of imports available until November 1969 show that the total imports at Rs. 1,477 crores were lower by Rs. 311 crores or 17.4 per cent compared to January-December 1968. The reduction in imports covers a wide range, from cereals to metal manufactures through raw cotton, fertilizers, dairy products and fuels. While imports of cereals at Rs. 262 crores were lower (as stated already by Rs. 121 crores) imports of fertilizers were lower by 30 per cent or Rs. 11.3 crores. Item-wise reduction in imports in respect of select goods has been as follows: Machinery (— Rs. 27.7 crores); raw cotton (— Rs. 20.1 crores); minerals, fuels, lubricants (—Rs. 14.9 crores); chemical elements and compounds (— Rs. 26.1 crores); zinc (— Rs. 14.1 crores); iron and steel (—Rs. 5.3 crores); tin (—Rs. 3.1 crores); scientific instruments, apparatus and appliances; (—Rs. 0.9 crores; dyeing and tanning substances (—Rs. 1.32 crores) and textile yarn and thread (—Rs. 71 lakhs). Increases in imports related to copper, fruits and vegetables, rubber, paper and pulp.

Protectionist Policies

Talking of imports, one will do well to heed the warning uttered in a recent study by ECAFE of Asian industrial development, that protectionist policies followed by these nations under the stress of shortages of foreign exchange have invariably kept most enterprises in the shade. There is nothing intrinsically wrong in any enterprise being in the shade but that the rub lay in the tendency of such units to operate on a scale smaller than their international counterparts. In the Indian case, the partiality of the Government, for ideological reasons, towards small-scale and medium-sized industrial units is likely to accentuate the trend and postpone the realisation of economies of scale in the dimension warranted for international competitiveness. Worse still, the quest for control over the commanding heights of the economy has egged the Government to vote for nationalisation of import trade which means, seeing how Government has so far behaved as a trader, that imports will be costlier for all units big and small, undermining their competitiveness in world trade. True, there have been vigorous protestations that this will not happen and will not be allowed to happen, but past experience with the State Trading Corporation and the Minerals and Metals Trading Corporation suggests that things will surely happen in the way they have in the past.

Out of the Inkwell

By RANDOR GUY

Goodnight, Sweet Princes!

Surely we live in exciting times. Old order changeth and all that sort of stuff. No more highnesses, no more fun and frothy frolic under gayly coloured *shamianas*, no more pappad-pulav—and peach melba parties at the palace gardens, no more Rajas and Ranisahebas. They are no longer recognised, in fact they have been 'derecognised' (one more fashionable word to add to my poor vocabulary)! I can never hereafter write a 'prince and pauper' yarn, for not even a derecognised (there, I go) publisher will touch it. What will the princes do, besides going to court? Of course, most of them are stinkingly rich, privy purse or not, and are already industrialists. Soft drinks... textiles... chemicals... But the world of glittering turbans, and gin-soaked heads beneath, gurgling girls and *garam masala beedas* seems to be gone for ever...

Sorry, Wrong Limb!

It happened in England, the land of Harley Street, F.R.C.S. and what else have you! They cut off the wrong limb of a patient recently. Lucky the poor person had two legs but think what would happen if we had only one leg, one arm and so on... Reminds me of a friend who had gone in for a kidney operation and half way through the cutting, the medico straightened up, took off the gloves and began packing. "Sorry, the right kidney is bad and needs cutting but I am only a left kidney specialist! Get another doc., so long." My friend who was somehow conscious, picked up a knife and stabbed *the departing doctor* at a vantage point which resulted in the specialist changing his voice and his wife leaving him for a gypsy! Very risky business, this doctoring...

INFORMATION IN DECISION MAKING PROCESS

By Brig. B. M. CHAKRAVARTI
Director, Andrew Yule & Co. Ltd., Calcutta

THE NEAR CATASTROPHE of Apollo 13 which was nearing the Moon on April 13 kept the whole world in a spell of anxiety and wonderment. During the whole rescue operation and later the one question that was raised in the minds of most people was where did the Apollo team known for its meticulous perfection in planning and execution slip?

In fact, the Apollo Team itself took the matter seriously and carried out an investigation costing a million dollars to find out the cause of the failure. Remarkably enough, the cause has turned out to be a simple yet an ubiquitous problem faced by most of the managements today. A slip in paper work has been pin-pointed as the basic error responsible for the failure of the machine.

Five years back, in 1965, the specifications for a heater in the oxygen tank were revised, but this information was not taken cognisance of in order to change the thermostatic switches used on previous design. When the switches were overloaded and insulation scorched off, the bare wires short-circuited resulting in the mishap.

This international event highlights the importance of communicating the right information at the right time in a project or a management function.

Management Decision Process

Management is essentially concerned with planning, co-ordination, execution and control. An essential and dynamic attribute of the management activity is decision-making. An activity resulting from a decision is an entity which results in value added to a commodity. The value added is a direct outcome of conversion. The conversion consists of the composite interplay of the factors of conversion. The factors of conversion and the conversion process in an industry can be viewed as an input output model.

The Intangible Asset

Plant, machinery and buildings being tangible assets are shown in the

Brig. B. M. CHAKRAVARTI

asset side of the Balance Sheet. Intellect on the other hand is an intangible asset and is covered up partly in salaries and wages and partly in administrative expenses normally termed as overhead. Intellect is the living dynamic ingredient. The other ingredients are inanimate. They get energised because of intellect. Intellect is the force which provides torque for the business motor; the torque is proportional to the force. The fuel which must be burnt to generate this force (intellect) is Information.

Like any fuel, information must have low residue and very high calorific value. Most of the time the fuel of desired quality is not available and hence sub-quality fuels have to be beneficiated to get the required quality of fuel. Beneficiation necessitates cost; the cost must be justified through gains greater than the cost incurred.

The effectiveness of a machine decreases over time till a stage is reached where increase in maintenance costs does not yield positive increase in the production from the machine. On the other hand, the effectiveness of the intellect can increase over time by providing continuously up-to-date information from a Central Data-Bank to deal with problems of today and tomorrow. The phenomenon is illustrated in Fig. 1.

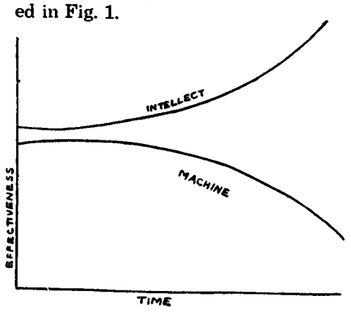


Fig. 1

It would be helpful at this stage to define data and knowledge. Data is any uninterpreted raw statement of fact or an unevaluated message. Information is data recorded, classified, organised, related or interpreted within the context of a specific problem situation to convey meaning. Knowledge is data evaluated or interpreted in a general context for future use. Therefore, information required for decision-making is evaluated data for a particular problem, for a specified individual or a team, at a specified time, and for the explicit purpose of achieving a definite goal.

Internal Information

In the sense in which we understand information, it is easy to realise that in any organisation the majority of the white-collar workers—ranging from the clerical force to the chief executive—are engaged in handling and shuffling the information. 90 per cent of the efforts of white-collor force concerns seeking and preparing information. Even in a typical engineering department 80 per cent of the efforts of engineers relate to information. In any manufacturing organisation over 30 per cent of its cost is found to be information cost—often conveniently hidden under "Administrative Expenses." With increased automation and sophistication in industry the portion of white-collor workers is on the increase.

Rise in Paper Work

Most of the information work manifests itself in the form of paper work, and paper work, in turn, is increasing at an enormous rate. For example, in the Ford Motor Company USA it has been estimated that they use a tonne of paper for every tonne of automobile produced. It is, therefore, clear that information is an area for enormous cost reduction, apart from making it effective for decision-making. Therefore, we should think in terms of information economics.

Information Explosion

In addition to the volume of internal information generated at a high premium, we are now faced with the external information which has an impact upon our organisation. There is such a plethora of growth of external information that the phenomenon has been described rightly as "Information Explosion." It is estimated that every year about 2,00,000 patents are being issued and about 10 million technical catalogues and product literature are being published. About 1,00,000 technical periodicals with well over 2 million technical articles within their covers are being issued every year. In such a situation, it is well-nigh impossible for an executive to know even the existence of information relevant to his work, however specialised it may be. Apart from the time factor, the cost factor

EXPANSION FOR EXISTENCE . . .

"Whatever has not been expanding is bound to decay; in these days of mounting costs industrial enterprises will have to expand to survive," said Brigadier Chakravarti, Director, Andrew Yule & Co. Ltd., in a talk with your correspondent.

The Brigadier advocated the tagging of a number of units in the small scale sector to a bigger unit. The small scale units have no coporate body of their own to command the facilities needed to maintain quality production and smooth marketing. The bigger units can help the smaller units in a variety of fields—right from the stage of procuring raw materials to that of marketing finished products. They can also help maintain quality standards at high levels. Ofcourse the bigger industries would benefit substantially by this 'parcelling out' as they can keep their costs considerably low.

Cost of Collection . . .

In modern management, the Brigadier stressed, there is need for maintaining a steady cash in-flow. Lack of attention to this has caused serious difficulties to many units. Brigadier Chakravarti said that the cost of bill collection for a medium engineering company worked out nearly to 4½ per cent of the total cost. Sufficiently attractive cash discounts for prompt settlement can help reduce this cost to a considerable extent. Many companies suffered a loss without the management knowing it. Paper profits there were in plenty but the liquidity was often affected by lack of attention to this.

The Brigadier described Madras as a heaven of engineering industries—Madras has got everything, the most important, a disciplined labour force. Brigadier Chakravarti referred to another interesting aspect of business organisation in Madras; over 95 per cent of industries in Madras are proprietory firms. Only in recent times there have been attempts to broad-base ownership.

Brigadier Chakravarti said that our philosophy, which he termed it as 'anti-work,' was responsible for industrial unrest. Thus in the industrialisation of the country one finds the conflict of two different economic concepts, one recognising the merit of productivity and the other conditioned by philosophy of contentment. A transformation is bound to occur, said the Brigadier.

Brigadier Chakravarti outlined the four pre-requisites of an engineer. He must organise production related to the national economy and the welfare of the people; he must know to evaluate the capacity of his customers; he must have the capacity to lead—an engineer by virtue of his experience and training is expected to lead a group and he must know to co-operate.

Brigadier Chakravarti was formerly Director of LRDE in Bangalore (from 1958 to 1966); for the next two years he was the Group General Manager of Kamanis. He joined Andrew Yule as Chief Executive in 1968, and was elevated to the post of Director early this year.

Brigadier Chakravarti is a qualified Telecommunications Engineer from the U.K. and he is a member of various professional institutions in India and abroad. He is widely travelled and he had attended an USAID-sponsored management course conducted by the University of Michigan. —*S.V.*

also is extremely high. But no executive can afford to dispense with the relevant data and knowledge. Particularly, the present competitive environment places a higher stake in the risk value of ignoring the information gap.

Efficiency in information handling assumes enormous importance when computers are used to process information. In two seconds a computer can commit errors equivalent to errors committed by 50 men working for 20 years only making errors. As a basis for organising an information system, we should evaluate knowledge or information in terms of quantity, quality, reliability and time.

Information Gap

It should, however, be admitted that, for management, there will seldom, if ever, be a situation where all the relevant information needed for an ideal solution of a problem will be available in time. Nevertheless, the cost of a poor decision resulting from a knowledge gap is too enormous to accept in the changed business environment. Therefore efforts should be directed to obtain optimum information within the time available to make a decision.

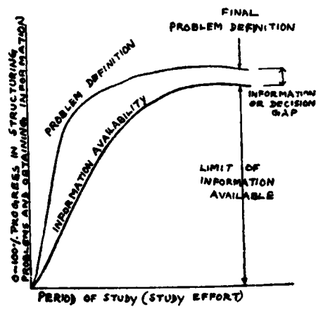


Fig. 2

Fig. 2, shows the typical decision-situation. The top curve indicates the statement or definition of a problem and the bottom one indicates the extent of information available in any given situation.

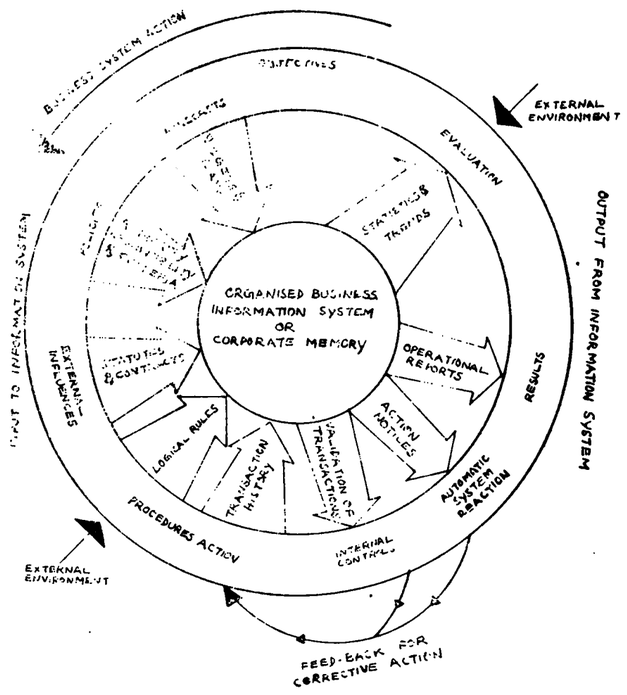


Fig. 3

The levelling out of each curve represents the recognition of diminishing returns for additional inputs. The gap between the levelling off points for both the problem definition and information availability curve represents the typical situations where we could consider making a decision without further information. This is called the decision gap. Only in this situation the use of human judgment is justifiable.

Problems of Information System

The management of information thus needs our full attention. The problem of organising for an efficient information system in a firm, therefore, can be boiled down to the following three areas:

(a) Determination of the information needs in an organisation, irrespective of the media carrying the messages;
(b) Designing of the formal of reports, forms, cards, tapes, etc. to suit the specific information needs; and
(c) Designing a system for proper management and servicing of information.

Profile of Information

There are three types of information required by any business organisation, for its decision making activity. These are:

(a) External Information — For planning and policy decisions. This includes information relating to national and international economics, trade and commerce, technology, research and development, Government policies relating to new licences, changing industrial, labour and management patterns,

trends of new products abroad, export data and so on.

(b) Competitive Information—For strategic and tactical decisions. This includes information relating to new licences new products, market intelligence, financial policies, expansion programmes, collaborations and mergers concerning the competitors.

(c) Internal Information — For control decisions. This includes information relating to the business operations such as progress reports, exception reports, correction measures and so on in the financial production, marketing, Research and Development and Personnel management areas.

The best method to ensure availability of such information at the right time to make decisions is to institutionalise information by organising a Business Information Centre. **This centre will acquire, classify, store, index and disseminate the external information, and the competitor information to the management. Such a centre should also include in its purview such of the internal information as are not available to the executives in the day-to-day reporting systems through line and staff channels.**

Dynamics of Total Business System

Organised information system in a business establishment encompassing its functions ranging from the abstract to concrete specification can be pictorially conceptualised as shown in Fig. 3.

The figure depicts the dynamics of a total business system. The top quadrants picture the abstract part of the business, while the bottom half represents the concrete. The quadrants to the left indicate actions contributing to the input into business information system—which could be likened to a corporate memory, while the right quadrant represents the output from the information system. Such a conception would help business managers to identify the areas required for evaluation of the essence of information relative to the health of their enterprise.

Information Scientist

A new type of technologist who has emerged specialising in information science is known as the information scientist or documentalist. In India there are two advanced Post-Graduate level training institutions preparing the specialist. These are (a) The Documentation Research and Training Centre organised by the Indian Statistical Institute at Bangalore; (b) The Indian National Scientific Documentation Centre at New Delhi.

Information — A tour de *Force*

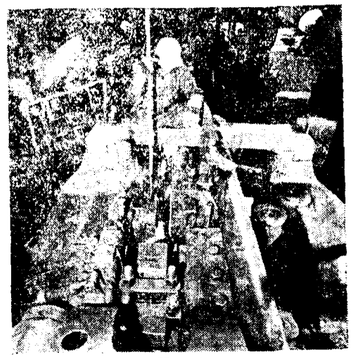
Information in a business establishment should be treated as the common denominator for all planning, co-ordination, execution and control activities of management. The content of all white-collar functions from the lowest clerk to the Chief Executive, should be viewed as an information handling process resulting in the end-product of decisions. In the changed buyers' market environment, the stake of every decision is very high. The information explosion has rapidly accelerated such high proliferation of information that the businessman, the technologist, and the managers and the business organisation as a whole are now exposed to rapid obsolescence—unless a counter-measure is designed to overcome it—as a continuous organisational process.

The business and industry willing to be progressive and competitive will be well-advised to consider the message contained in the statement of Albert Einstein—"Your decision is only as good as your information."

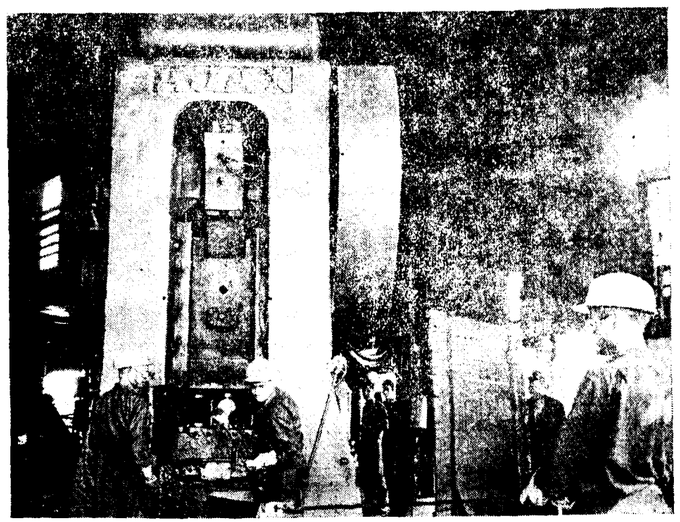
SERVING INDIA'S FORGING NEEDS

It was a small step at the start—just a few forged components for jeeps. Today Wyman-Gordon take in their stride more than 500 varied types of forgings—many vital components in a diversified range of industries including the automotive, diesel, tractor, earthmoving and other industries. Over the past 85 years, Wyman-Gordon has maintained its lead in the Western world as the largest and most diversified producer of closed-die forgings. Wyman-Gordon supplies forgings of every description to major segments of industry—automotive, aircraft, turbine, nuclear and space. Today Wyman-Gordon's total forging capability developed through constant process improvement, design refinement and materials pioneering contributes to man's success in space. A number of crucial service components have been forged for space rockets and missiles—where precision and strength of Wyman-Gordon forgings reach supreme standards.

Wyman-Gordon India Limited draws liberally from their collaborator's experience to bring the benefit of the most advanced features of forgings to customers in this country in highly technical fields. In the short span of the past seven years, it has forged ahead to become one of the top five forge shops in India, having reached a level of 6000 tons output besides other noteworthy attainments. Today, out of the more than 500 varied types of forgings that roll out of the Wyman-Gordon plant, as many as 300 are critical automobile components. Extensively used in vital applications in automotive vehicles, many of these components are forged from carbon and alloy steels. Among the more common Wyman-Gordon forgings used in the production of trucks, passenger cars, jeeps, scooters, railroad locomotives and wagons are connecting rods, crankshafts, gears, hubs, coupling hooks, universal joints, ball yokes and stub axles. Emulating its American collaborator who introduced the first heat treating of steel forgings, Wyman-Gordon is the first forge shop in India to develop stainless steel forgings. Recently, Wyman-Gordon supplied Rajasthan's Atomic Energy Plant with the Stainless Steel Anti-torque Collar. Wyman-Gordon forgings also make export news. Today Valve Bodies constitute a major item of export to the United States of America.



5" Upsetter



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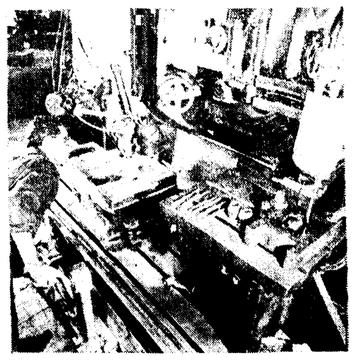
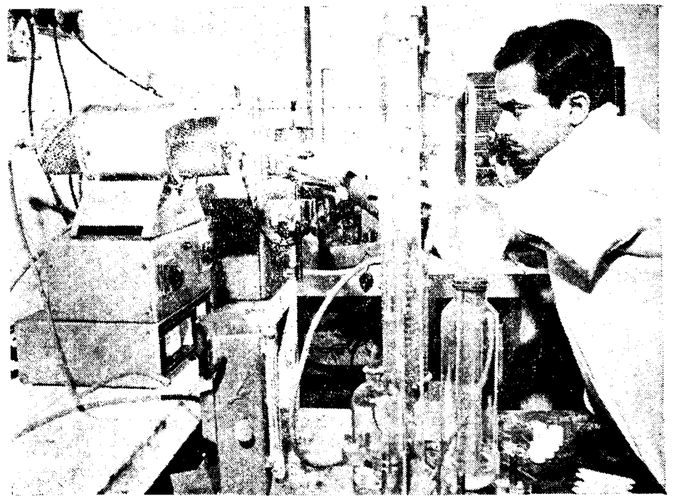


Hydro-Tel Die-Sinking Machine



Carbon Sulphur Determination

ELUSIVE INFLATIONARY TRENDS IN WORLD ECONOMIES

By OUR SPECIAL CORRESPONDENT

THE RICHER COUNTRIES of the world are facing an inflationary situation. The Organisation for Economic Co-operation and Development, which is an association of all the rich countries of the West besides Japan, has been, of late, harping on the theme that European inflation looks as if it has come to stay. Their price rise, as measured by the GNP deflator, has risen from an annual average rate of 3.7 per cent in 1968 to 5.25 per cent during the first half of this year. This is more than double the annual average for 1967, and, in fact, the highest since the Korean War boom. The peculiarity about official responses to the situation is that, in almost every country, there is an attempt at blaming the evil on the foreigner by describing the domestic situation as imported inflation.

Importing Inflation...

Such a belief has not been new. It has existed ever since Europe learned to walk on its feet after the Second World War thanks to Marshall Aid. In the 1960's this was reflected in the view of the West German Council of Economic Advisers that, without frequent upward revaluations of the Deutsche Mark, the country's superior economic strength would be exposed to imported inflation. France under De Gaulle had always been quick to blame everything on the U.S. payments deficit. Yet with the waning of the German surplus due to overheating of the domestic economy and with the outbreak of political and economic upheaval in France in 1968, the accusation was tuned in a lower key. The current fashion in European official circles is to view the continuing inflation as a world-wide phenomenon and to implicate "international trends" rather than economic failures on the home-front as the basic factor behind the inflation. And the burden of the song consequently is that inflation gets imported rather than created at home.

Here are a few samples: The French Finance Minister, referring to the E.E.C.'s call for an all-out effort against inflation, said that the call did not apply to France because its domestic restraints had eliminated excess of home demand but absorption of inflation from outside was queering the pitch. The Dutch argued that there would have been little difficulty in stabilising internal equilibrium had it not been for the inflation imported from outside. To the extent countries do absorb cost-push inflation from the outside world if the wage explosions there push up their import costs, there can be some mischief. But the point is that when the process has not affected international trade prices—in fact the prices have been entirely immune to it—how can domestic inflation be blamed on the external stimulant? Will it not be truer to say that in the great majority of cases, the villain of the piece is the failure of the official policy to maintain the proper relationship between the growth of incomes and the increases in output. Even if the U.S. deficit is to be blamed, it can be only by establishing that it has created unseemly spending pressures in European countries through the way in which it "stokes up the boilers of Euro-currency," the Euro-dollars as they are called.

In the United States, the headache is that the Administration's long campaign to check inflation without inducing a recession has run into serious trouble. In talking about this aspect of the President's policy, U.S. commentators have invariably used the rhyme:

"They told him it couldn't be done;
With a smile he went right to it.
He tackled the thing that could not be done
And couldn't do it."

Drop in Incomes of Companies...

This has particular reference to the serious drop in incomes of companies, the nasty news that General Motors and Ford, the two largest car companies reporting fall in incomes by 33 per cent and 25 per cent respectively and to the fact that the continued rise in prices is accompanied by rise in unemployment figures also. Short term money rates have been swinging wildly up and down. While the number of the unemployed rose to an additional one million, GNP fell by $2.9 billion in real terms even in the first quarter of the year. The greater anxiety is over the inflation indicators. Consumer price index is rising at an annual 6 per cent rate. What is significant about the index is that there are signs of weakness in the food component of the wholesale and consumer price indices. And, as U.S. monetary critics have been stressing, "when optimism is based on price wars over pork and beef in its country's supermarkets, the situation must be a good deal worse than the Government had hoped."

The computation of the inflationary trend ahead becomes, in consequence, a defeatist exercise. Original estimates were that, by the end of the

year, the overall price rise affecting GNP would be down to 3—3.5 per cent. The figure has been revised since to 4—4.5 per cent. The worry of the Administration is that, though there can be a lag between the imposition of anti-inflationary weapons and their results, there is, as yet, no idea of what exactly is causing the lag. That there has been considerable groping about it had been evident long enough. It may be recalled that, on the advice of Professor Friedman, a strict reduction of money supply was ordered and everyone believed that the results would be fairly visible by the end of the year (1969). But nothing happened. A further try had to be given to satisfy theorists who could say that they had been robbed of their hour of victory most cruelly at the precise moment when it was in the offing.

Tight Budget

President Nixon produced a tight budget in February but to no purpose. He had to cry halt and order that $1,200 million worth of funds for State and local construction be unfrozen, of which $500 million is to be spent this year. Money supply began to increase by 4 per cent even in the first quarter of the year and has begun to grow later on by about 10 per cent. With the lid on inflation away, it becomes evident that the Nixon decision has been motivated by political rather than economic considerations by the knowledge of what recession meant to the Republicans in 1960. The swing in favour of inflation automatically raises doubts as to how best it could be combated. In a leader, the *New York Times* demanded "a searching reappraisal of why the Administration's single-minded policies are failing to produce the advertised results" and described as an illusion the belief, optimistically held in the Administration, that slow growth in money supply is the elixir for steady and non-inflationary economic growth.

TABLE I

OUTPUT AND PRICES IN SEVEN MAJOR COUNTRIES

(Percentage change from previous period at seasonally adjusted annual rates)

	1958-67 Average	1968	1969	1970 I half	1970 II half	1971 I half
United States						
GNP ..	4.7	4.9	2.8	-1½	2	3¼
Deflator ..	1.8	4.0	4.7	5¼	4	3½
Canada						
GNP ..	4.7	4.9	5.0	3¼	1¼	4½
Deflator ..	2.4	3.6	4.7	4	3½	3
Japan						
GNP ..	10.7	14.0	12.2	10½	9½	12¾
Deflator ..	4.6	4.0	4.4	6½	4½	3½
France						
GNP ..	5.8	4.9	7.9	5½	5¼	5¼
Deflator ..	4.0	4.7	6.9	5¼	3¾	3¾
Germany						
GNP ..	4.8	7.2	7.9	4½	4½	3
Deflator ..	2.9	1.5	3.4	7½	5	4
Italy						
GNP ..	6.0	5.9	4.8	11¼	8	6
Deflator ..	3.8	1.5	4.0	6¼	7	7½
United Kingdom						
GNP ..	3.3	3½	1¾	1¼	4	3
Deflator ..	3.0	3¼	5	5½	4½	4
Total GNP ..	5.3	5.9	4.7	1¾	3¼	4¾
Deflator ..	2.5	3.7	4.7	5¼	4¼	3¾
Total excluding US						
GNP ..	6.2	7.3	7.2	6½	5¼	6
Deflator ..	3.6	3.2	4.6	6¼	4¾	4¼

Disturbing Factors

Experts of the International Monetary Fund have taken care to stress that by the end of 1969 speculative capital movements in the wake of currency realignments had abated. The dominant feature of the economy all through 1969 and the first half of 1970 was the inflationary momentum generated by developments of the preceding several years, the maintenance of a much more restrictive position fiscally than had prevailed in 1965-68 period, application of a tight monetary policy and a gradual long-lagged response of real economic activity to the financial restraint being applied. Internally, the inflation was reflected in the largest price and unit labour cost increases in almost two decades. The I.M.F. notes that the increase in the G.N.P. deflator from 1968 to 1969 "was nearly 5 per cent higher than expected by most observers; and the annual rate of increase in the first quarter of 1970 was even higher, amounting to some 6 per cent inclusive of a federal pay rise and to more than 5 per cent apart from that factor." The more disturbing thing is the slack in growth of real output and unemployment at 4.8 per cent of the labour force in the second quarter of 1970 against 3.5 per cent early in 1969. The slow-down has been due to financial policy: the 10 per cent income tax surcharge imposed in mid 1968, the statutory ceilings on federal expenditure and comparative checks operated in the monetary field by the Federal Reserve Bank in the form of higher discount rates, higher cash reserve ratios and the imposition of minimum reserve requirements on marginal Euro-dollar borrowing. It may be recalled that the tight monetary policy had resulted in suction of funds from Euro-dollar markets. Rapid movements of Euro-dollars which impacted credit and money markets abroad adversely were sought to be restrained by 10 per cent minimum reserve margin. In these circumstances a sizable balance of payments deficit in 1970 can be tolerated as a transitional phenomenon only if the U.S. Government's anti-inflationary measures bite deep enough.

U.K.'s Favourable Over-all Balance

As for the United Kingdom, its overall balance showed a favourable swing of almost £ 4 billion—from a deficit of £ 3 billion to a surplus of £ 0.9 billion. As a reflection of increasing confidence in sterling, especially after the French and German exchange rate adjustments and of the maintenance of tight financial policies, the net short term capital flow was close to zero for 1969 as a whole, compared to a net £ 2 billion in the previous year. Associated with this there was the shift in current account balance from a deficit of £ 0.3 billion to a surplus of £ 1.9 billion. The contributory factors for this sound position were an expansion of world trade (England as a nation of shopkeepers depends on world trade much more heavily than any other country), the devaluation of sterling and the adoption of stop-go policies. This followed by import deposit scheme turned the current account into a surplus at an annual rate of £ 1.5 billion which has been maintained in the first quarter of 1970. The restrictive financial policies helped limit outflow of funds from London even during the upheavels of European money and currency markets in the first three quarters of 1969. With the return of normalcy in Europe, the improvement in the U.K. position continued. The only discordant note is the wage rise which has not been contained because of the peculiar political milieu in which they have had their origin. Conservative or Labour, no British Government has any chance of containing inflation unless unions are shown their limits.

West Germany's Recovery

As for West Germany, by the beginning of 1969, German economy had completed its recovery from recession, unemployment had receded to 1 per cent of labour force and production was close to capacity. Whatever be the rationale of the financial restraint followed in 1969, it became clear by the beginning of 1970 that the targets of stabilisation policy had been missed by rather a wide margin. It may be recalled the price and wage hike had induced the Government in January last to limit or defer planned outlays, postpone scheduled tax cuts and accumulate "business cycle equalisation deposits" at the central bank to complement revaluation of the mark. In March, discount rates were raised and in July minimum reserve requirements were put up by 15 per cent and restrictive tax measures imposed. These included a refundable surcharge on income and corporation taxes and a temporary suspension of the system of declining depreciation allowances for most capital investments. Wages were sought to be contained by "a concerted action programme involving tripartite negotiations. By 1970, there were signs of a reduction in the external surplus. The late 1965 outflows of short term funds were reversed once more in the first quarter of 1970 when the flow turned inward in response to tight money policy."

For France, as for U.K., fluctuations in current account were exacerbated by capital outflows. During recovery since mid 1969 reserves were bolstered up by capital inflows. The economic adjustments in the aftermath of the devalution occurred without much sacrifice in terms of foregone output. Real GNP continued to grow throughout 1969, although at a somewhat slow rate, and continuing substantial growth of

TABLE II

CURRENT BALANCES O.E.C.D. COUNTRIES

$ 1000 million, seasonally adjusted annual rates

	Average 1960-68	1969	1970	1971
United Kingdom	—0.35	1.00	1.3	1.3
United States	2.85	—0.89	1.1	1.6
France	0.37	—1.55	0.4	0.6
Germany	0.62	1.81	0.4	0.4
Italy	1.05	2.37	1.0	1.4
Canada	—0.71	—0.67	—0.6	—0.6
Japan	0.10	2.19	2.5	3.0
Total above	3.93	4.26	7.2	7.3
OECD current balance with the rest of the world	2.80	3.90	5.8	6.0

output during 1970 was anticipated in official projections.

For Europe as a whole, as the I.M.F. points out, the impact of the Euro-currency and international bond markets on the effectiveness of national monetary policies has aggravated the problem of maintaining the independence of such policies. Effects of changes in monetary policies of large industrial countries, are quickly transmitted to other industrial countries with wide repercussions throughout the world. When for example, the U.S. adopts a severely restrictive monetary policy, major policy dilemmas are created for other countries whose own levels of economic activity and financial conditions are considered satisfactory or whose own policy requirements run in the opposite direction. For such a country, outflows of capital responsive to tightening of credit conditions in the U.S. will mean that the domestic monetary base and money supply will tend to fall. On the one hand, allowing this tendency to operate, while helping to minimise the impact on the country's international reserves, is likely to reduce domestic economic activity below level; on the other hand, an attempt to immunise domestic impact by neutralising the effects on the country's monetary base and money supply may expose the official exchange reserves to severe depletion. Equally difficult problems of an opposite nature could arise during a period of marked ease in U.S. monetary policy.

OECD's Optimism

The Organisation of Economic Co-operation and Development in its latest half yearly round up of the economic situation in member countries has sought to answer the question whether the price rise habit has become so deeply ingrained that the conventional remedies do not apply and the world does face an economic crisis of entirely novel proportions. Its answer is in the negative and according to monetary critics, excessively optimistic. Its argument is based on Table 1:

As for current balances, Table 2 represents position:

The optimism in the light of these figures impinges on the U.S. improving its price performance, the Euro-dollar market behaving as expected and governments in Europe are willing to accept prolonged stagnation or recession in return for price stability. How far these conditions will actually be realised depends on numerous imponderables, which makes OECD optimism less justifiable. It is all in the bargain insofar as, over the decades, international monetary systems have developed a built-in predilection in favour of internationalism in monetary policies, a goal that will remain as difficult of achievement as the "One World" idea of Utopians everywhere.

INCREASING ECONOMIC COLLABORATION BETWEEN MOSCOW AND BONN

By DR. ERHARD HAUBOLD
Press Bureau of German Industry, New Delhi

ONE OF THE MOTIVES behind the Soviet Union's decision to press forward with its negotiations for a Treaty with the Federal Republic is reported to have been a very candidly expressed need for access to W. German technical know how. This fact underlies one of the realities of the present day power alignment. During the past year, the Soviet Union realised the technological lag which separates it from US development in certain vital fields dramatized by major public events. One of these was the successful moon landings of American astronauts.

The lag can be localised in the field of 'delivery systems'. The heart and brains of a modern delivery system are electronic. Their existence and their efficiency are directly attributable to the invention of the transistor and the development of the micro circuit. To produce modern solid-state (this latter term meaning absence of valves and vulnerable wirings) printed microcircuits which allow computers to store many thousands of units of information per square inch, requires a sophisticated application of higher mathematics, high level electrical and electronic know-how, advanced photoelectric micrographic techniques, advanced micro-handling procedures — indeed a whole new scientific capability which is constantly being improved and expanded in its potential.

Pioneers in Electricity, Optics

One can readily see the role filled by the German precision industry in this demanding field of industrial effort. German research has long been one of the earliest pioneers in electricity, optics and photo electrical technology. The names of Siemens, Zeiss, Leitz, AEG-Telefunken and many others spring immediately to mind. When in the post-war era the German industrial revival began to gain momentum, a considerable effort and capital was channelled into research and development. Using the traditional experience at their disposal and applying knowledge developed during the war, which in its time applied a considerable incentive on the development of radar and radio techniques, the German industry was able very rapidly to regain its position of world prominence in these areas.

Thanks to an early association with other allied nations in aerospace research and satellite construction and development, the industry today is an important supplier of space hardware to the US space programmes. A particular emphasis being applied to such important matters as long range space communications by laser or electronics, nuclear power for space vehicles, selenium cell development and to serve all these the laboratory production of highly sophisticated electronic Thyristor crystals and super conductive materials.

In this field alone, the Soviet Union could have much to gain from a closer commercial association with Germany.

Significant negotiations on economic co-operation between the two countries are likely to be taken up during the second half of September. While Bonn's Economics Minister Karl Schiller and Science Minister Hans Leussnik are expected to travel to the USSR, W. German industries are preparing to receive a high-level Soviet delegation.

Giant Truck Factory in USSR

The first round of discussions most likely will concentrate on a giant truck factory, which the Soviet Union has invited Stuttgart-based Daimler Benz AG to build about 600 miles east of Moscow. According to existing plans, the new project will have an annual capacity of 150,000 heavy duty trucks (with a capacity of 10 to 20 tons) and will cost approximately 4,000 million D-marks (Rs. 800 crores). After negotiations with Ford of America had failed, Moscow invited the management of Daimler Benz, famous manufacturers of Mercedes passenger cars, trucks and buses, to visit the Soviet Union.

The new truck factory will be the largest in the world. While the Soviet Government will be in over-all charge, it has offered Daimler Benz to take up the entire technical responsibility, including issue of tenders and planning of production. Supplies of the German firm will comprise heavy equipment, licences and know-how. It is expected that an international consortium will be formed under the leadership of Daimler-Benz.

It will include the Italian Fiatgroup (which already has supplied and erected a large plant for passenger cars at Togliattigrad), Renault of France and DAF of Netherlands. The Soviet Union expects the Federal Republic to supply about half of the total investment, e.g. credits and equipment to the tune of 2,000 million D-marks (Rs. 400 crores).

During his recent talks with W. German Chancellor Willy Brandt, Soviet Premier Kosygin is reported to have invited Bonn to participate in the new Soviet Five Year Plan and offered an agreement stretching over 20 years on technical and economic co-operation. The Soviet Union, Mr. Kosygin said, had large untapped resources of non-ferrous metals, coal, natural gas and timber, and German collaboration would be welcome in exploiting this natural wealth.

'First Class Trade Partner'

What Moscow above all wants from Bonn are large industrial units and manufacturing plants which incorporate the latest technical know-how. While it is agreed that a number of difficult questions would have to be sorted out before it comes to that, W. German industrialists regard future collaboration with W. Germany's largest European neighbour with optimism. Mr. Berthold Beitz, Chairman of the supervisory board of Fried. Krupp, Essen, said in a recent interview: "The Soviet Union is a first class trade partner. She rigidly sticks to contracts and pays according to schedule." The large Krupp combine is considered a pioneer in developing German trade with Russia.

"Very impressed" with their recent visit to Russia were also the managers of Daimler Benz. They reported a high standard of Soviet engineering and technical know-how and stated that in terms of capacity, the Soviet Union was already the largest producer of trucks in Europe.

First to benefit from increasing economic co-operation between the two countries are W. Germany's producers of heavy equipment, machinery and steel. But the Soviet Union is also planning to considerably expand her chemical industries in the near future, again with German collaboration. In a few weeks from now, BASF of Ludwigshafen will start erection of 80 million D-marks (Rs. 160 million) plant for synthetic fibres near Sewerodonezk. Friedrich Uhde, part of the Hoechst group, has already supplied fertilizer plants in 1967 and 1969, while Linde AG is negotiating several petrochemical projects. Government-owned Salzgitter AG over the last 10 years have delivered 4 large chemical plants and are expecting new orders to come in soon.

Motor Cycles of Munich

Apart from steel, machinery and chemicals, the Soviet Union has also shown interest for W. German motorcycles. "You are producing the best motorcycles in the world", a board member of Munich-based BMW was recently told by visiting Russian guest. BMW, one of the oldest and most reputed manufacturers in Germany, would be willing to erect an efficient and large motorcycle plant in the USSR.

The biggest problem yet to be solved is the financial part. Already last year, the Soviet Union bought more than it sold to Bonn; the trade balance was with 276 million D-marks (Rs. 552 million) in W. Germany's favour. Russia's exports consisted mainly of raw materials, while Soviet consumer goods still have to find a market in Germany. The pipeline deal concluded between the two countries in February of this year, could serve as a model for future projects.

Under this deal, W. German steel firms Mannesmann and Thyssen are supplying pipes worth more than 1,000 million D-marks (Rs. 200 crores) to the Soviet Union under a credit scheme arranged for by private German banks. Moscow in return delivers natural gas to Germany. Similar arrangements involving long term credits will have to be made for projects now in the planning stage. Reports that Bonn was willing to back up a credit of 1,000 million D-marks for the proposed truck plant, have not been confirmed yet. Similarly, Bonn so far denied rumours that it was planning to extend a credit of 30,000 million D-marks (Rs. 6,000 crores) to the Soviet Union over a period of ten years.

F.A.O. LOOKS AHEAD TO 1985

IN ASSESSING THE world food problem for the crucial decade of 1975 to 1985, the prime consideration has to be the possible growth in world population in general and the demographic pressure in the developing countries in particular. According to the calculations made by the Food and Agriculture Organisation of the United Nations, in developing countries, population growth would account for 84 per cent of the total increase in demand for food in the decade up to 1975 under the low income assumption and 68 per cent under the high income assumption. To set this calculation in proper focus, it has to be remembered that, in developing countries, if population were to grow at around 2.6 per cent annually and G.N.P. were to expand in line with the high assumption—5.5 per cent per year from 1965 to 1975 and 6 per cent per year from 1975 to 1985—the increase in total food demand would be 112 per cent. With a slower advance in G.N.P.—3.6 per cent per year up to 1975 and 3.9 per cent per year thereafter, the food demand would still increase by 82 per cent. For North America, the corresponding figures are 91 per cent and 86 per cent. In the second decade population growth would account for as little as 59 per cent of the increase in demand in developing countries if the high income growth assumption is combined with slow population growth. Only in areas which combine rapid economic growth with slow population increase, such as Western Europe and Japan, will the income factor play the more important role.

TABLE 1

IMPACT OF THE LOW POPULATION ASSUMPTION ON THE DEMAND FOR CEREALS IN 1985

Areas	Population			Reduction in total cereals demand in 1985	
	1985A	1985B	Difference	Low income	High income
		Million	B—A	Assumption	
				Million tonnes	
Developed countries	878	906	28	4.1	4.0
Centrally planned economies	1,502	1,605	103	19.3	23.4
USSR, E. Europe	405	415	10	2.0	2.0
Asian centrally planned countries	1,097	1,190	93	17.3	21.4
Developing countries	2,387	2,473	86	12.1	15.1
India	737	755	18	3.0	3.8
World total	4,767	4,984	217	35.5	42.5

A — low population assumption
B — high population assumption
Source: F.A.O.: Agricultural Commodities Projections for 1975 and 1985.

Population Assumptions

Over the second decade 1975-1985 the adoption of two population assumptions permits the effect of a slowing down of the population increase rates to be assessed. As regards the total of developing countries, if gross domestic product growth were to follow the path of the high income assumption from 1965-1985 with population increasing at 2.6 per cent per annum upto 1975 and 2.5 per cent per year thereafter, it has been noted above that food demand would increase by 112 per cent. If, as a result of family planning policies, population increase falls off to 2.1 per cent per year for the second decade, the twenty year demand increase for food at 107 per cent would be only slightly less. This is due to the effect of reduction in the number of consumers being partly offset by higher food consumption per head associated with higher average income per head. Per caput demand for food as a whole is about 1 per cent higher on the low than on the higher population assumption, although the increase is greater for the foods with high income elasticities. However, the reduction in total population of 3.5 per cent is sufficient to account for a slight fall in the total demand for all food items. The impact of the low population assumption on the demand for cereals in 1985 is shown in Table I below. The reduction in world demand would be about 36 million tonnes under the low income assumption and about 43

million tonnes under the higher income alternative compared with the corresponding totals under the higher population increase rate.

Defining Hunger

In defining hunger, the major consideration is calorie intake. Judged this way, the problem of undernourishment would still be a matter of grave concern in developing countries. The increase in average calorie intake in these countries between 1962 and 1985 will not be any higher than 6 per cent. This would mean a calorie supply only 2 per cent higher than calculated requirements. Taking the inequality in income distribution *vis-a-vis* the expected 40 per cent increase in their population between 1962 and 1975, the number of persons suffering from undernourishment would be about the same in 1975 as in 1962 in spite of the increase in the average calorie intake. Under the high income assumption, the average calorie intake would be 11 per cent higher in 1975 than in 1962 for developing countries as a whole. The same gain would be achieved only just after 1985 under the low income assumption. In both cases, hunger would still be a problem. While in Asia and the Far East, the margin of safety would be only 5 per cent, in Central America, the Carribean and North West Africa, the average calorie intake would just reach the calculated level of requirements. Hence, only on the assumption of the high rate of economic growth upto 1985 would the problem of undernourishment be effectively solved at the end of the period. Assuming supplies were sufficient to meet the demand, average calorie consumption for developing countries as a whole should reach a level of 16 per cent above requirements by 1985 giving a margin of safety comparable with that enjoyed in developing countries today. For few individual countries representing a small fraction of the world population, demand may not reach the desired levels even by 1985.

Changes in Food Habits

Related to the question of calorie intake, there is the problem of changes in food habits and the consequent changes in the demand for the different types of food. The assumption in all this is that, upto a certain point, per caput consumption of basic foodstuffs like cereals, pulses and starchy roots will rise rapidly with income and the consumption will fall back after that, with the diets getting progressively more diversified. The level of income above which this happens is put at $250 per caput (Rs. 1875). At present staple foods account for 1500-1900 calories per day in developing countries against as low as 50 calories in the United States. It has similarly been calculated that the demand for protective foods like fruits, vegetables and dairy or other animal products rises steeply up to an income level beyond which it tapers off. The nutritional balance of such diets at this level consists in the better supply of animal proteins, calcium, iron and vitamins. In low income countries, any increase in income is expended on sugar and oils. They are prestigious items but have no minerals, no proteins, and very often, no vitamins.

Some of the general conclusions of F.A.O. studies in this regard do make interesting reading. The studies show that the proportion of calories derived from fats increases with the level of income, representing about 15 per cent of the total for countries where the per capita income is below $200 (Rs. 1,500) and more than 35 per cent where income is above $1,000 (Rs. 7,500). With a rise in income, the proportion of vegetable fats falls, while that of animal fats increases. For calories derived from carbohydrates, the share falls as income rises, from 70 or 80 per cent for countries with a per caput income below $200 (Rs. 1,500) to about 50 per cent at income levels above $1,000 (Rs. 7,500). This overall trend is the result of two contrasting influences: The reduced consumption of basic foods rich in carbohydrates (cereals, roots, tubers, pulses) and a strong increase in the consumption of sugar which is pure carbohydrate. The first tendency more than cancels out the second and the share of the carbohydrate in the diet in terms of calories is reduced as income rises. As for proteins, the population is closely linked to income. Compared with a level of 1 to 2.5 per cent for animal proteins in low income countries, it is over 8 per cent in North America. The opposite is true of calories derived from vegetable protein, which, at per capita incomes below $100 (Rs. 750) may constitute 7-10 per cent of total calorie intake as compared with only 3.5 per cent in North America. This difference is due to reduced consumption of cereals, roots, tubers and pulses at higher income levels.

Income and Protein Intake

It thus appears that the overall protein/calorie ratio is practically independent of variations in income. It is a remarkable fact that the protein/calorie ratio in East Africa where the average income is $76 per year is practically the same as in North America where average income is over $2000 (Rs. 15,000), 11.5 per cent compared with 11.8 per cent. Since in low income countries, protein intake is mainly of vegetable origin (from 7.6 per cent to 12.6 per cent in countries whose income level is below $100), the question whether or not there is a serious overall protein shortage depends largely on the protein content of staple foods. It is thus largely an ecological factor. The basic problem for most developing countries is to increase the supply of calories while at the same time increasing the calorie/protein balance. Such statistics as are available suggest that the countries where, in the national average, the share of calories derived from proteins is below 10 per cent, have a combined population of more than 500 million. This is more than one-third of the total population of developing countries; but the true proportion suffering from protein shortage is much higher when account is taken of the large section of the population that subsist on staple foods low in protein in some countries where the national average is satisfactory. As there is no prospect of solving their problems of protein deficiency over the next twenty years through stepping up animal production, it seems vital to attack the problem from the other side as well by trying to increase the consumption of vegetable proteins. It is because of this that first priority should be given to the distribution of protein rich foods for children who are attacked most by protein deficiency.

Developing Food Industries

The solution of these nutritional problems will be facilitated if the development of food industries, which is already taking place, were oriented in part toward manufacturing protein rich food mixtures adapted to the purchasing power and tastes of consumers. The Incaparina or Complan which have been evolved deserve further refinement and much more vigorous publicity than has obtained at present. The problem of nutrition is so potent in its impact on social and economic fields that a planned food policy is more than justified: taxes or subsidies to check or encourage demand and supply of local or imported products on the basis of nutritional criteria; nutrition education to encourage the best use of all available or potential resources.

The Cereals Gap

As noted above, the main task for developing countries is to increase their supply of calories while simultaneously improving the proportion of the calories intake contributed by protein foods. An increase in calories supply means a faster expansion in output of basic cereals alone for human food—rice, wheat, maize, millets, etc. In developing countries as a group, demand for cereals alone for human consumption is projected to rise by 90 and 100 million tonnes, on the low and high income projector respectively, above 1961-63 levels. If production increases as projected, there will be an increase in the deficit of developing importing countries on both assumptions. Their cereals gap could then amount to some 28 million tonnes on the higher assumption and some 50 million tonnes on the low income assumption, allowing for some increased use for livestock feeding. This would compare with 22 million tonnes in 1961-63 and 28 million tonnes in recent years. If supplies of calorie rich expensive foods did not materialise a further 7 million tonnes of cereals could be required on the low income assumption and 14 million tonnes on the high income assumption. Cereals deficit of importers will then be 42-57 million tonnes. The cereals gap will be wider still if the non-agricultural sectors expanded faster, as they could, with necessary foreign assistance.

Attention to Productivity

The F.A.O. says that the recent food production performance in developing countries gives no ground for optimism. Production per head, after increasing by nearly 1 per cent per annum between 1950 and 1958 has since remained almost stagnant. Future increases will hinge on productivity alone. For cereals, more than half of the production increase between 1949-53 and 1953-63 was due to extension of acreage. Only some 47 per cent of the basic foods—higher for rice but much lower for wheat—was due either to increase in the yields of individual crops or to a change in cropping pattern—crops with a low monetary return per hectare being replaced by those with greater return. During the next ten years, increase in the cultivated acreage in developing countries is expected to be less than it was during the 'fifties. Thus, the projections of food output which show increases from 1962 to 1975 of 2.8 per cent per year on the low income assumption and 3.6 per cent on high assumption imply a faster increase in yields than that between 1953-55 and 1962-63. Such an acceleration is not physically impossible; over the same period, increases in yields in Western Europe were three times as fast as in developing countries taken together. It presupposes the putting into operation of a series of auxiliary services allowing a sufficient number of cultivators to adopt a more advanced technology, an improved system of marketing and a wide range of institutional changes.

441 Projects in 83 Countries

The indicative World Food Plan focusses its attention on five broad areas: These are the wider introduction of high-yielding varieties of basic food crops, closing the protein gap, reduction of waste in food resources, improvement in the quality of life of the rural population, efforts to increase the earnings and savings of foreign exchange resources in developing countries. Considerable spade work has been done in this regard after the first World Food Congress of 1963 and after the Second Congress last July more direct action has begun to come forth. The World Food Programme has so far committed its food resources to 441 projects of economic and social development in 83 countries. Till the end of last year, about 7.5 million persons were benefiting directly from food supplies made under this programme. It has made 110 emergency food supplies in more than 60 countries to meet emergencies like drought and floods valued at about $ 85 million. (Rs. 63.75 crores). The programme has received support from rich and poor countries alike and for 1969 and 1970 the target of $ 200 million (Rs. 150 crores) set for pledges to the programme was oversubscribed by almost 50 per cent. The U.S. meets half the total but many recipients are also donors. For instance, Indian tea and Pakistan rice have been used to help people in Afghanistan and Indo-

nesia. Even small contributions of $1,000 (Os. 7,500) such as from Nepal and Cyprus are accepted gratefully since W.F.P. is anxious to win support from as many developing countries as possible. One of its biggest undertakings has been the supply of $56 million (Rs. 42 crores) worth of milk powder and butter oil to support India's dairy industry. In the United Arab Republic, food aid was used to pay part of the wages of agricultural labour employed in an irrigation project and in land reclamation and resettlement in the hinterland of the Aswan High Dam.

In India the major emphasis has been on relieving dependence on food imports through the high yielding varieties programme. There has however been a tendency to overplay the success of the green revolution. This year's output has been 99.5 million tonnes. The target for the next year is 106 million tonnes which may not be easy of reach. The output figure for 1973-74 is set at 129 million tonnes which is not also easy of reach. In fact, the improved farming practices have so far been impacting only a few pockets in the country. They are yet to percolate to the vast acreage outside the package belts and into the dry farming tracts which constitute the bulk of the sown area.

Mention in this connection should be made of the estimates of food requirements made by the Commission on Food and Nutrition which enquired into this question at the time of the meeting of the Indian National Food Congress in May last. The Commission felt that the country's food requirements for 1981 would be of the order of 102.78 million tonnes of cereals and 26.52 million tonnes of pulses. Other estimates of requirements were: sugar: 12.75 million tonnes; edible oils: 4.59 million tonnes; milk and milk products: 51.26 million tonnes; meat: 1.79 million tonnes; fish: 4.39 million tonnes; tubers like potato: 11.73 million tonnes and fruits and vegetables: 34.94 million tonnes. To overcome the protein shortage, the Commission called for the stepping up of production of pulses, soya beans, milk, poultry and milk products with particular emphasis on piggery. It recommended the popularisation of high-yielding varieties of edible oilseeds and pulses. What is important is that these schemes should be pushed through as expeditiously as possible. It is a matter for some concern that continuing farming problems like water-logging and drainage obstacles have not been tackled in deltaic cultivation areas, though there have been frequent on-the-spot enquiries and publication of their findings. Since a World Bank team is examining this problem in the Cauvery basin, can it be hoped that past lethargy in this field will soon become a thing of the past?

—*R.S.*

Mr. K. N. Ganesan, a farmer of Kalambur village in North Arcot district, has named his new-born son "IR-8", in gratitude to the paddy variety (bearing the same name) for helping him increase his rice production three-fold. Picture shows "IR-8" with his father Ganesan in the rice field.

WORLD FINANCE AND LIQUIDITY

By OUR SPECIAL CORRESPONDENT

THE REVIEW OF the world monetary situation both in respect of currency conundrums and jigsaws of balance of payments contained in the latest annual report of the International Monetary Fund covers understandably much familiar ground. But the main emphasis of the report is not so much on recording details of a past year but in hinting at provable correctives which can, nationalism willing, enable the world economy move forward towards greater stability and prosperity. The report records "a series of developments serving to improve the adjustment of payment imbalances and to strengthen the international monetary system." The problem lies, however, in sustaining these improvements.

Containing Currency Speculation

The improvements already effected deserve to be noted first. These are: containing the currency speculations and flights of hot money, the devaluation of the French franc, the upward revaluation of the Deutsche Mark, the shift to surplus from deficit in British balance of payments and the fortuitous surpluses which the reverse flow of Euro-dollars created in the U.S. balance of payments. All this could not obscure the basic sickness of Western economies stemming from an inflation and a wage boom unrelated to productivity. This was reflected in the overall deceleration of real G.N.P. in the advanced countries. And the failure of the U.S. inflation to cool off was a major setback from an international, as well as from a domestic, standpoint inasmuch as it imparted inflationary stimulus to the international economy. Price increases were uniformly larger in the industrial countries in 1969 than in 1968 and their output growth matched or exceeded the previous year's high rate—reaching 8 per cent in Germany, almost double the economy's long term growth rate, as demand expansion and productivity increases greatly exceeded all expectations. Growth was exceptionally high in France. The longest post-war boom, extending since 1965, continued in Japan without any apparent signs of slackening. The prolongation of U.S. inflation coupled with such boom conditions all over the industrialised world contributed not a little to the trading abnormalities reflected in higher export prices and larger demand for most primary products. To the extent the U.S. inflation has, because it is of a major financial and monetary unit, been acting both as a catalyst and a prop to inflation all round, the I.M.F. has called for quick steps to eliminate

GOLD: MARKETED STOCKS AND DISTRIBUTION BY USE, 1956—FIRST QUARTER TO 1970

(Millions of U.S. dollars at $ U.S. 35 per five ounce)

Year	A Newly available gold	B Additions to world monetary stocks	C Estimated industrial and artistic use	D Estimated private hoarding
1956	1,130	490	310	330
1957	1,279	690	320	269
1958	1,261	680	360	221
1959	1,382	750	380	252
1960	1,378	280	430	668
1961	1,490	605	470	415
1962	1,500	370	510	620
1963	1,906	820	540	546
1964	1,856	710	600	546
1965	1,840	220	690	930
1966	1,371	— 45	745	671
1967	1,401	—1,580	815	2,166
1968	1,388	— 700	890	1,198
1969	1,408	110	930	368
1970 I quarter	365	217	235	—87

A: New production plus sales by USSR less purchases by mainland China
B: Data from International Financial Statistics.
C: Fund estimates.
D: The residual amount: Columns A — (B+C)=D

Source: I.M.F. Annual Report, 1970

it as the essential first step towards tackling inflation everywhere else.

Euro-Currency Market

This does not preclude the need to turn the light on certain crucial developments in the international financial markets. In fact, as the I.M.F. Report puts it, the existence and rapid growth of the Euro-currency market and the international bond market have raised or sharpened several key international financial policy issues. Some analysis of the functioning of these two markets becomes apposite in this context. The Euro-currency market grew during 1969 by something like 50 per cent. As measured by total banking liabilities denominated in currency other than that of the country of residence, the increase was to $45 billion from $30 billion. Its Euro-dollar component expanded by a similar proportion to $37.5 billion from $25 billion. The non-dollar component comprising mainly Swiss francs and West German marks rose to $8 billion from $5 billion. Much of the substantial growth of the Euro-currency market was due to heavy demand for Euro-dollars by foreign branches of U.S. commercial banks, which pushed up Euro-dollar interest rates. The higher rates attracted dollars not only from Europe but also from the U.S. itself. The I.M.F. feels that the bulge in the U.S. balance of payments deficits on the liquidity basis in 1969 apparently stemmed in part from identified movements of U.S. owned funds, under the inducement of exceptional yields, into the deposits side of the Euro-dollar market. The same yield inducements, causing, according to the I.M.F., many Western European investors to switch funds out of claims denominated in European currencies and into Euro-dollar forms, also tended to draw official dollar reserves away from some European countries and thus to improve the U.S. balance of payments on the official settlement basis. Being highly sensitive to interest ratios, the supply and demand of Euro-dollars depend for its controls on the elimination of speculative movements in currency markets.

International Bond Market

Foreign bonds issues in the United States in 1969 were $1.7 billion against $1.9 billion in 1968. Canada, however, increased its floatations in the US to nearly $1.5 millions. The 1969 floatations of foreign bonds in Europe at $1.6 billion were about $150 million less than in 1968 as in that year, a substantial part was accounted for by borrowing requirements of governments and international organisations. Issues of international bonds in Europe totalled only $5 billion in 1969 compared with nearly $6 billion in 1968. The decline was partly a result of the historically record interest rates in the Euro-currency markets which diverted funds that might otherwise have been available for investment in the international bond markets. Concomitantly, the I.M.F. points out, high Euro-dollar

rates reffected heavy short term borrowing in lieu of offerings of bonds on which rates were also at peak levels. Offerings by U.S. corporations were limited to $ 1.4 billion against $ 2.1 billion in 1968; of this, only about half was inconvertible bonds, the attractiveness of which was seriously impaired by the downward slide of the US stock market. Denmark, France and Italy greatly increased their borrowings on the international bond market in response to official encouragement prompted by the desire to strengthen balance of payments. Similarly, U.K. issues doubled to about $ 300 million as the authorities attempted to offset the traditional deficit on long term capital movements providing cover for the foreign exchange risks involved in borrowing in Deutsche Mark and introducing legislation that allowed local authorities and State enterprises to borrow in the world bond market.

Mobility of Capital Flows

The impact of these new markets, and especially of the Euro-currency market, on the mobility of capital flows among countries has brought a high degree of integration to the international credit market as a whole and has enhanced the sensitiveness and sensitivity of capital movements to interest rate differentials. At the same time, mechanism has been provided for new forms of official investments, or intervention to influence both domestic banking activities and balance of payments positions. As the I.M.F. puts it, "the operation of the international monetary system is bound to be affected by actions of monetary authorities to avoid the new hazards or to seize the new opportunities presented by the Euro-currency market. Similarly the new channels for longer term capital movements that have been opened up by the evolution of the international bond market may sometimes encourage undesired capital outflows, as well as outflows fully compatible with the objectives of all the authorities concerned. Also, these developments would need to be taken into account in the complex task of estimating the future global need for international reserves." That, in short, is the crux of the evolving monetary situation of which there is considerable awareness among the leading nations.

Gold Stocks Up

As for gold, total official stocks are estimated to have gone up by about $ 110 million to a total of about $ 41 billion. Gold stocks of national monetary authorities increased by $195 million in 1969 after falling by $ 2,920 million over the three years 1966-68. In the first quarter of 1970, official holdings of gold rose by about $ 217 million. Gold holdings of I.M.F. amounted to $ 3,369 million at the end of 1969. This included $ 800 million invested in U.S. Government securities and $ 259 million held under general deposit. During the first quarter of 1970, gold holdings of the fund rose by a net $ 202 million. The Fund purchased $ 287 million worth of gold from South Africa under an agreement of December 1969 and $4.4 million from Austria when it was designated to provide currency with the special drawing rights facility. Estimates of private buying of gold for holding as hoards or for industrial uses were of the order of 37 million ounces worth $ 1.3 billion at $ 35 an ounce price, compared to 60 million ounces in 1968 and 85 million ounces in 1967. The rate of increase of industrial and artistic demand for gold in 1969 and in the first quarter of 1970 appears to have fallen considerably below the long-run average and also to have been markedly below the rate of increase recorded in 1968. In part, this can be attributed to large speculative increases in gold inventories in the wake of the European currency crisis. The comparatively sharp rise in price in 1960 (early) and in 1968 may have also been a contributory factor. Further, with the tightening of exchange restrictions in some countries like France, the opportunities for increasing private gold except through pushing up prices became impossible. Expectations of a rise in official gold price being thwarted by the two-tier system and the agreement of I.M.F. with South Africa, the leading supplier, the speculative acquisition of gold came to a dead stop almost after mid-1969 and had disappeared early in 1970. In any case, the table showing the diversion of gold into its various uses will be of more than academic interest in the light of the experience of international money markets in 1968 and 1969.

I.M.F.—Two Main Developments

The two most important developments in I.M.F. last year relate to the activisation of the Special Drawing Rights scheme and the revision of membership quotas. SDRs of $9.5 billion for three years 1970-72 with $ 3.5 billion in the first year and $ 3 billion in the next two years have been authorised for issue. The participants are to use SDR only in such "transactions as meet balance of payments needs or in the light of developments in its official holdings of gold, foreign exchange and SDR, and its reserve position in the Fund and not for the sole purpose of changing the composition of the foregoing as between SDR and the total of gold, foreign exchange and reserve position in the Fund." Participants can use SDR by designating other participants to provide currency for specified amounts of special drawing rights. A participant will "be subject to designation if its balance of payments and gross reserve position are sufficiently strong, but this does not preclude the possibility that a participant with a strong reserve position will be designated even though it has a moderate balance of payments deficit". All this is intended to promote over time equality in the ratios of holdings of SDR's to holdings of gold and foreign exchange.

In the first quarter allocation, no participant was designated for more than 42 per cent of the maximum amount to which it was subject under the scheme. A participant designated is obliged to provide "currency convertible in fact" in exchange for SDR. There are two categories of such currencies. One is inter-convertible currency. Such currency involved in a SDR transaction is convertible into any other inter-convertible currency that the transferer of the SDR wants. The French franc, the U.S. dollar and the British pound belong to this category. The other category comprises currencies of participants in the account, of which the issuer has stated that it will convert particular balances obtained in a transaction involving SDR into at least one inter-convertible currency. Balances of Belgian francs, Deutsche mark, Italian lire, Mexican pesos and Netherlands guilders have been established as "currency convertible in fact" of this second category. All of the foregoing currencies are convertible into U.S. dollars. While any "currency convertible in fact" may be provided by a designated participant, a participant using SDR may only request an inter-convertible currency. As for quota revisions, the resolution made provision for increases in quotas of Fund members totalling about $ 7.6 billion, thereby making the potential side of the Fund $ 28.9 billion. If the maximum quotas fructify, resources of the fund will increase by 35.5 per cent. This compares with an increase in the size of the Fund of about 33 per cent on the occasion of the Fourth Quinquennial Review in 1965 and an increase of about 54 per cent on the occasion of the adjustment of quotas In 1959. The quota increase is based on the growth in world economy. Allowance is made in quota allocations for members' exports, imports and invisible trade (and the variability of member's exports and invisible earnings), as well as for the level of members' external reserves and national income. Other important considerations include various developments affecting the need for conditional liquidity, the availability of unconditional liquidity and the maintenance of a balanced distribution of quotas within the whole membership of the Fund. All members were offered an increase in quotas of at least 25 per cent but about 75 members were offered increases in excess of 30 per cent. In the previous review, 16 members were offered increases in excess of 25 per cent.

Easier Liquidity

All these details are intended to highlight the fact that the availability of cash for world trade, technically known as liquidity, has been easier because of the improvements effected in the international monetary system. Even then in 1969, growth in reserves has been at a slow pace. World holdings of gold, foreign exchange and reserve positions in the Fund rose by only $ 0.2 billion on balance to $ 76.9 billion. Official reserve totals fluctuated very sharply. They fell by $ 2 billion, then rose by $ 2 billion in the second quarter and by a further $ 3 billion in the third quarter and they declined by $ 2 billion in the fourth quarter. These fluctuations reflected, in the main, large flows of dollars between private and

official holders in response both to uncertainties concerning exchange rates and to differences in conditions in national money markets. The reduction in global reserves in the fourth quarter of 1969 reflected to a predominant degree of the reflux of funds from Germany following revaluation of the Deutsche mark. Thus, apart from strains in trade cash, the main strain stems from monetary upsets troubling richer countries. This is precisely why the I.M.F. has been calling for more effective monetary-fiscal policies. It has not spared any words in decrying the weakness of national governments to play off on crucial aspects of fiscal policy and in pushing through corrective, anti-inflationary measures in a halting manner and in equally soft doses. Added to this, there has been the lack of courage to resist wage improvements which are really far ahead of productivity. In all these, criticism is far easier than action, because democracies, as they are constituted to-day, can rarely fulfil policy requirements cent per cent even with the best of the will at their command.

SIGNIFICANT CORPORATE TRENDS IN 'SIXTIES

By A. R. SUNDARAM

THE GROWTH IN the corporate sector and the rise in investment during the past decade in India constitute a major single factor which should engender optimism about the future of Indian democracy and the rate of growth. During this decade, there were real apprehensions about the role of private industry and the capital market. The survival of a well-organised and well-regulated capital market after the pressures and strains of the 'sixties, is a commentary on the dynamism of Indian entrepreneur and investor, while much valuable contribution to the overall investment and development has been made by foreign investors and friendly countries. There is one bright spot in Indian economic scene which should augur well for the future *viz.* the experience of the planners and the government that capital formation and growth in private investment cannot be brought about by legislative enactments, although the government's role in bringing about social justice and breaking monopolies and concentration of economic power is conceded. So long as the people believe that they are living in a democracy, it is however, the duty of the government to see that in the process of breaking monopoly and concentration of power, state monopoly is not created which in substance will again reverse the trend and put the people in the same old disquieting environment.

Corporate Liquidity Problems

While the problem of international liquidity is sought to be tackled by the creation of paper gold, in the domestic field, corporate liquidity problems have assumed considerable importance. Heavy reliance by Indian companies on short-term financing and on bank finance even in meeting the long term needs, have brought some important issues to the fore. A look at the ratio of debt to equity capital and also the ratio of equity to total employed capital will show that in the past, the role of the private capital market had been inhibited by the fiscal and tax policies of the government on one side and by the over-emphasis laid on lending by government financial institutions and by the underwriting by financial institutions. No doubt, lending by government financial institutions and their underwriting helped industry at a time when the capital market was almost moribund. But, it is to be remembered that it was the result of incentive-drying tax policies. The result was inflation, as industry was more and more sought to be helped and financed by institutional funds which were replenished by higher taxation. It is obvious that encouragement of private risk capital would have been less inflationary and more economically rewarding, thus avoiding the distortions which we see in debt-equity ratio and the none-too-healthy dependence on bank finance for everything and on public deposits, by non-banking companies.

Penetrating into Private Companies

The proposal to convert loans into equity and the grant of voting power to financial institutions who lend money to companies and investors, constitute some offshoots of an unbalanced growth in financial terms. These trends which underline the government's penetration into existing private sector companies, especially after the nationalisation of banks, are unique in their political and economic perspectives. The basic remedy to these problems lies in activisation of the capital market through incentives. The fear of backdoor nationalisation through conversion of debt into equity and through conferring the righ to vote on shares which are pledged with banks is a product of certain financial and corporate trends as noted above which became prominent during the 'sixties.

Growth of the Corporate Sector

There has been a steady growth in joint stock companies during the past decade. One important feature is the expansion of existing companies and their diversification, apart from the addition to the list of companies. There were 26,912 joint stock companies in operation in 1960, with a paid-up capital of Rs. 1,593 crores, while the number of companies at the beginning of 1969 exceeded 27,338 and the paid-up capital more than doubled at Rs. 3,445 crores. An idea of the corporate sector in the pre-war can be had from the figure of 11,114 companies at work in 1939 with a paid-up capital of Rs. 290 crores. The number of companies stood at 21,853 with a paid-up capital of Rs. 479 crores in 1947.

Government Companies...

The growth in government companies underline the steadily rising interest of the government during the decade. The total number of government companies which stood at 154

with a paid-up capital of Rs. 629.7 crores rose to 259 companies with a paid-up capital of Rs. 1,703.8 crores in 1969. The Stock Exchanges in the country were autonomous institutions till 1957. But, with effect from February 20, 1957, security market and security business are governed by the Securities Contracts (Regulation) Act, 1956, and this legislation has afforded considerable protection to the investors. In fact, the hazards of security business which were particularly in evidence in the pre-war years, have been considerably reduced by this regulation. In other words, the modern investor enjoys a high degree of protection, service and facilities though he is not expected to throw overboard the dictum of *"Caveat Emptor"*.

Though the trend of listing shares with the Stock Exchanges underlines the vast scope in the future, the number of companies listed so far in the principal Stock Exchanges bears testimony to the satisfactory growth in this connection and the community of interest between the corporate sector and the shareholders. The number of companies listed in Madras Stock Exchange rose over 359 at the beginning of 1969 from 192 in 1946 which year was important in stock market trends. There has been a good rise in the listing of companies; the number of companies listed in Madras, Bombay, Calcutta, Ahmedabad, and Delhi amounted to over 1850 in 1969.

Trend of Share Price Index

The behaviour of the general index for equity from 1961-62 when viewed with the movement of the index for preference shares may underline one important aspect of investment, decisions of the Indian investor during the decade. The point of interest is the absence of any noticeable switch from preference shares to equity. One interesting inference that flows from a study of the movement of both equity and preference share index is that even a mild boom in equity may not lead to any contraction of interest in the preference shares. The preference share index which stood at 90.9 in 1965-66 (base year 1961-62—100) touched at 99.3 at the beginning of September 1970. The equity index moved up from 75.9 in 1965-66 to 99.3 at the beginning of September 1970.

Bugbear of Modern Investor

Creeping socialism, high wages and high taxes are the bugbear of the modern investor in any country. But, the effect of all these trends on inflation and on investment psychology is seldom appreciated in the right perspective. It is to be remembered that depression is almost beaten out of economic calculations of modern governments. There is a built-in safety valve in the financial mechanism. The present economic and political posture of the country provides enough provocation to embark on a vigorous and dynamic research into the appropriateness or otherwies of equity investment, keeping in mind the inflationary background.

SOME PROBLEMS OF POWER GENERATION AND DISTRIBUTION

FASCINATING DEVELOPMENTS are taking place in the power situation of the country. Even with the decision of the Planning Commission to create additional generating capacity for over 9 million KW taking the total to 23 million KW there will be pockets with large deficits. For the first time in the Plan era, the need for dispersed, balanced and integrated development of hydel and thermal resources of energy has been recognised. It will be possible, by the end of the current plan period, to operate on an effective, integrated basis at least regionally. There are proposals for inter-linking State grids and even establishing duplicate transmission lines with higher voltages, for avoiding power losses so that generating capacity created at great cost can be profitably employed and power transmission and utilisation can be carried out on an optimum basis. Even now there are load dispatching centres functioning in Maharashtra which evolve systems capable of despatching instructions instantaneously and intelligently so that particular power systems could be cut off and particular others switched on. In this manner there can be a proper co-ordination of the functioning of hydel and thermal stations and power availability can also be maximised.

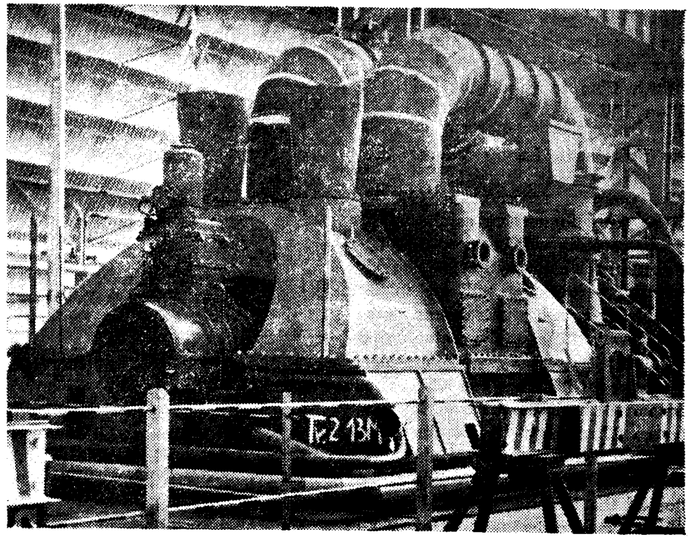
Integrated Approach

In the southern region Kerala and Mysore are already effectively interlinked with Tamil Nadu and the latter with Andhra Pradesh. Transmission of large blocks of power will have to be effected in the coming years from one direction to another and there is need for more links. There are proposals for achieving this objective in the current plan period. Having regard to the immense advantage that would flow from the formation of regional grids and ultimately the evolution of a national grid there should be no hesitation on the part of the Central Government to allot sizable amounts for this purpose.

Fourth Plan Allocation

In the Fourth Plan it has been decided that there should be an outlay of Rs. 2,447.57 crores on power. Out of this Rs. 974.06 crores will be spent by the States on continuing schemes while another Rs. 150.24 crores on new schemes. The transmission and distribution will account for Rs. 645.51 crores and rural electrification for Rs. 285.15 crores. There will also be additional expenditure by Centre on these schemes to the tune of Rs. 424.72 crores and allocation for centrally sponsored projects is Rs. 22 crores and for Union Territories Rs. 81.78 crores.

Besides the direct expenditure by the States and the Centre on various schemes, the Rural Electrification Corporation will be making available resources of the order of Rs. 150 crores. Efforts are also being made by some States to secure assistance from



During the 'sixties the capacity for power generating equipment has changed dramatically from almost total dependence to near self-sufficiency. Picture shows a 110 MW Steam Turbine manufactured by the Hyderabad unit of Bharat Heavy Electricals Ltd.

financial institutions so that the aggregate outlay may be Rs. 2,800 crores, if not more.

Emphasis on Existing Schemes

Out of the total 22,074 MW power capacity by 1973-74, thermal power will constitute a large proportion. In North India, apart from the second nuclear power station in Rajasthan, the capacity of coal fired thermal stations will be increased in a big way. In Andhra Pradesh, the Kothagudem and Ramagundam stations will have larger capacity while at Ennore in Tamil Nadu a big thermal station is springing up. The third thermal nuclear power station in the country is being set up at Kalpakkam. As regards hydel capacity there will be sizable additions to power availability with the completion of many continuing schemes. But due to paucity of funds and the long delays involved in constructing big hydel projects, the Planning Commission has preferred to lay emphasis on the completion of existing schemes. It has been indicated that by the end of the current Plan period they will be in varying stages of completion and power may become available early in Fifth Plan to the extent of 33.7 million KW.

New Units with Larger Capacity...

The progress recorded in 1969-74 will be truly impressive as the additions to capacity will be more than 60 per cent of the capacity in 1968-69 and generating equipment will be made available from indigenous sources in a massive way. The public sector units alone will be supplying generating equipment for 4.859 million KW. The balance will be imported from foreign sources. There can be considerable saving on these imports if there is proper coordination and effective utilisation of the facilities at the disposal of the heavy electrical units. However, there will be no problem regarding supplies of high-pressure boilers. The scope for eliminating imports can even

CREATION OF NEW GENERATING CAPACITY IN FOURTH PLAN

Statewise Classification of Continuing Schemes

State	Installed Capacity MW.	Aggregate Capacity MW.
Andhra Pradesh		
Ramagundam Thermal Scheme Extension	62.5	
Kothagudam Thermal Station Extension	220.0	282.5
Assam		
Umiam H.E. Scheme Stage II	18.00	
Garo Hills Thermal Station Extension	5.0	
Namrup Thermal Station	20.0	
Gauhati Thermal Station	20.0	83.0
Bihar		
Barauni Thermal Station	100.0	
Pathratu Thermal Station Extension	250.0	
Kesi H.E. Scheme	20.0	
Pathratu Thermal Station Extension	220.0	
Subernareka H.E. Scheme	65.0	
Chandrapura Thermal Station Units IV and V (DVC)	240.0	
New Unit in Bihar (N)	110.0	1,005.0
Gujarat		
Dhuvaran Thermal Station Extension	280.0	
Gas Turbine	54.0	
Ukai H.E. Scheme	300.0	
Ukai Thermal Station (N)	120.0	754.0
Haryana		
Faridabad Thermal Station	55.0	55.0
Jammu & Kashmir		
Kalakote Thermal Station	15.0	
Chenani H.E. Scheme	23.0	
Sumbal H.E. Scheme	22.0	60.0
Kerala		
Kuttiadi H.E. Scheme	75.0	
Idikki H.E. Scheme	260.0	335.0
Madhya Pradesh		
*Jawaharsagar H.E. Scheme	99.0	
Satpura Thermal Station	62.5	161.5
Rajasthan		
**Ranapratap H.E. Scheme	43.0	
Ranapratap Sagar Atomic Power Station	400.0	443.0
Maharashtra		
Vaitarna H.E. Scheme	60.0	
Koyna H.E. Scheme	320.0	
Purli Thermal Station	60.0	
Bhatgar and Vir H.E. Schemes	25.0	
Nasik Thermal Station	280.0	
Koradi Thermal Station	240.0	
†Tarapur Atomic Power Station	380.0	1,365.0
Mysore		
Sharavati H.E. Scheme Stage II	178.2	
Sharavati H.E. Scheme Stage III	178.2	356.4
Nagaland		
Dzuza H.E. Scheme	1.5	1.5
Orissa		
Talchér Thermal Station	62.5	
Balimela H.E. Scheme	360.0	422.5
Punjab		
Upper Bari Doab Canal H.E. Scheme	45.0	
‡Beas (Dehar Power Station)	165.0	
Bhatinda Thermal Station (N)	110.0	320.0
Tamil Nadu		
Parambikulam H.E. Scheme	155.0	
Basin Bridge Thermal Station	30.0	
Ennore Thermal Station	330.0	
Ennore Thermal Station	110.0	
Kodayar H.E. Scheme	100.0	
Kundah H.E. Scheme Stage IV	110.0	
@Kalpakkam Atomic Power Station	200.0	
Neyveli Thermal Station Extension	200.0	1,235.0
Uttar Pradesh		
Yamuna H.E. Stage I	28.0	
Yamuna H.E. Stage II	240.0	
Obra Thermal Station	100.0	
Obra H.E. Scheme	99.0	
Ramganga H.E. Scheme	120.0	
Harduaganj Thermal Station IV	110.0	
Obra Thermal Station	300.0	
Yamuna H.E. Stage IV	10.0	
New Units in U.P. (N)	220.0	1,227.0
West Bengal		
Jaldhaka H.E. Scheme	9.0	
Santaldih Thermal Station	240.0	
Little Ranjit H.E. Scheme	2.0	251.0
UNION TERRITORIES		
Delhi		
Indraprastha Thermal Station Unit V	55.0	
Badarpur Thermal Station	300.0	355.0
Himachal Pradesh		
Nogli H.E. Scheme	2.0	
Bassi H.E. Scheme	45.0	
Giri Bata H.E. Scheme	60.0	
Siul Baira (N)	200.0	307.0
Tripura		
Gumti H.E. Scheme	10.0	10.0
Manipur		
Loktak (N)	70.0	70.0

*Joint Project from Madhya Pradesh and Rajasthan **Also serves Madhya Pradesh

†Also serves Gujarat ‡Will also serve Haryana and Rajasthan @Also serves Andhra

now be examined. Alternatively, the Government should be agreeable to increase the allotment for generating schemes as it has, of late, been demonstrating that with a standardisation of equipment and the placing of orders by the various State Electricity Boards fairly in advance, the public sector units would be able to step up their output substantially. It is also expected that about 3.37 million KW capacity of plant and equipment would be in various stages of manufacture in the three units for supply to spill-over State projects. It will be necessary to organise the fabrication of heavy electrical equipment and conclude arrangements for manufacturing units with bigger capacity as in the Fifth Plan, there will have to be more than a trebling of production.

Maharashtra and Tamil Nadu Lead...

The power situation may indeed spring up unmanageable surprises as a rough appraisal of the additions to generating capacity shows that regionally the distribution will not take place on a uniform basis. Indeed, from the details given below it will be seen that out of a total capacity of 23,388 MW, Maharashtra and Tamil Nadu alone will be accounting for 5,709 MW or nearly 25 per cent of the total with a population of only a seventh of the total for all-India.

There are plans for energising as many as 12.50 lakh pumpsets all over the country and electrify a large number of villages. If there was greater use of power for agricultural purposes and domestic consumption, the demand for electricity may improve on a much bigger scale than is now expected.

In view of the serious problems involved in expediting implementation of new schemes and the paucity of resources, the much desired uniformity may not come about in a short period. But there is bound to be faster growth of power consumption in some regions and there will probably have to be doubling of capacity by 1978-79 from the level of 1973-74. This will have to be done as power will be used to a

greater extent than petroleum products in the coming years. In the absence of any significant success in the efforts of Oil and Natural Gas Commission to locate new reserves, the only way of reducing imports of crude oil will be through increasing use of electricity for railway traction, industrial operations and other purposes. It has been abundantly proved by the experience of Tamil Nadu and Maharashtra, the former particularly, that continuous emphasis on power generation and distribution will pay rich dividends; no time should be lost in finding additional financial resources for power projects. There will also have to be judicious formulation of thermal and hydel schemes. In Bihar, West Bengal and Madhya Pradesh there will have to be accent on the creation of thermal capacity based on coal. In Kerala, Mysore and Andhra Pradesh, the hydel potential will have to be fully exploited. The Sharavathi project has a remarkable effect on the economy of Mysore. If only careful attention had been paid earlier to the construction of transmission lines and the erection of a vast distribution network, there would be by now compulsion to execute the Kalinadhi project. This scheme has the potential of another Sharavathi project and no time should be lost in completing preliminary work. Likewise the Hogenekal project on the Cauvery should be executed jointly by Tamil Nadu and Mysore while the Srisailam scheme in Andhra Pradesh will be another big source of power. In time, with the taming of Brahmaputhra and the other major rivers huge blocks of hydel power can be generated.

STATEWISE GENERATING CAPACITY IN 1969-74

(in megawatts)

Sl. No.	State	Aggregate capacity in 1968-69	Additions during IV Plan	Aggregate capacity by 1973-74
1.	Andhra Pradesh	634.00	282.50	916.50
2.	Assam	158.26	83.00	241.26
3.	Bihar	1,300.99	1,005.00	2,305.99
4.	Gujarat	661.56	754.00	1,415.56
5.	Haryana	497.66	55.00	552.56
6.	Jammu & Kashmir	40.33	60.00	100.33
7.	Kerala	546.60	335.00	881.60
8.	Madhya Pradesh	704.44	161.50	865.94
9.	Mysore	799.95	356.40	1,156.35
10.	Maharashtra	1,639.04	1,365.00	3,004.04
11.	Nagaland	2.00	1.50	3.50
12.	Orissa	501.45	422.50	923.95
13.	Punjab	681.77	320.00	1,001.77
14.	Rajasthan	482.45	443.00	925.45
15.	Tamil Nadu	1,470.50	1,235.00	2,705.50
16.	Uttar Pradesh	1,371.66	1,227.00	2,598.66
17.	West Bengal	1,208.88	251.00	1,459.88
18.	Union Territories	272.77	742.00	1,014.77
19.	Self-generating industrial establishments	1,314.00	..	1,314.00
		14,288.31	9,099.40	23,387.71

Rational Approach Necessary

There will have to be planning on an ambitious basis for the construction of atomic power stations. It is felt that in Uttar Pradesh and in the north-western region a proper balance between hydel and thermal power can be achieved only by bringing into being new atomic power stations. In the south too there is need for two power stations with a capacity of 400 MW each. This would mean that in the not-distant-future power development will have to be carried out mainly on a regional basis.

Because there was a preponderance of hydel or thermal power in some areas a narrow approach should not be adopted in regard to the fixation of charges for use of electricity for different purposes. Even the regions which are richly endowed with hydel resources cannot afford to adopt an insular attitude, because once the hydel capacity begins to be fully used, fluctuations in availability cannot be avoided with the failures of monsoons. Also, serious operational problems may arise where large loads are involved. If the thermal stations are to function as base-load units the hydel stations will naturally function more actively during peak periods. A rational approach will, therefore, have to be adopted to the various problems and it should be the objective ultimately to make power available in plenty in all regions, to use available capacity economically and eliminate wide disparities in electricity tariffs.

AN ERA FULL OF HOPE AND PROMISE...

(CONTRIBUTED)

ANDHRA PRADESH IS endowed by nature with a rich variety of mineral resources such as coal, iron ore, manganese, limestone, barytes, asbestos, mica, etc. These minerals constitute the raw material for a large variety of heavy and medium scale industries. With the establishment of the Industrial Development Corporation, the Small-scale Industrial Development Corporation and the Mining Corporation in 1961, apart from many attractive incentives offered by the State Government, there has been a steady inflow of industrial finance into Andhra Pradesh. In addition, the location of many key central sector projects in or around the State's capital has added to the importance of the State occupying a pride of place on the industrial map of India.

Two units of the public sector company, the Bharat Heavy Electricals Ltd.—the Heavy Power Equipment Plant (HPEP) and the Switch Gear Unit—have been set up in the State at an estimated cost of Rs. 34 crores. The HPEP, set up with Czechoslovakian collaboration, is equipped for an annual output of 900 MW, in the range of 12 to 110 MW sizes.

Drugs Manufacture ...

The Synthetic Drugs project, another public sector venture in the State, is located near Hyderabad city over an area of 570 acres, gifted by the State government. Claimed to be the biggest of its kind in Asia, it is estimated to cost about Rs. 20 crores. Its production capacity at the peak period, will be 850 tonnes of modern synthetic drugs of sulpha group, anti-TB drugs, vitamins, etc. and about 4,560 tonnes of intermediates from which these drugs could be manufactured.

Special Purpose Machines from HMT

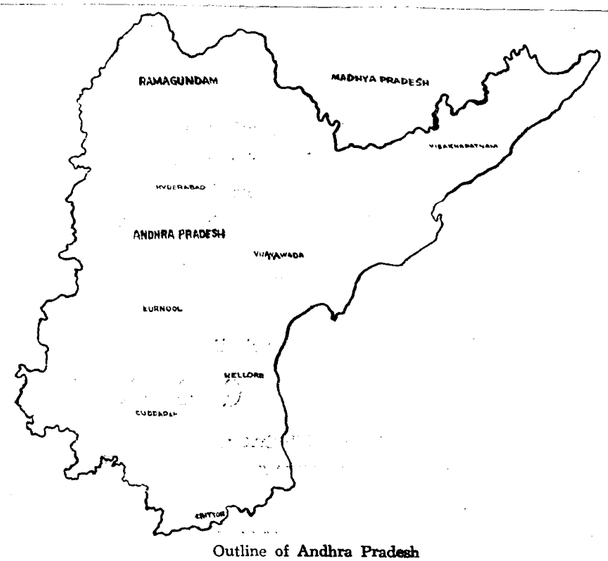
The fifth unit of the Hindustan Machine Tools, located near Hyderabad, was commissioned in December 1965. The Hyderabad unit specialises in the manufacture of fine boring machines and special purpose machines. The total investment on the unit is about Rs. 7.75 crores.

Established in 1948 with an authorised capital of one crore of rupees, Praga Tools was taken over by the Union Ministry of Defence in 1964. It manufactures machine tools, machine tools accessories, measuring and cutting tools, auto and diesel spares, besides regular defence equipment.

Singareni Collieries, the only coal mining centre in South India, came into being in 1921. It now holds mining rights over extensive area of about 800 sq. miles against a coal-bearing area of 3,000 sq. miles. At present Yellandu, Kothagudem, Tandur, Ramakrishnapur and Ramagundam are under exploitation. The biggest and most modern mine is located in the Kohagudem area. As a result of expansion schemes under the Five Year Plans, the production registered an upward trend from 15.94 lakh tonnes at the beginning of the Second Plan to 40.51 lakh tonnes by the end of the Third Plan.

More Fertilizers ...

The importance of fertilizer industry to an agricultural State like Andhra Pradesh needs, perhaps, no over emphasis. The State's annual requirement of nitrogenous fertilizers



Outline of **Andhra Pradesh**

is of the order of 30 lakh tonnes in terms of ammonium sulphate. The Rs. 50-crore Coromandel Fertilizer plant set up at Visakhapatnam in collaboration with certain U.S. firms has gone into production in December 1967, with an installed capacity of 2.5 lakh tonnes per annum. Its urea plant is the most up-to-date one in India. A letter of intent has also been issued to an American Firm (Occidental Ore) to set up another fertilizer factory at Visakhapatnam. A coal-based Ferilizer Project also is being set up at Ramagundam. Work on the project was inaugurated on October 2, 1970.

Rocket Launching Station

The Atomic Energy Department of the Government of India has set up the electronic complex at Hyderabad and the project is likely to be commissioned shortly. The AEC has also commenced work on the setting up of a rocket launching station on the east coast at Sriharikota island in Nellore district.

In the foreseeable future, Visakhapatnam will emerge as a very important industrial town in Andhra Pradesh. The Bharat Heavy Plates and Vessels Limited has been set up near Visakhapatnam for the manufacture of equipment required by the fertilizer, petroleum, petrochemical, other heavy chemical and allied industries. The plant is being set up with Czech assistance. During peak production, the factory is expected to produce equipment valued at Rs. 10 crores.

The zinc smelter plant at Visakhapatnam is expected to be set up during the Fourth Plan period. The project will have annual production capacity of 30,000 tonnes of zinc metal, 40,000 tonnes of sulphuric acid and 70-100 tonnes of cadmium metal. It will also include facilities for making special high grade zinc metal which is needed primarily for zinc diecasting alloys used extensively in industries.

It will be a matter of gratification to note that the Government of India have decided to set up a steel plant in the coastal region of Visakhapatnam. The proposed plant will mainly produce mild steel. It would be designed by Indian engineers, and the equipment is to be manufactured in India. The site selection committee of the Government of India, visited Visakhapatnam in the recent past.

The Rs. 37-crore Visakhapatnam Outer Harbour project is another ambitious venture. The harbour is designed to handle ore ships of the size of 100,000 DWT ships initially with in-built provision for future development to cater for 200,000 DWT vessels. Again, the outer harbour will be in a position to load 10 to 12 million tonnes of ore, as against 6 million tonnes which the present facilities at Visakhapatnam inner harbour can handle. The project is scheduled to be completed in 1974.

Thus Andhra Pradesh is on the threshold of new era on the industrial plane, an era full of hope and promise.

RECIP—A MANAGERIAL RECIPE FOR INDUSTRIAL GROWTH

By K. S. CANAPATI

FOR THE EFFECTIVE functioning of any industrial organisation, a scheme of managerial review and control is necessary. The criteria of effectiveness of the various activities will have to be formulated. Targets, physical as well as in terms of the time element, will have to be set and periodical appraisal of results is called for in order to assess and review performance and progress as well as to provide the requisite motivation so vital for sustaining progress. This new approach calls for a team of live-wire managers. This new team can be termed Research, Evaluation, Control & Information Panel—RECIP. It will serve as a powerful force for tackling the major problems of any industrial organisation. In addition, the panel will be engaged in realistic assessment of current trends and in conjunction with an analysis of the past, will probe into the future. The panel will be a co-ordinating factor in the attainment of overall objectives. Bearing these factors in mind, the major functions and responsibilities of such a panel may be enunciated in the following manner.

Research and Development, including improvement in the design of tools and products, besides development of new products; project engineering with particular emphasis on the growing needs of the organisation for equipment, indigenous and imported; work study, laying down of output standards, determination of rates and incentives, job evaluation and improvement of methods, manufacturing and administration; management accounting, performance appraisal and audit; establishment and improvement of quality control systems and procedures, as distinct from carrying out routine work associated with normal procedures; carrying out diagnostic studies and other specialised types of study with a view to bring about improvement in quality, output, etc.; operations research, market research, trend forecasting, pricing policy and export promotion strategy; study of problems relating to industrial relations and personnel management, especially determination of the optimum policies concerning staffing and over-time; setting up and improving inventory control system, making use of O.R. techniques wherever feasible; application of PERT and allied techniques for facilitating project planning and execution; determination of various kinds of data to be collected and preserved by the different departments of the organisation. This should ensure thorough inter-departmental communication and feed-back of information, by designing suitable proformas, cards, report-forms, etc; human engineering studies relating to employee motivation for obtaining the best response from every individual; preparation, development and implementation of training programmes; appraisal of personnel by the method of quantified objectives; preparation of manuals laying down guidelines wherever necessary e.g. Inspection Manual, Work Study Manual, Administration Manual, Budgetary Control Manual, Office Procedures Manual...

The panel will be responsible to top management and will be characterised by a total absence of hierarchy amongst its members. Examples of typical management problems which the panel will assist in solving are determination of optimum batch-size, study of the economic implications of a project involving capital expenditure, study of variations in output, devising incentive schemes consistent with the needs of total quality control and determination of the type and number of Data Processing Equipment.

RECIP, with its overall vision and integrated broad-spectrum approach, will prove to be a potent recipe for the most efficient utilisation of resources available for the operation of any man-machine complex.

ROLE OF PROTECTIVES IN FAMILY PLANNING

By S. N. WADHWA

ALL THE BASIC contraceptive techniques in use today have a developmental history extending back to at least 70 years with the possible exception of oral preparations. During this period perhaps no other contraceptive device has undergone so complete and radical a transformation as the protective—also commonly known as condom or sheath.

Four major innovations in manufacturing techniques *i.e.* the advanced latex technology, automatic production, electronic testing and pre-lubrication have contributed to the production of technically perfect and aesthetically acceptable protectives.

As a result of incorporation of these major innovations, large scale production of condoms has been possible in India. The public sector plant at Trivandrum with a capacity of 144 million pieces set up with Japanese collaboration, was inaugurated in April 1969. This plant is producing dry teat-end protectives.

The private sector plant was put up at Pallavaram, Madras, by London Rubber Company in 1965 in association with the world's largest manufacturers of condoms. The capacity of this plant was substantially enlarged in December, 1968 to produce 150 million pieces. This plant also produces the *Sensitol* treated lubricated protectives which were previously imported. The consumers in economically advanced countries use widely lubricated condoms as these are known to preserve the natural feel and sensitivity.

The indigenous manufacture of modern protectives has not only made the country self-sufficient but has also accelerated the target achievements for our Naional Family Planning Programme. It is estimated that approximately Rs. 3 crores worth of foreign exchange will be annually saved as a result of import substitution.

Between 1968/69 and 1969/70, approximately 160 million condoms out of the supplies received from abroad were distributed—100 million pieces given free for promotional purposes and 60 million units sold at subsidised prices.

Of all the contraceptives in use condom is unquestionably the most widely used one. Even in advanced countries its usage is very popular. In India more and more young couples are now accepting this simple device for spacing births and with the right emphasis placed on family planning the demand is on the increase from all sections. There are no known or recorded side effects with its use. Its usage requires no technical advice. Unlike the pill or the loop condom needs to be used only when required.

COMMUNICATIONS IN MANAGEMENT . . .

By V. T. KUMARASWAMY

MANAGEMENT, IN THE modern parlance, has a far greater depth of meaning and action than it did a quarter of a century ago. While the concept of management may not have so substantially changed in the more economically advanced countries, in India, it has undergone rapid transformation.

Business in this country was mainly one of trading and not so much production-oriented. Barring a few notable manufacturing houses, the country lived mostly on imported products and services. The trading houses had their traditional methods of management, tailored to meet the more leisurely pace of business life of those days. With rapid industrialisation in the era of planned economic growth, management processes have had to be redesigned to meet more sophisticated methods of operation. The problems of modern management and the need to chanalise human resources to profitable purpose, therefore, became more important.

Evolution of Communications

Communications is of vital importance in modern management. Looking around us in our day-to-day life we can see the signs and results of good or bad communications. These results are critically symptomatic of the quality of our communications.

The art of communication is one which can easily be developed in oneself and encouraged in others. The evolution of communications is in itself an interesting human study. Starting with prehistoric man's attempts at carving on stone or wood, the shapes and forms of the many objects around him to, thro' the medium of guttural noises, convey to his fellow creature his ideas, form the origin of communications. As man progressed, he developed the use of words to take the place of guttural noises, letters to form the alphabet and arrived at what is the basis of spoken and written communications today. The impediment to this form of communications, however, was distance. A further refinement to this is the American Indian's system of communication through smoke signals and drums, which ominous as they appeared and sounded in those days, was most effective in the circumstances.

From limitations such as this, man's ingenuity and enterprise led him to the discovery of the radio, telephone, telegraph and all the modern methods of conveying thoughts to others. In all of these various stages of progress, man's objective has remained constant —how to pass on what is in his mind effectively to another. This basic knowledge is now an important tool of management.

The most common method of communication in our daily lives is by word of mouth. To effectively communicate with others use the yard-stick–Who–What–Where–When–Why–How.

If your communication answers all these queries clearly, you will be able to achieve your objective without difficulty. In business, more than ever before, the need for effective communication is being keenly felt. Time lost as a result of misunderstanding or action delayed due to wrong interpretation have had costly consequences.

It is not always that a communication, as well compiled as possible, produces the reaction or result that the sender expected or intended. Obstacles in communication are many and differ from country to country, person to person. With such a wide scope for communications to be infructuous, the need to understand, isolate and rectify defects and obstacles, assumes importance. Words being the common means of expression, written or oral, can be a barrier if unintelligible to a reader or listener.

A classical example of delays in communication and consequently the disastrous result is the old saying "Because of a shoe, the battle was lost". Time being one of the important factors in effective communications, delays could make them infructuous. There are many reasons for delays to occur, the more important of which are due to human reasons such as lack of understanding of objective; time to work out details; different views on objectives; pre-occupations and social reasons—afraid to reveal details for fear of job being usurped.

Since any communication is likely to get distorted and it is essential that to be effective, a person must be given information on what he must know; what he needs to know and what would be nice for him to know. This last factor would be really a means of finding how much exactly is to be communicated, enough to get a real understanding of the objective.

Communications being a means to an end and not the end itself, a really efficient manager would use all these simple tools to make working with people profitable and inspire team work to secure job satisfaction for himself and those working with him.

PRODUCTION OF PLASTICS PROCESSING EQUIPMENT

By M. N. VENKATARAMAN
Brimco Plastic Machinery Corpn., Bombay

The origin of plastics dates back to 1865, when following the discovery of nitro-cellulose, Alexander Parkes in Birmingham endeavoured to use this material in the production of synthetic ivory. The current trend towards synthetics got its real start with the work of John Wesley Hyatt, back in the year 1868.

Plastics made its appearance in India much before World War II and a started making an impact on the industrial life of our nation only in the early 'fifties. Significant development was achieved during the first two Plan period. The initial development of the Indian plastics industry was geared to meet the consumer market only. Plastics had recently entered the industrial field in a big way. In the early stages all the raw materials were imported. Our country started producing the required raw materials in large proportions, thanks to the various petro-chemical and other large scale units which were established under the Five Year Plans.

With an estimated availability of thermoplastics of approximately 250,000 tonnes by 1973-74 there will be a big need for conversion equipment. A few farsighted leaders in Indian industry saw the immense possibilities of manufacturing plastics processing machinery in India even in the early 'fifties. Apart from producing conventional processing machinery, Indian companies are manufacturing on a large scale a vast range of sophisticated machinery such as machines for producing high density polythelene-oriented tapes which can be converted into woven sacks, twisted ropes, tarpaulins, tents, etc., and also blown film from rigid PVC which is comparable to cellophane, as also PVC blown bottles.

Although the growth of the plastics industry in India in the initial years was very slow, there has been a rapid increase in recent years. The increase in consumption is of the order of 23 per cent per year. With the likelihood of an increase in the per capita consumption of plastics, which is at present 0.1 kg., and with the estimated increase in availability of thermoplastics in the years to come, the plastics processing industry will have to increase its capacity substantially and there is enough scope for new industries springing up to utilise the available raw material. The Indian plastics processing machinery manufacturers are quite capable of meeting the future requirements of the country which is roughly estimated at over 1500 machines for different conversion applications of thermoplastic material.

STATISTICAL SUPPLEMENT

CENTRAL REVENUES AND EXPENDITURE

(Rs. Crores)

	1960-61	1961-62	1962-63	1963-64	1964-65	1965-66	1966-67	1967-68	1968-69	1969-70 Revised	1970-71 Budget
Revenues											
Income-tax & Corpn. Tax	278.0	321.8	407.5	533.2	580.6	572.6	637.6	636.0	678.2	720.0	780.0
Customs	170.0	212.2	246.0	334.8	397.5	539.9	585.4	513.4	446.5	415.0	465.0
Excise	416.3	489.3	598.8	729.6	801.5	897.3	1,033.8	1,148.5	1,320.7	1,525.8	1,814.4
Other Taxes	44.5	30.3	32.8	36.3	41.1	47.1	49.8	54.6	64.4	71.3	—
Total Tax Revenue	908.9	1,053.8	1,285.0	1,633.8	1,820.7	2,060.7	2,306.5	2,352.8	2,509.8	2,732.0	3,137.0
Non-tax Revenue	273.5	300.6	377.4	479.1	524.2	542.6	566.2	648.6	774.3	855.1	899.8
Total Revenue	1,182.4	1,354.4	1,662.4	2,113.0	2,344.9	2,603.3	2,872.7	3,001.0	3,284.1	3,587.1	4,036.8
Expenditure											
Defence	247.6	289.5	425.3	704.3	692.9	762.2	797.8	862.2	929.0	979.3	1,017.8
Interest on Debt	188.5	209.4	240.4	273.4	311.4	365.6	463.4	501.4	528.0	568.6	597.5
States' Tax Share	178.8	178.4	224.0	259.5	257.9	276.0	372.5	415.7	491.0	621.7	745.1
Grants-in-Aid to States	48.4	195.0	195.0	230.0	268.7	324.1	410.0	473.3	535.7	592.1	636.1
Administrative Services	58.7	59.2	75.2	77.5	81.9	95.4	123.0	136.5	159.3	182.3	195.5
Development Expenditure	240.0	182.2	216.3	195.3	220.8	257.6	300.5	323.9	343.4	398.5	467.8
Total Expenditure	1,131.2	1,229.5	1,549.0	1,925.4	2,071.0	2,283.5	2,643.9	2,897.0	3,203.2	3,598.1	3,897.3
Revenue Surplus or Deficit	+ 51.2	+ 124.9	+ 113.4	+ 187.6	+ 273.9	+ 319.8	+ 228.8	+ 104.0	+ 80.9	— 11.0	+ 139.5
Capital Account											
Receipts *(Net)	—	726.3	899.9	1,134.6	1,257.8	1,403.3	1,828.5	1,719.8	1,582.5	1,975.5	1,823.7
Disbursements	—	965.7	1,169.5	1,489.1	1,703.5	1,893.8	2,351.6	2,030.4	1,925.8	2,254.7	2,188.5
Overall Surplus or Deficit after Miscellaneous Adjustment	+ 116.8	— 114.5	— 156.1	— 166.9	— 171.8	— 172.8	— 295.3	— 210.2	— 262.4	— 290.1†	— 210.5

* Receipts are net of repayment by Govt. of India & Foreign loans and excludes conversion of treasury bills during the year.

† The revised deficit for 1969-70 is now placed at only Rs. 58 crores while that for 1970-71 is also expected to be much lower than the budgeted figure.

PUBLIC SECTOR OUTLAYS ON AGRICULTURE AND ALLIED SECTORS 1969-74

(Rs. crores)

Head of development 1	States 2	Union territories 3	Centrally sponsored 4	Centre 5	Total 1969-74 6
1. Agricultural production	331.721	22.571	46.302	19.64	420.23
2. Development of small farmers and agricultural labour				115.00	115.00
3. Research education				85.001	85.00
4. Minor irrigation	501.53	6.18		8.00	515.71
5. Soil conservation	123.90	5.41	29.44	0.63	159.38
6. Area development	22.04	0.02		16.26	38.32
7. Animal husbandry	70.91	5.40	5.25	12.50	94.06
8. Dairying and milk supply	39.77	1.95		97.253	138.97
9. Fisheries	44.88	4.43	6.00	28.00	83.31
10. Forest	73.12	14.31	1.39	3.73	92.55
11. Warehousing, storage and marketing	6.39	0.63		87.00	94.02
12. Food processing and subsidiary food			2.50	16.10	18.60
13. Central support to financial institutions				324.00	324.00
14. Buffer stocks of agricultural commodities				255.00	255.00
15. Co-operation	119.21	4.61	24.50	30.25	178.57
16. Community development	84.69	4.94	11.45	5.90	115.46
17. Panchayats	7.35	1.13			
18. Total	1,425.51	71.58	126.83	1,104.28	2,728.18

1. Includes provision for Research and Education and Development of Small Farmers.
2. Includes outlays on dry farming.
3. This includes an outlay of Rs. 95 crores provided for Indian Dairy Corporation.

STATEWISE FOOD PRODUCTION IN 1969-70

(Thousand Tonnes)

State	Rice	Jowar	Bajra	Maize	Ragi	Wheat	Barley	Small Millets	Gram	Tur	Other Pulses	All Foodgrains
Andhra Pradesh ..	4,700.0	1,351.3	320.9	309.6	267.4	4.0	—	185.0	20.6	85.7	156.3	7,399.6
Assam ..	2,057.5	—	—	14.5	—	7.1	—	3.1	1.0	2.7	32.8	2,118.7
Bihar ..	4,009.0	5.1	7.5	865.6	80.8	1,200.0	167.0	102.1	156.8	145.4	806.0	2,545.7
Gujarat ..	447.4	385.6	1,204.4	289.1	55.4	591.6	2.2	114.7	20.0	43.5	66.1	3,221.0
Haryana ..	371.0	55.0	516.0	138.0	—	2,119.0	180.0	0.1	1,143.0	4.5	50.3	4,567.4
Jammu & Kashmir ..	482.1	0.1	7.0	363.0	—	250.0	10.0	8.3	0.5	0.2	30.3	1,151.5
Kerala ..	1,241.9	0.6	—	—	7.6	—	—	3.5	—	3.5	12.5	1,242.6
Madhya Pradesh ..	3,201.6	1,467.5	167.3	417.7	5.4	2,216.0	165.7	369.8	893.2	318.3	546.1	9,769.1
Maharashtra ..	1,431.3	3,214.2	762.9	57.5	130.0	390.5	2.5	85.6	101.9	321.4	416.1	6,913.9
Mysore ..	2,290.0	1,800.0	223.6	104.9	855.0	133.3	2.9	73.4	90.7	124.2	186.7	5,890.7
Nagaland ..	49.8	—	—	—	—	—	—	—	—	—	—	49.8
Orissa ..	4,316.6	13.5	2.5	60.8	159.2	18.9	—	62.3	13.3	18.6	367.2	5,032.9
Punjab ..	572.9	3.0	221.9	827.8	—	4,800.0	80.0	0.2	400.0	1.0	30.9	6,936.7
Rajasthan ..	98.9	413.9	807.8	518.0	—	1,275.2	511.7	19.3	782.6	8.8	313.2	4,749.5
Tamil Nadu ..	4,532.2	575.1	309.9	13.9	336.7	0.4	—	361.3	2.2	24.1	83.2	6,239.0
Uttar Pradesh ..	3,532.9	431.4	752.7	1,192.2	195.4	6,314.3	1,467.0	317.4	1,775.9	716.1	851.9	7,547.2
West Bengal ..	6,350.0	0.3	0.1	45.5	7.3	400.0	49.8	7.8	133.7	23.4	345.9	7,363.8
Andaman & Nicobar ..	9.6	—	—	—	—	—	—	—	—	—	—	9.6
Delhi ..	4.1	3.1	17.6	0.9	—	69.4	2.5	—	4.4	—	1.2	103.2
Goa, Daman, Diu ..	66.3	—	—	—	—	—	—	—	—	—	—	66.3
Himachal Pradesh ..	113.8	0.2	—	443.5	10.6	300.0	75.0	18.0	5.8	0.1	15.3	982.3
Manipur ..	232.0	—	—	12.8	—	—	—	—	—	—	—	244.8
NEFA ..	45.2	—	—	—	—	—	—	—	—	—	—	45.2
Pondicherry ..	55.1	0.1	2.1	—	4.9	—	—	—	—	—	—	62.2
Tripura ..	234.7	—	—	—	—	—	—	—	—	0.2	0.9	235.8
Dadra & Nagar Haveli ..	10.8	—	—	—	1.5	—	—	—	—	0.5	—	12.8
All-India ..	40,429.7	9,721.0	5,326.8	5,674.3	2,117.2	20,093.3	2,716.8	1,732.0	5,545.6	1,842.2	4,302.9	99,501.3 (94,012.6)

PRODUCTION TARGETS 1969-74

Sl. No.	Commodity	Unit	Base level Production 1968-69	Target of addl. Production 1969-74	Estimated Production 1973-74	Percentage increase of col. (5) over col. (3)
	1	2	3	4	5	6
1.	Foodgrains	million tonnes	98	31	129	31.6
2.	Price	"	39.0	13.0	52.0	33.3
3.	Wheat	"	18.0	6.0	24.0	33.3
4.	Maize	"	6.2	1.8	8.0	29.0
5.	Jowar	"	10.0	5.0	15.0	50.0
6	Bajra	"	5.1	1.9	7.0	37.3
7.	Other cereals	"	7.2	0.8	8.0	11.1
8.	Pulses	"	12.5	2.5	15.0	20.0
9.	Oil Seeds	"	8.5	2	10.5	24
10.	Sugarcane (gur)	"	12	3	15	25
11.	Cotton	million bales	6	2	8	33
12.	Jute	"	6.2	1.2	7.4	19
13.	Tobacco	million kgs.	350	100	450	29
14.	Coconut	million nuts	5,600	1,000	6,600	18
15.	Arecanut	thou. tonnes	126	24	150	19
16.	Cashewnut	"	160	76	236	48
17.	Pepper	"	23	19	42	83
18.	Lac	"	35	17	52	49

TREND OF AGRICULTURAL PRODUCTION

('000 tonnes)

	1955-56	1961-62	1966-67	1967-68	1968-69	1969-70
Foodgrains ..	66,850	82,706	74,231	95,588	94,015	99,501
Rice ..	27,557	35,663	30,438	37,858	39,761	40,430
Wheat ..	8,760	12,072	11,393	16,568	18,652	20,093
Jowar ..	6,726	8,029	9,224	10,107	9,804	9,721
Bajra ..	3,645	3,554	4,468	5,132	3,802	5,327
Maize ..	2,602	4,269	4,894	6,275	5,701	5,674
Ragi ..	1,846	2,030	1,631	2,031	1,648	2,117
Barley ..	2,816	3,150	2,348	3,469	2,424	2,717
Small millets ..	2,070	2,050	1,488	1,912	1,804	1,732
Total cereals ..	55,805	70,951	65,884	83,352	83,596	87,811
Gram ..	5,418	5,785	3,622	6,042	4,310	5,546
Other pulses ..	5,627	5,970	4,725	6,194	6,109	6,145
All pulses ..	11,045	11,755	8,347	12,236	10,419	11,691
Groundnut (shell) ..	3,862	4,994	4,411	5,829	4,631	5,143
All oilseeds ..	5,734	7,284	6,425	8,238	7,090	
Cotton ('000 bales of 180 kg.) ..	3,949	4,581	4,973	5,562	5,270	
Jute mesta ..	4,232	6,358	5,358	6,369	2,931	5,609
Sugarcane (gur) ..	6,075	10,563	9,501	9,959	12,003	12,500
Potato ..	1,859	2,447	3,522	4,233	4,773	
Tobacco ..	303	339	353	344	347	

EAST EUROPE & ECAFE EMERGE AS INDIA'S BIG TRADE FARTNERS

(Rs. Crores)

Region	Imports into India		Exports from India		Percentage Total Imports		Percentage Total Exports	
	1960-61	1969-70	1960-61	1969-70	1960-61	1969-70	1960-61	1969-70
1. North America	347	534	120	264	30.9	34.1	18.7	18.6
U.S.	327	460	102	238				
Canada	20	74	18	26				
2. European Common Market	196	170	52	101	17.5	10.9	8.1	7.1
W. Germany	123	84	20	13				
Italy	26	40	9	13				
3. European Free Trade Area	248	129	178	183	22.1	8.2	27.7	12.9
United Kingdom	217	100	172	165				
4 East Europe	44	281	50	308	4.0	17.9	7.8	21.8
Soviet Union	16	170	29	176				
5. ECAFE Countries	179	260	143	378	15.9	16.6	22.3	26.8
Japan	61	67	35	179				
Australia	18	31	22	24				
6 Africa	71	141	49	88	6.3	9.0	7.7	6.2
U.A.R.	16	22	13	35				
7. Latin America	2	11	17	5	0.2	0.7	2.6	0.3
8. Other Areas	35	41	33	86	3.1	3.6	5.1	6.3
All countries	1,122	1,567	642	1,413	100.0	100.0	100.0	100.0

TEXTILES & JUTE MANUFACTURES

('000 tonnes)

	TEXTILES				Jute Manufactures			
	Cotton		Woollen					
	Yarn (Million kg.)	Mill cloth (Million metres)	Yarn ('000 kg.)	Fabric ('000 metres)	Hessian	Sacking	Others	Total
1951 ..	591	3732	7860	11100	326.4	529.2	33.6	889.2
1956 ..	758	4848	11616	14916	422.4	615.6	73.2	1111.2
1960 ..	792	4620	12696	13756	429.6	549.6	128.4	1107.6
1965 ..	936	4584	18132	9864	529.2	590.4	216.0	1335.6
1966 ..	900	4236	16596	9384	407.2	502.8	189.6	1119.6
1967 ..	900	4104	16656	9328	463.2	481.2	211.2	1156.8
1968 ..	960	4368	18540	12084	398.4	427.2	259.2	1084.8
1969 ..	944	4168	18844	12587	287 1	308.9	299.6	893.6

INDUSTRIAL PRODUCTION

Synthetic Fibre & Yarn

(Tonnes)

	Viscose yarn	Staple fibres	Acetate yarn	Synthetic yarn
1951 ..	2460	—	..	—
1956 ..	7416	8040	1440	—
1960 ..	19212	21780	1932	—
1965 ..	34560	37152	2028	1476
1966 ..	33624	42492	1572	1944
1967 ..	35076	52056	1800	2424
1968 ..	36276	61416	2004	5280
1969 ..	36326	57967	1820	7883

PAPERS & BOARDS

('000 tonnes)

	Printing & Writing	Wrapping	Special Varieties	Boards	Total
1951	80.4	26.4	3.1	24.0	134.4
1956	124.8	31.2	5.9	34.8	196.8
1960	214.8	61.2	8.6	52.4	346.6
1965	333.6	96.0	5.5	100.8	532.4
1966	381.6	98.4	6.5	97.2	585.6
1967	378.0	120.0	9.2	100.8	608.4
1968	393.6	127.2	19.4	117.6	646.8
1969	415.2	146.3	21.1	123.9	706.2

CEMENT, GLASS & SUGAR

	Cement ('000 tonnes)	Sheet glass ('000 sq. metres)	Sugar ('000 tonnes) (year ended Oct.)
1951	3,240	1,080	1,524
1956	5,004	4,428	1,886
1960	7,848	7,548	2,473
1965	10,584	8,136	3,260
1966	11,064	12,024	3,515
1967	11,316	14,304	2,174
1968	11,940	14,724	2,268
1969	13,624	17,290	3,564

ELECTRICAL MACHINERY

('000 Nos.)

	Elec. Lamps	Radio Receivers	Elec. Fans	House Service Motors	Elec. Motors	Power Transformer ('000 KVA)
1951	15,516	82.5	212.4	36	143	192
1956	30,732	151.2	338.4	228	360	924
1960	41,400	238.8	1,012.8	489	696	1,284
1965	71,256	586.2	1,448.4	1,116	1,704	4,320
1966	79,116	712.8	1,288.8	1,044	1,952	4,890
1967	79,152	854.4	1,381.2	924	2,076	5,256
1968	92,208	1,069.2	1,473.6	1,104	1,908	4,824
1969	97,747	1,700.0	1,522.0	1,559	2,070	4,998

IRON AND STEEL

('000 tonnes)

	Pig iron	Steel ingots	Finished steel
1951	1,824	1,500	1,932
1956	1,956	1,728	1,272
1960	4,176	3,238	2,220
1965	6,960	6,408	4,521
1966	7,624	6,690	4,486
1967	6,384	6,384	4,164
1968	7,080	6,444	4,476
1969	7,041	6,500	4,850

TRANSPORT EQUIPMENT

	Railway wagon (Nos.)	Passenger Cars & Jeeps (Nos.)	Passenger Busses & Trucks (Nos.)	Motorcycles & Scooters (Nos.)	Bicycles ('000 Nos.)
1951	—	12384	—	—	114
1956	16020	17448	—	5760	660
1960	10640	24588	27523	17736	1056
1965	35436	35280	37308	41676	1536
1967	18348	38904	31440	54012	1704
1968	16584	44604	34932	65324	1908
1969	15795	42044	35822	83553	1942

HEAVY CHEMICALS

(Tonnes)

	Sulphuric acid	Caustic soda	Soda ash	Chlorine liquid	Bleaching powder
1951	108648	14964	48309	5352	3648
1956	167868	40056	85593	15312	4728
1960	353940	98340	145284	31804	5928
1965	685344	214956	321972	51036	7356
1967	804456	251376	355836	78132	9252
1968	1008060	317100	398628	100440	10512
1969	1112343	347525	455574	128892	15545

FERTILIZERS & PAINTS

(Tonnes)

	Super phosphate (P_2O_5 Content)	Ammonium sulphate (Nitrogen content)	Paints & varnishes
1956	.. 13,740	79,044	42,000
1960	.. 53,028	76.800	51,600
1965	.. 113,892	88,020	69,600
1967	.. 137,880	81,816	79,200
1968	.. 131,688	109,896	66,000
1969	.. 112,330	135,818	56,400

NON-FERROUS METALS

(Tonnes)

	Aluminium	Copper	Lead
1951	3,912	7,200	876
1956	6,600	7,752	2,532
1960	18,390	7,812	3,780
1965	61,584	9,360	3,192
1966	65,304	9,362	2,484
1967	96,420	8,904	2,472
1968	1,20,132	9,492	1,644
1969	1,31,000	9,724	1,600

MACHINE TOOLS, SUGAR MILL MACHINERY, ETC.

	Machine tools (Rs. Lakhs)	Sugar Mill Machinery (Rs. Lakhs)	Dry Cells (Million Nos.)	Storage Batteries ('000 Nos.)
1951 ..	48	—	144	216
1956 ..	120	36	180	312
1960 ..	672	420	204	504
1965 ..	1,608	804	300	744
1966 ..	4,372	876	324	720
1967 ..	3,096	876	312	804
1968 ..	2,520	1,092	408	876
1969 ..	2,923	1,210	476	1,155

PRODUCTION IN SELECT LIGHT ELECTRICAL AND MECHANICAL INDUSTRIES IN 1968 & 1969

	Accounting unit	1968			1969		
		No. of Units	Capacity	Production	No. of Units	Capacity	Production
G.L.S. lamps	Million Nos.	8	59.35	84.51	10	77.35	94.00
Fluorescent tubes	,,	6	7.20	7.69	7	8.20	9.50
Miniature lamps	,,	5	24.80	27.44	6	30.80	36.00
Electric fans	Numbers	15	14,89,600	14,66,339	16	18,15,600	15,00,000
Storage batteries	,,	6	7,47,200	8,70,742	6	9,48,000	10,40,000
Dry batteries	Million cells	4	379.0	408.54	6	479.0	460.00
House service meters	Lakhs	14	17.30	13.20	14	17.36	15.00
Bicycles	Nos.	12	21,75,000	19,52,176	12	21,75,000	19,50,000
Ball and roller bearings	Million Nos.	6	12.74	12.09	6	11.20	13.20
Duplicators	Nos.	3	8,100	4,012	2	7,500	4,980
Pressure stoves	,,	1	50,000	18,545	2	50,000	22,422
Sewing machines	,,	5	3,97,000	4,23,220	5	4,93,000	3,94,039
Typewriters	,,	4	74,000	45,665	4	74,000	39,925
Zip fasteners	Metres	2	29,30,000	31,79,662	2	29,30,000	36,29,844
Razor blades	Million Nos.	5	1312.00	757.53	5	1,500	850.00
Watches	,,	2	0.67	0.36	2	0.67	0.42
Time pieces	,,	4	0.51	0.54	6	0.68	0.54
Steel furniture	Tonnes	13	41,437	26,112	13	41,437	21,160
Agricultural implements	,,	21	24,478.5	22,000	24	25,696.5	20,000
Agricultural machinery	,,	8	2.229	1,275	8	2,229	2,000
Collapsible tubes	Million Nos.	5	120.89	237.616	5	120.89	241.00

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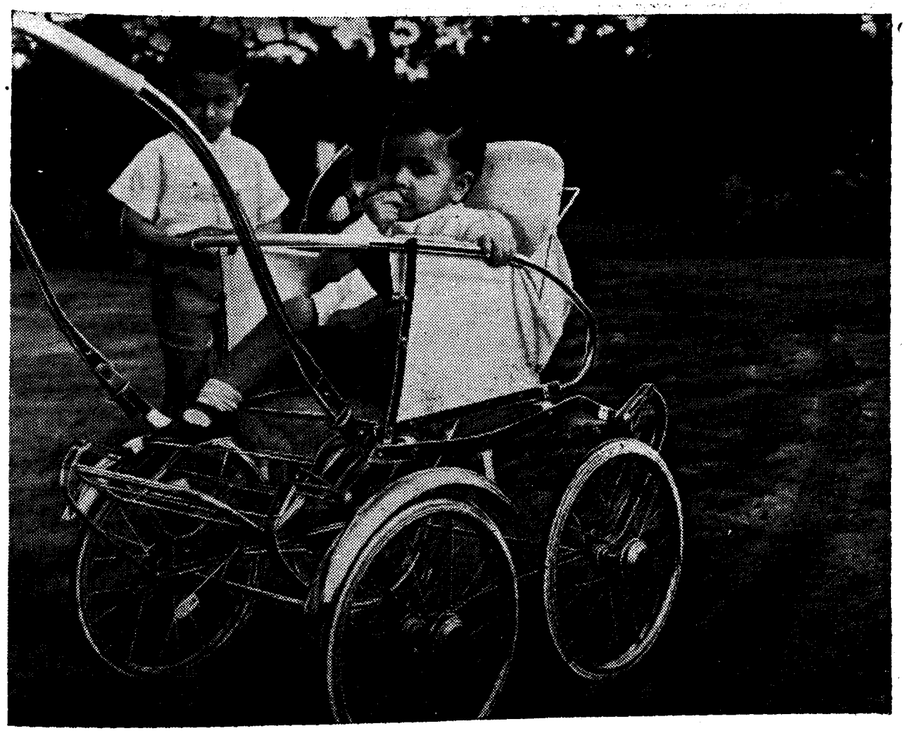

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