

ESTIMATES COMMITTEE
(1967-68)

FORTY-NINTH REPORT

(FOURTH LOK SABHA)

MINISTRY OF PETROLEUM AND CHEMICALS

FERTILIZERS



LOK SABHA SECRETARIAT
NEW DELHI

April, 1968/Chaitra, 1890 (Saka)

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(1967-68)

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INTRODUCTION

I, the Chairman, Estimates Committee, having been authorised by the Committee to submit the Report on their behalf, present this Forty-ninth Report on the Ministry of Petroleum and Chemicals— Fertilizers.

2. The Committee took evidence of the representatives of the Ministries of Petroleum and Chemicals and Food, Agriculture, Community Development and Cooperation (Department of Agriculture) on the 19th, 20th and 21st December, 1967. The Committee wish to express their thanks to the Secretaries and officers of these Ministries and officers of the Ministry of Industrial Development & Company Affairs and Planning Commission and Fertilizer Corporation of India for placing before them the material and information desired in connection with the examination of the estimates.

3. The Committee also wish to express their thanks to Shri A. D. Mango, the then Vice-Chairman, Fertilizer Association of India, for giving evidence and making valuable suggestions to the Committee.

4. They also wish to express their thanks to all those who furnished memoranda on the subject to the Committee.

5. The Report was considered and adopted by the Committee on the 27th and 28th March, 1968.

6. A statement showing analysis of recommendations contained in the Report is also appended to the Report (Appendix XIV).

NEW DELHI;

P. VENKATASUBBAIAH,

April 5, 1968.

Chairman,

Chaitra 16, 1890 (Saka).

Estimates Committee.

I. INTRODUCTORY

A. Definition and Role of Fertilizers

Definition of Fertilizers

1.1. A fertilizer is any substance that is added to the soil to supply those elements required in the nutrition of plants. From the point of view of their origin, fertilizers can be divided broadly into organic fertilizers and inorganic fertilizers. Organic fertilizers have been known for ages and consist of fertilisers derived from organic origin such as farm yard manure, green manure, compost, sewerage etc. The plant nutrients contained in organic fertilizers, normally form a small proportion of its total weight. The massive dose of plant nutrients required under modern agriculture cannot, therefore, be effectively and economically met from these traditional sources. These have, however, a place of their own because of their special qualities particularly in the matter of providing humus required in the soil and as a soil conditioner. Inorganic fertilizers are of more recent origin and generally contain plant nutrients in a more concentrated form. These are synthesised in large modern factories and are virtually tailor-made to suit the requirements of different soils and different crops.

Importance and role of Fertilizers

1.2. Much of the world is still hungry and ill-clad. If the soils, the people, the skills of modern science and economic resources can be brought into proper relationship an efficient agriculture can supply the food and clothing. India today faces shortage of agricultural products specially food, fibre and edible oils. The country has been passing through a crisis in the food-front caused by two successive droughts during the last two years. Production of adequate food for the people is India's most pressing problem. Notwithstanding the rapid development of industry during the last 20 years of independence, the Indian economy is still overwhelmingly dependent on agriculture. Over 66 per cent of the population depends upon it for their livelihood. About half of the national income stems from agriculture. With a population of about 500 millions—which threatens to increase to 520 millions in five years and 570 millions in ten years from now at the current growth rate—agriculture continues to be the mainstay of a vast majority of the people. Agricultural development is thus an essential condition of Indian economic growth.

1.3. Agriculture may be viewed as an industry in which crops are grown utilising the water and various plant nutrients present in the soil e.g., food-grains, fruit, fodder, fibre and other commodities needed by man and his

domestic animals. In any system of intensive agriculture, the harvesting of the crops takes place in succession, often several times a year. This involves a recurring drain of nutrients from the soil and sustained agricultural production at a high level will be impossible unless the nutrient elements removed from the soil are regularly returned to it.

1.4. Water occupies a special place in plant growth but availability of plant nutrient in the soils plays no less an important part. The restoration of plant foods to the soil may be effected by manuring which consists of adding plant and animal residues or by applying chemical fertilizers. Nitrogen, phosphorus and potash are the nutrient elements which are taken by plants in the largest quantities and are removed from the soil during cropping. It is principally these elements which have to be returned to the soil if crop yields are to be maintained.

1.5. Fertilisers and manures enable farmers to increase production and get higher returns for their expenditure of work and materials. Perhaps even more important on many soils, they make possible good yields of valuable crops that would not grow at all without them or would grow very poorly. This enlarged choice of crops enables the farmer to engage in a more productive and more profitable system of farming. The possibility of diversifying his crops is a great boon to the farmer, because this enables him to be more flexible in his farm management and to adjust himself more readily to changing economic conditions.

1.6. Manures, of which farm yard manure and compost are typical examples, contain all these three elements, but not necessarily in the right proportions for a particular crop. Their main limitations, however, is that they are bulky and are of low concentration and it usually takes many tonnes per acre of such manures to make good the drain of nutrients caused by a single crop. Organic manures have a beneficial effect on the physical properties of the soil and on its moisture-holding capacity. It is necessary, therefore, that organic manures should be carefully conserved and applied to the soil in the maximum available quantities. But the total quantity of bulky organic manures available in the country will not suffice to supply the soils with the amounts of plant food which needs to be supplied even for maintaining the existing relatively low productivity of the soil.

1.7. India has the inconceivable distinction of having the lowest per acre yield of almost every crop it grows. It is imperative that the yields per acre for cereal as well as for other crops should be substantially increased in order to feed the growing population and raise its standard of living, without recourse to imported foodgrains. It may be stated that the nation has had to import annually since independence between 1.4 and 5.1 million tons of foodgrains. Expert opinion has confirmed the belief that unless

agriculture is transformed into a more productive activity by resorting to the use of modern science and technology it will not be possible to solve the food problem. The strategy has been developed in increasing agricultural productivity centres, *inter alia* on increased use of chemical fertilisers. The doses of fertilizers to be applied of course vary according to the nutrient status of the soil and uptake of nutrients by the crops. Agricultural scientists have worked out approximate doses for large tracts of land on the basis of fertilizer trials.

1.8. World experience has shown that the efficient use of fertilizers can step up production manifold. This is particularly important where land for cultivation per family is limited to a small acreage, as in India. It has been generally accepted that the use of about 93.500 short tons of plant nutrients would be equivalent to adding a million acres of average crop land in terms of additional production. The importance of fertilizers to the Indian economy especially in the present unsatisfactory state of agricultural production cannot be over emphasised.

1.9. The Union Minister for Food and Agriculture at a Conference on Agricultural Productivity held in New Delhi on the 14th May, 1965 observe that "Unless we create a continuing hunger for fertilizers and meet that hunger, we will not be able to increase the productivity of Indian agriculture. . . To produce more food with less fertilizers is as imposible as to produce more steel with less iron ore or more cloth with less cotton". He added that Indian agriculture used fertilizer at an average of 3.2 Kg. per acre of cropland compared with 234 Kg. per acre in Japan and that unless the rate rose to higher levels India could never reap the increased harvests from its tired, sick soils that are demanded by its ever-increasing population. It behoved Indian society as a whole, he said, to change its attitude towards the solution of its agricultural problem by recognising the priority claims of agriculture to the allocation of the natural, physical and financial resources if the crop goals of the 5-year programmes are to be achieved.

1.10. An intelligent and sufficient application of the proper types of fertilizers is, of strategic importance in an agricultural production campaign. Manures, both organic and inorganic are necessary for good agriculture. The only way by which the manure requirements could be met effectively, however, is by the application of chemical fertilizers. Soil tests indicate that almost all soils in India must have additional nitrogen, about 85 per cent of soils need additional potash, if crop yields are to be increased by 50-100 per cent. India's low soil fertility limits crop production more than any other single factor. In this background, programmes of intensive cultivation particularly under irrigated and assured rainfall conditions are being undertaken for achieving better results in agricultural production. This would deplete the soil of its nutrients at a rapid rate. Unless the nutrients

are replaced in the soil by massive application of chemical fertilisers, the land will be unable to respond continuously to our need for greater production. Traditional methods of manuring cannot replenish the impoverished soil.

1.11. Past experiments with indigenous varieties of seeds indicated that 10 additional units of grains are obtained by the application of one unit of nitrogen and 7.5 units of grains from one unit of P_2O_5 . These results are only average indications of the potential in relation to existing varieties of seeds and at the existing level of adoption of other improved practices. These yields would be much larger (50 to 100 per cent more) for the new High Yielding Varieties of seeds now being adopted. We should, therefore, expect a large increase in agricultural production from increased fertilizer use.

B. Indian Fertilizer Industry

1.12. Fertilizers are not new to India. According to the information furnished to the Committee during evidence by the Secretary of the Ministry of Petroleum and Chemicals, fertilizer was first initiated in India in 1896 when imported Nitrate from Chili (South America) was used as a fertilizer. By about 1905, calcium nitrate, calcium cyanamide, ammonium sulphate, super-phosphate and potassium sulphate were also imported and used on the Indian soil. The recognition of the role of fertilizers in agricultural production was also emphasised in the report of the Royal Commission on Agriculture in 1928 and was re-emphasised in a report prepared by the then Agricultural Commissioner to the Government, Dr. W. Burns in 1938.

1.13. Although the bulk of the quantity consumed had been imported, production of ammonium sulphate in India was first achieved as a by-product of coking ovens. Synthetic ammonia production and its conversion to ammonium sulphate was first started in Mysore in the year 1938 in a plant established at Belagula with a rated capacity of 6,600 tons of ammonium sulphate per annum. In 1947 a larger plant with a rated capacity of 46,000 tons of ammonium sulphate per annum was put up near Alwaye in Travancore, the synthetic ammonia manufactured being converted into the sulphate partly by the use of gypsum and partly by reaction with sulphuric acid produced from sulphur.

1.14. On the basis of the recommendation made by the Food Grains Policy Committee in 1943 that it was necessary to undertake large-scale manufacture of nitrogenous fertilizers in India for stepping up food production, it was decided in 1945 to put up a Government factory at Sindri in Bihar for manufacturing 355,000 tons of ammonium sulphate per annum using the gypsum process. Arrangements for the design and construction

of the factory were taken in hand during 1947 and the work was completed before the end of 1951. The factory went into production in October 1951 and its management was entrusted to Sindri Fertilizers and Chemicals Ltd. which was incorporated on the 18th December, 1951.

1.15. In October 1951, the Government set up the Fertilizer Production Committee to select suitable locations and suggest the pattern of production during the period of the Second Five Year Plan. As a result of the recommendations made, a plant was set up at Nangal to produce both fertilizers and heavy water. The Nangal Fertilizer and Heavy Water Project, which was initially started as a departmental work of the Government of India, was incorporated as a Company with effect from the 27th February, 1956 under the name of 'Nangal Fertilizers and Chemicals Ltd.'

1.16. In March 1959, Government approved the installation of a fertilizer factory at Trombay. The execution of the factory was entrusted to Nangal Fertilizers and Chemicals Ltd., and its name was changed to Hindustan Chemicals and Fertilizers Ltd. with effect from the 14th July, 1959.

1.17. In order to ensure unification of control of fertilizer units in the public sector under a single company, Government formed the Fertilizer Corporation of India Limited with effect from 1st January, 1961 and placed the management of Sindri, Nangal and Trombay units under its control. The Corporation is at present the largest enterprise engaged in the fertilizer industry. It has three units in production (Sindri, Nangal and Trombay) and four under construction/implementation (Durgapur, Namrup, Gorakhpur and Barauni). The annual rated capacity of the various fertilizer units/projects of the Fertilizer Corporation of India is given below:—

(In tonnes)

S. No.	Plant	Capacity in terms of nitrogen	End product and annual capacity	
1	Sindri	117,000	Amm. sulphate	355,000
			Double salt	121,920
			Urea	23,470
2	Nangal	80,000	Cal. Amm. nitrate	388,000
3	Trombay	90,000	Urea	99,000
			Nitrophosphate	330,000
4	Namrup	45,000	Urea	55,000
			Amm. sulphate	100,000
5	Gorakhpur	80,000	Urea	179,320
6	Durgapur	152,000	Urea	305,000
7	Barauni	152,000	Urea	330,000

1.18. In addition to above units, the Fertilizer Corporation has also a large Planning and Development Division engaged in research, development and designing plants. The Division is considered to be a storehouse for technical knowledge so far as the fertilizer technology is concerned. The Division has come to a stage when it can undertake the designing and engineering of two fertilizer factories in a year.

1.19. Besides the Fertilizer Corporation of India there is another organisation known as Fertilizers and Chemicals Travencore Ltd. (Fact.) which was established as a private sector unit in 1943 at Alwaye in Kerala with an authorised capital of Rs. 10 crores. This unit started production in 1947. From 1960, the company became a public sector undertaking. The Fertilizers and Chemicals Travancore Ltd. have at present one unit in production at Udyogamandal in Alwaye and another under construction at Cochin. It has also got an Engineering and Design Organisation (FEDO) engaged in the designing and construction of plants based on the know-how it has developed on its own or secured from organisations like the Imperial Chemical Industries and the Power Gas Corporation of U.K.

1.20. While formulating the proposals for the Fourth Five Year Plan on the basis of studies made by the Working Group on Manures and Fertilizers of the Department of Agriculture, Agency for International Development (USAID) and the Stanford Research Institute, it was realised that any break-through in agricultural production, particularly of foodgrains will have to be based on massive fertilizer programme as nearly 44 percent of the additional grain production in the Fourth Plan was expected to result from fertilizer use. Such a programme was to be based on proper appraisal of the problems relating to fertilizer consumption, pricing, distribution, marketing and sales promotion. In October 1964, the Government of India constituted a Committee under the Chairmanship of Shri B. Sivaraman to go into these problems. This Committee, after an exhaustive study of the problems facing the fertilizer industry have made a number of valuable suggestions in this behalf in its report submitted to the Government on the 2nd September, 1965.

1.21. The production of fertilizers in the units under the Fertilizer Corporation, FACT and in others set up in public and private sectors during the three Plan periods, and those proposed to be set up during the Fourth Plan period, has been fully discussed in Chapter II of the Report. An unmistakable sign of a break-through in the fertilizer industry is that in 1969-70 and 1970-71 a capacity of 2 million tonnes of nitrogenous fertilizer will accrue as soon as various projects now under construction go into production. This is roughly two and half times the capacity that has been built up in the country over the 15 years of the three plans.

1.22. Achievement of self-sufficiency in food has been set as the objective of the Fourth Plan. Besides the High Yielding Variety Programme, the programme of developing production of export-oriented cash crop has been taken up. These two programmes are aimed at either import substitution or export promotion and would obviously lead to either saving in foreign exchange or earning of foreign exchange. The increased production of cash crops would also provide raw materials for industry. A growth rate of 5.6 percent per annum in agriculture during the Fourth Plan period has been suggested. Of the fertilizers are expected to contribute the largest share.

1.23. The Committee note with satisfaction that the Sivaraman Committee on Fertilizers in their report submitted to Government on the 2nd September 1965, has made a number of valuable suggestions on the problems facing the fertilizer industry in India, with particular reference to fertilizer consumption, pricing, distribution, marketing and sales promotion. The Report has also provided a basis for fixing targets of fertilizer consumption and production for the Fourth and Fifth Five Year Plans. The report of the Fertilizers Committee came at a time when the country is passing through a food crisis and the Committee hope that its recommendations will receive the earnest consideration at the hands of Government.

II. CONSUMPTION OF FERTILIZERS

A. Growth of Fertilizer Use

Fertilizer Consumption during the first three Plans

2.1. Prior to 1942 the use of fertilizer was mostly confined to plantation crops of tea and coffee. The earliest reliable figures of fertilizer supply, however, are available only from the year 1946-47 when they supply amounted to 35,000(N) tons Nitrogen 4,000 tons Phosphate (P_2O_5) and 1,800 tons Potash (K_2O). This can be taken as an indication of the general level of consumption at that time. By 1950-51 consumption rose to 55,000 tons N, 8,800 tons P_2O_5 and 6,000 tons K_2O . The First Five Year Plan laid emphasis on the various measures required to stimulate agricultural production. Fertilizers thus assumed a major role in planning for agricultural production. It was assumed that at the end of the First Plan consumption of fertilizers would rise to 1,76,000 tons N and 68,000 tons P_2O_5 . As against this, however, the actuals achieved by 1955-56 were 1,22,000 tons N and 14,000 tons of P_2O_5 . The supply of potash in 1955-56 was estimated to be of the order of 12,000 tons. This gradual growth of consumption continued during the Second Plan period. But as against the target of 3,70,000 tons N, 1,20,000 tons P_2O_5 and 30,000 tons K_2O the consumption achieved was only 2,10,000 tons N, 54,000 tons P_2O_5 and 26,000 tons K_2O by the end of the Second Plan.

2.2. By the time the Third Plan was being formulated, the importance of fertilizers was recognised to such an extent that much higher targets both for production and consumption were considered necessary. It was thus that the targets of 1.0 million tonnes N, 0.4 million tonnes P_2O_5 , and 0.2 million tonnes of K_2O were prescribed in the Third Five Year Plan. After the mid-term appraisal, the targets underwent a revision. The revised targets were 800,000 tonnes N, 250,000 tonnes P_2O_5 and 150,000 tonnes of K_2O to be achieved in 1965-66. Consumption of fertilizers since the beginning of the Third Five Year Plan, however, was much below the targets prescribed, as would be seen from the following Table:—

Year	Consumption (in '000 tonnes)		
	N	P_2O_5	K_2O
1961-62	250	60	28
1962-63	333	83	36
1963-64	377	116	51
1964-65	555	149	69
1965-66	554	121	80 (Estimated)

2.3. The figures of consumption of nitrogen in various States during 1963-64 to 1965-66, the last three years of the Third Plan, are given in the Table below:—

	(metric tonnes)		
Region/State	1963-64	1964-65	1965-66
South	173,572	206,905	213,402
Andhra Pradesh	74,238	72,552	78,792
Kerala	11,690	8,554	8,245
Madras	47,078	78,516	70,756
Mysore	25,287	32,413	31,035
Pondicherry	1,022	527	642
U.P.A.S.I.	6,538	7,041	10,277
Coffee Board	6,466	6,532	10,826
Rubber Board	1,253	670	2,080
Food Corp. of India	..	..	749
West	73,963	102,529	107,497
Gujarat	16,780	23,829	30,702
Madhya Pradesh	8,369	23,295	18,404
Maharashtra	48,190	55,007	57,368
Goa	624	398	1,023
North	123,430	121,592	149,273
Haryana	..	..	..
Punjab	45,098†	58,597†	46,257†
Rajasthan	5,843	9,431	9,042
Uttar Pradesh	70,314	50,738	88,105
Jammu and Kashmir	1,172	1,120	3,472
Delhi	165	602	638
Himachal Pradesh	838	1,104	1,759
East	52,572	59,081	108,296
Assam	585	1,605	5,090
Bihar	16,617	14,876	31,893
Orissa	3,267	7,902	15,973
West Bengal	18,115	19,517	32,388
Manipur	139	107	562
Tripura	21	178	250
Nagaland	..	..	12
Andamians	..	..	15
Tea Manure Mixtures	13,828	14,896	22,113

Source : Annual (1966-67) Review of Fertilizer Association of India.

†These figures are for the composite State of Punjab.

It will be observed from the above table that consumption in 1965-66 in Andhra Pradesh, and Pondicherry in the Southern Region, Gujarat,

Maharashtra and Goa in the Western Region, UP, J & K, Delhi and Himachal Pradesh in the Northern Region, Assam, Bihar, Orissa, West Bengal, Manipur and Tripura in the Eastern Region was more as compared to consumption in 1964-65. The States which showed reduced off take of nitrogen during 1965-66 were Kerala, Madras and Mysore in the Southern Region, Madhya Pradesh in the Western Region, and Punjab and Rajasthan in the Northern Region.

2.4. It will also be observed that among the States UP accounted for the highest consumption during 1965-66, followed in descending order by Andhra Pradesh, Madras, Maharashtra, Punjab, West Bengal, Bihar, Mysore, Gujarat, Madhya Pradesh and Orissa. The consumption in these 11 States accounted for 83 percent of the all India consumption. The balance was consumed by other States (10 percent) and plantation crops and industrial users (7 percent).

Carry-overs

2.5. According to the information furnished in the Report of the Committee on Fertilizers (1965) the carry-over stocks of fertilizers in terms of Nitrogen with various States during each year of the Third Plan period were as under:—

Carry-over stocks as on—

(in tonnes)				
1.4.1961	1.4.1962	1.4.1963	1.4.1964	1.4.1965
68,411	104,970	126,172	214,023	141,318

It will be seen from the above that the carry-over stocks of nitrogen rose from a figure of about 68,000 tonnes at the end of 1960-61 to nearly 214,000 tonnes at the end of 1963-64. This is stated to be attributable to delayed receipt of fertilizers after the manuring season, inadequacy of credit facilities for farmers and bottlenecks in the distribution arrangements.

2.6. As mentioned earlier, the Committee on Fertilizers after an exhaustive study of the demand for fertilizers and the requirements of new strategy recommended that the targets for consumption of fertilizers by the end of the Fourth Plan (1970-71) should be 4.1 million tonnes of nutrients. These estimates of the Committee are stated to have been based on field studies and discussions with farmers, agricultural extension workers and agricultural personnel at each State Headquarters and in Government of India. It has been stated that in formulating the estimates account had been taken of the following:

- (i) The area of each major crop, by district, on which a significant amount of fertilizer is based, separated into irrigated and non-irrigated area;

- (ii) Recommendations of fertilizer usage for each crop in each district, separately for irrigated and non-irrigated area;
- (iii) Percentage of crop estimated to be fertilized;
- (iv) Realistic assessment of achievements for production and supply of inputs which will affect fertilizer usage;
- (v) Fertilizer prices and returns to the farmer.

Fourth Plan Targets

2.7. Based on the above, requirements of the three plant nutrients (Nitrogen, Phosphorous and Potash) for each State have been worked out for the Fourth Plan. These details in respect of Nitrogen are given in the following Table:—

(Figures in '000 tonnes)

Name of State	Consumption in base year 1965-66	1966-67	1967-68	1968-69	1969-70	1970-71
Andhra Pradesh	95.0	157.4	193.5	234.6	267.5	299.1
Kerala	10.0	30.7	35.2	40.8	47.8	51.5
Madras	67.0	102.0	133.9	171.5	197.8	228.5
Mysore	41.0	66.4	86.2	108.4	124.0	141.8
Plantation (S. Zone)	15.0	15.0	15.0	15.0	15.0	15.0
Jammu & Kashmir	3.0	4.0	5.0	6.0	7.0	8.0
Punjab	61.0	109.8	159.2	216.8	248.3	298.7
Rajasthan	7.0	18.3	35.2	58.1	76.4	92.6
Uttar Pradesh	90.0	137.1	189.9	241.8	284.6	327.1
Assam	3.0	4.9	7.0	9.5	11.9	14.0
Bihar	29.0	45.4	69.4	94.6	115.7	144.4
Orissa	10.0	14.1	36.7	45.4	60.9	144.4
West Bengal	25.0	22.6	56.5	74.9	90.9	106.2
Plantation (N.E.I.)	18.0	18.0	18.0	18.0	18.0	..
Gujarat	28.0	51.5	78.1	113.2	132.2	158.0
Madhya Pradesh	28.0	51.7	68.9	89.9	104.1	124.9
Maharashtra	65.0	113.7	152.3	198.2	233.5	277.8
Union Territories	5.0	7.4	10.0	13.3	14.5	17.0
TOTAL	600.0	1000.0	1350.0	1750.0	2050.0	2400.0

Similarly, an assessment has been made of the demand for phosphatic (P_2O_5) and Potassic (K_2O) fertilizers also for each State.

2.8. The yearly requirements of fertilizers during the Fourth Plan period, as recommended by the Committee on Fertilizer and accepted by Government, are given below:—

(in million tonnes)

Year	Nitrogen	P_2O_5	K_2O
1965-67	1.00	0.370	0.20
1967-68	1.35	0.500	0.30
1968-69	1.70	0.650	0.45
1969-70	2.00	0.800	0.55
1970-71	2.40	1.000	0.70

The distribution of fertilizers during 1966-67 however, amounted to about 0.84 million tonnes N, 0.25 million tonnes P_2O_5 and 0.116 million tonnes K_2O against the targets shown above.

Result of increased use of fertilizers

2.9. Fertilizers can help double or even triple crop yields. By applying the correct amounts of fertilizer nutrients, crop growth is increased. The crop becomes greener and healthier. It grows faster and taller and yields more. By adding different amounts of fertilizers to plots next to one another and measuring the crop yields, we can determine the yield response on a soil. This is, for instance, being done under the 'Freedom From Hunger Campaign' Fertilizer Programme undertaken under the auspices of FAO of UNO in 17 countries in three regions, namely in West Africa, the Near East and North Africa and northern Latin America. Three years' results of many thousands of demonstrations and trials in farmers' fields in the three regions showed that the weighted average increase from the best fertilizers for all crops tested was 54 per cent. In the northern Latin America region the yield increase averaged 60 per cent, in West Africa 51 per cent and in the Near East and North Africa region, where the effect of fertilizers was more likely to be limited by the lack of moisture, 53 per cent. The yield increase was of course different by crop and country. For example, in Turkey the yield increase with maize and barley was up to 90 per cent, groundnuts 78 per cent, wheat and potatoes 70 per cent and rice 55 per cent. In Ghana, the increase with maize was upto 165 per cent, rice 100 per cent and groundnuts 80 per cent.

2.10. In India Fertilizers are applied both to the food crops and to non-food crops. On the whole, it is estimated that 70% of the fertilizers may be used for foodgrain crops and the remaining 30% for non-food-grain crops. While in the case of foodgrain crops, the average yard-stick of additional food production has been worked out, no such average was worked out for other crops. The additional production varies from crop to crop. In so far as foodgrains are concerned manure and fertilizers are estimated to have contributed during the Second Plan period to an additional production of 2.09 million tonnes. During the Third Plan period additional production resulting from fertilizers is estimated at about 6 million tonnes. Considering the consumption targets of fertilizers set for the Fourth Plan (1970-71) and High Yielding Varieties Programme, it is expected that additional agriculture production on account of fertilizers by the end of the Fourth Plan would be about 40% of the total additional production.

Fertilizer Consumption Level in India

2.11. The magnitude of the problems of fertilizers promotion in the country will become more apparent on a comparison of the levels in other countries. Fertilizer consumption per hectare of arable land in a few selected countries in 1965-66 is shown below. (In the case of India, the consumption levels both during 1965-66 and 1966-67 have been given)—

(In Kgs per hectare)

S. No.	Country	N	P ₂ O ₅	K ₂ O	Total
1	U.S.A.	26.01	18.16	15.46	59.63
2	Australia	1.97	26.78	1.80	30.55
3	West Germany	105.86	99.25	144.21	349.32
4	Canada	5.21	7.73	3.39	16.33
5	Japan	129.08	90.94	101.10	321.12
6	U.S.S.R.	9.95	6.56	7.94	24.45
7	Pakistan	5.10	0.43	0.09	5.62
8	India (1965-66)	3.44	0.81	0.48	4.73
9	India (1966-67)	5.27	1.53	0.70	7.50

Notes. 1. Arable land includes land under permanent crops (double cropped area counted only once), land temporarily fallow, temporary meadows for mowing or pasture, land under market and kitchen gardens and land under fruit trees, vines, shrubs and rubber plantation.

2. For India, consumption figures are based on despatches.

2.12. It is well known that economic survival of India is closely bound with the rapid development of its agriculture and attainment of self-sufficiency in food. The Committee feel that one of the principal reasons for the insufficiency in food production for the growing population of the country is the low per acre yield. To raise the low yield per acre inevitably means using adequate doses of fertilizers. They note from the available data that the consumption of fertilizer per acre of cultivable land in India is one of the lowest in the world whereas the loss of soil fertility is the same all over the world. The Committee find that India's level of fertilizer consumption in 1965-66 was 4.73 Kg. per hectare* as compared to 349.32 Kg. in West Germany, 321.12 Kg. in Japan, 59.63 Kg. in U.S.A. and 30.55 Kg. in Australia during the same period. The Committee are further distressed to note that though great emphasis was laid during all the three Plans for an organised use of chemical fertilizers, the consumption of nitrogenous fertilizers during the First Plan period was about 69 per cent of the target fixed, and dropped to 57 per cent during the Second Plan period. The progress even in the Third Plan, when the production of fertilizers had increased to a sizeable level, was not satisfactory as they find that the increase in consumption was not as high as anticipated inspite of available supplies. This is evident from the fact that the carryover stocks of nitrogenous fertilizers rose from a figure of about 68,000 tons at the end of 1960-61 to nearly 214,000 tonnes at the end of 1963-64. This low rate of consumption of fertilizers according to the observations of the Fertilizer Committee was attributable to delayed receipt of fertilizers after manuring season, inadequacy of credit facilities for farmers and bottlenecks in the distribution arrangements.

2.13. The Committee are convinced that if timely and concerted efforts had been made from the very beginning for promoting the use of fertilizers the country would have been saved from the successive short-falls in agricultural production, particularly foodgrains and would have been on the road to self-sufficiency long ago. Now that country's requirements for fertilizers have been worked out by the Fertilizer Committee after an exhaustive study of the demand for the Fourth Plan period (1970-71), the Committee hope that no efforts would be spared by the Central Government, State Governments and the manufacturers to raise the consumption of fertilizers from the level of 1.20 million tonnes in 1966-67 to 4.1 million tonnes of nutrients in 1970-71.

2.14. The Committee agree that one of the basic objectives of planned economic and social development in the country is to ensure balanced growth of the different regions. They consider that the real key to the

* 1 hectare = 2.47 acres.

development of the backward areas in strengthening of their agricultural sector along with the development of industries. In the opinion of the Committee the imbalances in agriculture growth in some areas, other things being equal, is largely due to inadequate use of fertilizers as compared to other agriculturally developed areas. The Committee are unhappy to note the wide variation in fertilizer consumption among farmers in various States. They find that farmers in the Southern region are more fertilizer minded than their counterparts in other regions. The uneven consumption of fertilizers is also apparent from the fact that out of 24 States| Union Territories the consumption of fertilizers in 1965-66 in 11 States viz. UP, Andhra Pradesh, Madras, Maharashtra, Punjab, West Bengal, Bihar, Mysore, Gujarat, Madhya Pradesh and Orissa, has been 83 per cent of the all India consumption, whereas the remaining States|Territories only accounted for 17% i.e. 10 per cent by States and 7 per cent by plantation crops and industrial users. For proper and balanced growth of agriculture in all regions of the country, the Committee urge that Government should undertake intensive studies of the areas where fertilizer consumption has not been upto the mark so as to take necessary remedial measures in this direction.

2.15. The Committee also consider it essential that an intensive fertilizer promotion programme should be drawn up and put into operation in order to step up consumption of fertilizers to the desired level. To familiarise the millions of cultivators in India with profitable use of fertilizers and to bring home to them the potential profit from fertilizer use, is a challenge which must be accepted and met by devising suitable promotional measures.

B. Measures for Basic Fertilizer Promotion

2.16 The Committee on Fertilizers in their Report have observed that effective basic promotion of fertilizer use involves the following measures—

- (a) Practical demonstrations to prove the utility and the economics of fertilizer use should be carefully laid out in adequate number of persons with training in agronomy with a view to convince the cultivators of the benefits of fertilizer application. The emphasis will have to be not so much on the number of demonstrations, but on their quality in obtaining successful results that will encourage the cultivators in adopting the recommendations made to them.
- (b) An efficient and adequate soil analysis organisation is required for making quick analysis of soil samples furnished by cultivators and collected from the field by Extension agencies. The speed with which the analysis is completed and fertilizer recommendations are conveyed to the cultivator in advance of the

season is of the greatest importance to the programme. The study of crop responses to micro-nutrients at high levels of fertilizer application is also necessary as a preparation for future agricultural development.

- (c) The best results in production with fertilizer input are achieved only when a proper use is also made of related inputs. The success of the Fertilizer Promotion Programme will depend to a considerable extent on the Promotion of the adoption of the recommended package of practices by the cultivators.
- (d) The message of fertilizer use has to be conveyed to the cultivators in language that they understand. For this we need an Agricultural Information Service which can effectively convey the profitability of fertilizer use to the cultivators. Such an information service will also have to make adequate use of audiovisual aids in its field publicity work.

Soil Survey

2.17 For the most effective use of fertilizers thorough knowledge of the soils is a prerequisite. In order to classify and map the soils, an elaborate soil survey programme was initiated in 1955. One main research station at New Delhi, and four Soil Correlation Centres at New Delhi, Nagpur, Bangalore and Calcutta were established. The State Departments of Agriculture have also carried out considerable amount of soil survey and classification for special projects in their States.

Soil Testing

2.18 It has been recognised that soil testing is one of the most accurate and practical means of making an assessment of the fertilizer requirements of individual fields. India started on the soil testing programme in 1955 with the assistance of the USAID. Under this programme, 24 soil-testing laboratories were set up between 1955 and 1960, each with a capacity for analysing 10,000 soil samples per year. Subsequently, the capacity of most of these laboratories is stated to have been increased for analysing 30,000 samples per year. Under the Intensive Agricultural District Programme, another 10 soil-testing laboratories have been set up, making a total of 34 laboratories. During the course of the Third Plan, the State Governments have set up 16 more laboratories of varying capacities. A list of the existing testing laboratories is at Appendix I.

2.19 During the Fourth Plan (1970-71), proposals involve the establishment of 26 new soil-testing laboratories. In order to facilitate giving quicker advice to the farmers regarding the use of fertilizers proposals have

also been prepared for the establishment of 320 Mobile Soil Testing Laboratories, at a net cost of Rs. 5.79 crores, Out of the proposed 320 mobile laboratories, clearance for the establishment of 30 laboratories at a cost of Rs. 39 lakhs during 1967-68 has already been given by Government.

2.20 It has been stated that during the few years that the soil testing service has been in operation in India, a large number of soil samples have been analysed in the laboratories. Based on the results of these analysis soil fertility maps have been prepared which indicate the nutrient status of nitrogen, phosphorous and potassium in different parts of the country.

2.21. Based on analysis the soils are classified into three categories, namely, low, medium and high. From the results of analysis, soil test reports are prepared in the laboratories. These are usually in three main parts. The first part indicates the result of analysis of the soil samples, the second indicates the fertilizer recommendations for the crop based on soil analysis, the history of the field and recent research work. This part indicates the quantities of nitrogenous, phosphatic and potassic fertilisers as also of lime and gypsum to be applied per hectare. The third part usually indicates the methods and time of application of these fertilisers and other practices required to make the fertilizer application efficient. The soil-test data can be properly interpreted by an experienced extension worker to give the farmer necessary advice on the quantities of fertilizers to be applied to particular fields, thus convincing the farmer that recommendations made to him are based on the actual needs of the soil.

2.22. In order to determine the optimum quantities of fertilizers to be applied, one of the best known methods is said to be field trials. Fertilizer recommendations have been compiled by the Agriculture Departments in States for general guidance of Agriculture Extension workers, farmers, etc. All these recommendations can give an economic net profit to the farmers but more precise recommendation on a farm-wise basis have to be obtained by soil-test as stated earlier. It has been stated that fertilizer recommendations are not final. These are revised as and when new problems in soil fertility arise. New crop varieties are continually being released and the nutrient requirements of these varieties may be quite different from those currently in use. Higher crop yields need the application of higher levels of major plant nutrients. The change of soil fertility levels with continued fertilization also necessitates the revaluation of the rate of fertilizer application. Fertilizer recommendations are reviewed periodically in fertilizer workshops, seminars, State Fertilizer Advisory Committees etc. by the State Departments of Agriculture. Besides research and extension workers of the State Departments Agriculture, Fertilizers Officers of the Central Government etc. also participate in these seminars and meetings.

2.23. During evidence when asked to indicate the extent to which the existing machinery had been helpful for the proper balancing of and correct

utilization and application of the fertilizers, the Secretary, Department of Agriculture stated that "this is the basic problem. It may interest you to know that even our research programmes had not taken note of the basic fertility of the soil . . . during the first three Plans when our basic approach was to increase the application of chemical fertilizer, the dosages were so small that the basic fertility did not come into play. . . it is now accepted that basic soil fertility, soil analysis should be done for intensive farming. The difficulty is limitation of the number of soil analysis laboratories in the country. So we have started with the programme of mobile soil testing laboratories who will go into the field, do soil testing on the spot and also collect the samples and send them on to the main laboratories. . . we are now trying with the idea of having the private sector support to this programme by involving unemployed graduates in the rural areas to do this rapid soil testing." The representative of the Ministry further stated that all the factories had been asked to have their own system of soil analysis.

National Extension Service

2.24. The agency for increasing agricultural production is the Extension Service. The National Extension Service was started in 1952 which shortly afterwards merged with the Community Development Programme. The Extension machinery created under Community Development Programme now covers the entire country. It is stated that the use of fertilizers has increased about 20 times since the inception of Planning. Extension Services in the States are more concentrated in areas under High Yielding Varieties Programme, Package District, Intensive Agricultural Areas etc. The primary responsibility of the Extension Service is to assist the farmers in increasing agricultural production by carrying out composite demonstrations with improved agricultural practices and by holding field days to vividly show the results to the farmers and to discuss with them the improvement agricultural practices. Use is also made of films, charts, leaflets and posters etc. to educate the farmers. Government are of the view that although the Extension Services in the States have done commendable work, yet a need has been felt to develop quality and competence of the personnel especially at the village level and to augment their strength and the strength of the subject matter specialists at the District level.

Commenting on the extension service, the Secretary of the Ministry of Food, Agriculture, Community Development and Cooperation stated during evidence that "this extension service which we have put into the field is at a very low level of technical development. Most of our extension officers in some States are not even agriculture graduates. We had to do because of no other alternative. More and more people are now going to post-graduate training and we hope to give sufficient technical support

of a higher standard in intensive areas in Fourth Plan period. Our object was to achieve this by 1970-71. We hope this is possible as colleges are turning out graduates in sufficient numbers—technical competency is also rising. We propose to give in-service training. Ludhiana has started. Other universities are going to start. Particularly Nalegar Committee had recommended that in a district there should be a support to the district agricultural officer of about 6 types of experts. Now we have not been able to reach 6 types of experts, but 4 of them have now been included in many of the intensive districts, mainly pest control, agronomy, fertilizer application and agricultural engineering.”.

2.25. The Committee regret to note the delay in not providing facilities for soil analysis, extension services and necessary aids for increasing fertilizer consumption in the country. They feel that proper and adequate attention should have been given to provide the above facilities in the beginning of the First Plan itself.

The Committee would like to stress that there should be a network of soil-testing service throughout the country together with continuous research to provide basic data on the best use of fertilizers and the best form of fertilizers for a given agro-climatic condition coupled with the study of soil. They feel that considering the vastness of the country and the fertilizer consumption programme embarked upon during the Third Plan, the number of soil-testing laboratories set up by the end of the Plan was far too inadequate. The Committee regret the lack of interest on the part of Government to expand the service which is so vital to promote the consumption of fertilizers by the farmers. They are, however, happy to note that Government have now a plan to add 26 new laboratories as also 320 mobile soil testing laboratories during the Fourth Plan (1970-71). They hope that the results of field trials by these laboratories will not only provide the scientific information needed for giving reliable guidance to farmers on efficient fertilizer use, but will also provide the basis for formulating national fertilizer policy in relation to agricultural development programme. The Committee also need hardly stress that the technical agronomic studies and research as available from the field trials should be evaluated by experienced agronomists and compared to similar studies made by other countries on similar crops. This would not only help in fulfilling the gaps in specific information but would also tend to provide an overall average of yields versus fertilizers treatment.

Demonstration Schemes

2.26. The best way to determine nutrient needs of crops is actually to conduct fertilizer demonstrations or trials in the field. In these, fertilizers are applied at known rate of plant nutrients, crop responses are observed

and final yields are measured. The advantages to be obtained from field trials and demonstrations are as follows:

- (1) They are the best way to determine the nutrient needs of crops and soils, for advising farmers about their fertilizer needs.
- (2) The trials and demonstrations show farmers and agricultural workers the benefits of fertilizer.
- (3) Economic evaluation of the results will give a better insight into the fertilizer needs.
- (4) The growing crop can be photographed. The pictures can be used in publicity and are useful for many years.

2.27. Besides the work being done by the Extension service, a central scheme for demonstrations was introduced in 1954 with the object of popularising such fertilizers as were planned to be produced in India at that time. The Demonstrations were laid out by the State Extension Agency on cultivator's fields on all crops, on all soils, types and in different agro-climatic regions. The size of the plot of the cultivator's field taken up for these demonstrations was 1/3rd of an acre in the beginning and later reduced to 1/10th of an acre. About 2 lakh demonstrations per year were organised during the first three years and about 1 lakh demonstrations per year in subsequent years. Under the scheme the cultivators were provided fertilizer at recommended level of application free of cost. These demonstrations are stated to have paved the way for increased consumption of fertilizers throughout the country and made the farmers fertilizer conscious.

2.28. Another National Demonstration Scheme was started in 1966 for demonstrations with specific crops on the recommendation of the panel of Agricultural Scientists. The main feature of the programme was to provide an opportunity to scientists and students of agricultural institutions to demonstrate convincingly that very high yield levels can be reached in our major crop plants by exploiting the results of the research work carried out in the country. Generally, high yielding varieties of important food crops were taken up for these demonstrations with a view to indicate the maximum yields that can be obtained under different agro-climatic conditions.

It is stated that the Scheme referred to in paragraph 2.27 is now proposed to be reorganised into two parts, namely, the Multicropping Demonstration Scheme on two-hectare plots to be run by the State Governments and Pilot Demonstration Scheme on 40-hectare plots, to be centrally sponsored, the objective being to demonstrate the maximum production per unit area for the whole year.

2.29. Besides the demonstration work being done at Governmental level, some of the producers and distributors like FACT Alwaye and Indian

Potash Supply Agency Ltd. also conduct field demonstrations with their own products.

2.30. Statement giving the State-wise allotment of National Demonstrations and amounts planned to be spent during the years 1964-65 to 1966-67 and latest figures of allotments made to the States for Fertilizer demonstrations scheme are at Appendices II and III. As desired by the Committee the firm figures of actual expenditure incurred by the States in this connection have not been furnished as it has been stated that these are not yet available from all the States.

2.31. During the course of evidence the Secretary of the Ministry of Food, Agriculture, Community Development and Cooperation (Department of Agriculture), stated that "we have agreed to have a second line of demonstration done by agricultural extension officers in the block supported by the technical experts in the universities and colleges. In 1968-69 we are starting a 100 acre demonstration on multi-cropping. If these demonstrations can really prove the utility of the new ideas, the farmer will catch up with them. The farmers' demand is rising and our difficulty is to keep pace with it." When told that farmer's judgement was more correct often than the conclusion arrived at by research assistants who work on insufficient data, the Secretary of the Ministry stated that it was the educated farmers who had again contributed to the success of the expansion of the programme. They found answers as to how a certain thing had happened. They were able to pin-point what was the thing gone wrong. He admitted that the technical competence in the extension field was still weak. But they had to depend upon them.

2.32. The Committee on Fertilizer in Chapter VII of their Report have suggested a number of steps for making field demonstrations more effective. The Committee hope that Government will examine the recommendations of the Fertilizer Committee with a view to re-organise and re-orient the demonstration programme as well as soil testing work particularly in backward areas. The Committee feel that the quality of the demonstration can be improved if special and adequate staff with sufficient training is designated for the purpose under an organisation charged specially with this responsibility.

III. FERTILIZER SUPPLIES

A. Production

Need for adequate supply

3.1. India does not yet produce enough of food for her requirements. The result is that India has come to depend heavily on imports for feeding her people. Food surpluses of exporting countries are diminishing. It is neither possible nor desirable for India to continue to import agricultural products from far away sources and it is imperative that her food production increases rapidly. Achievement of self-sufficiency in food has been set as the objective of the Fourth Plan. It has been stated that 125 million tonnes of foodgrains will be necessary in 1970-71 as against actual production of 88 million tonnes in 1964-65. The only approach to increased agricultural production constitutes an integrated effort and chemical fertilizers provide the key to it. Necessity for accelerating production of commercial fertilizers is accepted by every one in India. In view of the important role it plays in increasing the food production, the nitrogenous and phosphatic fertilizers have to be produced quickly in India. Their production will assist the achievement of plan targets for food production which is so vital and on which the whole economy of the country is dependent. The increased production of fertilizers reduces the burden on foreign exchange which is currently utilised to import fertilizers.

Plan Targets and Achievements of the first 3 Plans

3.2. Regular and adequate supplies of fertilizers are therefore of great importance in the growth of fertiliser demand. The creation of fertiliser demand without adequate provision for satisfying it will lead to frustration and dissatisfaction on the part of cultivators with adverse effect on the growth of fertilizer use. In order to maintain the recommended levels of consumption, the committee feel it is necessary to increase fertilizer production in the country to avoid increasing dependence on imports. It is in this background of urgent necessity to step up fertilizer production to cope with the demand that the Committee has in the following paragraphs

reviewed the production programme since the inception of Planning Commission. (Since indigenous* production of potassic fertilizer is insignificant and practically all demands are met through imports, the Plan targets of nitrogenous and phosphatic fertilizers only have been discussed in this Section. Availability of potassic fertilizers has been discussed in Section 'C' dealing with Imports).

(i) *First Plan*

(a) *Nitrogenous Fertilizers*

	In terms of Ammonium Sulphate	
	Tons	
Existing capacity (1950-51)	78,670	(15,734 of fixed N.)
Capacity envisaged (1955-56)	481,270	(96,265 tons of fixed N.)
Capacity installed	475,000	..
Production target	450,000	..
Production achieved	380,000	(76,000 tons of N.)

The capacity envisaged was expected to be brought about by the expansion of the following :

	1950-51	1955-56
	(in tons)	
By-product coke oven plants	26,070	27,060
Mysore Chemicals and Fertilizers, Balgula	6,600	13,200
Fertilizers and Chemicals (Travancore) Ltd. Always	46,000	92,000
Sindri Fertilizers and Chemicals Ltd.†	..	350,000
	<u>78,670</u>	<u>482,200</u>

†The Sindri Fertilizer Factory went into production in November, 1951.

The shortfall in production of 70,000 tons (in terms of ammonium sulphate) is stated to be due to the non-expansion of capacity of plants as envisaged.

*Production of low grade muriate of potash is at present confined to the northern states of Punjab and U.P. totalling not more than 2,000 tons of K₂O. No reliable data, however, are available as to the total quantity actually produced and consumed. Almost all potash consumed in the country is imported. A project for the production of muriate of potash from salt bitterns is under implementation at Tuticorin.

(b) Phosphatic Fertilisers

	(in tons)
Existing capacity (1950-51)	123,460
Capacity envisaged (1955-56)	209,355
Capacity installed	273,000
Production existing	55,089
Production target for the Plan	200,000
Production achieved	71,400

The projects of expansion under implementation and schemes envisaged under the Plan were as under:

	1950-51	1955-56
Dharmasi Morarji Chemical Co.	15,000	18,975
Fertilizers and Chemicals (Travancore) Ltd.	18,000	45,375
Parry and Co. (Ranipat Fy)	8,400	18,975
Alembic Chemicals Works Ltd.	..	2,500
Bihar Government Super-phosphate Factory	..	16,500
Raja of Venkatagiri Plant	..	16,500
Rest of manufacturers	82,060	90,530
TOTAL	123,460	209,355

The development programme was formulated in 1951 against the background of—

- (a) a serious shortage of sulphur and consequently of sulphuric acid; and
- (b) considerable reluctance on the part of cultivator to make use of phosphatic fertilisers for overcoming which extensive propaganda and education were required. It is stated that even the modest level of consumption in 1951 was achieved only by means of various types of inducements including a subsidy.

It will be seen from the above table that compared to what was originally visualised, there had been a considerable shortfall in production

(80,000) tons by the last year of the Plan. The reasons for this are stated to be failure of demand to expand as rapidly as was hoped:

(ii) *Second Plan*

(a) *Nitrogenous Fertilizers*

Capacity envisaged (1960-61)

	tonnes
Public Sector	344,000
Private Sector	38,000
	<hr/>
	382,000
Capacity installed	248,300
Production target	290,000
Production achieved	98,000

The increase in the capacity and production during the Second Plan was expected to be achieved by the completion of the following projects:

	Tonnes of N.
1. Expansion of Sindri Factory	47,000
2. Expansion of FACT	20,000
3. Varanasi Factory (M/s Sahu Chemicals)	10,000
4. Nangal Factory	80,000
5. Rourkela Factory	80,000
(It was scheduled to produce only 80,000 tonnes but has been designed for a capacity of 120,000 of N.)	
6. Neyveli	70,000
	<hr/>
	307,000

Against the above, the capacity established was:

1. Sindri Expansion	47,000 tonnes of N. (It was into production in January, 1959).
2. FACT	20,000 tonnes of N. (First stage went into production in 1961).
3. Nangal	80,000 tonnes of N. (Went into production in February, 1961).
	<hr/>
	147,000

The reasons for the plants not catching up with the capacity/production targets, as envisaged, are given below:

- (i) Expansion of Sindri Fertilizer Factory—The expansion scheme of Sindri envisaged the production of urea (capacity 11,000 tons of nitrogen annually) and ammonium sulphate/nitrate or double salt (capacity 36,000 tons of nitrogen annually). This scheme for the implementation of which technical assistance was provided by M/s Montecatini of Italy was completed in 1959 as against the end of 1957 set as the target date. Even so, no extra output was achieved at Sindri in the remainder of the Plan period for several reasons such as the low performance of the lean gas plant, shortage of coal of suitable quality, lack of spare parts as well as the caking characteristics and acidic nature of the double salt produced.
- (ii) Expansion of FACT—This expansion scheme envisaged the production of 20,000 tons of additional nitrogen in the form of ammonium sulphate and ammonium phosphate and ammonium chloride. There has been a delay of 18 to 24 months in the completion of the project as compared to the original date set for production viz. the end of 1958. The first stage of expansion programme for a capacity of 10,000 tons of nitrogen was completed in 1961.
- (iii) M/s Sahu Chemicals, Varanasi—This scheme for the production of 10,000 tons of nitrogen as ammonium chloride (and 40,000 tons of soda ash) was completed by the end of 1959 but, because of technical difficulties, no significant production was achieved during the rest of the Plan period.
- (iv) Nangal Fertilizer Factory—Production of calcium ammonium nitrate equivalent to 80,000 tons of nitrogen was envisaged at this factory. The construction schedule was delayed by a year owing to the foreign exchange crisis of 1957 and the consequent need to negotiate deferred payment arrangements for plant and machinery. The plant was brought into partial production (1/3 capacity) in February 1961.
- (v) Rourkela and Neyveli Fertilizer Projects—The Rourkela factory was scheduled to produce 80,000 tons of nitrogen as calcium ammonium nitrate (20.5 per cent nitrogen content). It was, however, designed for a capacity of 120,000 tons of nitrogen per year but the higher level of production was to be realised when additional coke oven gas supplies

were available from the expansion of the Rourkela steel works.

The Neyveli Fertiizer Project was originally planned for urea and sulphate nitrate but later this was changed to manufacture only urea (equivalent to 70,000 tons of nitrogen per annum) by the complete recycle process. The completion of both the factories was delayed mainly owing to foreign exchange difficulties.

(b) Phosphatic fertilizers (2 Terms of P_2O_5)

	tons
Capacity envisaged (1960)	120,000
Capacity installed	57,280
Production target	120,000
Production achieved	52,441

It was expected that the targets would be achieved by the production of 83,300 tons of P_2O_5 as single super-phosphate, 3,700 tons of P_2O_5 as ammonium phosphate and the balance as triple super-phosphate and dicalcium phosphate.

The increase in the capacity of the phosphatic fertilizer industry in India was achieved almost entirely by the expansion of the manufacture of single super-phosphate. Part of the scheme of M/s Fertilizers and Chemicals, Travancore for the manufacture of ammonium phosphate was delayed and was to materialise in full during the Third Pln. No scheme for the manufacture of triple super-phosphate or dicalcium phosphate materialised during the Second Plan period.

Although the production of single superphosphate increased sharply, the production in 1960 being four times that of 1956 (it rose from 13,530 tons in 1956 to 53,030 tons in 1960) the capacity and production achieved were well behind the target set for the Second Plan. The main reason for this shortfall is stated to be lack of demand commensurate with the expectations formed in 1956. Since for maintaining soil fertility, it was necessary to use phosphatic fertilizer along with nitrogenous fertilizers, the Fertilizer Distribution Enquiry Committee appointed by the Ministry of Food and Agriculture in 1959 recommended certain measures for popularising the use of phosphatic fertilizers. Among important measures suggested were (i) the grant of a subsidy of 25 per cent on all purchases of super-phosphate to be borne by the Central Fertilizer Pool; (ii) encouraging super-phosphate manufacturers to build up sales organisations and develop sales by providing incentives.

(iii) *Third Plan*(a) *Nitrogenous Fertilizers*

The Third Plan target capacity and production of nitrogen fertilizers were 1,00,000 and 800,000 tonnes of nitrogen respectively. The year-wise break-up is given below:

				(Tonnes)		
Year				Total require- ments	Capacity envisaged	Indigenous production envisaged
1961-62	.	.	.	400,000	242,000	140,000
1962-63	.	.	.	525,000	300,000	200,000
1963-64	.	.	.	650,000	400,000	300,000
1964-65	.	.	.	800,000	600,000	500,000
1965-66	.	.	.	1000,000	1000,000	800,000

The actual capacity installed and production achieved during the Plan period has been as under:

				(Tonnes)	
Year				Capacity installed	Production achieved
1961-62	.	.	.	240,700	144,900
1962-63	.	.	.	381,300	117,600
1963-64	.	.	.	381,300	222,000
1964-65	.	.	.	381,300	240,000
1965-66	.	.	.	585,000	233,317

(b) *Phosphatic Fertilizers*

Capacity envisaged (1965-66)	500,000 tonnes
Capacity installed	236,830 tonnes in terms of P_2O_5
Production target	500,000 tonnes
Production achieved	111,205 "

In the Third Plan it has been stated that under the straight phosphatic fertilizers a capacity of 200,000 tons in terms of P_2O_5 had already been planned. No further expansion of capacity was envisaged in terms of

superphosphate. The following table gives the targeted production, capacity actually installed and production actually achieved during the Third Plan period:

Year	Target	Capacity installed	Production achieved
(in '000 tonnes)			
1961-62	100	89.7	86.0
1962-63	150	129.6	80.6
1963-64	225	147.4	107.5
1964-65	300	158.67	130.9
1965-66	500	236.80	118.8

(c) *Implementation of the Projects*

The Third Plan envisaged the completion of the following projects of nitrogenous fertilizers:

	Public Sector	Private Sector
(i) <i>Continuing Scheme</i> (tonnes)		
Neyveli	70,000	
FACT (2nd stage)	10,000	
Rourkela	120,000	
(ii) <i>New Schemes</i>		
FACT (3rd stage)	40,000	Itasri/Katni 50,000
Trombay	90,000	
Namrup	45,000	Hanumangarh 80,000
Gorakhpur	80,000	Kpthagudam 80,000
		Visakhapatnam 80,000
		Durgapur 58,000
		Varanasi 10,000
		(expansion)
		Ennore 8,250
		Gujarat 96,000
		Mysore 100,000
		Tuticorin 64,000
TOTAL	455,000	626,250
GRAND TOTAL	1,081,250 tonnes	

Against the above, the projects which went into production during the Plan period are:

	Public Sector Tonnes	Private Sector Tonnes
Neyveli	70,000	Ennore 8,250
Rourkela	120,000	
FACT (2nd & 3rd stages)	50,000	
Trombay	90,000	
TOTAL	330,000	8,250
GRAND TOTAL	338,250 tonnes	

It has been stated that 18 applications had been received for the establishment of fertilizer factories (nitrogenous) during the Third Plan period in the private sector. Of these, 10 parties were granted licences with a capacity totalling 626,250 tonnes. Where more than one application was received for a particular location, the licence was granted to the party who were considered most suitable from the point of view of the capacity to obtain foreign collaboration, cost of production, etc. The position of each of these projects as at the end of the Plan period is summarised below:

Project	Date of issue of licence	Capacity tonnes	Remarks
1	2	3	4
1. Madhya Pradesh (Itarsi/ Katni).	March, 1961	50,000	M/s. Khandelwar Brothers with foreign collaboration. Dropped in April, 1962.
2. Rajasthan (Hanumangarh).	March, 1961	80,000	Shri B. L. Jalan with American collaborators, the Metro Corporation of American and the Continental Oil Company. Transfer of location to Kotah allowed in December 1964. Ultimately licence for Kotah revoked in April 1967, after giving it extensions for taking effective steps (1) upto 30-3-1965 and (2) the other upto 31-5-1966.

1	2	3	4
3. Andhra Pradesh (Kothagudam).	April, 1961	80,000	M/s. Andhra Sugars Ltd., in collaboration with M/s. Allied Chemical Corporation, USA. Licence surrendered in July 1967.
4. West Bengal (Durgapur)	August, 1962	58,000	Project initiated by the State Government and licence granted to Durgapur Fertilizers and Chemicals Ltd. Dropped in February, 1963 (subsequently revived through Fertilizer Corporation of India).
5. Uttar Pradesh (Varanasi Exp.)	January, 1960	10,000	M/s. Sahu Chemical, Varanasi. Licence revoked in June 1965.
6. Mysore (Bangalore)	December, 1961	100,000	M/s. Shaw Wallace & Co. Ltd., given Letter of Intent in participation with M/s. Rallis India Ltd., for collaboration with M/s. Dutch States Mine, Holland. Dropped in March, 1965 (subsequently fresh Letter of Intent issued in June, 1966).
7. Madras (Tuticorin)	November, 1961	64,000	M/s. Kothari and Sons. negotiated with M/s. Armour & Company USA and latter with Gulf Oil Corporation, Koppers International etc. Surrendered in April, 1964.
8. Andhra Pradesh (Visakhapatnam—Coro- mandal)	..	80,000	M/s. Parry & Co., in collaboration with M/s. California Chemical Co. and M/s. International Minerals Chemicals Corporation Co. of USA. Commissioned in December, 1967.

1	2	3	4
9. Madras (Ennore)	..	8,250	EID Parry Commissioned in December, 1962.
10. Gujarat (Gujarat Fertilizers)	..	96,000	Gujarat Government in collaboration with private sector. Commissioned in June, 1967.

It will be seen from above that during the Third Plan only one fertilizer factory at Ennore with a capacity of 8,250 tonnes went into production, against 10 projects licensed in the private sector. Two more projects viz. one in Andhra Pradesh (Coromondal Fertilizers) with a capacity of 80,000 tonnes and the other in Gujarat State (Gujarat Fertilizers) with a capacity of 96,000 tonnes were also commissioned in 1967-68 i.e. during the second year of the Fourth Plan period. The remaining 7 projects were ultimately abandoned. The detailed reasons for abandonment of each of these projects are given in Appendix IV.

Reasons for delay in completion of the Projects

3.3. The reasons for delay in the completion of the projects included in the Third Plan (both in public sector and private sector) are briefly indicated below:

(a) Projects in the private sector

Out of 10 projects, 7 had to be abandoned as promoters could not secure necessary foreign collaboration in the establishment of the respective factories.

(b) Projects in the public sector

(1) There was delay in the completion of the following projects:

Namrup:

- (i) Delay in the acquisition of land because of Supreme Court ruling;
- (ii) Stoppage of work due to Chinese aggression in November, 1962; and
- (iii) Soil investigation showed that the original site was not satisfactory for installing heavy moving machinery. Alternative site had to be acquired.

Gorakhpur:

- (i) Delay in selection of site.
- (ii) Delay in the acquisition of land.
- (iii) Delay in placement of orders.

(2) The following new plants set up went into production only by the end of the Third Plan and as such their production was not upto the capacity as envisaged during the Plan period. The reasons for late production in these projects are enumerated below:

Trombay:

Delay in the finalisation of the contract for supply of plant and machinery. There was modification in the composition of nitro-phosphate to be produced. There had also been some mishaps during trial runs.

Neyveli:

Could not progress according to schedule as steel for indigenous fabrication had to be imported. There were also teething troubles.

FACT (3rd Exp.):

Due to limitation of foreign exchange several items of original equipment had to be deleted from the contract and arranged for fabrication in India. Considerable delay ensued from the extended deliveries promised by India.

(3) As in the Second Plan, the existing plants at Sindri and FACT were also not producing in full capacity. The shortage of coke oven gas and power persisted even during the Third Plan period.

3.4. During the course of evidence the question of shortfalls in production during the three Plan periods also came up for discussion. The Secretary of the Ministry of Petroleum and Chemicals while clarifying the position observed that the First Plan target was achieved both in capacity and production. With regard to the achievement of targets in the Second Plan, he stated that capacity was calculated on the basis of any factory going into production even at the fag end of the year. Actually in the case of some factories, like the third stage of FACT and Nangal, there was only one month left for the completion of the Plan when they went into production. The capacity was reached on paper in the sense that the plants had been commissioned, but production to the maximum capacity could not be reached, due to delay in the erection of plants on account of foreign exchange shortage. As far as Third Plan was concerned, the representative of the Ministry stated that out of 10 plants, in the private sector, plants did not materialise with the result that the capacity amount-

ing to 600,000 tons of nitrogen could not come up at all. According to him one of the difficulties that were faced was in getting foreign collaboration. In addition, there was also some delay in construction, for example in Trombay and the third stage of FACT. On account of these reasons the capacity as envisaged could not be reached and the figures of production shown in the final year had to be assessed on the basis of number of months the plants had actually gone into production. About the projects in the public sector in the Third Plan, the representative of the Government stated that apart from the foreign exchange shortage and the difficulties in arranging credit, there were other difficulties about the selection of sites and acquisition of lands for the new projects. Asked whether it was due to inadequate technical knowledge, he replied "lack of practical experience with new projects. We were probably over-eager."

3.5. In reply to another query it was stated that in the case of Rourkela, a contract was finally signed with a German firm—Udhey—in March, 1959. The plant was commissioned towards the end of 1962 *i.e.* roughly about 45 months from the date of the signing of the contract. Asked whether there was any dispute between Fertilizer Corporation and the Hindustan Steel Ltd. the representative stated that there was some dispute with regard to supply of gas as far as the production programme was concerned. After the plant had been commissioned, it was found that the gas availability was not what was originally estimated and on account of this only 25 per cent. capacity was achieved at the stage of commissioning. He revealed that in 1964 the plant was handed over to the Hindustan Steel itself, because it was felt that they would be in a much better position to run it and achieve the gas balance. During the last two years, it had improved to some extent, but the gas problem was still haunting the plant and the under-production at the plant was as serious today as it was in the past. The representative of the Ministry further added that "there was an error in computing the quantity of gas that would be available, the nature of the coal, the quantity of gas that could be produced and the quantity of gas needed for steel production as such and what could be made available for fertilizer production."

3.6. About the Neyveli project the Committee were informed during evidence that "There was difficulty of arranging foreign exchange. The contract was actually awarded in October 1959 and then it was scheduled to go into operation by the end of 1961. But during the operation of construction schedules, there was some difficulty. It arose because of a clause in the contract that steel will be supplied from indigenous sources to the foreign contractor for fabrication purposes. It was later found that the steel was not available in the country and finally it had to be supplied by imports. This took some time in getting the thing through and the contractor also tried to take advantage of this clause." When

asked to indicate the reasons for the present 50 per cent. capacity of the plant, the representative of the Ministry stated that firstly there was some difficulty about the availability of lignite and secondly when that was overcome, certain operational difficulties arose for the import of certain materials, spare parts etc. from Germany. Asked further if there were various collaborators for each plant, the Secretary of the Ministry stated that for Thermal Plant it was U.S.S.R., for Fertilizer Plant the Italian and Germans were there. For Mining there was no collaboration as such but they were having consultants M/s Powel Dufryn and Co. from U.K. who were available on site for a considerably long time.

3.7. About Gorakhpur, the representative of the Ministry stated that the site was selected but it had to be changed because it was close by to an airstrip and defence reasons came in. Acquisition of land at the other site was delayed because owners of the land sent petition and they went to the courts. There was also the dispute about rehabilitation of the people displaced from those lands. Asked whether land was properly checked in the first instance about Namrup, the Government representative stated that the F.C.I. survey team went over the ground and discussed with the local agencies and their own data was obtained. The thermal station of the Assam Electricity Board was located near the site. The data given by Assam people showed that the site was all right. Subsequently, this particular site did not come out to be favourable as the data of the Electricity Board showed. Another site, a mile away from this place, had to be chosen. It was made clear in reply to a question that there was no infructuous expenditure as the buildings constructed were allotted to some school and earmarked for stores. Asked whether any detailed survey before embarking upon the project was undertaken, the Secretary of the Ministry stated that "It was thought that on the experience of adjoining enterprises there would be a suitable quality in the soil. I agree this should have been confirmed by actual tests. There was an error." About Trombay, the Committee were informed that it worked at 35 per cent of the capacity. In the last year or two, operations in Trombay had resulted in considerable losses to the F.C.I. The Trombay project came into production in November 1965, towards the close of the Third Plan. According to the representative of the Ministry the plant did not get into proper production because of teething troubles and more fundamental difficulties in the plan and faulty machinery for which the contractors were at fault. As regards Nangal, it was revealed to the Committee that there was no shortage of power at present. This was the case last year due to the paucity of rains.

3.8. About Sindri, the Secretary of the Ministry stated that there was one problem. The plant originally was based on gypsum available from West Pakistan when it was designed in 1946-47. But after partition it

had to be switched over to local sources i.e. on gypsum available in Jodhpur. The problem was about the quality of gypsum available now. The plant had to make do with the inferior quality of gypsum which was telling on the efficiency of the plant. The Jodhpur reserves were being exhausted now and the new reserves found were of still inferior quality. Even those too might not be available after sometime. The Secretary of the Ministry added that in the light of these problems a rationalisation scheme (as shown in Appendix V) had been drawn up to improve the operation of the plants in Sindri. Asked whether any study had been made of the good quality gypsum available in Bhutan, the Government representative stated that a study had been made on it but mining and transport of gypsum from Bhutan* would be very much higher.

3.9. Asked whether correct information about estimates based on the availability of funds, foreign exchange and also suitability of raw material was ascertained before sanctioning the project and undertaking it, the Secretary of the Ministry of Petroleum and Chemicals stated that "We have certainly gained through experience. In our newer projects we are going through certain critical items on how to organise various stages and how to ensure that time is not lost through unforeseen or unplanned eventualities." He added that "there is a question as to what we are doing now-a-days to ensure timely results. We have now set up a machinery for a critical study of project development. We have special groups working on this, keeping a close watch on the various critical events that come into the history of the project and taking steps to see that we do not slip. So we have gained from experience. We have now adopted some of the new techniques of project supervision. It is true in the past we dawdled a little."

Targets of Fourth Plan

3.10. The Fourth Plan targets of nitrogenous and phosphate fertilizers are given below:

(a) Nitrogenous Fertilizers

(Million tonnes)

Capacity envisaged (1970-71)	. . .	204
Production target	. . .	2.0
Production estimated	. . .	1.6

* Please also see paras 6.16 to 6.18.

The year-wise requirements, indigenous production and likely shortfalls for the five years of the Fourth Plan are given below:

(M. tonnes)

Year	Require- ments (estimated)	Production (estimated)	Shortfall
1966-67	1.00	0.308	0.692
1967-68	1.35	0.400	0.950
1968-69	1.70	0.698	1.000
1969-70	2.00	0.976	1.024
1970-71	2.40	1.569	0.831

(b) *Phosphatic Fertilizers*

(Million tonnes)

Capacity envisaged (1970-71)	1.00
Production target	1.00
Production estimated	0.50

The year-wise requirements, indigenous production and/likely shortfall are given below :

(In million tonnes)

Year	Require- ments	Production	Shortfall
1966-67	0.370	0.145	0.225
1967-68	0.500	0.235	0.264
1968-69	0.650	0.331	0.319
1969-70	0.800	0.381	0.419
1970-71	1.00	0.467	0.533

3.11. In a note furnished to the Committee it has been stated by Government that the above production estimates are based on the production from plants in operation and under construction at present and that these estimates are likely to vary in the light of changes in dates of completion of projects under implementation.

Production during 1966-67

3.12. The requirements of fertilizers during 1966-67, the first year of the Fourth Plan were 1.0 million tonnes N, 0.37 million tonnes P₂O₅. Against this, the indigenous production was 0.31 million tonnes N. and 0.14 million tonnes P₂O₅. The following tables gives the indigenous production of various types of fertilizers during 1966-67:

		(In tonnes)
Fertilizers		Indigenous (Material)
1. Ammonium Sulphate	. . . . .	446,231
2. Urea	. . . . .	141,033
3. Ammonium Sulphate Nitrate	. . . . .	60,018
4. Calcium Ammonium Nitrate	. . . . .	540,923
5. Ammonium Chloride	. . . . .	14,490
6. Ammonium Phosphate	. . . . .	77,478 (16-20-0)
7. Nitro-phosphate	. . . . .	70,612
8. Di-Ammonium Phosphate	. . . . .	..
9. Basic Slag	. . . . .	..
10. Superphosphate	. . . . .	695,418
16% (i)	. . . . .
18% (ii)	. . . . .	7,561
18.5% (iii)	. . . . .	16,189
19% (iv)	. . . . .	457
	TOTAL N	312,394
	TOTAL—P ₂ O ₅	140,385

Estimated Production during 1967-68:

3.13. The targets of consumption for 1967-68 are 1.35 million tonnes N. 0.50 million tonnes P₂O₅. Against this, the indigenous production is expected to be of the order of 0.4 million tonnes N. and 0.2 million tonnes of P₂O₅.

Phased Programme of Development of Capacity:

3.14. The phased programme of development of the capacity envisaged for the Fourth Plan period (1966-67) to (1970-71) is given below:

(a) Nitrogenous(in terms of N.)
tonnes**(1) Existing capacity**

Sindri	117,000
Nangal	80,000
Trombay	90,000
Rourkela	120,000
Neyveli	70,000
FACT	70,000
Gujrat	96,000
Ennore	8,000
Varanasi	10,000
By-product Amm. Sulphate from coke oven plants	20,000
	681,000

(2) Projects due for completion in 1967-68

(a) Namrup	45,000
(b) Gorakhpur	80,000
(c) Vizag	80,000
(d) Ennore Expansion	8,000
	213,000

(3) Project due for completion in 1969-70

(a) Durgapur	152,000
(b) Cochin	152,000
(c) DCM (Kota)	130,000
(d) FACT-IV Stage	22,000
(e) Gujrat Expansion	120,000
	576,000

(4) Firm projects due for completion in 1970-71.

(a) Madras	190,000
(b) Namrup Expansion	152,000
(c) Barauni	152,000
(d) Kanpur	200,000
	694,000

(5) *Project approved but work yet to start—likely to be completed by 1970-71*

	Tonnes
(a) Goa	160,000
(b) Trombay Expansion	229,000
(c) Mangalore	240,000
(d) Haldia	142,000
	771,000

(b) *Phosphatic Fertilizers (tonnes of P₂O₅)*

(1) *Existing capacity* 286,830

(2) *Projects due for completion in 1967-68*

Superphosphate factories (7)	47,985
Vishakhapatnam	73,000
By-product di-calcium phosphate	11,140
	132,125

(3) *Projects due for completion in 1969-70*

(a) FACT IV Stage	9,200
(b) Kota (DCM)	30,000
(c) Maharashtra Agro Industries Bombay	6,680
	45,880

(4) *Projects sanctioned and due for completion in 1970-71*

(a) Madras	85,000
(b) Trombay Expansion	124,000
(c) Haldia	79,000
(d) Mangalore	90,000
	378,000

(5) *Projects likely to be taken up and due for completion in 1970-71*

Sindri Expansion	156,000
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3.15. The necessity to expand the fertilizer industry in India has been receiving Government's attention from the First Plan period. The Committee are, however, distressed to note the heavy and persistent shortfalls in installing targeted capacity and in achieving production according to

installed capacity of fertilizers during each of the three Plan periods. It is surprising that even the installed capacity, both during the Second and Third Plan periods remained largely unutilised when the country was badly in need of regular supply of fertilizer for increasing the agricultural yield. They note that in the Second Plan against an installed capacity of 248,300 tonnes of nitrogenous fertilizers, production actually achieved was 98,000 tonnes i.e. about 36 per cent. Similarly, in the Third Plan against an installed capacity of 586,500 tonnes, the production was of the order of 233,000 tonnes i.e. about 40 per cent. What is more regrettable is that the capacity actually installed during these Plan periods was much less than capacity envisaged. While the capacity for nitrogenous fertilizers installed during the Second Plan was 65 per cent of the capacity envisaged, it dropped to about 59 per cent during the Third Plan. This shortfall in installing the capacity as envisaged and under-utilization of the capacity as installed, clearly indicates deficiencies in planning. The Committee feel that correct appraisal was not made of the requirements of fertilizers while fixing targets for the succeeding Plan. They consider that for realistic planning, it is necessary that the targets laid down in the earlier plan are reviewed and the reasons for their shortfalls identified and analysed for taking remedial action.

3.16. The Committee are also constrained to note that the indigenous production has not kept pace with the demand for fertilizers. While production of nitrogenous fertilizers during the First Plan was about 84 per cent of the target fixed, it dropped to 34 per cent during the Second Plan and further came down to 29 per cent in the Third Plan. The non-fulfilment of targets during the Second and Third Plans was due to the failure of both the public and private sectors to progress the implementation of the schemes according to schedule. It is a matter of deep concern that the public sector which should have been a pace-setter, has itself lagged behind in this matter. The Committee find that against an increase of 307,000 tonnes in the existing capacity expected to be achieved during the Second Plan, a capacity of 147,000 tonnes only was set up by the expansion of Sindri and FACT (First Stage) and by commissioning of Nangal Factory in February, 1961. The Varanasi factory which was the only project in private sector, though completed in 1959, could not be commissioned due to technical difficulties. The remaining two projects at Rourkela and Neyveli could also not be completed within the Plan period due to foreign exchange difficulties. It is also noted that in the Third Plan, apart from the three continuing schemes viz. Neyveli, FACT (2nd Stage) and Rourkela, there were four new schemes in the public sector viz. FACT (3rd Stage), Trombay, Namrup and Gorakhpur, with a total capacity of 455,000 tonnes. The capacity actually installed during the Plan was, however, 330,000 tonnes made up of Neyveli (70,000), Rourkela (120,000), FACT (2nd and 3rd Stages) (50,000) and Trombay (90,000).

Compared to the progress made in the implementation of the schemes in the public sector, the position in the private sector was still worse. The Committee are perturbed to note that while the private sector was expected to execute 10 schemes to create capacity for the production of 6.26 lakh tonnes of nitrogen at the end of the Third Plan, only one scheme at Ennore, with a capacity of 8250 tonnes was completed during the Plan period itself. Out of the remaining 9 schemes, 7 schemes aggregating as much as 442 lakh tonnes were abandoned either by the parties concerned or by their licences being revoked after a period, ranging from one to six years. In respect of the other two projects (i.e. Gujarat and Coromandal) with a capacity of 176 lakh tonnes, only construction work was started and the projects were completed and commissioned in 1967-68.

The main reason for abandoning the projects, as indicated by Government, was that promoters could not secure necessary foreign collaboration in the establishment of the respective factories. It appears to the Committee that neither enough care was taken in processing the applications for installation of manufacturing capacity for fertilizers nor was any close watch kept on the progress made by the parties concerned after the issue of letters of intent to make sure that they took effective action to tie up collaboration arrangements and place orders for machinery and equipment. The delay in revocation of licences of the parties concerned has not only resulted in foreclosing the capacity and thus keeping the genuine parties away from coming in the field, but has also affected adversely the production targets of fertilizers to the detriment of national economy. The Committee consider it unfortunate that the inability of Government to catch up with the fertilizer programme has retarded the progress of the country in attaining self-sufficiency in food production.

3.17. It is well recognised that intensive cultivation which leads to agricultural self-sufficiency requires ever-increasing application of chemical fertilizers. According to Government programme fertilizer complexes will now be springing up all over the country in response to the urgent need for augmenting the food output. In this context the Committee would like to strike a note of caution that if the projects do not come up as scheduled, self-sufficiency in agricultural production may elude us for many years to come. The time taken to establish new complexes and the time required to bring them to optimum level of production are of no less importance than the economics of the projects themselves. The Committee are convinced that if the projects that have already commenced construction and those approved by Government proceed with speed and according to schedule it should not be difficult to establish a capacity of 2.4 million tonnes of nitrogenous and 1 million tonnes of phosphatic fertilizers as laid down for period ending 1970-71. At the same time the Committee would like Government to ensure that the capacity set up does not remain unutilised for want of raw materials and other feedstock.

3.18. The Committee would also like the Government to give thought to the fertilizer production programme of the Fifth Plan so that action is initiated right now to study the raw material requirements, prospective location of new plants and possibility of expanding the existing units.

B. Measures to promote Fertilizer Production

3.19. The Committee have been informed that the following are some of the important measures taken to avoid failure of the production programme of fertilizers during the Fourth Plan period:

Investment of Foreign Capital

During the First and Second Plan periods the accent was on the public sector and as such there had been no foreign investment in the fertiliser industry. During the Third Plan period the only one plant which was commenced with foreign collaboration was in the private sector. The Vishakapatnam factory of Coromandal Fertilizer Co. Ltd. has 80,000 tonnes of nitrogen. It went into production on the 10th December 1967. This plant has been set up with collaboration from U.S.A. The foreign collaborators share in the equity capital of the company formed to implement the project is Rs. 3,99,24,900. This includes non-cash shares to the extent of Rs. 1,09,76,800 issued in consideration of the know-how made available by the foreign collaborators. The two foreign collaborators in the company are (i) Chevron Chemicals Company and (ii) International Minerals and Chemicals Corporation. In terms of an agreement, the U.S. collaborators agreed to make available a secret formula and a secret process for manufacture of complex fertilizers engineering and manufacturing information related to designing, construction and operation of the plant. The collaborators also made available qualified personnel in connection with construction and operation of the Plant.

New Policy

3.20. Since foreign investment was not forthcoming as envisaged during the Third Plan period on account of which many of the projects in the private sector had to be abandoned, the following decisions were taken in December 1965 to promote such investment:—

- (i) *Financing & Management:* Foreign investors are welcome to enter into partnership with private Indian parties for putting up fertilizer plants. In such ventures, they can hold majority shares, if they so wish;
- (ii) *Pricing and marketing:* The production target of 2.0 million tonnes of nitrogen fixed for 1970-71 represented an eight fold

increase on the figures for 1965-66. It was, therefore, considered necessary that the production facilities should be brought into commission as quickly as possible, at any rate well before the last year of the Fourth Plan. This had two implications. First, the construction of these facilities should be taken in hand quickly and the parties concerned should be enabled to obtain necessary machinery, equipment and know-how from foreign sources, consistent with the tight time schedule inherent in the programme, secondly the factories should be able to plan full production in the shortest time possible and establish for this purpose an effective organisation for distribution and marketing. After careful examination of the above aspects and other relevant factors, Government came to conclusion that the best way of achieving production target envisaged for the Fourth Plan was to give greater responsibilities to the production units and allow them freedom of action in regard to prices and distribution for the purpose of discharging the said responsibility. To this end, it decided that all fertilizer projects licensed on or before 31st December, 1967 would be free to fix prices of their products and to organise their own distribution for a period of seven years from the commencement of commercial production, subject to the condition that they would sell to the Government at the latter's option, upto 30 per cent of their products at a price to be settled between them and the Government.

- (iii) *High level Governmental assistance and speed up of procedures:* Government were conscious of the multiplicity of organisations which had to be consulted before a decision is taken on the application of private entrepreneurs to put up an industrial unit. To avoid such delays, Government set up a Special Committee of Secretaries to function as a single focal point for:
- (a) Dealing with all negotiations involving foreign collaboration in the fertilizer industry;
 - (b) Taking decisions leading automatically to grant of a Letter of Intent/Industrial Licence;
 - (c) Expediting necessary clearances;
 - (d) Providing assistance in the removal of bottlenecks during the construction stage;
 - (e) Ensuring smooth/operation of the plant after it goes into production.

- (iv) *High priority for the import of raw materials:* High priority would be given for the import of raw materials like sulphur and rock phosphate;
- (v) *Credit Facilities:* Rapid expansion of rural credit facilities in the marketing of fertilizers is now an accepted policy of Government. Credit facilities are being developed in order to ensure that no farmer who needs seeds, fertilizers and pesticides remains without them for want of necessary funds;
- (vi) *Seeding Programme:* Investors interested in the fertilizer industry have sought assurance that adequate supplies of fertilizer will be made available to them for 'seeding programme' i.e., programmes of market development in the economic supply area of a plant, for a period of three years prior to commencement of production. The aim of the market development programme is partly to stimulate consumption of the particular types of fertilizer to be produced and partly to enable private distribution organisation of the manufacturers' choice to set up their distribution and storage network. Government have agreed to seeding programme for the Vishakhapatnam, Kanpur and Madras projects and assurances have been given to the parties that certain agreed minimum quantities of fertilizer will be made available to them for three years prior to commencement of production in the new units. Similar facilities will be available to prospective investors. New projects can also make purchases from the plants under production to supplement supplies they may receive from Government for their seeding programme.
- (vii) Government will use their good offices in helping the new projects in procuring land and getting necessary supplies of water and power.
- (viii) Government will help them in arranging for quick port clearances of imported capital equipment and its internal transport to the plant site by rail or road.
- (ix) Government will also use their good offices in getting allocations of scarce building materials, namely, steel, cement, ACC sheets etc. during the construction stage.

Response received under the New Policy:

3.21 Since the announcement of the above policy in December 1965 proposals are stated to have been received from the following parties:—

(i) *M/s. Phillips Petroleum Company Ltd.:* A proposal was received in October, 1966 for the establishment of a fertilizer factory at Haldia

in West Bengal. A letter of intent was issued on 5th January, 1967 for the establishment of the factory. The letter of intent will be converted into an industrial licence after the fees to be paid as technical know-how etc. are settled to the satisfaction of the Government. The project is expected to have a plant capacity of 125,000 tonnes of nitrogen, 79,000 tonnes of P_2O_5 and 37,500 tonnes of K_2O based on 290 days of operation. Phillips will contribute to the extent of \$12.745 million and International Finance Corporation to the extent of \$2.999 towards equity capital.

(ii) *U.S. Cooperative League*: A proposal to set up a plant at Kandla was submitted by International Cooperative Development Association in August, 1967. The proposed plant will have a capacity of 215,000 tonnes of nitrogen, 127,000 tonnes of P_2O_5 and 66,000 tonnes of K_2O . The capital investment is estimated at Rs. 89.26 crores of which the foreign exchange will be about Rs. 38.18 crores. The entire foreign exchange is expected to be contributed by US AID.

A new company known as 'Indian Farmers Fertilizer Cooperative Ltd.' has been formed for implementation of the project. The company will enter into an agreement with the World Fertilizer Development Cooperative, appointing the latter as Engineering Managers responsible for process selection, engineering and construction of the plants, subject to the overall control, in all decision making of the Indian company. The details are yet to be finalised. In the meantime, a letter of intent has been issued on 19.10.67 in favour of the Indian Farmers Fertilizer Cooperative Ltd.

(iii) *Inter ore & Fertilizer (India) Pvt. Ltd.*: The party has shown interest in the establishment of a fertilizer plant at Kakinada. The details are awaited.

(iv) *Atlantic Richfield*: This party has also shown interest in the establishment of a fertilizer plant in India. No details have however yet been furnished.

(v) *British India Development Co. Ltd.*: This party along with M/s Salzgitter Industriebau, a West German firm submitted a tentative proposal for the establishment of a fertilizer plant at Paradeep. The detailed proposals are awaited.

(vi) *Tata/Allied Chemicals*: The proposal envisages the setting up of a fertilizer-cum-marine complex project at Mithapur. This is based on the import of ammonia, but is expected to contain a number of features that promote exports and save imports.

3.22 In addition to the above, the following proposals have been received from private parties with foreign participation:

(i) *Malabar Chemicals & Fertilizer Ltd.*: A proposal from Dr. G. S. Duggals to establish a fertilizer factory at Mangalore for the manufacture of complex fertilizers and urea in collaboration with M/s. International Development & Investment Co. Ltd. Nassau, Bahamas was received on 6.4.1966. Subsequently in March, 1967, the party informed that M/s. Girdler Corporation of U.S.A. will also contribute towards equity capital.

The foreign collaborators will contribute towards the equity capital of the company to the extent indicated below:—

(1) International Development & Investment Co. Ltd., Nassau, Bahamas	(Crores) Rs. 4.5
(2) Girdler Corporation, U.S.A.	Rs. 3.0

M/s. IDI Co. Ltd. will receive free equity in lieu of know-how equivalent to \$1.6 million. The know-how fees shall be payable to IDI because of its making the following available to the company:—

- (i) Assessment of plant and process requirement with particular attention to capital costs and efficiency;
- (ii) Secret formula for compounding of fertilizers;
- (iii) Technical personnel to supervise the operation of the plant, if required by the company;
- (iv) Facilities for training of Indian personnel in their factories abroad;
- (v) Assistance with the start up of the plant, etc.

(ii) *Modi/Rohm & Hass*: The proposal is to establish a fertilizer factory at Ghaziabad in Uttar Pradesh for the manufacture of urea. M/s. Rohm and Hass will contribute to the extent of Rs. 3.6 crores towards equity capital.

(iii) *Pilani Investment Corporation*: The proposal to set up a fertilizer factory at Mirzapur in collaboration with M/s. Kaiser Aluminium and Chemicals Corporation of U.S. was received from M/s. Pilani Investment Corporation. M/s. Kaisers will participate to the extent of Rs. 1.50 crores in the equity capital. The project will have a capacity of 160,000 tonnes of nitrogen.

3.23. The latest position (as on 29-2-1968) of the applications received are given below:—

Sl. No.	Name of Party	Location	Capacity tonnes of N	Latest position of the application
1	M/s. Malabar Chemicals & Fertilizers Ltd.	Mangalore	240,000	Licence granted on 8-12-1966.
2	M/s. Phillips Petroleum Co. Ltd.	Haldia	142,000	Letter of intent issued on 5-1-67. The party has since withdrawn their proposal due to financial commitments elsewhere.
3	M/s. Modi Spg. & Wvg. & Co. Ltd.	Ghaziabad	160,000	Letter of intent issued on 30-3-67.
4	Pilani Investment Corporation	Mirzapur	160,000	Letter of intent issued on 11-11-67.
5	Coromandal Fertilizers Ltd.	Vizag. Exp.	155,000	Letter of intent issued on 7-11-67.
6	Indian Farmers Fertilizer Co. Ltd.	Kandla	215,000	Letter of intent issued on 19-10-67.
7	Dharamsi Morarji Chemical Co.	Colaba in Maharashtra	90,000	Letter of intent issued on 7-2-1968.
8	Barium Chemicals	Vizag.	200,000	Details are awaited from the party.
9	Tata Chemicals Ltd.	Mithapur	460,000	The proposal is under examination.
			1822,000	

It has been stated that except in the case of Dharamsi Morarji proposal, all other projects approved are based on naphtha. Dharamsi Morarji proposal envisages the import of ammonia. The projects are expected to go into production only after 1970-71. About the pending applications, it has been stated that no target date has been fixed for their finalisation.

3.24. The extent of foreign investment involved in the above proposals and their source of supply are indicated below:—

		Total Foreign Exchange	Source of F.E.
1		2	3
1	Malabar Chemical & Fertilizers Ltd.	Rs. 28.20 crores	Equity participation by foreign investor & Suppliers credits. The party has since revised its proposal and information on the financing pattern and source of foreign exchange is awaited.
2	Phillips Petroleum	\$ 41.9 million Rs. 31.42 crores	Equity participation by Phillips and International Finance Corporation and loans from foreign financial institution. The party has since withdrawn the proposal.
3	Modi Spg. & Weaving	Rs. 17.79 crores	Equity participation by foreign collaborator and loans from financial institutions.
4	Pilani Investment Corporation	Rs. 18.75 crores	Equity participation by foreign Collaborator and loans from financial institutions.
	Coromandal Fertilizers Ltd.	Rs. 21.37 crores	To be finalised.
6	Indian Farmers Fertilizers Co. Ltd.	Rs. 38.17 crores	Loans from private institutions in U.S.A.
	Dharamsi Morarji Chemical Co.	Rs. 10.55 crores	Equity participation by Kuwait Chemicals & Fertilizers Company, International Finance Corporation and loans.

1	2	3
8 Barium Chemicals		Details to be finalised.
9 Tata Chemicals Ltd.	Rs. 46.77 crores	Equity participation by Allied Chemicals Corporation and loans.

Self-Sufficiency

3.25. According to the information furnished to the Committee the fertilizer requirements of the country are estimated to increase from 2.4 million tonnes of nitrogen expected in the year 1970-71 to about 3.2 million tonnes of nitrogen in the year 1972-73 and 4.0 million tonnes in 1975-76. To meet these requirements a number of projects are stated to be under consideration. It has been stated that at present a capacity of 2.16 million tonnes of nitrogen is firm and is expected to be in operation in 1970-71. However, the production from these plants is expected to be about 1.5 to 1.9 million tonnes of nitrogen. When the projects for which letters of intent and licences have been issued (upto 31.12.1967) fructify, the expected production of nitrogen in the year 1972-73 is 3.284 million tonnes of N. Apart from the above, further schemes are stated to be under consideration of Government like Trombay Expansion, M/s. Tata's project at Mithapur, Burmah-Shell project at Bombay, Korba/Kothagudam etc. It, therefore, could reasonably be assumed that the country would be self-sufficient in meeting the fertilizer requirements by 1972-73.

3.26 In the case of phosphatic fertilizers, the requirements are expected to increase from 1 million tonnes of P₂O₅ in the year 1970-71 to about 1.4 million tonnes in 1972-73 and 2.0 million tonnes in 1975-76. The expected production in the year 1970-71 is estimated at 0.427 million tonnes of P₂O₅ and about 1.18 million tonnes in 1972-73 onwards. The main raw materials required for phosphatic production namely, rock phosphate and sulphur (where required) are to be imported in the country. It is, therefore, likely that the self-sufficiency in the production of phosphatic fertilizers will be attained by 1974-76.

3.27. The Committee are glad to note that after an unsatisfactory performance of the private sector during the Third Plan period, Government have taken a number of measures to stimulate fertilizer production in the country. These measures inter alia include invitation to foreign capital for investment in the fertilizer industry. Government have made special concessions and offered liberal terms to foreign investors for this purpose. It

has been agreed to permit majority foreign participation, entrust management control to foreign collaborators, give seven-year price and distribution holiday, apart from other concessions like the high priority for the import of raw materials, credit facilities, seeding programme, assistance in procuring land and other infra-structure facilities. The Committee note that during the period of 2 years of the announcement of the new policy in December 1965, Government have received offers from only 9 parties. Of these, licence has been granted in one case for a capacity of 240,000 tonnes, letters of intent in six cases for a capacity aggregating 9,22,000 tonnes, while two proposals for a capacity of 660,000 tonnes are still pending consideration.

The Committee are of the view that the response to the liberalised terms has not been very encouraging even though the deadline for receiving the offers was extended from 31st March, 1967 to 31st December, 1967. They are further concerned to note that subsequent to the issue of a Letter of Intent on 5-1-1967 the proposal for the Haldia Project has been withdrawn by the foreign collaborator.

They hope that the remaining 8 proposals under the new policy would soon fructify. The Committee would urge that with the expiry of the deadline on the 31st December, 1967 Government should now lose no time in processing the proposals. In this connection, they would like to invite attention to the recommendation contained in their 9th Report (Fourth Lok Sabha) on Industrial Licensing that Government should "carefully examine the question of foreign collaborations having regard to the state of development of engineering and design organisations of Fertilizer Corporation and FACT, the need for achieving self-sufficiency in fertilizers at an early date to meet agricultural requirements and the imperative necessity of producing the fertilizers at economic and competitive prices so as to encourage their use on a wide scale in the interest of larger production."

3.28. The Committee would like to emphasise that utmost care should be taken to see that the construction of the projects does not suffer from delays as in the past and that adequate and effective steps would be taken to ensure that they are completed and commissioned according to schedule. It should also be enjoined upon the collaborators that for the construction of the projects they should procure as much of the equipment as possible from within the country.

C. Imports

Procedure for formulating yearly imports of fertilizers:

3.29. In the new agricultural strategy for increased agricultural production fertilizers constitute the most important input. As already mentioned earlier, the Committee on Fertilizers after a detailed study of (i) the potential fertilizer requirements based on the recommended manurial schedules;

(ii) the present consumption trends and (iii) increased fertilizer application rates for new high yielding crop varieties had recommended targets of 2.4 million tonnes of nitrogenous, 1.00 million tonnes of phosphoric acid and 0.7 million tonnes of potash by the end of the Fourth Plan. The Committee also suggested the year-wise break-up of these targets. These targets have been accepted by the Government. The yearly import requirements of plant nutrients referred to above are worked out after taking into account the yearly estimates of indigenous production made by the Ministry of Petroleum and Chemicals.

3.30. The State Governments are asked to intimate their requirements of fertilizers every year. At the time of the annual Plan discussions, these requirements are further discussed. Thereafter teams of Central Government officers headed by Secretary|Additional Secretary|Joint Secretary visit each State to discuss the agricultural production programme for the following year. The requirements of the State Governments for fertilizers are verified, reviewed and assessed by the Central teams. The experience of the Government during the past years has been that the total requirements mentioned by the States often exceed the annual targets of consumption of fertilizers laid down in the Plan. The Plan targets have, therefore, to be relied upon in the assessment of import of fertilizers from abroad. From the target of consumption for the year, the indigenous production as assessed in consultation with the manufacturers and the Department of Chemicals is deducted and the gap is sought to be covered by imports, as far as possible.

Imports during the three Plans:

3.31. The following types of fertilizers were imported during each of the three Plan periods:

1. Ammonium Sulphate
2. Sodium Nitrate
3. Ammonium Phosphate
4. Nitro-Phosphate
5. Urea
6. Triple Super-phosphate
7. Ammonium Nitrate
8. Ammonium Sulphate Nitrate
9. Muriate of Potash
10. Calcium, Ammonium Nitrate
11. Mono Ammonium Phosphate.
12. Mixed Fertilizer.
13. Ammonium Triple-sup.
14. Di-Amm. Phosphate.
15. Ammonium Chloride.

The quantity and value of each of these types of fertilizers imported during each of the three Plan periods are indicated in the statement at Appendix VI. Consolidated figures, Plan-wise are indicated below:—

Plan Period	Total quantity of imported fertilizers	Total value of imported fertilizers (Rs. crores)
First Plan (L.T.)	7,61,123	24.74
Second Plan (M.T.)	22,09,069	63.92
Third Plan (M.T.)	40,88,604	128.55
	<u>70,58,596</u>	<u>217.21</u>

Programme for the Fourth Plan:

3.32. To meet the gap between the estimated requirements and indigenous production of fertilizers as worked out for the Fourth Plan period, the following quantities of fertilizers are likely to be imported during each year of the Plan. For the sake of comparison the targets of requirements, indigenous production have also been indicated in the Table below:

(in million tonnes)

	Requirements (Estimated)	Production (Estimated)	Shortfall (To be imported)
Nitrogenous Fertilizers (N)			
1966-67	1.00	0.308	0.692
1967-68	1.35	0.400	0.950
1968-69	1.70	0.698	1.000
1969-70	2.00	0.976	1.024
1970-71	2.40	1.569	0.831
Phosphatic Fertilizers (P₂O₅)			
1966-67	0.370	0.145	0.225
1967-68	0.500	0.236	0.264
1968-69	0.650	0.331	0.319
1969-70	0.800	0.381	0.419
1970-71	1.000	0.467	0.533

Potassie Fertilizers (K₂O)

1966-67	0.200	0.200
1967-68	0.300	0.300
1968-69	0.350	0.350
1969-70	0.550	0.550
1970-71	0.700	0.700

3.33. Actual imports of various types of fertilizers during 1966-67 the first year of the Fourth Plan have been as under:—

(In tonnes)

Fertilizers	Imported (Material)
1. Ammonium Sulphate	12,03,786
2. Urea	5,21,639
3. Ammonium Sulphate Nitrate	41,991
4. Calcium Ammonium Nitrate	1,03,761
5. Ammonium Chloride	21,000
6. Ammonium Phosphate	2,16,220 (20:20:0)
7. Nitro-phosphate	
8. Di-Ammonium Phosphate	2,11,537
9. Basic Slag	2,000
10. Sulphate of Potash	5,000 (48%K) 24,652 (52%K)
11. Muriate of Potash	1,95,887 (60%K) 29,597 (50%K)
TOTAL N	6,17,215
TOTAL P₂O₅	1,40,911
TOTAL K₂O	1,47,057

Requirements of Foreign Exchange:

3.34. The foreign exchange requirements for imports have been calculated by the Committee on Fertilizers as under:

Year	(Rs. in crores)					
	Nitro- gen	P ₂ O ₅	Sulphur	Rock phos- phate	K ₂ O	Total
1966-67	78.00	11.88	6.19	9.92	9.00	114.99
1967-68	107.25	20.79	6.99	11.21	13.50	159.74
1968-69	78.00	12.96	13.00	20.83	20.25	145.04
1969-70	78.00	15.39	16.35	26.21	24.75	160.7
1970-71	91.00	23.67	19.16	30.71	31.50	196.04
TOTAL	432.25	84.69	61.69	98.88	99.00	776.51

NOTE : Import price of N, P. and K has been assumed as Rs. 1300.00 Rs. 900.00 and Rs. 450.00 per tonne respectively.

3.35. The Committee on fertilizers has further recommended that the required foreign exchange should be assured for fertilizer imports as fertilizer input is practically the sheet-anchor of the entire plan for agriculture.

3.36. During the course of evidence the Secretary of the Ministry of Food, Agricultural, Community Development and Cooperation revealed that the estimates of imports during 1968-69, which were more or less certain, were 1 million tonnes of nitrogen, 2.85 lakh tonnes of P₂O₅ and 4.56 lakh tonnes of K₂O. He said that it, however, depended on the production. Some of the factories might do better than what was considered and if the teething troubles were got over in some of the factories, it might be a little better in 1969-70 and 1970-71. When his attention was drawn to the increase in the import bill from Plan to Plan, the Secretary of the Ministry stated that "This is a reflection of the adoption of fertilizers by the farmers. It is significant that in the Third Plan we imported fertilizers worth Rs. 128 crores whereas in the first year of Fourth Plan alone we imported worth Rs. 128 crores and for 1968-69 our bill is Rs. 225 crores". Explaining the reasons for this steep rise he added "Actually in June 1966 the pressure of this was felt and a

special team was sent to find out foreign entrepreneurship to establish fertilizer factories here. It was taken seriously then seeing the gap between the requirements and our local availability. It is from that day that most of these factories—four factories in the public sector and the expansion of Trombay—have been sanctioned within a year. It takes 3½ years for a factory to come into operation. So, by the end of 1969 or early 1970 these factories shall start. Meanwhile in 1967 the high yielding programme has come in full play. This was not contemplated in 1966—not in this magnitude—so this is an additional factor which has stepped up the fertilizer requirements in the country. So our entire objective has had to be changed because of the responses of the farmer to this fertilizer programme.”

3.37. The Committee are constrained to observe that the delay in the implementation of scheduled fertilizer programme and the under-utilisation of the installed capacity, ranging from 30 to 40 per cent. during the Second and Third Plan periods have cost the country heavily in importing substantial quantities of fertilizers. This has not only resulted in heavy drain of foreign exchange which was so vitally required for development of the country in other spheres, but has made the country dependent more and more on others to solve the food problem of the country. The Committee note that fertilizers imported in the country during the First, Second and Third Plan periods amounted to 7.61 lakh tons, 22 lakh tonnes and 40.88 lakh tonnes which cost the country to the tune of Rs. 24.74 crores, Rs. 63.92 crores and Rs. 128.55 crores, respectively totalling Rs. 217.21 crores in foreign exchange. The Committee are given to understand during the course of evidence that during 1968-69 alone the bill of fertilizer import will go upto Rs. 225 crores on account of the high yielding varieties seed programme having come in full play during 1967. The Committee have no doubt that if concerted and determined efforts had been made to put up fertilizer plants in time, the country would have saved considerable amount of foreign exchange which had to be spent on the imports of fertilizers and foodgrains during the Plan periods.

3.38. The Committee agree that the recent increase in the tempo of modernisation of farming is largely due to the promise of greatly increased profitability of crop production through the use of high yielding varieties of seeds, coupled with heavy dressings of fertilizers. They hope that this tempo will gather momentum, as this is the only course to take the country to self-sufficiency in food needs before long. In the meanwhile the Committee would urge Government to ensure that the fertilizer plants under construction/contemplation are completed expeditiously so that the deadline set for achieving self-sufficiency, both for food production and fertilizers, is advanced in national interests.

IV. DISTRIBUTION AND MARKETING OF FERTILIZERS

A. Distribution

Central Fertilizer Pool

4.1. The widespread use of fertilizer in the country is of recent growth; before the Second World War only small quantity (about 1.0 lakh tons of sulphate of ammonia) of fertilizer was consumed and much of it was applied to plantation and cash crops, very little fertilizer being applied to other crops. After the fall of Burma and the consequent cessation of imports of rice from that country, it became necessary to adopt measures to increase rapidly the production of food. As a result of decisions taken by a high level conference held in Bombay in 1942 a 'Grow More Food Campaign' was launched. Increased use of fertilizers was one of the special features of this campaign.

4.2. At that time the nitrogenous fertilizers were being produced only to a small extent (about 28,000 tons) by one factory in the South and a few steel plants in Bengal and Bihar as a by-product. The country was thus dependent largely on imported fertilizers, the supplies of which dwindled during the War owing to curtailed production in the exporting countries. Imports were also meagre, as for example, during the years 1943 and 1944, no import of nitrogen was made while the import of superphosphate in 1944 amounted to only 1572 tons and that of potash amounted to 597 tons only. The shipping difficulties further affected supplies. To meet these and other problems, an International Emergency Food Council of the Allies was set up. The Council which acted as a coordinating agency for various commodities including fertilizers, allotted supplies of fertilizers from the surplus to deficit countries. India became a member of the Council. It was roughly estimated that the potential demand of nitrogen in undivided India would be of the order of one million tons per annum. No estimates of demand, however, appear to have been framed for phosphate and potash, as at that stage, the deficiency of nitrogen only was known to be widespread in Indian soils. As the allocations of the International Emergency Food Council were made only to Governments, a Central Pool for import and distribution of nitrogenous fertilizers was established in 1944.

Role of the Pool

4.3. The Central Fertilizer Pool was placed under the administrative Control of the then Ministry of Food and Agriculture as a State Trading Scheme. The objects of the Pool are—

- (i) to popularise and push up the consumption of fertilizers in the country;

- (ii) to make them available to cultivators at economic rates; and
- (iii) to ensure equitable distribution of available supplies in order to maximise agricultural production.

4.4. The expenditure on this scheme is met out of Capital budget of the Central Government. The sale proceeds of the fertilizers distributed to various interests are credited as "Recoveries" to the Capital head. The accounts of the scheme are prepared on financial year basis. After the close of annual accounts, a proforma account is also prepared on Commercial Lines, showing the trading account, profit and loss account and the balance sheet.

4.5. The Pool mainly handles Ammonium Sulphate, Urea, Calcium Ammonium Nitrate and Ammonium Sulphate Nitrate procured from abroad and from indigenous sources. In addition it also handles Ammonium Phosphate, Di-Ammonium Phosphate, Ammonium chloride, Sulphate of Potash and basic slag etc. procured from abroad. While materials imported from abroad will continue to be handled by the Pool as before, in respect of indigenous production, a decision has been taken whereunder the factories are free to market 30 per cent of their production in the areas of their choice and at prices determined by them with effect from 1-10-1966. The percentage released for free sales was increased to 50 per cent from 1-10-67 and will further go upto 70 per cent from 1-1-68. Hence the Central Fertilizer Pool will not be dealing with the indigenous production after 1st October 1968 except to the extent that it exercises option to take over 30 per cent of the production.

4.6. The fertilizers procured from indigenous sources and those imported from abroad, are pooled together and sold at uniform prices for each type throughout the country to the various interests. Allocations of fertilizers from the Pool are made as under:—

(a) *State Government*: Allocations of fertilizers are made in favour of the State Governments, who arrange for their sale to the cultivators through the distribution agencies appointed by them. In most of the States, the internal distribution of fertilizers has been entrusted to the Co-operatives. The Co-ordinating organisation (State Department of Agriculture or apex Cooperative Marketing Society) in a State then furnishes despatch instructions direct to the factory or the Regional Director of Food concerned, on receipt of which fertilizers are despatched. In some States both cooperatives and private agencies are undertaking distribution. State Departments of Agriculture also distribute fertilizers along with other agencies in some States.

(b) *Requirements of plantations:* Requirements of nitrogenous fertilizers are met directly by the Central Pool for use of plantation crops like tea, coffee, rubber on the basis of demands received from the concerned corporate bodies namely the Tea Board, the United Planters Association of South India, the Coffee Board and the Rubber Board. Distribution agents for these have been appointed to whom supplies are made. These distributing firms in turn cater to the requirements of the individual planters either in straight form or in the form of mixtures.

Terms of Sale

4.7. The allottees have to furnish despatch instructions to the suppliers direct (Factories|R.D.Fs.) under advice to the Pool. The price charged for issues from the Pool is known as Pool price which is said to be uniform throughout the country, for respective interests and is fixed by Ministry of Food Agriculture, Community Development and Cooperation from time to time. The price so charged is per M.T. F.O.R. Ports|Despatching Stations, freight paid by the Central Fertilizer Pool upto rail-head destination by the shortest and cheapest route, whether by all rail, rail-cum-river-cum-rail or river-cum-rail route. In order to expedite movement of fertilizers as also to avoid any bottlenecks due to wagon shortage etc., consignees have been allowed in certain cases to lift the fertilizers by road, full reimbursement of such transportation costs being allowed to them.

4.8. The cost of fertilizers supplied to State Government is recovered by book adjustment after 60 days of the date of despatch of material, thus allowing them deferred payment terms of two months on supplies obtained from the Central Fertilizers Pool.

4.9. The cost of supplies to distributors of fertilizers to plantations *i.e.* tea, coffee and rubber is recovered through a system of "Letter of Credit" to be opened in advance with the factories on Regional Directors (Food) who handle imported fertilizers at ports on behalf of the Pool.

Working of the Pool

4.10. As mentioned earlier, the Central Fertilizer Pool was established in 1944. During the course of working of the Pool, certain amount of profit accrued in the operations except in the year 1946-47, 1954-55, 1965-66 and 1966-67. The table below indicates the profits earned or

losses incurred in the operation of the Pool during the years 1944-45 to 1966-67:

Year	Net Profit (+) or loss (-)
	Rs.
1944-45	6,71,583
1945-46	25,64,061
1946-47	(-)4,40,316
1947-48	14,29,857
1948-49	1,42,639
1949-50	19,63,799
1950-51	11,43,466
1951-52	4,44,627
1952-53	3,40,158
1953-54	68,70,760,
1954-55	(-)45,47,472
1955-56	8,75,985
1956-57	22,58,216
1957-58	1,54,78,413
1958-59	3,50,50,140
1959-60	6,37,07,000
1960-61	7,44,81,003
1961-62	9,47,19,930
1962-63	8,50,06,580
1963-64	5,14,33,663
1964-65	40,14,300
1965-66	(-)1,54,22,627
1966-67	*(-)48,23,00,000 (Estimated)

*Includes about Rs. 47.88 crores towards element of subsidy on imported fertilizers, on account of devaluation in June, 1966, when it was decided to neutralise its effect, and maintain pre-devaluation prices for the cultivators during 1966-67.

4.11. Referring to the profits which the Pool had been making since its inception in 1944, the Committee desired to know as to why in view of the grave food shortage, the prices of the fertilizers were not revised downwards in order to make available cheaper fertilizers to farmers during all these years. Government in reply stated that in fixing the prices of fertilizers handled by the Pool, it was not the intention to make any profits. The profits were only incidental and accrued generally on account of appreciable fall in the procurement prices of imported fertilizers. Since the aim was to make the country self-sufficient in fertilizers and as the procurement prices of indigenous fertilizers were still very high, the Pool prices were not reduced to avoid an adverse impact on use of fertilizers in the

event of subsequent rise in import prices and increase in ratio of the indigenous production. The actual profits that accrued were thus in a sense unintended and unanticipated due to a lower indigenous production and a falling trend in world prices.

4.12. It has been stated that during the Third Plan period the prices of fertilizers were reduced from time to time as shown in the table below:

Name of Fertilizer	Prices upto 30-11-61	Price from 1-12-61 to 4-10-61	Prices from 5-10-62 to 31-12-63	Prices on 1-1-64
	Rs.	Rs.	Rs.	Rs.
Sulphate of Ammonia	344.50	330	330	330
Urea	684.10	670	670	570
Amn. Sul. Nitrate	408.50	400	400	400
Cal. Amn. Nitrate	324.80	310	278	278

4.13. As a result of these reductions the profits of the Pool were cut down progressively. The loss of Rs. 1.54 crores was sustained during 1965-66 mainly due to retrospective increase in the procurement cost of indigenous fertilizers from F.A.C.T. and Rourkela factories and hardening of fertilizer prices in the world market.

4.14. The prices of Pooled fertilizers were revised from 1.4.67 with a view to withdraw the bulk of the subsidy on these fertilizers. However, in some cases an element of subsidy was allowed to be continued in the year 1967-68. The concessions of off-season rebate and movement by road etc. sanctioned in the earlier years were also decided to be continued. On the basis of the procurement prices then known a loss of Rs. 15 crores for the year 1967-68 has been estimated after taking into account the above factors. Due to a fall in the import prices of some fertilizers, it is now estimated that the loss may be considerably reduced.

4.15. In this connection, the Committee would like to point out that as early as February, 1958, the Ministry had clearly stated in a note (*Appendix VII*) submitted to the Public Accounts Committee (1957-58) that the Ministry was running a State Trading Scheme on 'no profit no loss basis' for the purchase and distribution of chemical fertilizers with a view to popularising their use and making them available to the cultivators at a reasonable rates in the interest of maximising agricultural production.

4.16. The Committee are constrained to observe that the Central Fertilizer Pool which was originally set up with the object of running the State Trading Scheme on a 'no profit no loss basis' had made substantial profits since its inception in 1944-45 till 1964-65 except in two years i.e. 1946-47 and 1954-55. The profit had progressively increased from year to year from Rs. 671 lakhs in 1944-45 to as much as Rs. 947 lakhs in 1961-62. These were particularly heavy during the years 1957-58 to 1963-64 and amounted to about Rs. 42 crores. The Committee are unable to agree with the Ministry that "the profits were only incidental and accrued generally on account of appreciable fall in the procurement prices of imported fertilizer...". It is apparent that Government made no serious attempts during the period to adjust the prices on their 'appreciable' fall and give the benefit of such fall in prices to the cultivators as an incentive to consume more fertilizer. The Committee fully endorse the views of the Public Accounts Committee expressed in their 23rd Report (1963-64) that this "was not consistent with the object of the Pool, which was never intended to be a revenue earning scheme, but was to serve as an equalisation fund, so that all the imported and indigenous fertilizers could be made available to the consumers at a uniform price throughout the country...". The Committee hope that such a situation will not be allowed to develop in future and that constant thought would be given to review the pricing policy keeping in view the objects of the Pool. The prices of various types of fertilizers should be so fixed that the benefit of lower imported price or reduction in the cost of indigenous production is actually passed on to the consumers to promote their sale and wider use.

B. Distribution arrangements in the States

Mode of Assessment of Fertilizer Requirements

(a) Upto 1965-66:

4.17. Upto 1965-66, the assessment of the fertilizer requirements of the State Governments was made after taking into account the following factors:—

- (i) demand received from the State Governments,
- (ii) total supplies of fertilizers available by way of indigenous production and imports,
- (iii) carry over stocks already available with the States,
- (iv) past performance of the States in lifting quota allotted to them,
- (v) need for popularisation of fertilizers planned for production in the State; and

(vi) irrigation facilities available in the State.

(b) for 1966-67:

4.18. In the new pattern of agricultural strategy for increasing agricultural production within the shortest possible time from irrigated and assured rainfall areas, special programmes like High Yielding Varieties Programme, Intensive Agricultural District Programme, had been indentified. It was considered necessary to put in intensive efforts to those programmes by the provision of the required quantities of inputs like fertilizers so that increased yields of foodgrains etc. could be achieved. In the context of the limited availability of fertilizers due to inadequate indigenous production, difficulties of foreign exchange and the need for utilising the supplies available to the maximum advantage of agricultural production, the following principles were evolved for assessing the requirements of the State Governments and allocation of fertilizers from the Central Fertilizer Pool at a conference of the Chief Ministers and Agricultural Ministers held in April, 1967, for the financial year 1966-67:

- (i) Requirements of the programme for intensive cultivation of approved high yielding varieties to be allotted in full.
- (ii) Requirements of the intensive cultivation programme in selected areas for export oriented commercial crops viz., Jute Oil-seeds, Tobacco and cotton to be allotted in full.
- (iii) Requirements of the intensive agricultural districts programme (which have achieved notable increase in fertilizer consumption) to be met in full.
- (iv) The balance to be allotted on pro-rata basis for meeting the requirements of intensive agricultural areas and normal areas.

(c) For 1967-68:

4.19. The factories engaged in indigenous production of fertilizers have been allowed to effect direct sales outside the Pool, of 30 per cent of their production from 1st October, 1966. The percentage of direct sales has been raised to 50 per cent with effect from 1st October, 1967. In view of this the principles of allocation have been further suitably modified for the year 1967-68 and these are as indicated below:

- (i) The requirements of High Yielding Varieties Programme for the acreage to be brought under cultivation as agreed will be met in full.

- (ii) The requirements of intensive agricultural district programme will be supplied at the same level as in the last year (1966-67).
- (iii) The requirements of fertilizers for export oriented commercial crops like jute, cotton, oilseeds and tobacco will be met in full.
- (iv) The requirements of fertilizers for Multiple Cropping Programme as approved are met in full.
- (v) In States where there are fertilizer factories the requirements of normal programmes should be met from free sales by factories. Allotments from the Central Fertilizer Pool will be made for meeting normal (including Intensive Agricultural Areas) requirements of States where there are no factories.

4.20. The Committee understand that teams of Central Government Officers headed by Secretary|Additional Secretary|Joint Secretary visit each State periodically to discuss the agricultural extension programme of the various States for the year and the progress achieved in the implementation of the programme. The assessment of requirements of fertilizer is verified and reviewed by the Central Team during these visits.

4.21. The Committee are glad to note that Government have been reviewing yearly the mode of assessment of the fertilizer requirements of the States from 1965-66 onwards keeping in view the new pattern of agricultural strategy for increasing agricultural production within the shortest possible time from irrigated and assured rainfall areas through the special programmes like the High Yielding Varieties Programme, Intensive Agricultural District Programme etc. They hope that as a result of this annual exercise a near realistic figure of the State's requirement of fertilizers would be available to the Central Government.

Allocations to States:

4.22. The Table below gives the demand, allotment and supply made to States in respect of Ammonium Sulphate, Urea, Ammonium Sulphate Nitrate and Calcium Ammonium Nitrate during the years 1961-62 to 1966-67. A statement indicating this information in respect of each State for the year 1966-67 is at Appendix VIII.

Year		A.S.	Urea	A.S.N.	C.A.N.
1961-62	Demand	1472401	252564	307859	314143
	Allotment	798272	16625	84949	246251
	Actually supplied	744455	145968	88417	219316
1962-63	Demand	1749175	277766	285040	324775
	Allotment	1165372	198980	47762	356962
	Actually supplied	936257	184630	54994	294725
1963-64	Demand	1796994	283999	224739	490457
	Allotment	908108	310941	54037	540881
	Actually supplied	988308	276041	53036	535572
1964-65	Demand	1983700	327625	213990	736527
	Allotment	936615	310974	59300	637535
	Actually supplied	903130	303737	48933	574148
1965-66	Demand	3039091	575359	178680	1404513
	Allotment	1349529	356936	52249	526104
	Actually supplied	1275103	301953	52456	513552
1966-67	Demand	2416911	705147	220139	1121735
	Allotment	1690375	701542	90934	611139
	Actually supplied	1565153	586448	83914	552858

It will be seen from the above Table that there are wide variations between demand and allotment and between allotment and actual supply.

4.23. Explaining the reasons for these variations the Secretary of the Ministry of Food, Agricultural Community Development and Cooperation stated during evidence that "Upto 1965-66 the method of allotment was based on demand from the State Governments, total supplies of fertilizers available, carry over stocks available with the States, past performance and the need for popularisation of fertilizers and the irrigation facilities available in the States. In 1966-67 with the introduction of the intensive programme, we rationalised the distribution as follows:

Requirements of the programme for intensive cultivation of approved high-yielding varieties, requirements of the intensive cultivation programme in selected areas for export-oriented crops like jute, oil seeds, tobacco and cotton. This was also met in full. Then the requirements of intensive agricultural district programme were also met in full. Whatever balance was left was pro-rata divided among the States on the basis of demand from other areas. Then we found that some of the States were not able to lift them because of various difficulties about distribution, organisation and so on. During the year we gave extra quotas to some other States which were able to absorb them. In 1967-68 allocation was made to high-yielding varieties, IADP, export crops and multi-cropping programme. For these 100 per cent was allocated and the balance was divided on a pro-rata basis. Each State was given a quota. On the whole the quota system worked well. The only complaint on our side was that some of the States are not able to absorb these things because of credit facilities. We have asked some States to streamline their organisation. We have sent letters a couple of months ago saying that by 1968-69 if they do not set right some of the distribution bottlenecks they may have to do with less fertilizers and we will give more to other States." Asked as to what could be the best distribution system the Secretary of the Ministry added that "We have recommended to the States that it will be better to have a mixed policy, that is, private and public and co-operative sector. That will solve the problem of distribution. Andhra Pradesh got into a tight corner by saying that they are going to distribute only through co-operatives. In August this year they had large stocks in hand and their ways and means were not in a happy position and they just did not know what to do. They listened to our advice

and gave about 30 per cent to mixture manufacturers and private distribution. Then they allowed the co-operatives to have a free sale of fertilizers without permit system to the members and farmers. They disposed of 8 crores worth of fertilizers in just about 3 weeks time. So, our advice was vindicated. Madhya Pradesh is still not prepared to get away from their cooperative ideology.”

4.24. The Committee note that there have been wide variations between demand, allotment and actual supply of fertilizers to States during the period 1961-62 to 1966-67. They find that in certain cases the quantity of fertilizers allotted has been as low as about 40 per cent of the demand, the actual supply being still further less. The Committee are distressed to learn that some of the States were not able to lift fertilizers because of various difficulties about distribution, organisation, etc. The Committee, in this connection, need hardly stress that the tendency of inflating the demand or under utilising the quantity supplied, particularly in the present period of shortages of fertilizers in the country, should be discouraged as it not only gives rise to infructuous expenditure on the transportation and handling of such quantities of fertilizers as cannot be consumed as programmed but also keeps out the genuine consumers who need them most in other areas. The Committee, therefore, consider it desirable that the States should be encouraged to develop through an organised effort a system of realistic assessment. In the opinion of the Committee this can be done only if the States are given the feeling that their demands would be carefully examined with due regard to the actual consumption and that the allocations made would not necessarily be on a uniform pro-rata basis. It need hardly be stated that reliable advance estimates of the probable demand would help in the timely allocation of necessary foreign exchange if, any of the requirements are to be met through imports.

4.25. Now that the fertilizer units have been given freedom to market 50 per cent of their production in the manner they choose with effect from 1st October, 1967 (to be raised to 70 per cent from 1st October, 1968) the Committee suggest that the State Governments should enter into suitable arrangements direct with the fertilizer units in their respective areas, where existing, for the supply of fertilizer requirements to the extent possible. The Committee feel that such an arrangement would be beneficial and economical both to the manufacturers and the consumers as it would cut down the expenditure on movement and other handling charges besides ensuring quick delivery. The Committee further consider that the requirements over and above the supplies available direct from the fertilizer units should only be met from the Central Pool.

4.26. The Committee also suggest that with a view to ensure regular supply of fertilizer to cultivators in time of need, the State Governments should build necessary buffer stocks of fertilizers with supplies to meet requirements in times of emergency created by delay in the receipt of requisite supplies on account of non-arrival of anticipated imports, bottlenecks in clearance from ports or difficulties in transport arrangements or there being a marked fall in the indigenous production. They feel that it should not be difficult to build and maintain such buffer stocks during the off-season of manuring.

C. Marketing

Facilities for effective marketing of fertilizers

4.27. The quantity of fertilizer which has to be sold to farmers for achieving agricultural production targets, is expected to reach a figure of 4.1 million tonnes of nutrients by the end of the Fourth Five Year Plan. This needs a properly organised marketing effort. The success of any system of marketing in fertilizers has ultimately to be judged by the extent to which the requirements of the farmers are satisfactorily fulfilled. For this purpose there are certain essential facilities which are to be provided both to the farmers as well as to the distribution system for effective marketing of fertilizers. These essential facilities are indicated below:—

(a) *Facilities to be provided to the farmers:*

- (i) the farmers must be convinced of the profitability of fertilizer use through effective demonstrations.
- (ii) Adequate credit should be made available to the farmer *in time* at reasonable rates of interest with simplified procedure for obtaining the credit.
- (iii) The fertilizer should be priced at reasonable levels in a competitive market.
- (iv) The fertilizer must be sold to the farmer at the right time, the right place and at the right price.

(b) *Essential facilities which need to be provided to the distribution channels:*

- (i) Direct, prompt and efficient handling of fertilizers in the distribution channel is related to the smooth flow of fertilizer from the ports or factories. Therefore movement facilities should be provided for the purpose.
- (ii) The distributor has natural interest in increased earning from commission and less per unit over-head charges by handling a

large volume of business. There should be sufficient distribution margin allowed to the distributors to make the fertilizer distribution work remunerative to them. The distribution margin should be sufficient not only to meet adequately for interest charges, storage charges and shortages etc. but also it should provide for undertaking sales promotion work by the distribution agencies.

- (iii) Adequate storage facilities are also one of the essential facilities to be provided for successful marketing of fertilizers.
- (iv) The distributor has not sufficient financial resources to purchase and stock the fertilizers beyond a certain period before the same are sold out. Adequate financial support is also necessary for this purpose to the distributors.

4.28. In order to meet the above mentioned requirements of the distributors as well as the cultivators, suitable steps are stated to have been taken both by the Centre and by States so as to ensure an effective marketing of fertilizers. More important of these steps are indicated below:

(a) *Central Government:*

1. Fertilizers are supplied to the State Governments by the Central Fertilizers Pool on 60 days deferred payment terms.
2. In order to ensure timely supply, fertilizers are allowed to be transported by road by meeting additional transport cost from Pool funds.
3. Off-season rebate is given in order to enable the distributors to stock fertilizers during non-manuring seasons.
4. Transport subsidy is given for transporting fertilizers to hilly and inaccessible areas.
5. Margins permissible to distributors in respect of pooled fertilizers to meet trading expenses (including interest on capital employed or borrowed) and net commission for services rendered, have been increased, e.g. margin for sulphate or ammonia which stood at Rs. 30.00 per tonne in 1965 is now Rs. 55.00 per tonne and that for urea which was Rs. 45.00 per tonne in 1965 is now Rs. 80.00 per tonne.
6. Short-term loans are given for the stocking of fertilizers by distributors and for advancing taccavi to the cultivators.
7. The Reserve Bank of India has also opened a new line of credit (besides the usual credit line to cultivators) for the co-operatives for stocking of fertilizers. The Reserve Bank of

India has also requested the States to make use of line of credit provided by the State Bank wherever necessary.*

8. The National Cooperative Development Cooperation gives financial assistance to the cooperative system in the States for the construction of godowns.
9. The Central Warehousing Corporation accepts fertilizers for being stocked in their godowns at special rates.

(b) *State Governments:*

1. The Committee on Fertilizers (1965) estimated that nearly 50 per cent of the fertilizers were then being sold on credit and that the credit sales would rise to about 70 per cent by the end of the Fourth Plan in view of larger outlay in intensive cultivation, on inputs like seeds, pesticides and fertilizers as well as other cultivation expenses. The institutional sources of credit for the farmers are the cooperative societies. Besides the cooperative loans, teccavi loans are also available to the farmer, particularly those who are not members of the cooperative societies.
2. Necessary propoganda is done through the Extension Services and the private organisations.
3. Retail fertilizer depots are provided at village level in all States through cooperatives or others.
4. Soil analysis service is provided through permanent soil-testing laboratories which have been established in various States.
5. Subject-matter specialists have been provided in the Blocks to render advice to the farmers on their problems.

Steps taken to ensure supply of fertilizers to farmers:

4.29. In a note furnished to the Committee Government have stated that the following steps are taken to ensure supply of fertilizers to states for distribution to farmers:

- (i) Despatches of fertilizers from the various sources are continuously watched and remedial measures to remove congestion at the ports and factories are taken by allowing road transport, wherever possible and by arranging despatches by special trains or block loads.
- (ii) Special staff are being posted at major ports to coordinate movements by rail and road.

*At the time of factual verification, the Ministry of Food, Agr. CD and Cooperation (Dept of Agr) have stated as under :—

“Commercial Banks are being encouraged to step in the field of financing credit to the agricultural sector. Some of the Banks such as Syndicate Bank, Bank of Patiala, Bank of Baroda have already entered in this field. The upto date information as to how much amount of this loan has been given by the commercial banks to the cultivators is not available”.

- (iii) Diversion of ships is effected in certain cases to meet the emergent demands of areas.
- (iv) Continuous contact is maintained between the Chief Director of Movements in the Food Department and the officers of the Food Department at the various ports and railways so as to ensure that the supplies are moved as expeditiously as possible.
- (v) Assistant Commissioner (Ports and Shipping) and Assistant Commissioner (Movement) are being deputed from time to time to various ports and factories to remove bottlenecks and accelerate rate of despatches
- (vi) The suppliers with whom contracts have been placed have been asked to adhere strictly to the schedule of delivery.

Agencies for distribution of fertilizers:

4.30. In almost all the States three types of distribution agencies are engaged in the distribution of fertilizers. First comes the cooperative institutions, which in recent years have been handling bulk of the fertilizers allocated to a State. In some of the States, such as West Bengal, Assam, Himachal Pradesh and Kerala where the cooperative system is yet to expand, quite a considerable quantity of fertilizers is handled by private traders and the departmental agencies such as Block depot or the depot of the Agriculture Department. In a few States, other agencies such as Panchayats, farmers' unions etc. are entrusted with the distribution of fertilizers. In Uttar Pradesh Cane Unions are also operating in the field of fertilizer distribution.

4.31. At the end of the First Plan period the cooperatives constituted only about 30 per cent of the total number of distribution points functioning in various districts. This increased to 45.6 per cent by the end of the Second Plan period. During the first year of the Third Plan, the proportion of cooperatives was increased to 70.3 per cent and in the subsequent year i.e. 1962-63, it touched the highest level of 78 per cent. This is somewhat significant particularly from the quantitative growth of the number of cooperative outlets in the field of distribution of fertilizers. The number of cooperative depots increased almost 25 times from about 261 at the end of the first Plan period to little over 6,000 during the year 1962-63.

4.32. The following are the arrangements for distribution of various types of fertilizers in the States:

(i) *Nitrogenous Fertilizers.*—In the States of Andhra Pradesh, Bihar, Gujarat, Madhya Pradesh, Maharashtra, Mysore, Orissa, Punjab and Rajasthan, distribution of nitrogenous fertilizers has been entrusted to Co-operative Organisations on a monopolistic basis. In Uttar Pradesh, the distribution is done through cooperative agencies as well as through the Agriculture Department. In West Bengal, Kerala, Madras, Goa,

Diu & Daman and Pondicherry distribution is undertaken by Cooperatives as well as private trade. In Assam, the distribution is entirely in the hands of private agencies, whereas in Himachal Pradesh, Manipur, Tripura and the Andamans, the distribution is entirely in Government hands. In States like Andhra Pradesh, Maharashtra, Gujarat, Mysore and Punjab, the performance of Cooperative agencies in fertilizer distribution has been substantial and the growth of fertilizer use in these States has been maintained. In States like Madhya Pradesh, Orissa, Bihar and Rajasthan, however, where the level of consumption is rather low, the Cooperatives have not been able to push up fertilizer sales probably on account of the weakness of the Cooperative system in those States. In States like Kerala and Madras, Cooperatives have been able to play their role in fertilizer distribution along with the private trade.

4.33. In the assessment of the performance of the cooperatives in the field of distribution of fertilizers the Sivaraman Committee has observed that "The performance of cooperative agencies in fertilizer distribution has not been upto expectations in many areas for various reasons. On account of the lack of marketing experience of most of the Cooperative agencies and on account of inadequate distribution margins, fertilizers distribution has in many cases been a monetary drag on the Cooperative system. The volume of credit available from the cooperative sector was also as low as 30 per cent of the total borrowings of rural households with the result that the Cooperative agencies could not effectively serve a large number of farmers outside the cooperative fold. Retail fertilizer agencies from the private trade generally have the advantage of their existing organisation so that they are able to manage with relatively smaller overhead charges and lower distribution margins. Cooperative depots, on the other hand, generally do not have the advantage of wholtime salesmen. Cooperative depots do not also deal with other commodities in general. It would hardly be possible for a depot dealing solely in fertilizer to be self-supporting without an annual turnover of atleast 200 tonnes of bagged fertilizers. Most of the Cooperative depots have turnovers of much smaller quantities and it is unlikely that a larger number of retail fertilizer depots in rural areas will be able to have a large turnover in the next few years. The result has been that fertilizer distribution has proved unprofitable to many cooperative agencies. No cooperative can survive as a marketing organisation unless it makes reasonable profit in the transaction."

(ii) *Phosphatic Fertilizers*.—In the years 1948 to 1952 the distribution of phosphatic fertilizers was in the hands of the Central Fertilizer Pool on account of the protection sought by producers of phosphatic fertilizers from competing imports. From 1952 onwards, the marketing of phosphatic fertilizers is in the hands of the producers themselves. In certain States like Bihar, Madhya Pradesh, Orissa, Punjab and Rajasthan, bulk

purchases of phosphatic fertilizers are made by the States and distributed through the Cooperative agencies. In the other States, the distribution agencies are organised by the manufacturers themselves. Both Cooperatives and other agencies participate in the distribution system in these States except in Asam where the distribution is handled by the Government agency. In General, the producers of phosphatic fertilizers have at present adequate marketing organisations of their own.

(iii) *Potassic Fertilizers*.—Almost the entire requirements of Potassic fertilizers are met by imports. Imports are canalised through the State Trading Corporation except some small quantities which may be imported and distributed by the Central Fertilizer Pool. The State Trading Corporation have appointed the Indian Potash Supply Agency, a private limited concern, to handle and distribute the potassic fertilizers imported by it. The Distributors appointed by I.P.S.A. are both cooperatives and private traders.

(iv) *Complex Fertilizers*.—The indigenously produced complex fertilizers, such as Ammonium phosphate and Nitrophosphate are marketed by the producers direct through their agents who are both cooperatives and private traders. Imported complex fertilizers are distributed in the same manner as nitrogenous fertilizers are distributed by the Pool.

New Policy

4.34. As stated earlier, Pool Fertilizers are mostly distributed through the cooperative societies. The cooperative societies also share the distribution of other fertilizers with Private trade. On the whole it has been estimated that about 70 per cent of the fertilizers are distributed by the cooperative societies in the States.

4.35. With the object of speeding up investment in the fertilizer industry as a means to establishing internal production capacity to meet the fertilizer requirements of the Fourth Plan, it was decided in December, 1965 that new fertilizer projects licensed upto 31st March, 1967 would have freedom of distribution without control on prices of their products, for a period of 7 years from the commencement of their commercial production, subject to Government having the option to take upto 30 per cent at a negotiated price. In April, 1966 it was decided to extent this concession to all fertilizer factories, existing, under construction and planned. In March, 1967 it was decided to extend the freedom for marketing to all factories licensed upto 31st December, 1967.

4.36. In pursuance of this policy, control on distribution of nitrogenous fertilizers indigenously produced, was liberalised to enable the producers to establish their own market. From 1st October, 1966, factories whose production was being taken over into the pool, were allowed to market freely 30 per cent of their production. The direct marketing quota was increased to 50 per cent from 1st October, 1967 and it is proposed

to be extended to 70 per cent from 1st October, 1968. Thereafter the Central Fertilizer Pool will have the option to take over not more than 30 per cent of their production for distribution through its arrangements.

4.37. In the light of the new fertilizer policy when atleast 70 per cent of the indigenous production will be marketed directly by the manufacturers, the quantities of such production handled by the pool will progressively diminish. It is, however, expected that the Pool will continue to handle all the imported nitrogenous and phosphatic fertilizers. On the whole, nearly 50 per cent of the nitrogenous fertilizers and nearly 60 per cent of the phosphatic fertilizers in use by the end of the Fourth Plan will be distributed directly by the producers. The rest of the quantities will be handled through the Central Fertilizer Pool. The Pool may also handle certain quantities of potassic fertilizers.

4.38. A leading non-official organisation in a memorandum submitted to the Committee has commended the new policy of the Government in the following words:

“We think that the policy of freedom of marketing and pricing now adopted by the Government is a sound one and will work to the benefit of the consumers. As pointed out, potential competition from imported fertilizers will have a restraining influence on manufacturers in fixing prices. When after a period of years, domestic production of fertilizers catches up with the demand, mutual competition between manufacturers will keep prices in check. The responsibility for marketing fertilizers which has now been squarely placed on manufacturers will make for the development of sensitive relations between the producers and consumers and for economy in the cost of production of fertilizers as well as improvements in the quality of the fertilizers and post sale service to the consumers.

4.39. The Committee find that in the matter of distribution of fertilizers, States like Andhra Pradesh, Bihar, Gujarat, Madhya Pradesh, Maharashtra, Mysore, Punjab and Rajasthan, have resorted to cooperatives on a monopolistic basis. They are, however, concerned to note from the observations of the Committee on Fertilizers (Sivaraman Committee) that “the performance of cooperative agencies in fertilizer distribution has not been upto expectations in many areas.” Considering the large scale involvement of cooperatives in the distribution of fertilizers in the States, the Committee have no doubt as to the usefulness and popularity of the system in the rural areas. In order that the system is made more affective and the distribution of fertilizers is organised on scientific lines, the Committee would suggest that the functions of the cooperatives may not be confined to merely distribution of fertilizers, but that they should rather serve as a multipurpose institution so as to meet the needs of the farmers for other inputs like seeds, pesticides, agricultural implements etc.

4.40. In order to stimulate healthy competition the Committee also feel it necessary that the distribution of fertilizers through other private agencies may be encouraged to the maximum. They hope that in the light of a new fertilizer policy, when atleast 70 per cent of the indigenous production will be marketed directly by the manufacturers themselves, the marketing system will be so organised that the manufacturers have adequate control and supervision over their distribution agents to ensure that they actually give the services required by the cultivator in respect of which an allowance has been made in the distribution margin. The Committee also trust that the industry would extend voluntary vigilance on its part for ensuring adequate supplies of fertilizers to the farmer in time and at reasonable prices with a view to facilitate the Government to work out a realistic pricing and distribution policy.

4.41. As the proper location of supply points largely determines the effectiveness of fertilizer distribution, it is of paramount importance that convenient locations, easily accessible to the farmers, are judiciously selected for the sale of fertilizers. Particular care has to be taken in the location of distribution points in hilly, remote and backward areas where communication and transport facilities are comparatively less developed and the costs involved make it an uneconomic business even for cooperative societies to come forward to undertake this job in such areas.

4.42. The Committee are of the view that in a country like India, where fertilizer has come into use recently, an organised educational and marketing programme is essential to gain general acceptance of the farmers to use of the product. Besides attempting purely marketing tasks, the Committee therefore consider that the programme should devote its attention to the problem of consumer acceptance and to convincing farmers of the benefits of fertilizer usage. This is all the more necessary in view of the massive programme of production of fertilizers in the coming years, as production without effective marketing, may result in accumulation of stocks and thus jeopardize the national economy.

4.43. The Committee consider that for an organised marketing system emphasis should be laid on the following programme:

- (a) It should organise a decentralised storage and distribution system. The network should be so organised that no farmer need walk long distances to obtain his fertilizer requirements;
- (b) It should provide credit to the farmers either through trade channels or through independent agencies like cooperative societies or farm banks.
- (c) An organised and efficient agronomic service unit as part of the selling and servicing organisation should be necessary part

of the programme. The agronomic service should be comprehensive and include soil testing facilities, advice on fertilizer application, selection of seeds, use of pesticides, etc.

- (d) Programmes for the education of farmers, using all mass communication media techniques such as fertilizer festivals or fairs, exhibitions, field demonstrations, films, newspapers, etc. are essential to the success of the entire marketing programme. In these programmes, field demonstrations are successful means of convincing farmers of the profitability of fertilizer application. Similarly, mobile audiovisual units could also be used effectively in village programmes.

New arrangements in public sector for sale of fertilizers

4.44. During evidence the Committee desired to know whether any units in the public sector had built their own organisation for the sale of fertilizers under the liberalisation policy. The Secretary of the Ministry of Petroleum and Chemicals stated that "At present the public sector is organising itself for the distribution, marketing etc. Nangal, Trombay and Sindri have their own independent distributors. They have been organising their distribution system through cooperatives and other licensed distributors. . . . F.C.I. is now going into the problem of multiple factories which are coming up in the adjoining areas. We will have two to three factories like Durgapur, Sindri and Gorakhpur all within 200 miles. So they are going into the problem of how best to organise the marketing of products of these factories."

4.45. The role of F.C.I. and FACT in the matter of marketing of fertilizers has been explained in a note furnished to the Committee subsequently. The position stated is as under:

"FCI LTD.—The FCI Ltd. is building up its own organisation for the sale of fertilizers released under the liberalisation policy. From 1st October, 1968, when the 100 per cent production of fertilizers will be at their disposal for free sale, they will arrange to have their own selling depots in all the States nearer to their factories. At present, only 50 per cent of their production is being sold under free sale arrangement and most of this quantity is taken away by the Apex Cooperative Societies for distribution and retail sale at the fixed selling prices. Trombay Unit has recently set up its own new sale office in Hyderabad while Durgapur Division has its main office at Calcutta to feed the requirements of sale depots set up/being set up for retail sale to the consumers. Thus, the F.C.I. are building up their own organisation for sale of fertilizers released under liberalisation policy.

The F.C.I. has demarcated the areas to be fed by each of their factories to avoid duplication. For example, Maharashtra, Mysore, Madras, Hyderabad and Andhra Pradesh etc. are being fed by Trombay Unit, Sindri Unit is feeding the Eastern Zone including Bihar, West Bengal etc. Gorakhpur Unit will distribute in U.P. and Nangal Unit is selling in Punjab, Rajasthan, Haryana, Delhi, Himachal Pradesh etc.

FACT—The FACT has one of the most dynamic organisation in the fertilizers industry. It has its area of operation in Kerala, Mysore, Madras and Andhra Pradesh. FACT have built up a satisfactory marketing organisation in all these States.”

Foreign Advice for Marketing of Fertilizers.

4.46. The Study Group of the Committee during their visit to Namrup Fertilizer Factory in September, 1967 have learnt that Government of India had decided to take the advice of an American firm for marketing the fertilizers produced in the Fertilizer Corporation as a whole. Accordingly, an American expert had come to India to visit various factories in the public sector.

4.47. During the course of evidence the Secretary of the Ministry of Petroleum and Chemicals stated that the services of the American expert were obtained by Government under the U.S. Technical Assistance Programme at the suggestion of F.C.I. and in consultation with the Ministry of Finance and the Ministry of Agriculture. The services of the expert have been obtained for about 2 years to help the F.C.I. to organise its marketing service on an efficient and adequate scale. Asked whether he has given any report, the representative of the Fertilizer Corporation stated that “He is a marketing consultant only. Only on points which we refer to him he gives his advice. He will be with us for two years. There will be no question of any report. He advises the Managing Director on questions which are referred to him.” Further asked whether the appointment had the approval of the Cabinet, the Secretary of the Ministry of Petroleum and Chemicals stated that it had not gone to the Cabinet. About the technical assistance received under the U.S. Programme, the Secretary of the Ministry of Food, Agriculture, C.D. & Cooperation (Department of Agriculture) clarified the position as under:

“Under the U.S. Programme they offer a certain number of experts every year and then the various demands come up and then distribution is made. Now this expert was given to the F.C.I. for this purpose. The problem is of fertilizers distribution on a large scale basis. It is one of the technical

needs. We have no previous experience of this. Many of our public sector projects have pushed their products through the pool and this pool has been taking the responsibility for marketing, transport and everything. Factories had nothing to do in this matter. Then, fertilizers promotion, distribution services, etc. all these have developed very much in foreign countries. As I mentioned earlier, the fertilizers is a marginal profit making concern in the foreign countries. They have to do a lot of pushing too. Their expertise in this field was welcome. So it is a cooperative effort. They come in for overall expertise in the marketing structure and so on and our expertise supplies the market knowledge and what is available here. This is a joint effort for meeting the needs of this particular market."

4.48. In regard to terms and conditions of appointment of the expert, the following information has been furnished to the Committee subsequently:

"The Corporation is to pay Rs. 25 per day to the US AID authorities in lieu of transportation charges and in addition the following further facilities are to be provided to the expert :

- (a) Suitable office space, office equipment furnishing and supplies, stenography, secretarial/translation and interpreting services and technical assistance as required; cost of official communications, telephones etc.
- (b) Necessary indentification of the expert and his family for his use and facilitating travel into and within India.
- (c) Facilities for local adequate housing to be rented at a reasonable rate.
- (d) Transport and other facilities at the Units/Divisions etc. whenever he is required to visit them.

Shri Burgess has, however, not been provided any residential accommodation on rent by the Corporation. He is working at Headquarters of the Corporation as marketing consultant.

The expert arrived in India on 1st October, 1967 and joined F.C.I on the 7th October, 1967. The expert has submitted a report regarding the marketing organisation which is under examination of the Managing Director.

The expert has visited Nangal, Trombay and Gorakhpur Factories of F.C.I. and has also visited FACT's plants at Alwaye and Coromandal Fertilizer Plants at Vizag and Gujarat State Fertilizer Factory at Baroda."

4.49. The Committee are unable to appreciate Government's decision in allowing the F.C.I. to obtain for two years the services of an expert from America for advising the F.C.I. on matters connected with the marketing of the fertilizers produced by the Corporation. They feel that the Central Fertilizer Pool which has been engaged in marketing and distribution of fertilizers both indigenous and imported since its inception in 1944, would have, by now built up sufficient expertise to advise the units particularly in the public sector, to organise their own marketing and distribution system under the new fertilizer policy. Further, FACT, being a dynamic organisation in the fertilizer industry has already built up a satisfactory marketing organisation and has evolved an integrated programme for the distribution, sales, servicing and consumer education. Under the circumstances, the Committee consider that the decision of Government in obtaining the services of a foreigner on marketing has not been a sound one. They are of the opinion that the country should not go in for foreign experts on subjects where indigenous talent is available even though the services of such experts are easily available under some Aid Programme. In the present case, it is doubtful whether a foreigner, howsoever expert he may be in marketing, could have more. Even in such cases the selection should be done only after the approval of the the villages, than an Indian expert in the field.

The Committee need hardly point out that the country has reached a stage where in many fields India will not be found wanting in expertise knowledge as compared to advanced countries. They would, therefore, emphasise that consistent with the national honour and dignity, Government should, as a matter of policy, not go in for the services of foreigners unless these are very essential in highly technical and scientific fields. Even in such cases the selection should be done only after the approval of the Cabinet.

Need for an independent Marketing Organisation.

4.50. The Fertilizer Distribution Enquiry Committee in their Report (1960) had observed that "the Pool is a Section of the Department of Agriculture and as such has little freedom of action although it is called upon to operate a trading scheme. This is not to disparage the good work the Section has been doing with all the limitations under which it has to work. The Committee considers it important to replace these arrangements by an organisation which can handle the fertilizer distribution more effectively. In the next few years this organization will be called upon to procure and distribute greatly increased quantities of fertilizers. If the Committee's recommendations relating to subsidies for mixtures and for phosphatic fertilizers are accepted, greatly increased responsibilities may devolve on the Central Fertilizer Pool in administering these subsidy schemes. The Pool will also have to undertake special propaganda work for promoting the use of the new fertilizers which will be manufactured and of mixed fertilizers

as well as phosphatic fertilizers. It is, therefore, considered very necessary that the duties now performed by the Central Fertilizer Pool as well as the additional responsibilities which it will be called upon to discharge should be entrusted to a successor organisation which may be called the Central Fertilizer Marketing Corporation. This Corporation should enjoy a liberal measure of autonomy while working under the direction and superintendence of the Department of Agriculture of the Ministry of Food and Agriculture”

4.51. The Committee on Fertilizers in their Report (1965) has emphasised the need for a Central agency to handle the distribution of pooled fertilizers efficiently on business lines. Recommending the establishment of a Fertilizer Promotion Corporation to take up this responsibility, among other assignments, the Committee has stated that “At present there are several agencies responsible for procurement and despatch of fertilizers to the ultimate destinations. The arrangements for import of fertilizers are handled in the Ministry of Industry and Supply. The allotments are controlled by the Department of Food for imported nitrogenous fertilizers and of the manufacturers for indigenous production of N. The imports of potash are handled by the State Trading Corporation while the receipt and the distribution is handled by the Indian Potash Supply Agency Limited. For ensuring a proper and timely distribution of fertilizers, responsibility must be fixed on a single authority so that supplies and movements are planned in advance and so organised as to make allotted quantities available to cultivators in time for seasonal application. The Committee, therefore, recommends that in the short term, the distribution of fertilizers which are presently handled by the Central Fertilizer Pool, should be entrusted to the Promotion Corporation.”

4.52. The Fertilizer Committee has recommended that the proposed Fertilizer Promotion Corporation should be assigned the following responsibilities:

- (a) Planning the procurement and despatch of fertilizer supplies handled by the Central Fertilizer Pool;
- (b) import and distribution of adequate quantities of other fertilizers as a seeding programme for popularisation of new high analysis complex fertilizers;
- (c) import and distribution of adequate quantities of fertilizers (including potash) until the indigenous production is adequate to meet the local demand;
- (d) ensuring adequate supplies at reasonable prices in difficult and remote areas even in a competitive market by taking over a

- (d) small percentage of indigenous production when indigenous producers are unable to meet this responsibility adequately;
- (e) countering situations of temporary shortages by moving supplies to such areas from imports or from indigenous production at reasonable prices;
- (f) special attention to difficult and remote areas where fertilizer use is at a low level by ensuring adequate supplies and undertaking a purposeful promotion programme;
- (g) taking charge of a massive promotion programme throughout the country to ensure the consumption of large quantities of fertilizers programmed to be made available in future by organising an effective demonstration programme; and
- (h) giving free assistance to farmers by providing soil testing services and agronomic advice on the use of fertilizers and other related inputs in an integrated programme with the help of farm information services.

The Fertilizer Committee were of the view that there would be considerable saving in the overhead expenses by combining the responsibility for fertilizer distribution in a single independent authority.

4.53. Government in reply to a question, have stated that the recommendation of the Fertilizer Committee for the establishment of a Fertilizer Promotion Corporation is under consideration.

4.54. The distribution and marketing of fertilizers by a separate authority has also been recommended by the Study Team appointed by the Ministry of Petroleum and Chemicals in their Office Memorandum No. Fertg. II/51(22)/67 dated the 7th October, 1967. (copy reproduced at Appendix IX).

The Study Team consisted of the following.

Convener

- (1) Mr. M. Ramakrishnayya, Joint Secretary, Ministry of Petroleum & Chemicals.

Members

- (2) Mr. W. F. Emmons, Tennessee Valley Authority, U.S.A.
- (3) Mr. L. W. Gopp, Tennessee Valley Authority, U.S.A.
- (4) Mr. E. J. Best, Tennessee Valley Authority, U.S.A.
- (5) Mr. R. D. Grisso, Tennessee Valley Authority, U.S.A.
- (6) Dr. Kamla Chaudhuri, Indian Institute of Management, Ahmedabad.
- (7) Mr. K. C. Sharma, General Manager, Fertilizer Corp. of India Ltd., (Sindri Unit), Sindri.

- (8) Mr. D. G. Rao, Chief Engineer, Planning and Development Division, Fertilizer Corporation of India Ltd., Sindri.
- (9) Mr. R. N. Warriar, Marketing Manager, Fertilizer and Chemicals Travancore Ltd., Kerala.
- (10) Mr. B. K. N. Murthy, Administrative Staff College of India, Hyderabad.

The services of the members at Serial Nos. 1 to 4 were secured under the Indo-US Technical Cooperation Programme from the Tennessee Valley Authority which is a public sector corporation in the U.S.A. The Study Team submitted its report to Government on the 16th December, 1967. The Study Team *inter alia* has recommended that "There should be one public sector fertilizer corporation, charged with the responsibility for planning and development, construction of projects, production of fertilizers and related chemicals, and marketing of fertilizers and related chemicals, save for the production of fertilizers by the two other public sector corporation..." The Team has also recommended that a single marketing division should be established to market the products of all the manufacturing units of the corporation (as proposed by the Team) and such fertilizers as may be produced by plants in other public sector corporations as incidental to their major functions. The marketing division should be organised by regions and areas to cover the country and these should function under the direction of the central headquarters.

4.55. The Committee note that Government have not so far been able to entrust the functions of marketing and distribution of fertilizers either to a Marketing Corporation as recommended by the Fertilizer Distribution Enquiry Committee in 1960 or to a Fertilizer Promotion Corporation, as recommended by the Committee on Fertilizers in 1965. They are inclined to agree with the observations made by the Fertilizer Distribution Enquiry Committee that the Pool being a section of the Department of Agriculture "has little freedom of action although it is called upon to operate a trading scheme". The Committee on Fertilizers have also emphasised the need for a central agency to handle distribution of pooled fertilizers efficiently on business lines. The Committee feel that the formation of a single central agency, would no doubt help in taking coordinated action for planning, procurement, distribution and despatch of fertilisers more efficiently and economically.

The Committee are glad that the Study Team appointed in October 1967 has gone into this aspect again and have *inter alia* recommended that a single marketing division should be established to market the products of all the manufacturing units. The Committee hope that very early action would be taken on the recommendation of the Study Team so that the marketing and distribution of fertilizers of public sector factories, which is per-

perhaps more difficult a problem than the production of fertilizers itself, is organised on more scientific lines, keeping in view the role which the Public Sector has been called upon to play under the new marketing and pricing policy of fertilizers.

D. Quality Control of Fertilizers

4.56. In a situation of acute shortage of fertilizers there is always a likelihood of unscrupulous traders resorting to the malpractices of adulteration and selling fertilizers of sub-standard quality. The Fertilizer Distribution Enquiry Committee in its report submitted to Government in August 1960 mentioned about frequent complaints of adulteration of fertilizers sold in the market.

4.57. The Fertilizer Committee has also referred to adulteration of fertilizers and the need for greater vigilance on the part of the State Governments who are responsible for administering the Fertilizers Control Order, 1957. That Committee has also indicated the number of samples taken, analysed and found defective in the various States in 1963-64, as in the Table below:—

Name of the State	Number of Samples taken	Number of Samples analysed	Number of Samples found defective
1. Andhra Pradesh	255	297	67
2. Gujarat	264	296	61
3. Kerala	244	244	7
4. Madhya Pradesh	611	611	Not indicated.
5. Madras	424	384	35
6. Maharashtra	1500	1500	Not indicated.
7. Mysore	124	124	4
8. Punjab	314	314	147
9. Rajasthan	3	3	1
10. Uttar Pradesh	282	283	59
11. Bihar	118	118	Not indicated.

4.58. The Committee understand that adulteration of fertilizer had become so wide-spread in West Bengal in recent years that the State Government last year decided to ban the sale of mixture as they did not have adequate facilities for sampling and analysis.

4.59. The Committee feel that there is considerable scope for intensification of the quality control programme by drawing a larger number of samples and by providing additional trained staff for this purpose, where necessary. They consider that if adulteration becomes common it would not only have an adverse impact on the yield but would also shake the confidence of the farmers in the effectiveness of fertilizers. In order to protect a larger number of farmers against the mal-practices of the trade, the Committee feel that there is need for greater vigilance in strictly enforcing the provisions of the law. They consider that regular drawal of samples for test analysis from straight fertilizers as well as mixtures at various stages in their marketing is an effective instrument for enforcing the control over the quality. They suggest that the provisions of the Fertilizer (Control) Order may be suitably amended in the light of past experience so as to provide deterrent punishments in order to give protection to the farmers against supply of sub-standard materials, high prices through monopolies and combines, false and exaggerated claims for various fertilizers.

4.60. Since maintenance of standards of storage and packaging have an important bearing on the maintenance of quality and the prevention of adulteration at all distribution levels, the Committee also suggest that ways and means should be devised to effect improvements in the fertilizer packaging and storage facilities in consultation with the industry.

E. Credit for Fertilizers

Credit to Marketing Agencies

4.61. The Sivaraman Committee on Fertilizers has pointed out that the smooth flow of fertilizers from one agency to another in the distribution system is dependent on the adequacy of financial arrangements for payment of the cost of fertilizer sold through the distribution system. Whether the fertilizer is sold on a cash and carry basis or it is sold on terms of credit with an assurance of recovery of the cost within a prescribed time limit, the movement of the fertilisers depends on the capacity of the purchasing agencies to make suitable financial arrangements to the satisfaction of the seller. Fertilizer distribution is no exception to the normal business principle that no trader can afford to have large outstandings on sales made by him over long periods. If the distribution system is to handle four million tonnes of nutrients within a short time the speed of turnover of its resources will be basic factor that will determine the efficiency of distribution. The vital role of adequate credit for marketing agencies in the distribution of large quantities of fertilizers cannot be emphasized.

Credit to farmers

4.62. One of the major factors inhibiting increased food production is the inadequacy of agricultural credit in the country. Agricultural indebtedness has been a great problem in India for many years and continues to be so. Most of our farmers are economically weak and do not have the

facilities to purchase the new inputs like seed, fertilizer and pesticides which are the essential ingredients of the new Agricultural programme. Unless credit is made available to the farmer he will not be in a position to get these materials.

4.63. Agricultural credit plays a very important role in fertilizer consumption. Over 80 per cent of the fertilizer consumed in the country will be through a credit system. The credit requirements for this purpose will reach according to the Sivaraman Committee Report a staggering figure of Rs. 400 crores in 1970-71. According to Ministry of Food, Agriculture, Community Development & Cooperation (Department of Agriculture) this figure will, however, go up due to increase in the prices of fertilizers since then.

4.64. The provision of credit to the farmers for use of fertilizer has to be in kind with the conditions of repayment at harvest. Availability of the credit in time is also essential to ensure the maximum utilization of supplies which may have been arranged well in advance. There are thus three aspects in the provision of credit to the farmers for the use of fertilizers namely adequacy of the credit sanction to meet the farmers requirements of fertilizers, avoidance of procedural delays in making the credit available and effective linking of credit with production and marketing enabling the farmer to pay back in time.

Financial Assistance to States for purchase of Fertilizers

6.65. Asked about the arrangements made for provision of credits to the farmers for the purchase of fertilizers, Government in a note furnished to the Committee have stated that it is for the State Governments to provide credits to the farmers for their agricultural operations including purchase of inputs, namely, seeds, pesticides and fertilizers. The Central Government does not provide credit to farmers directly. It, however, provides financial assistance to the States so as to help them in finding resources for advancement of loans to the cultivators. Mainly cooperative credit and the taccavi loans sanctioned by the State Governments have been the heads under which cultivator has obtained credit for purchase of inputs.

4.66. In so far the Centre is concerned, it has been providing financial assistances for the purchase and distribution of seeds, pesticides and fertilizers. The short-term loans sanctioned upto 31st March, 1966 were repayable by State Governments within a period of 18 months. Besides meeting the cost of procurement of the materials therefor, they could utilise the loans so sanctioned also for advancement to cultivators. From 1966-67, however, the principles of advancing short-term loans to the States have been changed so as to make the best possible use of the available funds.

4.67. Under the new policy the following system of sanctioning short term loans is in force from 1966-67.

- (1) The Central Fertilizer Pool supplies fertilizers on the basis of deferred payment for 60 days after despatch.

- (2) In order to provide financial accommodation to the marketing agencies, short-term loans to the extent of 50 per cent of the value of pooled fertilizers to the State Governments can be sanctioned to cover the pre-sale period of stocking.
- (3) In order to assist State Government to advance taccavi loans to cultivators, who are not members of the Cooperative Societies, short-term loans to the extent of 1/6th of the Total value of pooled fertilizers distributed by the State Government are sanctioned subject to the condition that the amount so sanctioned does not exceed the actual amount of Taccavi disbursed by the State Government.
- (4) The short-term loans are repayable within 6 months and the current rate of interest is 4 per cent.

4.68. It has been stated that short-term loans are now given distinctly for 'marketing' and for 'production' purposes. After this system had been introduced, the Reserve Bank of India was also persuaded to provide financial accommodation to the cooperative system for 'stocking' of fertilizer. During 1966-67, the Reserve Bank of India introduced this system, the main features of which were as under:

- (1) The Reserve Bank of India sanctioned credit limits *at the Bank rate* in favour of the State Cooperative Banks for making financial accommodation available for marketing purposes upto the primary level.
- (2) The Reserve Bank of India line of credit was not admissible on 50 per cent of the stocks of pooled fertilizer for which loan from the Central Government was admissible. In respect of the remaining 50 per cent, the State Cooperative Banks could sanction loan upto 90 per cent of the value in favour of the distributing agency. In respect of non-pooled fertilizers, financial accommodation to the extent of 90 per cent of the total value was admissible.
- (3) The loan was repayable within a period of 6 months.
- (4) The State Government had to furnish a guarantee to the Reserve Bank of India to enable the Cooperatives to avail of this line of credit. The Reserve Bank of India was requested to liberalise the conditions on which funds are made available by them for the purpose. They agreed from this year to provide financial accommodation to the extent of 90 per cent of the fertilizers, whether acquired from the Pool or from the open market, subject to the provision of 10 per cent margin money by the Cooperative system. Credit limits for the purpose have now been sanctioned to

State Cooperative Banks by the Reserve Bank of India, on the basis of cover of stocks worth 110 per cent of the amount due to the Reserve Bank of India, backed by the State's guarantee. The Reserve Bank has expressed its readiness to provide credit limits of Rs. 50 crores with which it may be possible to handle fertilizers worth at least Rs. 100 crores by rotating the available funds twice in the year.

4.69. Wherever the line of credit from the Reserve Bank of India is not available or is inadequate, the Central Government continues to give short-term loans to the State Governments for 'marketing' of fertilizers to the extent necessary for the purpose subject to the ceiling of 50 per cent, besides short-term loans for taccavi purposes on the usual basis of 1/6th of value of pooled fertilizer distributed. For the three inputs, namely, fertilizers, seeds and pesticides, budget provision for the current financial year is Rs. 105 crores out of which about Rs. 80 crores is likely to be sanctioned for fertilizer 'marketing' and 'taccavi' loans.

4.70. The Reserve Bank of India has also authorised the State Bank of India to extend financial accommodation to the States and other agencies for handling fertilizers to the extent they are unable to meet their requirements from the Central Government and from the Reserve Bank of India's line of credit to Cooperatives. It appears that certain commercial banks also now propose to provide financial accommodation to private dealers for the stocking and distribution of fertilizers.

4.71. The following Table shows the short term loans sanctioned to State Governments during the year 1964-65, 1965-66 for purchase of fertilizers:—

Serial No.	Name of the State Government	1964-65	1965-66
(1)	(2)	(3)	(4)
1.	Andhra Pradesh	740.57	512.50
2.	Assam	10.00	20.00
3.	Bihar	34.29	101.25
4.	Gujarat		
5.	Kerala	32.50	28.40

(1)	(2)	(3)	(4)
6.	Madhya Pradesh	204.81	360.00
7.	Madras	572.64	425.56
8.	Maharashtra	203.37	
9.	Mysore	10.71	100.00
10.	Orissa	30.00	62.00
11.	Punjab	102.57	557.60
12.	Rajasthan	184.20	159.00
13.	West Bengal	38.00	44.00
14.	Uttar Pradesh	204.90	450.00
TOTAL		2,368.66	2,830.31

4.72. The Tables below show the short-term loans sanctioned to States during 1966-67 and upto 23rd March 1968 in 1967-68. The Budget provision for 1967-68 for fertilizers, pesticides and seeds is Rs. 105 crores.

Name of State	Marketing		Taccavi	
	1966-67	1967-68 (Upto 23-3-1968)	1966- 1967	1967-68 (upto 23-3-1968)
(1)	(2)	(3)	(4)	(5)
Andhra Pradesh	691.56	1415.69	140.00	193.40
Bihar	*263.51	114.40@	..	..
Gujarat	145.72	141.55	..	..
Haryana	..	..	80.00	267.85†
Kerala	101.33	163.11	20.71	2.66
Madhya Pradesh	79.40	104.99	100.00	83.00

*These loans have been sanctioned on 100% purchase as special case due to drought conditions prevailing in the States.

@ 100% basis.

†For pesticides and Seeds.

(1)	(2)	(3)	(4)	(5)
Madras	447.67	911.65	67.68	356.33
Maharashtra	53.00	..	100.00	300.00
Mysore	50.00	50.00§	..	18.57
Punjab (Old)	212.20	..	200.00	232.73
Punjab (New)	..	..	120.00	..
Orissa	115.69	216.95	100.00	..
Rajasthan	*167.71	205.00	66.53	200.00†
Uttar Pradesh	195.69	1199.32	200.00	900.00†
West Bengal	41.00	..	..	69.63†
Jammu & Kashmir	..	91.55	..	..
TOTAL	2564.48	5413.31	1194.92	2624.17

4.73. The Committee understand that the Reserve Bank of India had recently set up a Rural Credit Review Committee to go into all aspects of agricultural credit requirements and arrangements for providing the same. Simultaneously the Fertilizer Association of India had set up a Fertilizer Credit Committee under the Chairmanship of Shri B. Venkatappiah Member Planning Commission and ex-Chairman, Reserve Bank of India to study the present system and the measures that should be introduced to ensure the free flow of adequate credit. These two committees are understood to have collected a great deal of material, facts, statistics and views. The Committee understands that the fertilizer credit committee of the Fertilizer Association of India has already submitted its report on 14-3-1968. In

*These loans have been sanctioned on 100% purchase as special case due to drought conditions prevailing in the States.

**For all the three inputs *i.e.*, fertilizers, pesticides and seeds.

§For all the 3 inputs *i.e.*, Fertilizers, Pesticides and Seeds.

†On 1/3rd basis.

December, 1967 a seminar was held in New Delhi on 'Fertilizer Credit and Distribution' under the auspices of the Fertilizer Association of India at which several papers were read and discussed and a number of suggestions on the subjects made.

4.74. The Committee need hardly stress that an adequate and timely supply of credit facilities is a pre-requisite for the growth of fertilizer consumption. They feel that for providing the farmer with plant nutrients to the extent of 3.7 million tonnes (indigenous production and imports) by 1970-71, credit facilities both at the farmer's level (credit to farmers) and at the distribution levels i.e. (marketing credits) will have to be augmented. They suggest that the Central and State Governments, banking institutions (Reserve Bank and other commercial banks) and the State, the smaller size units and the high investment, they feel that the high wide adequate funds so that the cultivator does not suffer for lack of financial resources for the purchase of fertilizers and other agricultural inputs.

V—PRICING

A. Policy

5.1. Until recently sale price and distribution of nitrogenous fertilizers were fixed by Government. According to Government this was necessary because the demand was larger than the available supplies. Moreover, there was considerable disparity between the prices of indigenously produced and imported fertilizers. Imports were from different sources and the prices varied. There was an obvious need for a common or pooled price. Government were also keen to ensure that fertilizers were equitably distributed throughout the country and attempts were therefore made to equalise the price all over the country. Government sought to achieve this objective through a Central Pool which was conceived as a promotional measure.

5.2. It has been stated that Government were considering for some time the measures to be taken for ensuring that the production targets for fertilizers fixed for 1970-71 were achieved in time. Since these targets represented an eight-fold increase on the figures for 1965-66, it was necessary that the production facilities should be brought into commission as quickly as possible, at any rate well before the last year of the Fourth Plan. This had two implications. Firstly, the construction of these facilities should be taken in hand quickly and the parties concerned should be enabled to obtain necessary machinery, equipment and know-how from foreign sources, consistent with the tight time schedule inherent in the programme; secondly, the factories should be able to plan full production in the shortest time possible and establish for this purpose an efficient organisation for distribution and marketing.

5.3. After careful examination of the above aspects and other relevant factors, Government came to conclusion that the best way of achieving production targets envisaged for the Fourth Plan was to give greater responsibilities to the production units and allow them freedom of action in regard to prices and distribution for the purpose of discharging the said responsibility. To this end, it has been accordingly decided that all fertilizer projects licensed on or before 31st December, 1967 will be free to fix prices of their products and to organise their own distribution for a period of seven years from the commencement of commercial production, subject to the condition that they shall sell to the Government at the latter's option, upto 30 per cent of their products at a price to be settled between them and the Government.

5.4. It is the view of Government that with the grant of freedom to fix prices of the products and arrange for distribution and marketing facilities as required, the factories concerned would achieve full production upto their licensed capacity as quickly as possible and at any rate not later than two years from the date of commencement of commercial production.

5.5. Clarifying the present pricing policy of Government the Secretary of the Ministry (Agricultural Department) stated during evidence that "the present policy of the Government is to give a fair price to the fertilizer production because it is basic and fix a minimum price to the farmer on the basis of the input that he has to put in. The Agricultural Price Commission advises the Government on the basis of the economic return what will be the minimum price support necessary. I think the price fixed is Rs. 10 higher than the minimum price based on the input cost of the farmer today. The pricing policy is not to subsidise fertilizer but to give the farmer a good return for his output. The whole pricing policy in the major part is based on this factor and as the big factories go into production the competition will come up and we will come to a position where the prices will actually start falling. So, there is no danger of the farmer being put in a disadvantageous position in regard to fertilizer prices."

5.6. Asked further during evidence whether Government has fixed any procedure to be followed in fixing the price of the 30 per cent of the products of the fertilizer factories which they would be purchasing under the new policy, the Secretary of the Ministry (Agricultural Department) stated that "No specific procedure is fixed. It is only a question of negotiation when the time comes".

5.7. Having regard to the acute shortage of fertilizer in the country, the Committee note Government's decision in allowing all fertilizer units licensed on or before the 31st December, 1967 the freedom of fixing prices for the sale of their products for a period of seven years from the commencement of commercial production. In order that this concession is translated into action within the minimum period possible, they would like to urge that Government should extend all possible assistance to the manufacturers to ensure the erection and commissioning of the new plants within the stipulated period as longer period of construction would not only result in loss of production but would also enhance the cost of production on account of increased capital costs.

5.8. The Committee apprehend the possibility of misuse of the concession of pricing on the part of manufacturers and traders by creating artificial shortages and thereby increasing the price of fertilizer in certain area. The Committee therefore need hardly stress that effective measures

should be taken to ensure adequate and regular fertilizer supplies to match the requirements, so that no situations of shortages are created at any time in any part of the country.

5.9. As regards Government's option to purchase 30 per cent of the fertilizers production from the manufacturers at negotiated price the Committee note that Government have not so far laid down any specific procedure for fixation of the price. They, however, hope that the option will be so exercised by Government that it helps in stabilising the fertilizer prices at a very reasonable level to the advantage of both the consumer and the producer.

B. Fixation of Fertilizer Prices

Basis

5.10. As already mentioned earlier the fertilizers procured indigenously and those imported from abroad are pooled together and issued at uniform prices fixed for various interests throughout the country. These uniform prices are known as Pool prices and are fixed per M.T. f.o.r. Port despatching stations, freight pre-paid by the Central Fertilizer Pool upto the rail head destination. These prices are influenced by procurement prices paid to the indigenous factories and to the foreign suppliers. According to the information furnished to the Committee the following factors are broadly taken into account for deciding the Pool prices to be charged:—

(1) *Purchase Costs*

(a) *Indigenous*.—The Central Fertilizer Pool takes over the production of indigenous factories by paying them agreed ex-factory prices known as the retention prices or procurement prices. This price is settled after consultation with the Chief Cost Accounts Officer, Ministry of Finance who conducts cost study of the products with due regard to costs of production and fair return to the producer, before making his recommendations.

(b) *Imports*.—The Central Fertilizer Pool places indents on the Department of Supply for placing contracts on the manufacturers|supplies abroad. The indents specify the quantities, the types and the material and bagging specifications. The Department of Supply places contracts with foreign suppliers in consultation with the Ministry of Finance. Arrangements for shipping of the imported materials are made mainly by the Chief Controller of Chartering in the case of purchase of f.o.b. basis. For shipping of supplies contracted on c.i.f. basis, arrangements are made by suppliers abroad.

(c) *Ocean Freight*.—Where purchase contract is on f.o.b. basis the ocean freight is paid by the Pool, as determined by the Chief Controller of Charter-

ing. In the case of imports under U.S. AID, 50 per cent of the cargo is to be carried by U.S. Flag Vessels.

The above elements of cost and freight are computed and an annual working average on the basis of the contracts finalised and likely to be finalised at the time of determining such costs, is worked out separately for each of the fertilizers.

(2) *Handling charges on Imports*

These charges comprise of port trust dues, stevedoring, clearing and forwarding charges, storage at ports etc. The charges on these elements may vary from port to port but an average figure is adopted.

(3) *Interest on capital*

This represents the amount of interest charged on the capital outlay on imports for working out the no-profit no-loss price. This rate is fixed by the Ministry of Finance from year to year.

(4) *Departmental charges*

Departmental charges for services rendered, in respect of imported fertilizers are levied by the approved agencies, namely the State Trading Corporation of India, the I.S.M., Washington and the I.S.D., London. In the calculations the element of Departmental charges at 1.0 per cent is included. These charges vary from 0.5 per cent to 1.5 per cent.

(5) *Inland Freight*

This represents the freight incurred on despatching fertilizers from port factories to railhead destinations. An All-India average is arrived at for the purpose and is adopted for fixing the Pool prices.

(6) *Incidental charges*

These comprise of indirect expenses on administration such as salaries, pension, contribution, godown rent and other charges and losses in transit etc. An *ad hoc* figures of Rs. 4 per M.T. is adopted on this account.

(7) *Interest on 60 days credit*

The State Governments have been allowed a credit of 60 days for paying the cost of fertilizers supplied by the Central Fertilizer Pool. A provision of interest @ 8.25 per cent P.A. is made on that account.

5.11. All the above costs are added together and a 'no-profit no-loss' price is arrived at by dividing the total cost by the total tonnage of the particular fertilizer. Normally the no-profit not-loss price is the guiding

factor for fixing the Pool price. Besides this, the following points are also stated to be kept in view in deciding the final Pool price:

- (1) Possibilities that these costs may undergo changes due to price trends and other unforeseen reasons.
- (2) Relative popularity of different types of fertilizers.
- (3) Need to provide incentive for promoting the sale of certain varieties of fertilizers.

5.12. Asked during evidence as to how Government arrive at the Pool price, the Secretary of the Ministry of Food, Agriculture, Community Development and Cooperation (Department of Agriculture) explained the position as under:

“The present Pool price for this year 1967-68 is based on the assumption of an overall subsidy of Rs. 15 crores. We try to fix the price at such a level that the new factories that are coming up would be able to supply at that level and also that there should not be any sharp tendency upward or downwards. Such of the factories which are new we give them some subsidy involved in the pricing and on some items like diammonium phosphate which we get cheap we are passing it on a fair unit price keeping in view that when our factories come up this year the price may not go up. So by these adjustments we have kept the level at Rs. 15 crores. After the prices have been issued, in the new tenders, e.g., we got diammonium phosphate still cheaper as a result of which this Rs. 15 crores has been wiped out and loss is marginal. So, the pricing has been done not strictly on the basis of imported price but on the basis of fertilizers to be manufactured in the country, to maintain a level which will not vary much when the new production comes in. For the farmer his per unit cost will remain more or less the same. We have maintained this parity.”

Various elements making up the Pool prices

5.13. The following table indicates the ex-factory prices, C & F prices and other elements that make the ‘No-profit No-loss’ price as it compares with Pool prices:

(i) *Indigenously*

Fertilizer	Ex-factory retention price	Inland freight	Incidental charges	Sales tax	Interest for 60 days deferred payment	No-Profit No-loss price	Pool sel- ling price for States
Ammonium Sulphate Sindri	316.00	30.80	4.00	9.48	4.72	365.00	} 437.00
F.A.C.T., Always	350.00	30.80	4.00	7.00	5.22	397.02	
Bye Product	246.00	30.80	4.00	4.92	9.72	289.44	
Urea	582.00	33.00	4.00	1.00	8.35	628.35	760.00
Calcium Ammonium Nitrate (20.5%)	300.00	30.80	4.00	..	4.52	339.32	385.00
Calcium Ammonium Nitrate (25%)	312.00	30.80	4.00	..	4.71	351.51	455.00
Ammonium Sulphate Nitrate	426.00	30.80	4.00	8.52	6.52	475.54	515.00

(ii) Imports

Fertilizer	Average C&F Price	Handling charges	Depart- mental charges	Interest on capital	Inland freight	Inciden- tal charges	Interest for 60 days credit	No profit No loss price	Pool selling price for States
Ammonium Sulphate	458.03	15.00	4.58	9.60	30.80	4.00	7.18	529.19	437.00
Urea	577.01	15.00	6.77	14.18	33.00	4.00	10.31	760.27	760.00
Calcium Ammonium Nitrate (26%)	366.99	15.00	3.67	7.69	30.80	4.00	5.89	434.04	475.00
Ammonium Sulphate Nitrate	423.75	15.00	4.24	8.88	30.80	4.00	6.69	439.36	515.00
Ammonium Phosphate]	769.99	15.00	7.97	16.70	33.00	4.00	12.01	885.67	738.00
Di-Ammonium Phosphate	738.48	15.00	7.83	16.42	33.00	4.00	11.82	871.55	1000.00
Basic Slag	263.81	15.00	2.64	5.53	33.00	4.00	4.35	328.43	260.00
Ammonium Chloride	375.00	15.00	3.75	7.86	33.00	4.00	6.08	444.64	450.00
Sulphate of Potash	506.89	15.00	5.07	10.62	33.00	4.00	7.90	582.48	585.00
N.P.K. Complex	708.08	15.00	7.08	14.37	33.00	4.00	10.75	792.28	700.00

It has been stated that the retention above prices were fixed by a Committee of Secretaries, on recommendation of Chief Costs, Accounts Officer, and were prevalent in 1966-67. They are provisional for 1967-68, pending a review by Chief Cost Accounts Officer (Ministry of Finance).

5.14. It will be seen from the above table (i) that there is wide difference in the ex-factory retention price of fertilizers and the Pool selling price for the States. Even after adding the expenditure on inland freight, incidental charges, sales-tax etc., there is still difference between such price and the Pool selling price. Explaining the reasons for these variations in a note furnished to the Committee, Government have stated that "the retention (ex-factory) prices of indigenous fertilizers taken over by the Pool are based on cost of production of these units as worked out by the Chief Cost Accounts Officer of the Ministry of Finance. The recommendations of the Chief Cost Accounts Officer also take into account a fair return on the capital employed in these units. On the other hand, the Pool issue prices are fixed with reference to "no-profit no-loss" prices of both indigenous and imported fertilizers taken together and not separately with reference to cost price of indigenous or imported fertilizers. While it is true that there is an element of profit in case of indigenous fertilizers, at the same time there is an element of loss in the case of imported fertilizers. Thus the difference between the retention prices and Pool prices is counter balanced by high imported prices.

5.15. It has been stated that the Pool issue prices of fertilizers are not strictly related to "no-profit no-loss" price worked out for each type of fertilizer. The factors taken into consideration in fixing the price of each type of fertilizer, include (1) need to promote the use of the particular fertilizer; (2) the plant nutrient content; (3) the selling prices of similar products marketed outside the Pool; and (4) Possible level of price of similar products in the new factories under construction. The concept of "no-profit no-loss" applies to the total operations of the Pool and does not apply to individual fertilizers. Certain fertilizers may require to be sold at a price higher than the "no-profit no-loss" price, taking into account the four factors mentioned above, and for certain fertilizers for the same reasons, a price lower than the "no-profit no-loss" price may be necessary. This is quite in order, so long as the total operation of the pool is made on a "no-profit no-loss" basis.

Retail Prices:

5.16. The following table shows the basis of arriving at the retail prices at which fertilizers are sold to the cultivators:

retail prices of pooled fertilizers w.e.f. 1-4-1967

(Rupees per metric tonne)

Fertilizers	Pool Price	Distribution margin	Retail Price
1 Sulphate of Ammonia.	448.00 for 50 kg. 437.00 for 100 Kg. (average taken Rs. 440.00)	500.00	492.00
2 Urea	760.00	80.00	840.00
3 Ammonium Sulphate Nitrate	515.00	62.00	577.00
4 Ammonium Phosphate	738.00	80.00	818.00
5. Calcium Ammonium Nitrate 26%	475.00	60.00	535.00
6 Di-Ammonia Phosphate	1000.00	95.00	1095.00
7 N. P. K. Complex	700.00	75.00	775.00
8 Basic Slag	260.00	44.00	304.00
9 Ammonium Chloride	450.00	55.00	505.00
10 Calcium Ammonium Nitrate 20.5%	385.00	52.00	437.00

For the purpose of comparison, the Table below gives the farmer's prices of Pool Fertilizers for the years 1964-65, 1965-66, 1966-67 and as on 1-4-1967:—

(Rs. per M.T.)

Fertilizer	1964-65	1965-66	1966-67	From 1-4-67
1. Ammonium Sulphate	360.00	360.00 (upto 31-1-66) 405.00 (from 1-2-66)	405.00	492.00
2. Ammonium Sulphate Nitrate	435.00	435.00 (upto 31-1-66) 515.00 (from 1-2-66)	515.00	577.00
3. Urea	615.00	615.00 (upto 31-1-66) 680.00 (from 1-2-66)	680.00	840.00
4. Calcium Ammonium Nitrate (20.5 %N) ¹	310.00	310.00 (upto 7-8-65) 342.00 (from 8-8-65) (to 31-1-66) 365.00 (from 1-2-66)	385.00	437.00
5. Ammonium Chloride (Imp)		455.00 (from 28-4-65)	455.00	505.00
6. Ammonium Phosphate	605.00	605.00 (Upto 6-6-65) 617.00 (from 7-6-65) (to 31-1-66) 660.00 (from 1-2-66)	600.00	818.00
7. Basic Slag		..	304.00 (from 23-9-66)	304.00
8. Dia Ammonium Phosphate (Imp)		..	830.00 (from 29-4-66)	1095.00

9	Calcium Ammonium Nitrate (Imp)	..	..	485.00	535.00
10	N. P. K. Complex	..	..	..	775.00
11	Sulphate of Potash	..	..	..	655.00 (from 29-5-1967)

Notes :—Upto 1965-66 the prices are those prevailing in all the State except U.P., Madras and Orissa.

Distribution Margin:

5.17. The following table indicates the model break up of the distribution margin fixed for the various types of fertilizer the prices of which were revised with effect from the 1st April 1967:—

	1	2	3	4	5	6	7	8	9	10	11
		Sulphate of Ammonia	Urea	Ammonium phosphate Nitrate	Ammonium phosphate Nitrate 26%	Cal-Ammonium Nitrate	Di-Ammonium phosphate	Basic Slag ex	Cal-Ammonium Chloride	Ammonium Nitrate (20.5%)	
		Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.
1. Commission to dealers :											
(i) Wholesaler		4.40	7.60	5.20	7.40	4.80	10.00	7.00	2.60	4.50	3.90
(ii) Retailer		10.90	19.00	12.90	18.50	11.90	25.00	17.50	6.50	11.30	9.70
2. Incentive Commission (to be funded)		2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
3. Administrative charges		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
4. Transport Charges											
(i) Rly to wholesale godown		2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
(ii) Wholesale godown to retail godown		8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00
5. Loading and Unloading :											
(i) Wholesaler		2.50	2.50	2.50	2.50	2.50	2.50	2.50	2.50	2.50	2.50
(ii) Retailer		2.50	2.50	2.50	2.50	2.50	2.50	2.50	2.50	2.50	2.50

	1	2	3	4	5	6	7	8	9	10	11
6. Godown rent for wholesaler and retailer Rs. 0.80 per tonne per month for six months		4.80	4.80	4.80	4.80	4.80	4.80	4.80	4.80	4.80	4.80
7. Shortage for Wholesaler and retailer		2.20	3.80	2.60	3.70	2.40	5.00	3.50	1.30	2.30	1.90
8. Interest charges. (4 months on an average)		11.70	20.30	13.70	19.70	12.70	26.70	18.70	6.90	12.00	10.30
9. Supervision, publicity etc. (Apex. Society for wholesaler)		8.00	6.50	4.80	7.90	5.40	5.50	5.50	2.60	2.10	3.40
10. Miscellaneous expenses		1.30	..	..
TOTAL		55.00	80.00	62.00	80.00	60.00	95.00	75.00	44.00	55.00	52.00

5.18. Asked during evidence whether there was any possibility of reducing the distribution margin, the Secretary of the Ministry (Agricultural Department) replied in the negative. He added "In fact, there should be a margin for development or promotion which we have not so far given here. With the more and more fertilizers coming this promotion aspect becomes important and something more may have to be provided." Asked further if the minimum promotional activities had been defined, it was stated "At present there is nothing at all".

5.19. The Committee find that there is wide difference in the ex-factory retention price of indigenous fertilizers and the pool selling price. Even after adding the expenditure on inland freight, incidental charges, sales tax etc. there is still a difference between this price (no-profit-no-loss price) and the pool selling price. For example, one tonne of indigenous urea at the ex-factory retention price of Rs. 582/- after adding the incidental charges to the extent of Rs. 46.35 is sold at the pool price of Rs. 760/- per tonne as against the 'no profit no loss' price of Rs. 628.35 per tonne. Similarly, in the case of certain imported fertilizers it is noted that the 'no profit no loss' prices are more than the pool prices. The Committee are, therefore, constrained to observe that the pool prices have not been correctly fixed in the past. In view of this they feel that there is need for making a fresh review of the basis for fixation of prices both in respect of indigenous and imported fertilizers. The review has become all the more necessary in the view of the liberalised pricing and marketing policy under which the producers have been given the option to sell atleast 70 per cent of their products in the manner and at a price they choose with effect from the 1st October, 1968. They therefore suggest that a committee of experts drawn from the fertilizer industry, Commerce and Trade, economists, cost accountants and representative of farmers etc, should be set up to go into the various elements and economics of cost structure so that a uniform price policy, advantageous both to producers and consumers, is laid down under the changed conditions.

5.20. The aforesaid expert committee may also examine the question of introducing cost planning, cost control and cost reduction techniques by installing a cost reduction cell in each organisation, both in the public and private sectors for ensuring economic cost in all the stages of processes of production.

C. Cost of production

Existing Units

5.21. The cost of production of fertilizers for the years 1964, 1965-66 and 1966-67 in respect of the units under the Fertilizer Corporation of

India and Fertilizers and Chemicals Travancore Ltd., is given below:

	(Rs. per tonne)		
	1964-65	1965-66	1966-67
<i>Sindri</i>			
Ammonium Sulphate	227.57	285.52	307.59
Double Salt	455.90	429.73	434.63
Urea	532.80	486.31	510.52
<i>Nangal</i>			
C.A.N.	206.14	221.13	229.39
<i>FACT</i>			
Ammonium Sulphate	418.00	576.74	410.55
Super-phosphate	175.00	202.02	249.23
Ammonium phosphate.	604.00	813.00	668.71

Units under construction

5.22. The cost of production of fertilizers in the plants now under construction under F.C.I. and F.A.C.T. is given below:

	(Rs. tonne)
<i>Namrup</i>	
Ammonium Sulphate.	340.84
Urea	527.98
<i>Gorakhpur</i>	
Urea	469.56
<i>Durgapur</i>	
Urea	343.00
<i>Cochin</i>	
Urea	420.00

It will be observed from the above that cost of production of fertilizers in India varies from unit to unit (both in existing units and the units under construction).

5.23. In reply to a question, the Secretary of the Ministry of Petroleum and Chemicals stated during evidence that "some of our costs are higher because they are mostly old plants. In the new plants, the costs will be just the same as in the public and private sectors." The Secretary of the Ministry of Food, Agriculture, Community Development and Cooperation (Department of Agriculture) explained the position as under:

"Our public sector plants will be in a favourable position on the basis of the pool prices in the new factories. The old factories, if they produce according to capacity, will be having higher profits, because they are all old plants and their depreciation has been written off. In fact, Sindri can make very good profit and so also Nangal fertilizers at the present pool prices. For them it is an advantage. The new factories in the public sector can do at these prices quite favourably. The pool

prices are based on the port prices in world market, on the basis of our devaluation. The devaluation in June 1966 created a new problem for the entrepreneurs from foreign countries, because the question of new machinery *vis-a-vis* the plants already under production came up. The price naturally would be much higher. They had worked out all their calculations on the basis of pre-devaluation prices. It took more than 6 months for the things to stabilise. It was only early this year that some understanding on the price levels could be reached that too after the pool prices fixed on the 'no subsidy' basis. There is a slight subsidy even now."

Prices in other countries:

5.24. The prices of fertilizers as paid by farmers in India are higher as compared to the prices in many other countries. The prevailing prices as paid by farmers in India and those prevailing in Pakistan, Japan, U.S.A. and Britain during 1965 as they compare with those in India are given below:

Prices paid by farmers
(In Rs. per metric ton of plant nutrient).

Country	Ammonium sulphate	Urea	Single super-phosphate.	Muriate of Potash**
India (Prevailing).	2343 (from 1-4-67)	1826 (from 1-4-67)	2035 (in the eastern region from 1-4-67) 1948 (in other region from 1-10-67)	731 (from 10-10-67)
India*** (1965-66)	1804	1396	1321	505@
Pakistan East (1965-66)£	829	600	600	286
Pakistan West (1965-66)££	729	748	876	..
Japan (1965-66)	1257	1152	1162	486
U.S.A. (1965-66)	1324	..	1081	476
Britain (1965-66)£££	800	..	657	524

*Below 25% P₂O₅

**Above 45% K₂O.

***Average price during 1965-66 (July-June) and Ex-factory; 16% P₂O₅ @Ex-Codown, 60% K₂O.

£ Prices shown with a deduction of subsidy (usually 53%). No subsidy allowed to the Pakistan Tea Association, Pakistan Tobacco Company and Sugar Estates.

££ Subsidy of 50% has been deducted from prices shown.

£££ Prices are shown with subsidies deducted. Ammonium sulphate: subsidy of Rs. 414.29; Single Super-phosphate-Subsidy of Rs. 328.57.

5.25. In 1965-66 the prices in India were higher than those in the above said countries by the percentage indicated below:

Country	Ammonium Sulphate.	Urea	Single Super-phosphate	Muriate of Potash
Pakistan (East)	118%	133%	120%	77%
Pakistan (West)	147%	87%	51%	..
Japan	44%	21%	14%	4%
U.S.A.	36%	..	22%	6%
Britain	126%	..	101%	14%

5.26. According to the Fertilizer Association in India, one of the most important reasons for the high cost of fertilizers in India is the fact that they are manufactured in imported plants which have paid a high import duty. In the view of the Association the obvious way to reduce production costs is "to waive or reduce the import duty. The justification for such a course lies in the fact that fertilizers are basically the raw materials in agricultural production and they are a commodity destined for use by farmers, the bulk of whom are poor, small scale operators. Delivered prices to farmers can also be reduced by granting concessional freight rates for transport to fertilizers and fertilizer raw materials. Similarly, they can be reduced by waiving sales tax on these materials."

5.27. It has also been represented to the Committee that "The price of the fertilizers in India is not in the least competitive with the international price. The European price for Ammonium Sulphate ranges between 2.5 cents to 1.7 cents per lb. and that of Urea 4.1 cents to 4.4 cents per lb. The major reason is the high capital cost of the plant, particularly because of the indecisive attitude of the Government and a prolonged erection period. Even though the Government provides a subsidy to the fertilizer price when distributed to the farmers, the net price as paid by the farmer for the fertilizers is beyond their means and as such, there has not been a heavy demand for the use of fertilizers on firm lines."

5.28. In a note furnished to the Committee, Government have explained the reasons for higher prices of fertilizer in India as follows:

The prices of fertilizers in India are higher as compared to their prices in many other countries, mainly because, on account of inadequate internal production, we have to depend on imports involving additional expenses on ocean freight, loading and unloading etc. etc. at the ports besides price paid to foreign

suppliers. The landed cost of imported fertilisers in India is therefore naturally higher than the domestic prices in the exporting countries. The cost of production of indigenous fertilizers is also quite high. After devaluation the cost of imported fertilizers and raw materials has gone up by 57.5 per cent as compared to pre-devaluation prices. Despite the various factors that contribute to prices of fertilizers in India being high, an effort has always been made to keep them down as far as possible so that the cultivators find their use economical. After devaluation on 6th June, 1966, prices of fertilizers and raw materials imported from abroad were subsidised to counter the effect of devaluation to the full extent, upto 31st March, 1967. However, on a review of this policy, Government of India felt that heavy burden of this subsidy on the exchequer cannot be continued and the Government therefore decided to reduce this subsidy with effect from 1st April, 1967."

Cost of Fertilizers required for growing high yielding varieties of crops:

5.29. The following table gives the cost of fertilizers required for cultivation of one acre with the new high yielding varieties at current prices:

(in rupees per acre).

Crops	Cost of 'N' per acre		Cost of P ₂ O ₅ per acre		Cost of K ₂ O per acre		Total		Net increase from 1-4-67.	Rs. % age	Revised total since 1-12-67. Due to slight increase in the price of Potash
	Before 1-4-67	After 1-4-67	Before 1-4-67	After 1-4-67	Before 1-4-67	After 1-4-67	Before 1-4-67	After 1-4-67			
Paddy	60.89	73.66	46.63	50.60	11.19	14.75	118.71	139.01	20.30	17.1	140.00
Wheat	60.89	73.66	46.63	50.60	11.19	14.75	118.71	130.01	20.30	17.1	140.00
Maize	60.89	73.66	46.63	50.60	11.19	14.75	118.71	139.01	20.30	17.1	140.00
Jowar	45.67	53.25	37.30	42.48	8.40	11.06	91.37	106.79	15.42	19.9	107.00
Bajra	30.44	36.83	27.98	30.36	5.60	7.38	64.02	74.57	10.55	16.5	75.00

It will be observed from the above table that the cost of fertilizers required for cultivation of one acre are:—

Paddy, wheat and maize.	Rs. 140
Jowar	Rs. 107
Bajara	Rs. 75

5.30. It is stated that the new high yielding any hybrid varieties of crops which were introduced on a large scale from last year give much higher output per acre and a much higher return to the farmer as compared to the investment. The average per acre output of the new varieties and the estimated income on the basis of assumed average procurement prices for different crops are given below:—

Food-grains	Yield per acre in quintals	Average assumed procurement prices per quintal	Total income	Cost of fertilizers
		Rs.	Rs.	Rs.
Rice	12.5	85	1,062.50	140
Wheat	15.00	78	1,170.00	140
Maize	13.3	55	731.5	140
Jowar	12.5	54	675.00	107
Bajra	7.5	54	405.00	75

5.31. For several years now the effective demand for fertilizers has far exceeded the total availability including indigenous production and imports. According to Government, the principal reason for introduction of State Trading in fertilizers and its continuance for the past 22 years has been the shortage of supplies as compared to effective demand. It is stated that even this year when the total supplies have been stepped up substantially to about 1.35 million tonnes of Nitrogen, it has not been possible to meet the demand in full. There has been a substantial spurt in demand from Madras, Uttar Pradesh, Punjab and Maharashtra. Even now, there are pressing demands for additional supplies from Uttar Pradesh and Punjab for top dressing the Rabi crops. In the opinion of the Government the rising demand is a clear indication of the fact that the demand has not been seriously affected by the increase in prices.

Subsidy: !

5.32. To popularise the use of phosphatic fertilizer among the farmers their distribution has been subsidised since the First Plan period. A

subsidy not exceeding 25 per cent of the sale price of phosphatic fertilizers has all along been granted upto 31st March, 1967, the cost of subsidy having been shared equally by the Central and State Governments. From 1st April, 1967 the central subsidy has been withdrawn as the phosphatic fertilizers are stated to have become comparatively popular. In certain backward Union Territories (Manipur, Tripura, Andaman and Laccadives) a subsidy at 25 per cent of the retail price of nitrogenous fertilizers and 50 per cent of the retail price of phosphatic fertilizers was being given till 31st March, 1967.

5.33. The policy of subsidy was reviewed by the Government in March, 1967 and it was generally agreed that there was no further need to continue subsidised distribution of phosphatic fertilizers. In regard to the backward Union Territories it has been decided in consultation with the Planning Commission to reduce the rates of subsidy gradually and to abolish it completely from 1969-70. The rates of subsidy in force in 1966-67 and those proposed for the next three years in respect of the backward Union Territories are given below:

Year	Nitrogenous fertilizers	Phosphatic fertilizers
1966-67	25%	50%
1967-68	20%	40%
1968-69	15%	25%
1969-70	Nil	Nil

5.34. At present about 2/3 of nitrogenous fertilizers, about 1/3 of phosphatic fertilizers and the entire potassic fertilizers consumed in this country are imported. Although devaluation resulted in an increase in c.i.f. cost of imported fertilizers and fertilizer raw materials by 57.5 per cent fertilizer prices were not immediately increased.

5.35. A subsidy to off-set the increase in prices of imported fertilizers and fertilizer raw materials as a result of devaluation was paid:

- (i) to the manufacturers of indigenous fertilizers and ground rock-phosphate using imported raw materials; and
- (ii) to the State Trading Corporation of India for imported potassic fertilizers.

5.36. The entire cost of this (Rs. 2.2 crores in 1966-67) was met by the Government of India. The pool issue prices of fertilizers imported by the Government of India and distributed by the Central Fertilizer Pool were also maintained at the rates prevailing before devaluation and the:

losses to the tune of Rs. 47.88 crores arising from this absorbed by the Pool.

5.37. It has been stated that if the subsidy had been continued at the same levels and the pool prices also maintained at the same levels as were prevalent during 1966-67, the cost of these subsidies would have come to Rs. 57.72 crores approximately during 1967-68.

5.38. In view of the heavy cost of maintaining this subsidy it was decided to make the following changes with effect from 1.4.1967:

- (i) Subsidy paid to indigenous manufacturers producing fertilizers using imported raw materials was discontinued.
- (ii) The subsidy on imported muriate of potash was reduced to 50 per cent of the previous rate and fixed at 18.25 per cent of the c.i.f. cost of the fertilizers. The subsidy on sulphate of potash which is the other potassic fertilizer used in the country was abolished completely as it is used primarily for tobacco and grapes which are highly remunerative crops.
- (iii) The subsidy on powdered rock phosphate was reduced to Rs. 30 per tonne from the ceiling rate of Rs. 57 per tonne.
- (iv) The pool issue prices of fertilizers imported and sold by the Central Fertilizer Pool were revised upwards in order to reduce the losses suffered by the Pool. While revising the prices the nutrient content of each fertilizer, the degree of its popularity with the farmers and the average price per unit of nutrient were kept in view.

Economics in the cost structure of Fertilizer Plants:

5.39. The Committee desired to know the measures which the Government had taken to bring out economies in the cost structure of fertilizer plants. In reply, Government have stated that the economies in the cost structure of fertilizer plants could be brought about by adopting the following measures:

(a) *Planning*

- (i) adoption of modern technology in processes employed.
- (ii) choice of raw materials.
- (iii) adopting standardisation of processes as well as unit capacities of plants.
- (iv) production of high nutrient fertilizers.

(b) *Project Management*

- (i) choice of location.

- (ii) adoption of modern monitoring methods for construction of plants, namely critical path schedule.
- (iii) adequate coordination at the Government level to assist in obtaining approvals from State Government or other departments of the Central Government.

(c) *Production*

- (i) Operation of full capacity.
- (ii) inventory control.

5.40. The above aspects are stated to be under examination by the Government from time to time. It has been stated further that the new projects in the country are being based on modern technology. The size of the single stream has increased from 70 tonnes per day of Sindri to 750 tonnes per day of Ammonia in Madras Project and thus would contribute to lowering of investment costs. Similarly, use of naphtha has found favour because of lower running costs as well as low first costs on plant. As far as standardization of size is concerned, a standard design of 600 tonnes ammonia plant and 1000 tonnes of urea plant are being adopted at Durgapur, Cochin, Namrup II, Barauni. Even some of the private sector plants like Goa, Ghaziabad and Mirapur are envisaging a 600 tonnes per day ammonia plant and about 1000 tonnes per day urea plant. Urea is a high nutrient nitrogenous fertilizer. Production of triple super-phosphate in Sindri rationalisation or complex fertilizers (29-29.0) at Madras are indicative of the pattern adopted for production of high nutrient fertilizers.

5.41. With regard to attaining full capacity of the operating plants it has been stated that schemes have been approved for Sindri and Rourkela plants. The Trombay plant has also been studied and suitable modifications are being adopted. At Neyveli also, a study team was formulated at the request of Ministry of Mines and Metals under the chairmanship of Chief Project Officer of the Ministry of Petroleum and Chemicals. The recommendations are being implemented and production is increasing.

5.42. The Committee are concerned to note the high cost of production of fertilizers in the country. While they agree that the cost of ammonia produced in the existing plants at Sindri, Nangal, Trombay, Rourkela, Neyveli and Alwaye is higher because of raw materials used, old technology, the smaller size units and the high investment, they feel that the high operating costs are also largely due to non-utilisation or under-utilisation of the capacities on account of teething troubles and faulty equipments used. The Committee have no doubt that sustained and continuous efforts would be made to modernize some of the older plants and to improve production by installing additional balancing equipments where necessary

so that increased production in these units may result in reduction in costs.

5.43. The Committee are glad to learn that the cost of production in the new units at Namrup, Gorakhpur, Durgapur and Cochin would be lower due to larger capacities and modern technology. They are, however, surprised to note that even in these units the costs will vary from unit to unit though the raw material to be used in these units would be the same. As for instance, the cost of urea in Gorakhpur has been worked out to Rs. 469.56 per tonne as against Rs. 343 in Durgapur and Rs. 420 in Cochin. The Committee hope that Government would go into this aspect with a view to bring down the costs to the lowest level and as near to each other as possible.

5.44. The Committee are also constrained to note that fertilizers are made available to farmer in India at costs much higher as compared to farmers in other countries. They find that the price paid by Indian farmer in 1965-66 for one metric tonne of nutrient—ammonium sulphate, even at the subsidised rates, was Rs. 1804 as compared to Rs. 729 in Pakistan (West), 1257 in Japan, Rs. 1324 in U.S.A. and Rs. 800 in Britain. Due to the impact of devaluation in June 1966 and the removal of subsidy, the price stands at Rs. 2343 per tonne with effect from 1st April, 1967. The Committee feel that one of the factors for high costs of agricultural products in India is the high cost of inputs used by the farmers. They consider that the aim of the fertilizer industry should be to manufacture and make available to the farmer fertilizers at the lowest possible price, so that the cost of agricultural products is proportionately brought down at rates competitive with other countries. In the opinion of the Committee the lower costs per tonne of fertilizer for investment, maintenance and labour would be possible by—

- (i) optimum plant equipment and plant lay-out;
- (ii) construction of standard capacity units instead of tailor-made installations; and
- (iii) increase of unit capacity to the optimum.

The Committee have, no doubt, that cheaper fertilizers for farmers can flow out of the factories if the financial outlays are reduced to the minimum by properly assessing the realistic needs in phase, cutting down the time of erection and commissioning of the plants, using largely the raw materials/ feedstocks available indigenously, judicious selection of advanced technology, efficient management for controlling and managing the physical distribution aspect of marketing.

The Committee are convinced that if fertilizers are made available in time at economic prices, the Indian farmer would not be lagging behind his counterpart in other countries in making full use of them to step up production and bring the proclaimed goal of self-sufficiency within reach.

VI. RAW MATERIALS AND FEEDSTOCKS

6.1. The three primary plant nutrients are Nitrogen, Phosphorous and Potassium. Any national or regional fertilizer programme designed to augment agricultural yields must provide for the manufacture of Nitrogenous, Phosphatic and Potassic fertilizers in required proportions. The raw materials that can be used for the manufacture of the three kinds of fertilizers are listed below:—

Nitrogenous Fertilizers:

- (i) Natural Gas
- (ii) Coke Oven Gas
- (iii) Petroleum Refinery Gas
- (iv) Fuel Oil
- (v) Petroleum Naphtha
- (vi) Coal
- (vii) Coke
- (viii) Lignite
- (ix) Gypsum (for fixing ammonia as ammonium sulphate. It is also used in Manufacture of phosphatic fertilizers.)

Phosphatic Fertilizers:

- (x) Rock-phosphate
- (xi) Sulphur
- (xii) Sulphur-bearing minerals, such as Iron, Copper and Zinc pyrites.
- (xiii) Phosphoric Acid|Phosphorous.

Potassic Fertilizers:

- (xiv) Potassic Minerals

Some of the raw materials on which production of fertilizers is based are entirely indigenous while some are imported. Of these raw materials, coal, lignite, coke oven gas, naphtha and heavy oil residues from refineries based on indigenous crude are completely indigenous. Such raw materials for fertilizer production do not involve direct or indirect recurring foreign exchange expenditure.

A. Raw materials for Nitrogenous Fertilizers

6.2. The following Table illustrates the basis of installed nitrogen capacity as it exists now and as being envisaged; figures are based on the licensed and approved capacity as shown in Appendix X.

(Tonnes of Nitrogen)

	Existing capacity.	Licensed and approved capacity.
Electrolysis	81,300	81,300
Coal and Lignite	144,200	144,200
Coke oven gas and coke oven by product.	147,300	147,300
Naphtha and refinery gas.	283,500	2,546,500
Natural gas.	48,000	238,000
	704,300	3,157,300

It will be observed from above that out of the range of feedstocks available, the emphasis has been on naphtha in the current programme for the production of nitrogenous fertilizers. While naphtha manufactured from indigenous crude can be said to be completely indigenous, that part of it, manufactured with imported crude, is not so.

6.3. The availability of raw materials mainly used for the manufacture of nitrogenous fertilizers is indicated below:—

(i) Natural Gas

It is well-known that the economic production of synthetic ammonia is largely a matter of production of hydrogen at low cost. Hydrogen can readily and economically be obtained from natural gas and therefore it is preferred to other raw materials as feedstock for ammonia plants. India is not very happily placed in respect of this raw material. There are, as at present known, only a few commercially workable gas fields; two in the State of Assam at Naharkatia and Moran and three in the State of Gujarat at Anfleshwar, Cambay and Kalol-Navagam. The gas occurs partly associated with petroleum crude and partly as non-associated gas.

6.4. A production of about a million cu. meters of gas per day is available from the Naharkatia field, a portion of which is low pressure gas. It has been stated that with adequate facilities for boosting and storage of gas, it would be possible to make available from this source, 1.84 million cu. meters of gas per day from 1971 upto about 1983. According

to the present arrangements, about 1.25 million cu. meters of gas per day are expected to be utilised for the following purposes:—

- (a) 0.79 m. cu. meters per day for the Assam State Electricity Board (Namrup Power Station) and for the Assam Gas Company (Gas Distribution Project).
- (b) About 0.227 m. cu. meters per day for fertilizer production (Namrup Fertilizer Project). !
- (c) Upto 0.227 m. cu. meters per day for Assam Oil Company for their field use.
- (d) Small quantities for supply to brick kilns and tea gardens.

6.5. A fertilizer plant based on natural gas is under construction at Namrup. It is designed to produce 45,000 tonnes per year of Nitrogen in the form of Urea and Ammonium Sulphate. It will use 0.227 million cu. meters of gas per day as mentioned at (b) above. Plans are stated to be underway to expand the fertilizer factory under construction so as to utilize 0.735 million cu. meters of gas per day in the manufacture of fertilizers. The capacity of the plant after expansion will be 197,000 tonnes of Nitrogen per year.

6.6. A quantity of marketable gas at about 0.573 m. cu. meters per day from 1973 to about 1983 is expected to be available from the Moran Gas field.

The available output of gas from the Ankleshwar gas field is estimated at 0.75 million cu. meters per day. It is proposed to be utilised as follows:—

- (a) 0.3 million cu. meters per day to be supplied to the Utran Power Station.
- (b) 0.3 million cu. meters per day to be utilized for fertilizer production by the Gujarat State Fertilizer Company.
- (c) 0.05 million cubic meters per day to be supplied to the Baroda Municipal Corporation for distribution to domestic consumers.
- (d) 0.11 million cubic meters to be supplied for industrial use in the city of Baroda.

6.7. A fertilizer plant based partly on natural gas and partly on petroleum naphtha has been established at Bajwa near Baroda. It has an installed capacity to produce 96,000 tonnes of Nitrogen and 50,000 tonnes of P₂O₅ in the form of urea and ammonium phosphate. Steps have since been taken to expand the capacity of this plant to 216,000 tonnes of Nitrogen. As much natural gas as is available will be used as feed-stock

and the balance will be made up by petroleum naphtha. Presently, the plant is using 0.3 million cu. meters of gas per day as mentioned earlier.

6.8. The Cambay gas field is expected to yield 0.50 million cubic meters of gas per day and the entire quantity is earmarked for the Dhuvan Power Station.

6.9. The Kalol-Navagam-Sanand gas field is expected to produce about 0.50 million cubic meters of gas per day which is fully committed for use by the Ahmedabad Power Station.

(ii) *Coal*

6.10. There are vast resources of non-coking coal in India although the same cannot be said of the high grade coking variety. Reserves of the former are estimated at about 71,800 million tonnes while those of the latter are placed at 15,500 million tonnes. Coal deposits are concentrated mostly in the Bengal-Bihar mineral belt, but sizeable deposits are also located in the State of Orissa, Madhya Pradesh and Andhra Pradesh. Fertilizer production based on direct gasification of coal has not been attempted so far, but the fertilizer factory at Sindri, which has a capacity of 117,000 tonnes of Nitrogen per annum, uses coal as the starting raw material. The coal is converted into coke in the coke-oven plant and the coke is used in the gas plant for the production of synthesis gas. The Coke-oven gases are also reformed for the production of synthesis gas. The fertilizer production at Sindri is thus coal based although no direct coal gasification process is employed.

6.11. The Committee have been informed that at Sindri, the Fertilizer Corporation have been facing continuous difficulties in getting good quality of coal which is suitable for coke production at Sindri. The problem became acute after the steel plants came into existence. Continuous efforts have been made all these years to get regular allocations of proper types of coal for Sindri Coke Ovens, but this has met with only limited success. Since the reserves of good quality coking coals are fast getting depleted, the company is continuously making efforts to locate alternative sources of supplies or experiment with different types of blends and try to utilise these coals in the factory's ovens.

6.12. A scheme to locate a fertilizer factory in the coal belt of Korba in Madhya Pradesh based on gasification of local coals was decided in 1962. Feasibility studies, project report and economic analyses were prepared a number of times till finally Government decided in July 1965 not to proceed with the scheme in view of the relatively higher investment output ratio as compared to naphtha based plants. The Lok Sabha were informed in reply to a question on the 21st December, 1967 that the Fertilizer Corporation of India had incurred an expenditure of Rs. 107.68

lakhs on the Korba project upto 31st March, 1967. Subsequently, the then Ministry of Mines and Metals suggested the Planning Commission to revive the proposal of a coal based fertilizer project at Korba for the effective and economic utilisation of the coal production capacity developed in Korba with a large quantum of Soviet aid. It is stated that a feasibility report for the project was prepared in September 1967 at the instance of the Ministry of Petroleum and Chemicals. The report is stated to be under consideration.

(iii) *Lignite*

6.13. Deposits of Lignite are known to exist in India in two places. The more important deposit is at Neyveli in South Arcot District of the State of Madras. The other, relatively less important, is at Palna in the State of Rajasthan. The Neyveli Lignite deposit has been investigated intensively and reserves amounting to over 2000 million tonnes have been established in an area of about 254 sq. km. Presently, an area of about 14 sq. km. with 200 million tonnes of Lignite reserves has been taken up for exploitation. The composition of the Neyveli Lignite is approximately 53 per cent moisture, 3 per cent ash, about 24 per cent volatiles and 20 per cent fixed carbon. On account of its low ash content, it is considered to be of very good quality. It has a calorific value of approximately 2450 kilo calories kgms; 2½ tonnes of Lignite being equivalent to one tonne of good quality coal in heat value.

6.14. The only lignite based plant in the country is at Neyveli which is designed to produce 463 tonnes urea per day. This plant went into production in 1966.

(iv) *Gypsum*

6.15. There are abundant deposits of gypsum in India. The reserves are estimated at over 1000 million tonnes with the gypsum content of about and over 80 per cent. The use of mineral gypsum in the fertilizer manufacture is, however, limited to the production of ammonium sulphate by MERSEBURG process at the Sindri Fertilizer factory. The yearly consumption of gypsum in this factory is about 550,000 tonnes depending on the quality of gypsum received. The use of mineral gypsum for the production of ammonium sulphate is not likely to increase as a process for the use of by-product gypsum obtained in the manufacture of phosphoric acid for the manufacture of ammonium sulphate has been developed by M/s Fertilizer and Chemicals Travancore Limited. The cost of by-product gypsum is stated to be negligible as compared to the mineral gypsum and therefore mineral gypsum is not likely to be used where by-product gypsum is available in adequate quantities. Small quantities of mineral gypsum are however used as a filler in fertilizer mixtures and the

present consumption for this purpose is estimated at about 25,000 tonnes year.

6.16. The Study Group of the Estimates Committee during their visit to Namrup Fertilizers Factory in September 1967 were given to understand that large deposits of good quality gypsum were existing in Bhutan and that these could be exploited and used in the place of imported sulphur. The Committee desired to know whether the feasibility of importing the Bhutanese gypsum for use as feedstock for the fertilizer factories in India had been explored. Government, in a written note furnished to the Committee, have stated that the reconnaissance survey by the Geological Survey of India brought to light the existence of Gypsum deposits in eastern Bhutan. Subsequent surface examination led to the inference that the reserves might be about 87 million tonnes. But to ascertain the exact quantum of reserves and their economic viability it is necessary to carry out further exploration and drilling work. It has been stated that there is no road leading to these deposits and lack of communications present a serious handicap to the development of the deposits.

6.17. About the possibilities of exploiting the deposits, the note says that the preliminary investigations conducted in 1966 by the Chief Mining Engineer and Geologist of the Fertilizer Corporation of India revealed that further drilling would have to be done to establish the thickness of the deposits and to confirm the estimates of reserves. However, on the basis of the information available so far it was estimated that exploitation of these reserves for production of 7 lakh tonnes gypsum per annum might require an investment of more than Rs. 3 crores. This estimate does not include the expenditure that would have to be incurred for further investigation for proving the nature and quantum of the deposits.

6.18. In view of the decision taken to change the pattern of production at Sindri* and give up the use of natural gypsum in favour of by-product gypsum by 1970-71, Fertilizer Corporation of India do not consider it prudent to make heavy investment of capital at this stage for detailed exploration and exploitation of gypsum from deposits of Bhutan. The Ministry of External Affairs at whose instance the matter was studied was informed in February, 1967 that FCI was not interested in exploiting gypsum sources in Bhutan for the time being.

6.19. The Committee understand that recently new gypsum deposits have been found out near Mohangarh in Jaisalmer District in Rajasthan. It is also understood that the new Pokaran Jaisalmer railway line is also available for the transportation of this mineral to other points of the country.

Please see Appendix V which gives details of the Sindri Rationalisation Scheme.

(v) *Petroleum Naphtha*

6.20. The recent trend in India, as indeed all over the world, is to prefer naphtha as raw material for ammonia production. According to the technoeconomic feasibility study of Planning and Development Division of the FCI made in connection with the setting of a coal plant at Korba, out of the existing capacity of 704,300 tonnes of nitrogen per year, only a capacity of 283,500 tonnes is based on naphtha, the remaining being based on coke, lignite, coke oven gas and electrolytic hydrogen. Similarly, out of a licensed and approved capacity of 3,157,300 tonnes/year of nitrogen, the naphtha based capacity will be to the tune of 2,546,500 tonnes i.e. above 80 per cent. According to the study of P&D the total available naphtha from the refineries by the end of 1972-73 is expected to be about 4.134 million tonnes. Demands on this naphtha would be for use as motor gasoline, as feedstock for petrochemicals and fertilizers and for exports to pay off a part of the foreign exchange required for import of crude.

6.21. A rough split up of original allocation of the various end uses is given below:

	(M. tonnes/year).
1. Refinery capacity, crude	22,090
2. Available naphtha	4.134
3. Gasoline requirements	1.471
4. Petrochemicals	0.861
5. Export at current levels.	0.515
	2.847
6. Net available naphtha for fertilizer production	1.287
7. Commitments of naphtha for fertilizer production (as per Appendix XI)	2.864
8. Net deficit of naphtha	1.577

6.22. According to study made by the Indian Institute of Petroleum in December, 1967 the demand, production and surplus/deficit of light distillates during each of the year 1971 to 1975 are indicated below:—

Year	Demand	Production	('000 tons. surplus/ Deficit.)
1971	3066	3856	-110
1972	5329	4322	-1007
1973	6270	4714	-1556
1974	6087	5167	-1820
1975	7486	5525	-1961

It will be seen from the above table that the marginal deficit of 0.11 million tonnes in 1971 will rise to 1.96 million tonnes in 1975. The study points out that there are 3 solutions to overcome the situation, namely—

- (a) Process lighter crudes so as to conform more closely to the pattern of demand;
- (b) Increase naphtha production by adjusting the yield of various distillates; and
- (c) to use secondary processes such as hydro-cracking in selected plants.

(iv) *Import of Ammonia*

6.23. Recently, another aspect of the fertilizer problem has been highlighted. This concerns the import of liquid ammonia. The Committee understand that the World Bank was the first to suggest to the Government of India to permit foreign companies to import liquid ammonia for the manufacture of fertilizer. Liquid ammonia is a synthesis of nitrogen, which is taken from the air, and hydrogen, which is derived from naphtha, a petroleum product. Liquid ammonia is an intermediate stage of manufacturing fertilizer from naphtha.

6.24. Government have already received three proposals for the import of liquid ammonia. These are from:

- (i) Messers Dharmasi Morarji Chemicals Co. Ltd., Bombay;
- (ii) Messers Tata Chemicals Ltd., and
- (iii) Mess Atlantic Richfield Oil Co.

6.25. The proposal from Messrs Dharmasi Morarji Chemicals Co. Ltd. envisages the establishment of a fertilizers factory to produce 500,000 tonnes/year of Dia-ammonium Phosphate. The salient features of the scheme are—

- (i) Import of 1,15,000 tonnes of liquid ammonia and 2,00,000 tonnes of sulphur linked with it to be supplied by the Kuwait Chemicals Fertilizers Co.
- (ii) Implementation of the entire project within two years from the date on which all clearances are given.
- (iii) A substantial contribution to the phosphatic fertilizer production of 2,30,000 tonnes of water soluble P205 in the form of a high analysis complex fertilizer (18:46:0).

The project is to be established in collaboration with Kuwait Chemicals and Fertilizer Company (KCFC), a public sector Company of Kuwait which is wholly managed by Kuwait nationals. The ammonia and sulphur

will be made available by the KCFC on a guaranteed supply basis for a period of years. The Lok Sabha were informed on 16th November 1967 in reply to a question that the proposal was ultimately rejected as it "was not considered advantageous."

Other proposals.

6.26. Regarding other proposals, viz M/s. Tata Chemicals Ltd. and M/s. Atalantic Richfield Oil Company it has been stated in a note furnished to the Committee that Government have not yet completed the study of these proposals. It has been added that "while the Atlantic Richfield Co. has given only an outline of their proposal, Tata Chemicals have made a more detailed proposal which envisages the establishment of a fertilizer-cum-chemical complex at Mithapur. On full implementation of the proposal, in six phases extending over a period of 8 years, the production of over 2.2 million tonnes per year of finished, concentrated and balanced fertilizers is expected to be achieved. In terms of plant nutrients, this production will amount to about 460,000 tonnes Nitrogen, 370,000 tonnes P_2O_5 , 279,000 tonnes K_2O .

Import of Ammonia is envisaged for ten years. For the first three years, phosphoric acid will also be imported. Later, the production of phosphatic fertilizers is proposed to be based on imported sulphur and rock phosphate. Arising out of operations connected with fertilizer production, salt, cement, bromine, potash and gypsum in sizeable quantities are expected to be produced in a phased manner. As an integral part of the fertilizer complex, a full mechanised, captive, deep-sea water jetty is included. This is expected to result in considerable savings in freight handling costs.

6.27. In another note furnished to the Committee, Government have stated that the following are the advantages as have been cited in the various proposals received for establishing fertilizer production based on imported liquid ammonia:—

- (i) There is likely to be a shortage of naphtha for meeting the requirement of all the fertilizer projects to be established during the next few years. If fertilizer production during the Fifth Plan were to be of the order of 4 million tonnes or more of nitrogen per year, it is unlikely that all the naphtha required will be available locally. Besides, there may be growing difficulties in the import of naphtha with the demand for naphtha for fertilizers and petrochemicals growing at a fast pace in most countries.
- (ii) Facilities for fertilizer production based on imported ammonia could be established 1½ to 2 years earlier than if they are based on naphtha.

- (iii) The capital cost of ammonia based fertilizer plant and its foreign exchange component is lower than that of naphtha based plants.

6.28. Government have stated that the import of ammonia has not been favoured for the following reasons:—

- (i) There will not be shortage of indigenous naphtha for the next four years and even if a shortage does develop for a short period it could be met by import of naphtha.
- (ii) For the years after 1971, a study must be made of the probable demand for all oil products, the extent to which they will justify the increase in refining capacity and the possibility of meeting our requirements without making imbalance of supply and demand. In the light of this study a view must be taken carefully about the feedstocks on which increased fertilizers production must be planned.
- (iii) In the manufacture of fertilizers from imported ammonia, there are limitations on the products that can be made. The production of Urea will involve setting up expensive carbon dioxide manufacturing facilities. Normally Urea is produced simultaneously with ammonia in the same plant as carbon dioxide is available practically free of cost from the ammonia plant.
- (iv) The foreign exchange expenditure to be incurred by import of ammonia will be higher than that involved in the import of naphtha.

6.29. Asked during evidence about the import of feedstock the Secretary of the Ministry of Petroleum and Chemicals stated that "We do not yet see the way clear for building the fertilizer capacity we need without having to import feed-stocks even after the fullest possible utilisation of gas and coal in economically viable areas. We believe that there are going to be problems of feed-stock availability. The question is whether naphtha or ammonia or both must be imported. This is the question which Government has to consider and is considering". Asked further whether after having rejected the application of M/s. Dharmasi Morarji there was any change in the policy of Government on the receipt of another application from Tatas for the import of ammonia, the Secretary stated that "there is no change in policy so far. But arising out of the proposal made by the Tatas and arising out of a representation which Dharmasi Morarji has made, they are under the law entitled to show cause why their applications should not be rejected and they have shown cause accordingly. Their case has to be submitted for fresh orders on the basis of the cause they have shown. They have given a lot of material in respect of feedstock situation, in respect of sulphur availability, prices, change

in terms and conditions of supplies etc. The question is being examined. The proposal Tatas have made plus the proposal which we have received from the Atlantic Richfield company are now the subject of study with reference to our long-term production of naphtha for the requirements of the fertilizer industry."

6.30. The Committee have been informed subsequently in reply to a question that M/s. Dharmasi Morarji's proposal has since been accepted on reconsideration and letter of intent issued on 7th February, 1968.

Economics of Patterns of raw materials :

6.31. The relative economics of fertilizer plants based on various raw materials is discussed below:

(a) Economics of a gas-based plant as compared to a naphtha based plant.

The economics of fertilizer production from natural gas or naphtha depend upon various factors such as initial investment, size of the plant, its location, cost of raw materials and utilities, the product mix and the sale price. Plants based on natural gas can normally be located near the source (gas fields) unless the installation of transmission lines is economically justified, whereas naphtha-based plants can be located at sites away from refineries also, since naphtha can be transported as such in tank-wagons.

6.32. Several assumptions which are rarely applicable in all cases in practice have to be made in arriving at comparable capital cost and cost of production estimates for the two types of plants viz. gas-based and naphtha-based. Capital cost of a gas-based plant located near the gas fields having an installed capacity of 1,52,000 tonnes nitrogen per year in the form of Urea is estimated at about Rs. 35 crores against about Rs. 39 crores for a plant of similar size based on steam reforming of naphtha.

6.33. Assuming that the naphtha-based plant is located near the refinery and gets its supply of naphtha at 113/tonnes and that a gas-based plant gets its supply of gas at Rs. 1.5/100 cft., the cost of production, including 10 per cent return on investment in the case of Urea is estimated at Rs. 465 per tonne for a gas-based and a naphtha-based plant respectively.

(b) Economics of a Pyrites based Plant:

6.34. The Committee have been informed that the cost of production of fertilizers will definitely be affected by the use of pyrites as compared to sulphur since cost of production of sulphuric acid, which is the inter-

mediate product used in production of fertilizers, is higher in the case of a pyrite based as may be seen from the table below:

(Cost per tonne of acid in Rs.)

	Sulphur based	Privates. based
New Plants (100 te/day)	188.1	235.4
New Plants (250 te/day)	175.8	206.6
New Plants (500 te/day)	170.4	194.3
New Plants (1000 te/day)	163.7	179.6
Converted Plants (100 te/day)	188.1	244.1
Converted Plants (250 te/day)	175.8	213.2
Converted Plants (500 te/day)	170.4	199.3
Converted Plants (1000 te/day)	163.7	183.3

It may, however, be noted that in both the cases, the difference in cost of production becomes less and less as the capacity of the plant is increased.

(c) *Economics of an Naphtha-based plant as compared to a coal-based plant:*

6.35. Economics of fertilizer production from naphtha or coal depend upon various factors such as process routes, initial investment, size of the plant, its location, cost of raw materials and utilities, the product mix and the sale prices. Several assumptions which are rarely applicable in all cases in practice have to be made in arriving at comparable capital cost and cost of production estimates for the two types of plants viz. coal-based and naphtha-based. Plants using coal as the feedstock may either utilise coal for direct gassification or utilise coke oven gas for production of fertilizers and sell or utilise coke for other purposes or utilise both coke and coke oven gas for fertilizer production.

6.36. Assuming that a plant is based on direct gassification of coal and has an installed capacity of 228,000 tonnes nitrogen per year in the form of urea, its capital cost is estimated at about Rs. 73 crores against Rs. 51 crores for a plant of similar sizes based on steam reforming of naphtha. Coal-based plants of lower capacities (say 500 tonnes ammonia/day) are considered still more financially unattractive compared to naphtha based plants. This comparison has, therefore, been given on the bases of 900 tonnes/day plant. These figures should not be taken as precise as they are based on very rough calculations and broad assumptions. There is no recent experience of coal based plants of this size in India or abroad which can be drawn upon. On the other hand, large naphtha-based plants

are being put up in various parts of the world and it is, therefore, possible to estimate more correctly the capital investment involved. The comparative figures given above may, therefore, be taken as merely indicative of the higher capital cost of a coal-based plant.

6.37. Assuming that a coal-based plant gets coal at Rs. 35 tonne and the naphtha-based plant gets naphtha at 113/tonne, the cost of production of urea inclusive of 10 per cent return on investment is estimated at Rs. 455 and Rs. 540 per tonne for a naphtha-based and a coal-based plant respectively. The latter figure may get reduced to some extent if process routes other than direct gasification can be used or coke is gainfully utilised otherwise as part of a composite scheme.

6.38. A naphtha-based plant cannot be changed over to coal-based plant without major modifications.

Raw Materials for Public Sector Plants:

6.39. The Committee desired to know whether at the time of planning fertilizer projects in the public sector the availability of relevant raw materials required to feed the plants was taken into consideration. Government in a note furnished to the Committee have explained the position as under:

“Before a project is approved steps are taken to determine and ensure that the required feedstock will be available. But sometimes certain unforeseen developments take place. Rourkela Fertilizer plant is the only instance of a public sector fertilizer plant working below its rated capacity due to shortage of feedstock. This project was approved on the basis of availability of sufficient coke oven gas from the coke ovens in the steel plant. Unforeseen variations in the quality of coal and in the complex demand on the heat energy from different units of the steel plant have contributed to the short-fall in coke oven gas. The matter has been examined by an Expert Committee and on its recommendations steps have been taken for augmenting the gas supply by installation of a supplementary Naphtha gasification unit. This is expected to be brought on stream shortly.

In the case of Sindri Plant, the problem is different. It cannot be said that there is a shortage of feed stock. But there have been variations in the quality of certain materials. The gypsum of Pakistan which was originally chosen for Ammonium sulphate was of 90 per cent purity. But after Partition, the plant had to rely on Rajasthan deposits which turned to be of lower purity. Similarly in the case of coal, the blend

required for the Sindri coke oven plant proved to be somewhat difficult to obtain in practice, thereby limiting the production of feed stock to the expanded ammonia section of the plant. Here also, an additional gasification unit has been sanctioned and is being constructed.

6.40. The Committee observe that one of the factors for non-fulfilment of the targets of fertilizer production during the plan periods was the non-availability of raw materials and feed-stocks in required quantity and quality. The shortage of electric power and non-availability of good quality coal which affected the production of FACT and Sindri respectively during the Second Plan period continued to persist during the Third Plan period also. The deteriorating quality of gypsum also inhibited the Sindri factory from attaining the optimum capacity. The production at Rourkela Plant was much below its installed capacity mainly on account of non-availability of coke oven gas. The production at Nangal factory also suffered due to shortage of electric power. All these are indicative of calculations in planning going wrong and failure to take adequate timely measures to ensure the supply of raw materials and feed-stock to these factories. The Committee urge that effective measures should be taken to ensure the availability of raw materials and feedstock to the existing fertilizer plants so as to ensure that the capacity for the production of fertilizers installed in the country is utilised to the optimum.

6.41. The Committee are informed that in view of the deteriorating quality of Rajasthan Gypsum and exhaustion of the mines, Government have decided to introduce Sindri Rationalisation Scheme which would produce phosphatic fertilizers and replace Rajasthan gypsum with by-product gypsum from the proposed phosphoric acid plant, at a cost of about Rs. 23 crores, including foreign exchange component of about Rs. 6 crores. The Committee understand that new deposits of gypsum have been found recently in Jaisalmer area in Rajasthan. They would, therefore, suggest that before launching the expensive rationalisation scheme, Government should make a thorough study of the economics of the new deposits to see whether the gypsum available in these deposits can be suitably used under the existing process of production in the Sindri Factory.

6.42. As regards the import of liquid ammonia, the Committee find that the proposal from Messrs Dharmasi Morarji which was rejected by Government a couple of months ago has been accepted on reconsideration and a Letter of Intent issued to the firm on the 7th February, 1968. The Committee understand that the proposal has been pushed through on the consideration that in the coming years there will be growing pressure on

the supply and prices of naphtha, while ammonia prices are likely to go down.

The Committee also note that the proposal to set up a coal based fertilizer plant at Korba, abandoned in 1965, is now being reconsidered for revival after an infructuous expenditure of Rs. 1.7 crores.

The Committee are concerned to note that Government have not yet been able to take a firm decision on the basic issue as to how much future fertilizer capacity would be based on naphtha, imported ammonia or any other raw materials. They, therefore, feel that it is high time that Govt. take firm and final decision on this vital issue.

B. Raw Materials for Phosphatic Fertilizers.

6.43. Every phosphatic fertilizer unit is a substantial consumer of Rock Phosphate and Sulphur. Almost the entire requirement of the aforesaid raw materials is imported. The following are the quantities and value of imported rock phosphate during the Second and Third Plan period:

	Quantity (000 tonne)	Value (Rs. crores)
1957	115.0	1.55
1958	121.3	1.13
1959	185.9	1.70
1960	236.2	2.07
1961-62	254.0	2.30
1962-63	306.0	2.60
1963-64	337.0	2.76
1964-65	364.0	3.19
1965-66	565.7	5.56

6.44. The import of sulphur during the Third Plan period is as follows:—

	Tonnes	Rs. in crores
1962	2,48,031	4.74
1963	2,61,018	4.90
1964-65	2,78,245	5.42
1965-66	3,00,211	6.93

6.45. As regards the Fourth Plan requirements almost all the sulphur and rock phosphate required will have to be imported. Year-wise break up of imports is given below:

	Rock phosphate	Sulphur
	(In tonnes)	
1967-68	900,000	365,000
1968-69	1,200,000	425,000
1969-70	1,400,000	485,000
1970-71	3,000,000	600,000

The total foreign exchange required on this account would be of the order of Rs. 207 crores.

6.46. The present availability position regarding rock phosphate and sulphur is given below:—

(i) *Rock Phosphate*

The present annual requirement of rock-phosphate by the Indian Fertilizer industry of the order of 800,000 tonnes is expected to increase to nearly 3.5 million tonnes by 1970-71. As no rock-phosphate is available in the country, all of it has to be imported. All supplies of rock phosphate are at present being canalized through the State Trading Corporation. An intensified programme of search for phosphate deposits has been launched and the results of the investigation available so far indicate the presence of workable deposits in the Mussorie area in Uttar Pradesh and Birmania-Jaisalmer-Udaipur areas in Rajasthan. Some apatite deposits in Andhra Pradesh have also been located and in Bihar, phosphate deposits are known to exist in the Singhbhum and Basari Bagh areas. Details in regard to the extent and quality of these deposits are as under:—

(a) *Mussorie area in Uttar Pradesh*

Around Mussorie in Dehra Dun District of Uttar Pradesh an area of about 120 sq. kms. has been under investigation and phosphatic horizons with P_2O_5 content ranging upto 20 per cent have been located. The ore will have to be upgraded by beneficiating to make it suitable for use in the manufacture of fertilizers.

(b) *Birmania-Jaisalmer-Udaipur areas in Rajasthan;*

Three formations have been discovered viz. (a) Birmania Formation in Jaisalmer District (b) Arravalli Formation near Udaipur and (c) Lathi Formation in Jaisalmer District. The deposit occurring near Birmania varies in thickness from 1 to 4 meters. The total indicated reserves estimated in the area are of the order of about 4.8 million tonnes containing 10 per cent P_2O_5 . The ore will have to

be beneficiated upto 30 per cent before it can be used. As no source of water is available at site, this is going to present some difficulties. The Arravalli Formation consists of 3 deposits which are superior in quality and extent as compared to Birmania deposit. In the Lathi Formation, the phosphorite bed extends over a total distance of 12 KM and the thickness varies from 0.6 meters to 2 meters. Samples so far analysed indicate P2O5 content varying 12 to 15 per cent.

(c) The apatite deposits in Andhra Pradesh cover an area of about 25 sq. Km. and contain 30 to 40 per cent P2O5. Reserves are however estimated to be only about 200,000 tonnes.

(d) The Singhbhum deposits in Bihar are estimated at 700,000 tonnes containing 20 to 25 per cent P2O5.

6.47. As has been pointed out earlier all imports of Rock phosphate are canalized through the S.T.C. who arrange procurement and shipment. It has been represented by a non-official organisation that the State Trading Corporation has not been able to discharge its function efficiently with the result that the phosphate industry has suffered either through shortage of raw materials or through an excessive supply in some months leading to storage difficulties and that they are also not happy with State Trading Corporation's method of invoicing, pricing, ex-jetty deliveries, etc. Import of large quantities of rock phosphate during the monsoon seasons of 1966 and 1967 has been cited as an example of State Trading Corporation's inefficiency and lack of imagination.

6.48. The Ministry of Petroleum and Chemicals in a note furnished to the Committee have stated that "These allegations have been examined in the Ministry in consultation with the Ministry of Commerce. In regard to these points, the State Trading Corporation claims that, in the circumstances obtainable from time to time, they have done the best that could be done by any agency and in spite of many odds they have managed to keep the consumers adequately fed. Delays in the release of free foreign exchange, devaluation of the rupee and the closure of Suez Canal have been cited by them as some of the impediments that came in the way of timely imports and better delivery schedules. In regard to heavy imports during the monsoon period, the State Trading Corporation says that there is no substance in the criticism as there are no insurmountable difficulties in unloading rock phosphate during the monsoon period. In fact, they state that the major portion during the monsoon period was arranged by M/s. Morarji Brothers, who are the Indian agents for Moroccan and Tunisian suppliers and who were then permitted to import the material on behalf the State Trading Corporation."

(ii) Sulphur

6.49. There are no known deposits of elemental sulphur in India and the entire requirement is imported. The current annual requirement of

about 700,000 tonnes is expected to rise to about 1.5 million tonnes by 1970-71. Due to the world wide shortage that has developed during the last 2-3 years, it is becoming increasingly difficult to procure all the requirements through imports. The production of fertilizers especially of phosphatics has suffered considerably on this account.

Requirements

6.50. It has been stated that the capacity for producing Phosphatic fertilizers P_2O_5 in the country has remained considerably under-utilised (roughly 30 per cent) because of the shortage of sulphur. The following table shows the requirement and availability of sulphur:—

(In tonnes)

Year	Sulphur requirements			Availability
	Fertilisers	Chemical Industry	Total	
1953-54	125,000	110,000	235,000	232,756
1954-55	135,000	135,000	270,000	278,245
1965-66	135,000	150,000	285,000	300,211
1966-67	275,000	175,000	450,000	260,000
1967-68	365,000	256,000	621,000	Uncertain
1968-69	425,000	283,000	708,000	„
1969-70	485,000	317,000	802,000	„
1970-71	800,000	330,000	1130,000	„

6.51. As is already mentioned, the Fourth Plan (1970-71) target for the production of phosphatic fertilizers is one million tonnes of P_2O_5 . For that capacity to be achieved by 1970-71, about 433,000 tonnes will be based on imported sulphur, 284,000 tonnes will be based on imported phosphoric acid and the remaining 280,000 tonnes on the use of pyrites and other sulphur bearing materials. It will thus be seen that about 0.72 million tonnes of the capacity is based on imported sulphur or phosphoric acid. The production of P_2O_5 that can be realised in the last year of the Fourth Plan is estimated at about 600,000 tonnes. If sulphur does not become available in the required quantities the production may go down to about 277,000 tonnes of P_2O_5 thus either creating a marked imbalance in the nutrients requirements of the soil or forcing larger import of finished fertilizers.

Procurement

6.52. In a memorandum submitted to the Minister of petroleum and Chemicals a non-official organisation has *inter alia* stated that "State Trading Corporation, which comes under the Ministry of Commerce, has no direct experience or involvement in the fertilizer industry. On the other hand, the Ministry of Petroleum & Chemicals, which is in charge of fertilizer production, appears to have little or no control over the procurement of fertiliser raw material. . . . Its weaknesses in this respect are due to its lack of control over the supply of materials required by the industry over the foreign exchange requirements". The memorandum suggests that "the Ministry of Petroleum & Chemicals should have an annual allotment of foreign exchange to be utilised for import of raw materials and maintenance requisites by the fertilizer industry and also should have the responsibility for determining the quantity of raw material to be allocated to each manufacturer and of directing purchases and shipments satisfying the requirements of the industry."

6.53. The Committee desired to know during evidence whether any difficulties were being experienced by the Ministry of Petroleum and Chemicals in the existing arrangements for the import/procurement of raw materials for the fertiliser industry. In reply, the Secretary of the Ministry stated that there had been some difficulties in actual supplies being available due to some maladjustments between arrival and distribution. He added that "We have done something to remedy the situation. We have now in the Ministry of Petroleum a Committee which represents the major users of producers of fertilizers to advise the Government as to the requirements, timing etc. We are now in the process of setting up an inter-ministerial group for regulating imports of these materials from abroad. Coordination which was somewhat lacking is now being provided."

6.54. Asked further whether the suggestion of the Fertilizer Association of India for the appointment of a Fertilizer Raw Materials Committee had been considered, the Ministry of Petroleum & Chemicals in a written note furnished the following information:—

"Government have considered and accepted the suggestion made by the Fertilizer Association of India. In pursuance thereof, a Committee has been set up to advise the Ministry of Petroleum and Chemicals on provisioning, import and allocation of fertiliser raw material. The Committee consists of a representative each from the Fertilizer Association of India FACT and FCI. The first meeting of the Committee was held on 1-12-67. In addition to the above mentioned Committee, an Inter-Ministerial Committee of the organisations concerned with fertilizer raw material at Government

level has also been constituted to coordinate action on matters relating to import, allocation and distribution. The Committee consists of the representatives of the following organisations:

- (1) Ministry of Finance—Deptt. of Economic Affairs.
- (2) Ministry of Industrial Development—Economic Adviser to the Govt. of India.
- (3) Ministry of Commerce,
- (4) Directorate General of Technical Development.
- (5) Chief Controller of Imports & Exports.

The Joint Secretary, Department of Chemicals will be the Chairman of the Committee”.

6.55. In reply to another question, it has been stated that there is a Sulphur Advisory Committee in the Ministry of Commerce for considering the reasonableness of prices, delivery schedules etc. of firm offers received from overseas suppliers and also to ensure equitable allocations to the various categories of users and this Committee is presided over by the Chief Controller of Imports and Exports and there are representatives of the State Trading Corporation, Ministry of Industry, DGTD, Fertilizer Association of India, Iron & Steel as well as Ministry of Petroleum and Chemicals. It is stated that this Committee's deliberations have been useful in evaluating the offers which have been received from various sources from abroad.

Distribution

6.56. Prior to 1961 actual users and established importers were getting licences for import of sulphur against free foreign exchange. From early 1961, on account of foreign exchange difficulties, licences for import of sulphur were issued against DLF/AID loans. Actual users were finding it difficult to import sulphur under these loans in small lots. It was, therefore, decided in the last quarter of 1961 to bulk the requirements of the actual users and issue licences to two firms—M/s. Dharmasi Morarji & Co. and M/s. E.I.D. Parry Ltd. who were the agents of the U.S.A. suppliers.

6.57. Sulphur imported by established importers was supplied mostly to small consumers and in rare cases to the large consumers. The Actual Users of sulphur were not approaching the Dte. General of Technical Development for allocation of the material in their favour as this commodity was available from importers at reasonable prices. The major consumers,

however, used to approach the Dt. General of Technical Development for allocation of Sulphur imported through M/s. Dharmsi Morarji & Co. and M/s. E.I.D. Parry. This ate. allocated sulphur imported by these two firms, to cover their requirements on the basis of their capacity and after taking into account the expected arrival of stocks. There was, however, no real shortage of sulphur until end of 1964. All actual users were able to procure their full requirement of sulphur either by allocation by the Dte. General of Technical Development or by procurement from the established importers. From the beginning of 1965, however, a world shortage of sulphur occurred and sulphur was not available for distribution to actual users against the imports made by established importers. It became necessary for the DGTD to meet requirements of sulphur of actual users both in the organised as well as in the small scale sector out of the imports arranged through M/s. Dharmsi Morarji & Co. and M/s. E.I.D. Parry Ltd. and the State Trading Corporation. Since imports were not adequate to meet the full requirements of the consuming industries, it was necessary to distribute sulphur to the consumers on a rational basis taking also into consideration the importance of different industries. After estimating the total requirements of sulphur by the various consuming industries, the available material was distributed industry-wise on a *pro rata* basis but some additional weightage was given to the fertilizer industry. The defence requirements were met in full.

6.58. It has been stated that prior to the period April 1965—March 1966, import of sulphur was allowed through established importers. During April 1965—March 1966, import of sulphur was canalised through State Trading Corporation on 27-8-1966. However, in January 1967 it was decided to issue direct licences to all the categories of importers for quantities of 5,000 tonnes and above.

6.59. During the course of evidence the Secretary of the Ministry of Petroleum & Chemicals stated that "We do not have any natural sulphur resources. There are no known resources. There are some poor resources at Ladakh but their exploitation is beset with serious difficulties both physical and economic. We are trying hard to develop pyrites deposits as a source for sulphur substitution. We have lately taken up for preliminary study the possibility of gypsum as a source of sulphuric acid. We are now planning to commission a feasibility study on this from the Khetri Copper Project. . . In Amjhore we have now in six months time to undertake production and by the end of 1968 we hope to be able to produce enough pyrites to feed the sulphuric acid plant that has been built at Sindri. Our present requirements of sulphur are 700,000 tons per year.

(iii) *Pyrites.*

6.60. Information on the extent and availability of pyrites in the country is given in the following table:—

Name of deposit	Extent of the area	Qty. of deposit. (Sulphur) content	Reserve (Million tonnes)
1. Amjhore, Shahabad Distt. Bihar	124 sq. Km.	40%	385
2. Saladipura, Shikar Distt. Rajasthan	..	22.5%	115
3. Ingaldhal, Chitaldurg District, Mysore	40 sq. miles.	25.30%	2
4. Simla Area, Himachal Pradesh	No precise information is available. The deposit is, however, insignificant.		

6.61. Of the above mentioned deposits, only an area of 2.7 sq. Km of Amjhore deposits is at present under exploitation by the Pyrites & Chemical Development Co., a public sector undertaking under the Ministry of Petroleum & Chemicals. The development of the mines for an annual production of 2.4 lakh tones of pyrites ore is under implementation. The Project is expected to go into production by the middle of 1968. The Company has also programmed to mine an additional 1 million tonnes of pyrites from Amjhore deposits and the Preliminary step of intensive exploration has been taken.

6.62. It has been decided that the Saladipura deposits should also be developed by the PCDC. The Company has prepared a feasibility report on the basis of the available data.

6.63. As for the Mysore deposits, the Department of Geology and Mines, Mysore are presently conducting exploratory work. The Mysore Government have also formed a Pyrites and Copper Company.

6.64. In the immediate future, 2.4 lakh tonnes of pyrites will be produced from Amjhore annually. There is a further programme of producing 1 million tonnes. As per the feasibility report of DCDC. 3 lakh tonnes of pyrites per year could be produced from the Saladipura areas. If all the projects materialise as planned, pyrites will provide 500,000 tonnes per year in terms of sulphur by about 1975. The estimated local requirements of sulphur in that year, however, stands at about 2 million tonnes. It may be noted that the Fertilizer needs are growing and accordingly the demand for sulphur is also likely to grow, though not at the same rate.

C—Potassic Fertilizers

Potassic Minerals

6.65. There are no known deposits of potassic minerals in India. The only source of potassium is the bitterns from marine salt works which contain about 2.5 per cent of potassium chloride. It is not economical to recover potassium chloride from bitterns directly on account of this low percentage but when bitterns are evaporated mixed salt containing about 20 per cent of potassium chloride is obtained. India's production of marine salt is of the order of 4.3 million tonnes/year. For every hundred tonnes of Marine salt produced, about 6 tonnes mixed salt produced, about 6 tonnes mixed salt is obtained. Potassium salts that can be recovered from the mixed salt are potassium chloride (KCl), Potassium schoenite ($K_2SO_4 \cdot Mg \cdot SO_4 \cdot 6H_2O$) and potassium sulphate (K_2SO_4). All the three can be used as Potassic fertilizers. Processes for the production of these potassium salts from salt bitterns have lately been developed and commercial production of potassium chloride and potassium schoenite is expected to start soon. But the salt works are spread all over the country and it is not possible to obtain large quantities of bitterns in one place for processing. Further, the bitterns are discharged from the salt works twice in a season and only for a few days on each occasion. Storage of bitterns for ensuring a regular supply to a potassium chloride recovery unit throughout the year becomes rather unecoromical. Assuming, however, that all potassium salts are recovered from available bitterns, the total recovery is not likely to exceed 40,000 tonnes in terms of K₂O. This is only a fraction of the requirements of potassic fertilizers which are estimated at 0.70 million tonnes per year in terms of K₂O by 1970-71 and large imports of potassic minerals are unavoidable.

6.66. The entire requirements of Potassium fertilizer are currently being met through imports. There are however, possibilities of recovering the Potassium Salt Bitterns. A considerable amount of research work in this direction is stated to have been already done by the Central Salt and Marine Research Institute, Bhavnagar. This work, however, is yet to be brought into fruision on a commercial scale.

6.67. The Committee understand that out of 1 million tonnes of phosphatic fertilizer which is the target fixed for the Fourth Plan period, a considerable portion i.e. about 0.72 million tonnes will be based on imported sulphur and rock-phosphate. Hence in order to achieve this target it is imperative that a regular and uninterrupted supply of imported raw materials is made available to the fertilizer factories on a high priority basis. In view of its world-wide shortage the Committee desire that no efforts should be spared by Government to procure sulphur. In this connection they welcome the constitution of the Sulphur Advisory Committee:

in the Ministry of Commerce and the Fertilizer Raw Materials Committee consisting of representatives of Fertilizer Association of India, Fertilizer Corporation of India and FACT to advise the Ministry of Petroleum & Chemicals. The Committee hope that problems relating to provisioning, import, allocation and distribution of raw materials will be tackled speedily and satisfactorily in the interest of smooth running of the factories and that difficulties which were faced in the recent past in this regard will be solved.

6.68. India suffers from lack of indigenous sources of sulphur and rock phosphate. It is understood that owing to universal chronic shortage of sulphur various processes for the production of phosphatic fertilizers without the use of large quantities of sulphur are under study in various parts of the world. The Committee suggest that Government should keep themselves abreast and take full advantage of such technological developments so that India may reduce her dependence on imported sulphur to the maximum extent possible. It is, therefore, essential that vigorous and intensive efforts should be made for exploring, prospecting and exploiting the rock-phosphate and pyrites deposits in U.P., Madhya Pradesh, Rajasthan and Andhra Pradesh. The Committee are glad to learn that the increasing shortage of sulphur and its high cost has turned Government's attention to the production of nitro-phosphates in some of the factories, e.g. Trombay Fertilizer Factory which eliminates the use of sulphur.

VII. DEVELOPMENT OF FERTILIZER TECHNOLOGY

A. Growth of Technology

7.1. The inventions which are embodied in fertilizer technology were made early in the century. The growth of the industry has been gradual upto the end of the Second World War. After this period the growth has been abnormal due to the pressure of rapidly rising population. The improvement in technology or rather of techniques have largely been in the direction of increases in size of individual units. Better utilisation of energy within the process has become possible on account of this and without changing the essential characteristics of the process, economics have been achieved both in capital cost and operating expenses. The previous tendency towards multiple units has been overcome by a strong predilection of single large units. This has been possible due to improvements in fabrication techniques, adjustment of processes to limitations brought on by the size factors, closer integration of energy utilisation and increasing dependability of running equipment, process optimisation and automatic control. The progress has been spurred by demand and cover the entire field of the industry.

7.2. While this has been most spectacular in the ammonia industry, where as late as 1963, a stream of 150 tonnes day was considered big, it is no longer inconceivable to talk a single stream of 2000 tonnes/day. A similar phenomenon has taken place in the urea manufacture also. Phosphoric acid has been another field where large single stream plants have become common, a 500 tonnes of P_2O_5 per day stream is a usual size at the present and has been achieved in compact trouble free plants which are in distinct contrast to the plants of earlier days.

7.3. In so far as India is concerned many of the plants which are in operation today are based on the older conception of small multiple units. The first of the large size plants based on the new single stream principle are the Cochin and Durgapur plants. The special technological features, adopted in the new fertilizer projects as compared to the now existing units, are mainly confined to the following improvements:

- (i) Higher capacity plants are adopted into single stream units and thus economising on first cost of plant;

- (ii) Use of naphtha or natural gas have come into prominence on account of the improvements in steam reforming process, the materials of construction and catalysts.
- (iii) The use of centrifugal compressors with steam turbine drives enabling integration of energy balances in large scale single stream ammonia plants.

7.4. It has been stated that centrifugal compressors have been incorporated in the ammonia plants at Durgapur, Cochin, Barauni, Namrup II and Madras in public sector and Goa, and possibly in Mirzapur projects in the private sector. It has been further stated that the research and development programme in the developed countries is intensive and continuous improvements in technology could be anticipated. One example of recent development subsequent to the sanctioning of the projects mentioned above is the new stripping process for urea. Government consider that this process is also likely to be adopted in this country in some of the private sector plants in the future.

7.5. The Committee are glad to note that a beginning has been made with the large size plants based on the new single stream principle in ammonia and urea production by setting up the plants at Cochin and Durgapur. They also note that most of the new plants will be producing urea which is the most concentrated nitrogen fertilizer and also complex fertilizers. The larger production of more concentrated fertilizer will also help in reducing transport and distribution costs. Recent advances in the technology of fertilizer production has been phenomenal in the developed countries. The Committee would like to stress the need to keep abreast of the new ideas and techniques in the fertilizer industry and hope that Government will make full use of the fast growing technological advances in this field and use them effectively in the new plants under construction/contemplation.

B. Process know-how design and Engineering

Role of Planning and Development Division of Fertilizer Corporation of India and FACT Engineering and Design Organisation

7.6. In order to equip the country in fertilizer technology and accelerate the process of self-reliance there are today two major design, research and engineering organisations in the public sector fertilizer industry. These are (i) Planning and Development Division of the Fertilizer Corporation of India; and (2) FACT Engineering and Design Organisation, called FEDO. Their functions are briefly given below.

(i) *Planning and Development Division, FCI*

7.7. The larger of the two organisations is the Planning and Development Division of the Fertilizer Corporation of India, hereafter called

'P&D' with the headquarters and major facilities adjacent to the Sindri Unit. This organisation had its origin in the Technological Department of the Sindri Fertilizer Plant, established in 1951.

7.8. In 1955 the Government of India, on the recommendation of an expert (provided under the UNTA programme) decided to develop the Technological Department at Sindri Fertilizers and Chemicals Ltd., into a Central Technical Institute for providing services on Research, Development, Design and Engineering for the fertilizer industry in India. In 1961 when the Fertilizer Corporation of India Ltd. was formed, all the planning, design, research and engineering functions and personnel at Sindri were placed under a new division called the Planning and Development Division.

7.9. P&D is presently composed of about 250 engineers and scientists engaged in research and development. About 300 engineers and drafting staff are engaged in process design and design of major chemical works, pilot plants and the production of drawings and specifications for the main plants, including supervision or procurement and delivery of equipment to the project site. About 500 sub-professional and administrative personnel such as operating and service technicians, clerks, typists and miscellaneous labour ranks. P & D develops process design on its own and also contracts with foreign companies for use of non-Indian know-how under licences. These foreign companies are also supplying some major equipment. P & D has been very active in developing its plants and also has established a record in promoting greater use of private indigenous manufacturing and fabricating plants and of aiding these companies to improve their capabilities to produce sophisticated equipment. At the present time P & D is stated to be responsible for the planning, design and procurement of major items on all fertilizer plants being constructed by the Fertilizer Corporation of India.

7.10. It has been stated that the P & D have designed and engineered, to start with, small scale pilot and production plants since 1953-54. Since 1955-56, they have started playing important role in the planning for new projects, designing of pilot plants and small commercial production plants like catalyst plants. Since 1958-59 the Division have embarked upon design and engineering of complete major fertilizer plants. Their experience to date include the 250 tons per day ammonia sulphate plant for Sindri expansion; and the nitric acid and nitro-limestone plants of Rourkela, one of the biggest in the country which went into production in 1961. The know-hows required for the purpose were developed from fundamentals without even purchasing basic know-how from any other firm.

7.11. In 1962, the responsibility for the design and engineering of the sulphate plant at Namrup was handed over to the Division. In addition,

the entire design and engineering of the Korba Plant was also entrusted to it. Subsequently, on a Government directive work on the Korba project was, however, abandoned. The organisation has also designed the auxiliary plants for Gorakhpur. The organisation has undertaken the responsibility of designing fertilizer plants in Cochin and Durgapur, based on the know-how which it has secured from Montecatini of Italy. This organisation is considered to be a storehouse for technical knowledge so far as the fertilizer technology is concerned.

7.12. It has also acted as consultants for Gujarat State Fertilizer Company Ltd. to scrutinise the tenders received and drawing out contracts for the same. The Division was appointed as advisers by the Industrial Development Bank of India and the Industrial Finance Corporation to scrutinise the loan application from GSFC. It submitted to IDBI and IFC detailed report on the viability of the GSFC Project. The Committee understand that the activities of the P & D have resulted in a saving of foreign exchange to the extent of Rs. 4.25 crores (as on 1.8.1966) to the fertilizer industry.

(ii) *FACT Engineering and Design Organisation*

7.13. The other research and engineering group is the FACT Engineering and Design Organisation, hereafter called 'FEDO' located at Udyogmandal Fertilizer Plant near Cochin.

7.14. The FACT Udyogmandal plant was started in 1944 with the design and basic plant engineering being performed by foreign technical organisations. The Development of schemes, layout, some installation and major coordination were carried out by FACT's engineers. With the first plant on stream the engineers of FACT proceeded to plan and executive subsequent expansions, utilising individual chemical plants designed and engineered by foreign firms but with the FACT engineers responsible for the lay out coordination and integration of the entire project. During these expansions FACT formed a Research and Technology Department to perform applied research, related to the processes and extensions of processes being utilised in their Udyogmandal plant. In 1965, the research, process and plant design and engineering were combined into a separate division called FEDO.

7.15. This organisation at present is composed of 132 engineers engaged in process design and the design of major chemical works, pilot plants and the production of drawings and specifications for large fertilizer plants or additions including the procurement and delivery of equipment to the project sites. Fourteen engineers and scientists are engaged in research plus 96 sub-professionals such a draftmen, technicians and clerks.

7.16. FEDO develops process designs related to their present plants and has contracts with foreign technical firms for utilising their designs for chemical plants under licence arrangements. FEDO also licenses foreign firms to utilise designs which they have developed.

7.17. It is stated that FEDO has entered into an agreement with M/s Power Gas Corporation of U.K. for the designing and engineering of Synthesis Gas Plants based upon ICI Steam Reforming Process and Ammonia Synthesis plants based upon IC Synthesis process. Besides it has successfully developed and improved a process for the manufacture of ammonium sulphate from by-product gypsum. In addition, the production of sodium fluoride for the first time in the country has been developed at FACT. The Research Department has also successfully developed a process for the utilisation of waste sulphuric acid from the Travancore Titanium Products Ltd. This process provided a means for the production of ammonium sulphate and rouge (a pigment) as co-products in the recovery of the waste acid.

(iii) *Overlapping Responsibilities of P&D & FEDO*

7.18. Regarding the duplication and overlapping of functions of the two organisations viz P&D Division of FCI and FACT, it has been stated that the two fertilizer projects at Cochin and Durgapur are being designed and constructed jointly by both. The gasification portions of both these plants are being designed by FEDO, while the ammonia synthesis and urea plants are being designed by P&D. In both cases, the owner organisations also provide all the other services including overall management, coordination and the provision of utilities and general services, as well as the gas conversion and purification plants. In areas like ammonium sulphate, out of natural gypsum of sulphuric acid, both companies have the know-how and could design plants. But in the use of by-product gypsum, FACT have established its own process and gained a considerable lead in world industry, with their operating plant at Udyogmandal.

7.19. So far as research is concerned, the P&D is stated to have a very well-equipped laboratory and have been doing work extensively in the field of fertilizers and in particular for the development of catalysts. The Research Department of FACT is a similar organisation. It is smaller compared to P&D's but is more directed towards applied research and the development of products peripheral to the main products. In this respect it has been very successful and had developed several products of commercial value and have patented a number of processes.

7.20. It has been stated that in the possession of know-how a certain amount of overlap is inevitable. Duplication in design and engineering effort is being avoided to a large extent by mutual consultation and co-operative working.

(iv) Combination of P&D and FEDO

7.21. The Study Team recently appointed by the Ministry of Petroleum and Chemicals have observed in their Report that "Basically the P&D Division of FCI has continued to exist broadly as could probably be justified by stated indications of the Government that they expected this organisation to become a full fledged Central Technical Institute performing research and design for the fertilizer industry in India. The Government has not designated P&D as such and has not supplied special funds for its operation. Costs for P&D operations have been an integral part of FCI's operations. In addition, the costs for research, design, and engineering performed by P&D have been combined until recently so that the total costs in any one of these separate fields were not easily determined. Now the costs for design and engineering are being separately accounted for. This will supply management with the information necessary for an evaluation of actual expenditure on research as distinct from design and engineering.

7.22. The FEDO Division of FACT also has a research group but it is comparatively small. They have concentrated mostly on applied research. The Team suggests that "the practice of separate accounting for design and engineering as followed by P&D be adopted also by FEDO." The Study Team have recommended that "the functions of the P&D Division and FEDO be placed under the direction of Technical Director in the Headquarters organisations, thus beginning the process of reorganisation. Shifts in location, personnel or internal lines of responsibility in the individual organisation should not be undertaken at this time."

7.23. The Committee note that there is some element of overlapping and duplication in the present activities of the P&D Division of FCI and the FEDO of FACT. They would, therefore, suggest that these organisations should work in close collaboration with each other so that they operate in a complementary manner. Care should, however, be taken to ensure that available know-how and engineering capabilities of each of these organizations are fully utilized and no avoidable payments in foreign exchange are made for acquisition of services which may be available with one or the other of the organisations and which can be put to mutual help in working out schemes. The Committee hope that when the two organisations are placed under the direction of a Technical Director, as recommended by the Study Team set up by the Ministry of Petroleum & Chemicals, necessary improvements would be made to bring about effective co-ordination and liaison between the two organisations.

Process Know-How

7.24. The term 'fertilizer' covers a large number of products. The process required for each product is different and so also there are wide variations in process depending on the raw material. The basic division is into:

- (i) Nitrogenous fertilizers; and
- (ii) Phosphatic fertilizers.

(i) Nitrogenous fertilizers:

7.25. Ammonia is a basic product in the nitrogenous fertilizer industry and can be made from a variety of raw materials. In India, Nangal produces ammonia from electrolysis of water, Trombay, FACT and Ennore produce it from partial oxidation of naphtha; Neyveli from gasification of lignite; Sindri from coke; Rourkela from Coke oven gas; Namrup from natural gas etc. The latest technology in ammonia synthesis starts from naphtha and uses the Steam Reforming Process. The plant at Gujarat is based on this process as are also the Cochin and Durgapur plants now under construction and several others now under planning or progress.

7.26. The know-how for this process is the patented property of the Imperial Chemicals Industries Ltd. of U.K. and is available under licence to a limited number of firms. The FACT Engineering and Design Organisation, has become a sub-licencee of this process. Licences for ammonia synthesis plant design are held both by the planning and Development Division of the Fertilizer Corporation of India and FACT Engineering and Design Organisation. Licence for the Montecatini process of urea is held by P&D Division of Fertilizer Corporation of India Ltd. which is presently designing and engineering, the urea plant of Cochin and Durgapur Projects. This know-how will also be used for the Barauni and Namrup plants.

7.27. Besides, there are areas within these plants which are even now being designed completely indigenously as these are not covered by specific patents or know-how. Wherever such freedom exists, the two engineering organisations are operating to develop or have already developed their own designs and know-how.

7.28. So far as the products starting from Ammonia are concerned, Nitric Acid and Ammonium Nitrate and Calcium Ammonium Nitrate plants can be designed by P&D Division of FCI. Ammonium sulphate plants using sulphuric acid, natural gypsum or by-product gypsum can be designed by FEDO as well as P&D Division of Fertilizer Corporation of India. Ammonium chloride is a field in which complete indigenous know-how is available with FEDO. P&D Division of FCI has also developed its own technology for the manufacture of some of the catalysts used in fertilizer industry.

(ii) *Phosphatic Fertilizer*

7.29. The basic phosphatic fertilizer is single superphosphate, for which no foreign know-how is required. For phosphoric acid almost the entire detailed engineering can be done in the country and a licence for the most well-known Prayon process has been negotiated by the FACT Engineering and Design Organisation. Ammonium phosphate, which is made out of phosphoric acid can be designed and engineered completely by FEDO.

Manufacture of Catalysis:

7.30. The following catalysts for the fertilizer industry have been developed by the P&D Division of the Fertilizer Corporation of India based on its own know-how:

- (1) HT CO Conversion catalyst
- (2) LT CO Conversion catalyst
- (3) Natural gas/methane steam reforming catalyst
- (4) Methane steam oxygen reforming catalyst
- (5) Naphtha steam reforming catalyst
- (6) Methanation catalyst
- (7) Zinc Oxide based desulphurisation catalyst
- (8) Iron oxide desulphurisation catalyst
- (9) Ammonia synthesis catalyst.

It has been stated that several of the above catalysts have been put to use for the manufacture of fertilizers in Sindri.

7.31. A factory in the private sector (EID Parry) has recently begun to use one of these catalysts. Replacement orders are also reported to have been received from Neyveli Plant and some other factories which had one initial charge of imported catalysts. The total value of catalysts already supplied for use in commercial plants to date is of the order of Rs. 1 crore.

7.32. The new plants to be installed by the Fertilizer Corporation of India are being progressively designed, and engineered on the basis of P&D catalysts. In the Durgapur project for example. CO Conversion catalyst to be used will be of P&D manufacture. In the Barauni and Namrup Finansion projects, the process schemes evolved are such that most of P&D's own catalysts will be used in the operating sequences for ammonia production, starting from either naphtha or natural gas, as raw material viz. (a) primary reformation catalyst for naphtha/natural gas, (b) secondary reformation catalyst for naphtha/natural gas. (c) HT CO Conversion catalyst, (d) LT CO Conversion catalysts, (e) Methanation catalyst and (f) zinc oxide based desulphurisation catalyst. It is estimated that the use of

P&D's own catalysts in these two projects will result in a total saving of Rs. 171 lakhs on account of a consequent increase in the indigenous component of design engineering etc. to a considerable extent.

7.33. The Committee have been informed that the demand for P&D catalysts from fertilizer units other than those owned by F.C.I. is expected to grow more rapidly than in the past when P&D Division demonstrated the successful utilisation of its catalysts in the F.C.I.'s own plant and provide the potential users with the optimisation data guarantees and other essential technical details. It is well known that the cost of catalysts represents a small proportion of the value of a plant and its production, although it is critical to its operating efficiency and profitability. The catalysts users are therefore generally, reluctant to switch over to new makes unless they have the necessary guarantees and the makers win their confidence about the performance of their makes. These developments necessarily take some time.

7.34. The Study Group of the Committee which visited the Planning & Development Division of the Fertilizer Corporation of India in September 1967 learnt that the P&D Division were one of the four firms in the world who knew the know-how regarding the production of catalyst. The Study Group noticed a feeling of disappointment among the scientists|engineers of the Division over the proposal of Government to award a licence to a foreign firm for manufacture of catalysts in collaboration with an Indian firm as they claimed that they were in a position to manufacture these catalysts with the know-how already developed by them.

7.35. During the evidence the question of manufacture of catalysts by M/s Catalyst Chemicals of U.S.A. in collaboration with M/s A. H. Lalji, an Indian firm, also came up for discussion. While clarifying the position, the Secretary of the Ministry of Petroleum and Chemicals stated that "the proposal had been approved in principle for the manufacture of catalyst for the fertilizer, oil and chemical industries in the private sector. F.C.I. has of course been doing a good deal of pioneering work. But in a standard fertilizer plant there are as many as six or eight catalysts in need. F.C.I. have developed two or three of these. There are certain others even in a fertilizer plant which are not covered by FCI's development activities so far. These have still to be imported and as I said there are important catalysts for oil refining, petro chemical plants which are not at the moment under FCI scope of work and Government came to the conclusion that side by side with FCI's own initiative and developmental work there is need and room for the manufacture of a range of catalysts which are not at present made here, which are not available from FCI. This is the basis of the approval which has been given to another project... Now this is a collaboration with an American Company, called Catalyst

and Chemical Inc. of USA which is a world renowned Company. They have given a trial charge of catalyst for the Mathnol Plant. That firm plus an Indian Group—this is a joint venture between Indian Group (Lalji Group in Bombay) and American Co.” When his attention was drawn to the impression in P&D that this type of catalysts could be manufactured by them the Secretary of the Ministry stated that “This is probably a misleading impression that has been given. We have gone into this is very considerable detail as to the work which has been done, the developments which have taken place, the needs of the fertilizer industry in the country and also the needs of other industry. It is always, of course, easy to give a twist to a point of view but I believe in our Ministry there is no intention or no desire what-so-ever to minimise the importance of the work which P&D is doing.”

7.36. Asked further whether it was not necessary for Government to encourage their own department to produce catalysts in preference to a private party, the Secretary of the Ministry stated that “We never considered the public sector for the production of catalysts except to the extent P&D is already operating in the field. We did not go out to seek collaboration in settling up production of catalysts in public sector... P&D is there to take the initiative that it wishes to take to the extent that the FCI finances them. If we find there is greater scope for development of P&D, we will encourage FCI to give them the necessary financial support.”

7.37. In a note subsequently furnished to the Committee the Ministry have explained the position as under:—

“Manufacture of catalysts is not included in the First Schedule of the Industries (Development & Regulation) Act, 1951; hence, no industrial licences is necessary for the manufacture of catalysts. No licence has therefore been granted to M|s Catalysts & Chemicals of U.S.A. or Shri A. H. Lalji their Indian collaborator. However, as the proposal involves foreign investment and foreign collaboration, it has to be approved by Government. These aspects of the proposal are still under consideration.”

About Lalji the facts of the case are as follows: Shri A. H. Lalji of Bombay submitted a preliminary proposal for the manufacture of a range of ammonia, refining and petrochemical catalysts in Bombay with the technical and financial collaboration of M|s Catalysts & Chemicals Inc., USA. The proposal was examined in the light of the detailed estimates of demand worked out in collaboration with the Fertilizer Corporation of India, Indian Oil Company, Oil and Natural Gas Commission (Petrochemicals Division) and the Indian Institute of Petroleum. Shri Lalji then revised his production, details of which are set out in the (Appendix XII). It

will be seen that it contains catalysts used in fertilizers, petroleum and petrochemicals industries. The total capital cost of the project excluding working capital is estimated at Rs. 1 crore. The promoters have proposed an equity debt ratio of 62.5:37.5 M/s Catalysts & Chemicals Inc., USA will hold 50 per cent equity. This will fully cover all the foreign currency required for payment of know-how, engineering, imported plant and equipment.

It may be noted that the know-how and expertise developed so far by the P&D Division of FCI are confined to some fertilizer catalysts only. In other words, there is at present no indigenous know-how available for the manufacture of catalysts in use in the petroleum and petrochemical industries. Even in the case of fertilizer catalysts, a number of items on which the P&D Division has been working is still to be proved on a commercial scale and developed fully for gaining acceptance from potential users. The application of Shri A. H. Lalji was, therefore, examined from three points in view:—

- (i) What is the best method of establishing capacity in the country for producing petroleum and petrochemical catalysts the demand for which is rising fast and for which no indigenous know-how is in sight;
- (ii) How best to safeguard the development of indigenous technology in the field of fertilizer catalysts; and
- (iii) How the manufacture of all kinds of catalysts in the country can be so organised as to claim a reasonable share of the foreign markets, particularly in the Middle East countries.

One of the main attractions of the Lalji|CCI proposal is the manufacture of petroleum and petrochemical catalysts for which no indigenous know-how is presently in sight. But they indicated their unwillingness to go ahead with petroleum and petrochemical catalysts only. One has, therefore, to take a larger national point of view of this context. Theoretically, it may be to the advantage of the country if somebody comes forward to manufacture petroleum and petrochemical catalysts only, thus leaving the fertilizer catalysts to be developed through indigenous know how. But in this highly specialised and restricted field of know-how it is not always possible to persuade the foreign parties to accept such limitations. Government have, however, persuaded them successfully to accept two conditions which are calculated to safeguard the development of the indigenous know-how of the P&D against unfair competition. They are as follows:

- (i) The capacity of the Laljee-CCI plant in respect of fertilizer catalysts will be limited to a portion of the assessed demand on account of private sector fertilizer plants only, leaving

the entire demand of the Government-owned plants and a portion of the private sector plants to be captured by the FCI. More than 50 per cent of the internal demand would thus be available for P&D to meet with its indigenous know-how.

- (ii) Domestic sale of fertilizer catalysts by Lalji-CCI plant will be restricted to pre-determined quantities for five years from the date of commercial production. This is expected to re-lease for export about 50 per cent of all catalysts taken together.

It is proposed to incorporate these conditions suitably in the foreign collaboration agreement at the time of according Government approval. Adequate precautions have been taken to see that the growth and development of indigenous catalyst know-how is not jeopardised in any manner. Simultaneously, all the assistance needed is extended to the P&D Division for speeding up the development and production of catalysts based on their own know-how. For example, it has been decided to use P&D catalysts in the new plants to be set up by FCI at Barauni and Namrup and the required foreign exchange has also been released for organising the production of catalysts in the P&D Division.

The Foreign Exchange saving in this proposal is estimated at Rs. 70 lakhs annually. Foreign exchange savings in establishing domestic manufacture are large since import of Rs. 53 lakhs of raw materials (rare and precious metals or their salts) will yield catalysts of a (c.&f.) value of over Rs. 3 crores. This scheme involves exports valued at Rs. 150 lakhs.

Government have fully considered the impact of the proposal on the activities in the P&D Division in this field. When the proposal was received, Government *suo-moto* called for the reaction of FCI to the proposal. The FCI were not in favour of grant of licence|permission to the party for the manufacture of fertilizer catalysts for which they claimed to have sufficient know-how. They have not come forward to manufacture petroleum and petrochemical catalysts which are also envisaged in the CCI-Laljee proposal. They will, however, have full opportunities to develop, manufacture and promote the use of fertilizer catalysts based on their own know-how.

Design and Engineering

7.38. Till some time ago the designing and engineering know-how required for fertilizer production was not available in the country. Some encouraging developments have taken place in the recent past. As a result we are now in a position to undertake the complete designing and engineering of fertilizer plants with minimum foreign assistance. It has been stated that a beginning has been made in the design and engineering of

complete fertilizer plants by the Joint efforts and licensing arrangements of FEDO and the P&D Division of FCI. Except for highly proprietary areas mentioned earlier no external assistance is required in engineering by the two organisations jointly, in some cases, even individually.

7.39. The Working Group of Planning Commission in its report on advance Planning for Fertilizers for the Fourth Plan has stated that the P&D Division of the Fertiliser corporation is at present capable of undertaking complete designing and engineering, procurement and installation of two plants of about 200,000 tonnes capacity each year. As the establishment of a fertilizer plant takes about 3 years, the organisational arrangement existing with the Fertilizer Corporation is at present considered to be adequate to handle simultaneously about six projects in various stages of preparation and construction. About the FACT, the Working Group are of the view that with further expansion it would also be capable of undertaking the design and engineering of two fertiliser projects every year. The Working Group have further stated that "It has, however, not been possible to put to test the capacity of these organisations at practical plane and to identify such deficiencies as might exist, because neither of these two organisations has so far been given responsibility to completely design, engineer and construct a fertiliser project. The dependence on foreign technology and the need to secure foreign exchange under aid|foreign investment led to contractual arrangements with foreign designers and suppliers so that the planning and designing organisations in the public sector, projects had little significant contribution to make either in the preparatory or in the construction stage of the fertilizer projects currently under implementation."

Expansion of Trombay Unit

7.40. During their visit to the Planning and Development Division of the Fertilizer Corporation of India in September 1967 the Study Group of the Committee came to know that Government had a proposal to entrust the expansion of the Trombay Unit to an American firm on a turn-key basis. During the course of evidence in December 1967, the Secretary of the Ministry of Petroleum and Chemicals in reply to a question stated that the expansion of the Trombay Project would be "on the basis of inviting bids from the American contractors. But, we have made some changes this time. We have stipulated that the American contractors will have to accept the P&D Division or FEDO as an associate for all sorts of jobs. They have accepted this change and we have been able to make that in the expansion of Trombay."

7.41. In a further note furnished to the Committee the position has been clarified as under:—

"The Trombay Expansion Scheme which involves the establishment of an ammonia plant of 1000 t/p[d and other facilities

for manufacture of urea, diammonium phosphate and complex fertilizers has been posed to USAID for assistance. As required under the USAID stipulations, it is proposed to select a U.S. contractor on the basis of competitive tenders. It has, however, been settled that maximum utilisation of design, engineering and construction competence developed in the country will be made full use of. Accordingly, the service of P&D Division of the Corporation and/or FEDO of Fertilizer and Chemicals Travancore will be availed of in the implementation of the project. Further, equipment and materials available in the country will be fully used. The Fertilizer Corporation of India was consulted at every stage and the above approach was settled with its consent. It may be added that no contract has been signed so far and the proposal is still under consideration of USAID."

7.42. The Committee are glad to learn that the Planning and Development Division of the Fertilizer Corporation of India and the FACT Engineering and Design Organisations (FEDO) have made valuable contributions to the development of fertilizer industry in the country. They observe that as a result of past experience gained and accumulated by the engineers, scientists, managers and workers of these organisations over the years, in the design, construction and erection of various machinery and plants it has now become possible to organise full-fledged engineering and design organisations competent to undertake the complete designing and engineering of fertilizer and chemical plants in India itself, a work hitherto undertaken by foreign firms only. The Committee are, however, concerned to note the observations of the Working Group of the Planning Commission that it has not been possible to put to test the capacity of these organisations at practical plane and to identify such deficiencies as might exist, because neither of these two organisations has so far been given responsibility to completely design, engineer and construct a fertilizer project."

The Committee feel that with the experience gained as a result of designing and erecting the two plants at Durgapur and Cochin, the Planning and Development Division and the FEDO would play a greater role and would be able to take over the entire responsibility of designing and engineering of at least two fertilizer plants a year with the know-how developed by them or acquired and purchased from other countries. They have no doubt that the fulfilment of these tasks according to schedule would largely depend on the extent to which the fertilizer production programme can be insulated from the uncertainties of foreign aid and put on firmer ground by greater reliance on domestic capital and equipment and know-how. It hardly needs to be stressed that the utilisation of the indigenous know-how in this vital

sector would not only save considerable foreign exchange on design, engineering and know-how expenses, but would also result in maximum utilisation of the indigenous fabrication facilities for equipment.

7.43. The Committee also feel that with the coming up of a number of new fertilizer plants these organisations, P&D and FEDO, will have to undertake a larger number of assignments in the coming years. They, therefore, suggest that the scope of these organisations should be expanded and strengthened suitably so as to enable them to shoulder the additional responsibilities ahead in the process of rendering on-the-spot expert advice.

7.44. The Committee are unable to appreciate Government's decision to pose the Trombay extension scheme to USAID for assistance particularly when P&D claim that they could undertake this assignment and had amply demonstrated their capabilities by the designing, engineering and installation of the Rourkela Fertilizer group of plants as far as ten years back.

They are of the opinion that projects undertaken with tied foreign loans or on turn key basis often cost much more than similar projects wherein the country is free to utilize its own know-how and equipment to the maximum extent possible.

7.45. As regards the proposal for the manufacture of catalysts by the firm of Laljee in collaboration with M/s Catalysts and Chemicals of USA, it would be seen from the facts furnished by the Ministry that the preliminary proposal submitted by the firm did not include manufacture of catalysts used for fertilizers. It is not clear to the Committee why this item was included at a later stage. With a view to safeguard the development of the indigenous know-how of P&D against unfair competition, Government propose to incorporate two conditions in the foreign collaboration agreement at the time of according Government approval. The Committee have, however, their own doubts whether Government will be able to ensure compliance of the two conditions in actual practice. In these circumstances, anxiety among the scientists and engineers of the P&D Division is understandable. The Committee have more than once deprecated the tendency of depending on foreign capital, technical know-how, import of equipment, components and raw materials, without exploring the possibility of finding these services from within the country. They feel that there is an urgent need to give the much needed encouragement and confidence to the indigenous talent.

C—Fabrication of Plant and Equipment

7.46. The equipment and machinery required for the establishment of fertilizer factories cover a very wide range. Broadly speaking, these can be classified as mechanical equipments covering high medium and low pressure vessels, storage vessels, compressors, pumps, pipes, fitting and valves

etc., electrical equipments such as high rated motors, transformers, switch-gear etc. and industrial instruments. While a number of items of equipment are of standard design and can be procured from specialist manufacturers, several of the other items of equipment required are tailor-made and have to be specially designed for specific use. The main dependence on imports is currently in respect of compressors, pumps, instruments and high pressure vessels.

7.47. The Working Group on Fertilizer and Chemical equipment set up by the Planning Commission to draw up the programme for the Fourth Plan have made estimates of requirements of common items of machinery required in the fertilizer and allied industries. It has been stated that based on these estimates schemes have been drawn up for inclusion in the Fourth Plan for meeting some of the important deficits.

7.48. In a note furnished to the Committee, Government have stated that efforts are being made to achieve self-sufficiency in the manufacture of fertilizer machinery in the country in the next five years in a progressive manner. Some of the important projects which will supply fertilizer plants and machinery are given below:

- (i) The Heavy Plants and Vessel Works, Visakapatnam will have a capacity of about 23,000 tonnes of equipment per annum including heat exchangers pipe fabrication etc.
- (ii) The Foundry Forge Project at Ranchi will meet part of the requirements of high pressure vessels.
- (iii) Valves for fertilizer plants could with slight modification in design be supplied by the Bharat Heavy Electricals Ltd., Tiruchirapalli.
- (iv) High Pressure centrifugal compressors can be manufactured in the Heavy Power Equipment Plant of Bharat Heavy Electricals Ltd. Hyderabad.
- (v) The requirements of instruments for fertilizer projects is expected to be met from the instruments factories proposed be set up at Kota and Palghat (Kerala) as well as other private sector units.

Some other proposals for the establishment of seamless steel pipe plant, second heavy plant and vessels project etc. are also stated to be under consideration by the Ministry of Industrial Development and Company Affairs.

7.49. In reply to a question it has been stated that approximately 35 to 40 per cent in terms of value of the total plant and machinery required for the fertilizer plant are now being made available from indigen-

ous sources. The Committee have also been given to understand that even where foreign assistance is obtained for the establishment of fertilizer plants, the maximum possible amount of indigenous equipment is being insisted upon in each case. The import of equipment in all such cases is said to be subject to detailed scrutiny by the DGTD as usual.

7.50. The Committee have been informed that only 35 to 40 percent in terms of value of the total plant and machinery required for a fertilizer plant is now being made available from indigenous sources. They are, however, happy to note that a major break-through in the indigenous fabrication of plant and equipment would be progressively achieved in the next five years. The Committee have no doubt that with concerted effort from both the public and private sectors and with the encouragement and vigorous follow up action on the part of Government, it should be possible for India to accelerate and advance the pace of self-sufficiency in the manufacture of plant and machinery for the fertilizer project.

7.51. The Committee also consider that it would be necessary and possible to enforce standardisation as soon as a measure of self-reliance is achieved in the matter of equipment. The Committee would like the Government to impress upon the enterprises in the private sector licensed for producing fertilizers with or without foreign collaboration to incorporate into their design and engineering maximum quantum possible of standard indigenously manufactured plant and equipment.

VIII—GENERAL

A—Movement of Fertilizers by Railways

8.1. On account of the largeness of the country and long distances involved, Railways play a prominent part in the movement of fertilizers from the ports|factories to the place of distribution|consumption. In a note furnished to the Committee it has been stated by Government that the Railway Administrations are quite alive to the need for the expeditious clearance of fertilizer both imported and indigenous as well as raw materials to the factories engaged in the production of fertilizers. To this end, their movements have been accorded higher priority as indicated below:

- (i) Imported as well as indigenous fertilizers when programmed and sponsored by the Union Ministry of Food and Agriculture and approved by the Railway Board.
- (ii) Fertilizers and manures from various factories when programmed and sponsored by the State Governments and accepted by the Railways.
- (iii) Fertilizers and manures on trade account which are required for agricultural use, on production of a certificate to the Station Master of the despatching station from the District Agricultural Officer of the receiving District or Officers nominated by States.
- (iv) Raw materials to Fertilizer factories in accordance with the programme fixed from time to time with the approval of the Railways.

8.2. In so far as movement of imported fertilizers is concerned, which incidentally enjoys the same priority as imported foodgrains, it is arranged in accordance with daily quotas which are fixed from various ports every month on the basis of a programme received from the Ministry of Food and Agriculture. A combined requisition for issue of daily quotas separately for foodgrains and fertilizers is received from that Ministry. The total quotas on a combined basis both for foodgrains and fertilizers are notified so as to give flexibility in the offering of this traffic according to the daily needs of local officials at each port. The wagons made available at each Port daily are distributed by the local officials of the Food and Agriculture Ministry for movement of foodgrains and fertilizers depending upon the availability of these commodities at the Port concerned on a particular day.

As the movement on Defence account of operational nature, which enjoys priority Class 'A', is negligible from Ports, movement of imported fertilizers enjoys the highest priority and as such there should normally be no difficulty in meeting the demands.

8.3. In view of the high priority accorded to the movement of indigenous fertilizers and also raw materials to fertilizer factories, there is also normally no difficulty in ensuring their expeditious clearance by rail.

8.4. So far as freight charges for fertilizers and raw materials for the manufacture of fertilizers are concerned, the classification of these commodities has been kept at a very low level. In addition, special concessional rates have also been quoted in certain cases. Details are given below:—

- (i) Manures like farmyard refuse, fish manure, guano, spent mowha flowers etc., have been classified at the lowest level of 22.5A (wagon-loads) and 35-C for smalls. These are the only commodities having such low classification.
- (ii) Chemical manures have also been classified at a low level. Diammophos is charged 40-A (wagon-loads) under Chemical Manures Division A. Other fertilizers like Ammonium Phosphate, Ammonium Sulphate Nitrate, Calcium Sulphate, Superphosphate etc. are charged 35-A (wagon-loads) under "Chemical Manures Division-B".
- (iii) Certain chemicals namely, Muriate of Ammonia, Sulphate of Ammonia, Urea and Muriate of Potash, which can be used both as fertilizers and as chemicals are charged at the lower rate applicable to Chemical Manures, Division-B, when booked as fertilizers, though they are chargeable at a much higher rate when booked otherwise. The classifications of these commodities when used as fertilizers and when used otherwise are shown below for the purpose of comparison:

Commodity	Classification applica- tion when booked as fertilizers		Classification applica- tion for other pur- poses.	
	smalls	wagon-loads	smalls	wagon-loads
Muriate of Ammonia. . . .	50—C	35—A	90—C	80—B
Sulphate of Ammonia. . . .	50—C	35—A	90—C	80—B
Urea.	55—C	40—A	120—C	100—B
Muriate of Potash.	50—C	35—A	90—C	80—B

- (iv) Special concessional rates, equal to class 32-5A, have been quoted for gypsum when booked from certain stations to Sindri Fertilizer Factory for the manufacture of fertilizers.
- (v) Special rates equal to class 32.5-A, against the tariff classification of 35-A, have been quoted from a number of stations for gypsum and lime-stone intended for reclamation of alkali lands.

8.5. During evidence the Secretary of the Agricultural Department stated that "The movement of fertilizer on Railways is in Class 'C' next only to defence and food. Special wagon quota is sanctioned from the various ports under the overall special quota for fertilizer—Over and above this, when there is hold-up of stocks full train loads are moving fertilizers under special permission." About the movement of raw materials, the Secretary stated that it is given Class I, next to fertilizers. We also allow road transport over long distances. The present maximum limit of 25 paise per kilometre ton has never been reached yet. Recently we had big movement from Bombay upto Punjab and Uttar Pradesh, by road transport. From the side of Madras, Mysore, Andhra Pradesh, there are large truck movements. Coastal movement is being organised by Maharashtra. There is trawler movement from some of the ports to minor ports. That also we support. There is the same rate of 25 paise per kilometre ton. Special concessions of railway freight is given by the Railway Board for urea, ammonium sulphate and ammonium chloride. Against the general classification it is less than half in some cases." About Naphtha, the Secretary of the Ministry of Petroleum and Chemicals stated that "it being a raw material is given concessional rate. But the railways have been thinking of withdrawing this concession. This matter is now under discussion between ourselves and the Railway Ministry. We feel that it would be a retrograde step."

8.6. The Committee are glad to note that the Railway Administrations are fully alive to the need for the expeditious clearance of fertilizer both imported and indigenous as well as raw materials to the factories engaged in the production of fertilizers and have accorded priority for this purpose. They hope that fertilizer units will keep constant watch over their production and take urgent measures in consultation with the Railway to despatch the products so as to avoid accumulation in the factories. The Committee consider that a certain amount of advance planning would be necessary to ensure movement of supplies from the ports/factories to the centres of distribution/consumption. This would be possible if the fertilizer requirements of the various States and other consumer interests are properly assessed to correlate despatches from the ports/factories to avoid unnecessary delays and expenses on movement.

B. State Advisory Committees on Fertilizers

8.7. According to a Government note furnished to the Estimates Committee, the Sivaraman Committee is stated to have recommended that for proper distribution of fertilizers, the State Governments|Union Territories should establish District Fertilizers Committees under the Chairmanship of the District Collectors acting in consultation with the District Agricultural Officer|Deputy Registrar Cooperative Societies/Panchayat Raj representatives and the wholesale agencies. A similar committee at the State level under the Chairmanship of the Head of the Department charged with the responsibilities for Agricultural production should also be set up. The responsibilities of these committees would be primarily:

- (a) Proper estimation of fertilizer demand in the district and in the States;
- (b) Proper control over indents to ensure availability to the full extent of allocations made by the Central Government;
- (c) Selection of distribution agencies for the entire quantity allotted to the District or State, while giving preference to Cooperatives for the quantities which they are willing and able to handle; and
- (d) Equitable allotment of distribution agencies to ensure that each distributor opens adequate number of retail depots in the interior areas.

8.8. The above mentioned recommendation is stated to have been commended by Government to the States/Union Territories. The following States have since set up Advisory Committees at State level:—

1. West Bengal
2. Orissa
3. Bihar
4. Madras
5. Mysore
6. Kerala
7. Maharashtra
8. Gujarat
9. Punjab.

8.9. In Rajasthan and Andhra Pradesh, there are no State level Committees and the Agriculture Production Commissioner coordinates the work. All the above States (except Kerala, Madras, Bihar and West Bengal) have District level Committees also. No reasons or non-constitution of the Committee have been given.

8.10. It has been stated that the Pondicherry Administration has no objection for setting up a Committee at Regional level.

8.11. The following States/Union Territories have not set up any Committee as they feel that the existing distribution arrangement is satisfactory and there is no need for setting up such committees:

1. Delhi
2. Andamans
3. Jammu & Kashmir
4. Madhya Pradesh.

8.12. The Government of Asam, Uttar Pradesh and Himachal Pradesh have not expressed any views on the recommendation.

8.13. The composition of the State level Committee in Maharashtra is shown below:—

- | | | |
|--|---|---------------------|
| (a) Minister of Agriculture—Chairman | } | Official
Members |
| (b) Director of Agriculture | | |
| (c) Registrar Cooperative Societies | | |
| (d) Fertilizer Association of India. | | |
| (e) Manure Mixing Society. | | |
| (f) Cooperative District Wholesalers. | | |
| (g) Private Manure Mixing Firms. | | |
| (h) Superphosphate manufacturers. | | |
| (i) Deccan Sugar Factories Association, Bombay. | | |
| (j) Mambai Rajya Shakari Sakhar Karkhana Sangh Ltd., Bombay. | | |
| (k) Apex Cooperative Marketing Society. | | |
| (l) 4 progressive farmers one from each district. | | |
| [(d) to (l) Representative non-official members.] | | |

(Details of the composition of the committees in other States where set up have not been furnished to the Committee).

8.14. The Committee note that in implementation of the recommendation of the Sirvaraman Committee some States, viz. West Bengal, Orissa, Bihar, Madras, Mysore, Kerala, Maharashtra, Gujarat and Punjab, have set up Advisory Committees on Fertilizers, while others have either not set up or do not feel any need for such committees. As the Advisory Committee consists of persons concerned with the use and distribution of fertilizers, the Committee feel that its constitution would enable the State Governments to better understand and resolve the various problems that might arise from time to time during the course of execution of various schemes on fertilizers. They would, therefore, like the Union Government to use their good offices over such of the State Governments/Territories as have not yet set up the advisory

committees with a view to persuade them to do so in their respective States/Territories. The Committee also feel that there is need to define the composition and functions of the advisory committees so as to bring uniformity in their outlook in all the States/Union Territories as far as possible.

C. Location of Plants

8.15. In a memorandum submitted to the Committee the Fertilizer Association of India have suggested that "in deciding the location of projects the criteria, viz., economy, efficiency and lower costs of production should form our judgment. Quite often, political factors bulk too large in this matter and economic considerations tend to be ignored. Among other reasons, employment potential in the region is a strong factor which impels State Governments to make a plea for locating a factory in their area, irrespective of whether or not the location is favourable from the point of view of raw material availability or access to markets. It must be emphasised that nearness to the market or the raw material sources vitally affects the economy of a fertilizer project. Creating employment opportunities could only be a secondary factor, especially since technological advances have reduced the requirements of operative personnel."

8.16. In a note explaining the criteria laid down for the location of the fertilizer plants, Government have stated that "the primary factor in deciding the location of fertilizer factories is the availability of raw material. In the new plants that are being set up at present the raw material used is naphtha. The location of factories at Visakhapatnam, Gujarat, Cochin, Madras, Barauni, Trombay is based on this consideration. Namrup is selected as the site because the natural gas is available there.

The factors relating to the availability of land, power, water and transport facilities for the distribution of the products are also taken into account. The demand for fertilizers and the readiness to absorb the products have also influenced the location of the factory. The port sites like Goa, Mangalore, Kandla, are favoured because it is more economical to produce complex fertilizers which require import of large quantities of sulphur and rock phosphate or phosphoric acid.

8.17. The Committee consider that at the present stage of development of fertilizer industry, the need for bringing down the cost of production of the plant nutrients is of paramount importance. The interest of the country, as a whole, would be better served if the location of the project is decided by the logic of economic factors so as to maximise production at the most competitive rates as compared to international prices. The choice of plant location should be based on the total economies which can be realised through consideration of all factors involved, such as plant size, availability of raw materials, power and water, transportation and

marketing facilities in the context of the infra-structure available. Significant capital savings are possible by judicious selection of the site where import and plant units could be located from within the available area. Collection of dependable contour and soil data (for foundations design) is an essential first step. Had these points been taken care of, the wastage of time and money in setting up plants at Namrup and Gorakhpur could have been avoided. In this connection the Committee would also like to draw the attention of the Government to their recommendation on location of industries in paras 3.180 of their Ninth Report (Fourth Lok Sabha) on Industrial Licensing.

D. Need for close coordination amongst various Ministries concerned with fertilizers

Responsibility for production, pricing, distribution and imports

8.18. At present the production of fertilizers is handled by the Ministry of Petroleum and Chemicals along with Ministry of Iron and Steel (for Rourkela and Neyveli fertilizers), their pricing and distribution is done by the Ministry of Food & Agriculture (Department of Agriculture) while arrangements for import of fertilizers are made by the Ministry of W.H.&S. and for raw material like Rock phosphate and sulphur the Ministry of Commerce (STC). Asked as to whether it would not be advantageous if all these functions relating to fertilizers *i.e.*, production, pricing, distribution and imports were handled by one Ministry, the Secretary to the Ministry of Petroleum and Chemicals stated during evidence that "Our view is that these functions may be kept where they are today. They represent two different lines of expertise and administrative action and we have not found any conflict. As a matter of fact, they are distinct operations. To the extent that the production units will in future be playing their part in the distribution, I think some harmonisation will come about in any case. But so far as governmental policy is concerned, distribution aspects are essentially related to agriculture, growing of food and other crops, and I think the allocation of fertilizers and control over the fertilizer distribution etc., are more appropriately left with the Ministry of Food and Agriculture." In reply to a further question whether there is possibility of conflict of functions arising amongst these Ministries, he added "We have discussed it amongst ourselves and we believe that there is likely to be no conflict, nor is there likely to be any difference of opinion in regard to these functions. In any case, we act in very close consultation. There is a Secretaries Committee on Food and Agriculture and Fertilizers; similarly there is a Cabinet Committee. It gives special attention to these areas of operation."

8.19. It has been stated that the Ministry of Petroleum and Chemicals examines in consultation with the Ministry of Food and Agriculture the question of establishing capacity for the production of required quantities of fertilizers in keeping with the resources of the country, financial and others, including assistance from abroad. The Ministry of Petroleum and Chemicals decides the pattern of production and the question of production of each project in consultation with the Ministry of Food and Agriculture. Aspects regarding the financial requirement for the projects are settled by them with the Ministry of Finance

8.20. As regards pricing, upto 1966-67 the Central Fertilizer Pool used to take over the entire indigenous production of straight nitrogenous fertilizers produced in the public sector. The new fertilizer policy, including system for fixation of prices by the producers, has been introduced since 1966-67. The price of the indigenous fertilizers, produced at the public sector factories, still taken over by the Central Fertilizer Pool (called the retention price), is decided in consultation with the Ministry of Petroleum and Chemicals and the Ministry of Finance (including the Chief Cost Accounts Officer).

8.21. In a note furnished to the Committee it has been stated that no difficulties have arisen in the past amongst the concerned Ministries (namely, the Ministry of Petroleum and Chemicals, Food and Agriculture, Industrial Development and Company Affairs, Finance) in deciding the various facts of the fertilizer policy and its implementation in regard to the actual establishment of the fertilizer production capacity.

However, the factories have in the past gone into production much behind the schedule. With a view to keeping a watch over the progress of establishment of the factories, and to remove bottlenecks that may arise and to expedite clearance of licences etc., Government has set up a special committee of Secretaries consisting of the Secretaries of Ministries of Petroleum and Chemicals, Agriculture and Finance.

8.22. The Committee are glad to learn that there is complete accord and close consultation amongst the various Ministries concerned with the planning, production, pricing, distribution and import of fertilizers. The Committee, however, consider that in view of the importance of the fertilizer programme in the new strategy of food production it is essential that this team spirit and coordination amongst the various Ministries is not only maintained but further strengthened. They would further emphasise that the procedure for consultation should be simplified and streamlined so as to ensure that all procedural delays are eliminated and speedy decisions are taken.

Administrative control over fertilizer factories

8.23. All fertilizer factories in the Public Sector, except the Rourkela & Neyveli are at present being administered by Ministry of Petroleum and Chemicals through F.C.I. & FACT. As regards Rourkela & Neyveli, they are under the administrative control of Ministry of Steel & Mines (Department of Iron & Steel) and Ministry of Steel & Mines (Department of Mines & Fuel) respectively. The reasons for such arrangements are stated to be as follows:

Rourkela Fertilizer Factory

8.24. The working of the Rourkela Fertilizer Plant is intimately linked with the operation of the Rourkela Steel Plant since the Fertilizer Factory depends upon the Steel Plant for the supply of its principal feed stocks, namely coke oven gas and nitrogen. In addition, it draws upon the maintenance resources of the steel plant for maintaining its plant and equipment. It is also dependent on the steel plant for power, water and other utilities. The present administrative arrangements have been devised in view of this dependence, in fact, the Rourkela Fertilizer Corporation of India from the time it was commissioned in October, 1962 till April, 1964. During this period, some difficulties came to notice arising out of the fact that the steel plant and the fertilizer plant were under different managements. It was, therefore, decided to transfer the Rourkela Fertilizer Factory to HSL and to place it under the General Manager of the Rourkela Steel Plant.

Neyveli Fertilizer Factory

8.25. The Neyveli Lignite Corporation is an integrated Project consisting of a Lignite Mine, a Thermal Power Station, a Fertilizer Factory producing Urea and a Briquetting and Carbonisation Plant producing carbonised briquettes, all the latter three using lignite as raw material. All the units are situated at the pithead and are inter-dependent. The mine supplies the raw material *viz.* lignite to the other unit. Power required for the operation of the mechanised mine, the Fertilizer Plant and the Briquetting & Carbonisation Plant, is supplied by the Thermal Power Station. And the requirement of water for the industrial units is met from the water pumped out of the artesian wells in the mines. The project was thus conceived as an integrated one requiring unified control for proper co-ordination and functioning. If different units of the Project are controlled by different administrative Ministries serious difficulties will arise in ensuring co-ordinated functioning of the project as a whole.

8.26. In the present set up, the Ministry of Steel, Mines and Metals is responsible for the maintenance, production and operations of the fertilizer plants at Rourkela and Neyveli. That Ministry maintains close liaison with Petroleum and Chemicals Ministry. Periodical reports on production are directly sent to the Ministry of Petroleum & Chemicals by the two plants in

order to enable this Ministry to keep a watch on the overall production of fertilizers in the country. Whenever necessary, the Ministry of Petroleum & Chemicals advises other Ministries about special steps to be taken for improving production and depute its technical officers to the units for the same purpose with their consent. As regards distribution of fertilizers, general policies are laid down by the Ministry of Food and Agriculture in consultation with the Ministry of Petroleum & Chemicals. These policies apply to Neyveli and Rourkela factories in the same manner as to the public sector factories under the administrative charge of the Ministry of Petroleum and Chemicals. Close liaison is maintained between the three Ministries in regard to distribution, pricing and other policies.

8.27. In reply to the enquiry whether any difficulties have been experienced in the working of such arrangements, it has been stated that "the present arrangements have worked fairly satisfactorily, although the production of the Rourkela Fertilizers plant has been somewhat less than 50 per cent of its rated capacity; this has been mainly due to certain technical difficulties which are being set right with the installation of Naphtha Reforming Plant which is expected to be commissioned in the last quarter of 1968. A high level Technical Committee has since been appointed to review the working of the By-product plant of the Rourkela Steel Plant and supply of coke oven gas to the Rourkela Fertilizers plant and recommend measures necessary to secure rapidly full and efficient performances. Some experts of the Ministry of Petroleum & Chemical are members of this Committee.

8.28. The question of maintaining close liaison and coordination in the working of the aforesaid two factories between the Ministry of Petroleum and Chemicals and the Ministry of Iron & Steel was also discussed with the Secretary of the Ministry of Petroleum & Chemicals during evidence. The Secretary stated that "from purely administrative angle I think the existence of these factories as appendages of Neyveli or HSI is more convenient. They share so many services. . . . Production part is our responsibility. We are establishing, shall I say the predominance of the Ministry of Petroleum and Chemicals as a guide, as a leader of these units in this way. In the case of Neyveli we have set up a technical visiting committee composed of the experts in the Ministry of Petroleum and Chemicals to guide and watch the performance, to study the actual operations and suggest changes, etc. We are trying to do that also for Rourkela plant. We have just now got down to demarcation of area of operation. This idea occurred to us in the last two, three months, watching the continued poor performance at these plants and our responsibility to produce fertilizers. We felt that we have to have a role in the operation of plants."

8.29. In reply to the question whether the Ministry of Petroleum and Chemicals had any control in the running of the Plants, it is stated that the Ministry of Petroleum & Chemicals had a Director in the Board of Neyveli but not in Rourkela.

8.30. The Committee note the heavy shortfalls in production in both the Rourkela and Neyveli Fertilizer plants. They feel that there is need for keeping a close watch on the production, maintenance and operations in these two plants through regular reports, returns and visits of the technical committee set up for the purpose, and giving the two factories the expertise available with the Ministry of Petroleum & Chemicals. The Committee further recommend that with a view to associate the Ministry of Petroleum & Chemicals more actively in the operation of the two factories, it should be represented in the Board of Directors both at Rourkela and Neyveli. ;

E. The Fertilizer Association of India.

8.31. In a note furnished to the Committee, Government have stated that the Fertilizer Association of India undertakes the collection, study and dissemination of information relating to the fertilizer industry, with specific reference to production and distribution of fertilizers, including the agronomic aspects. Important and relevant data on the above fields in respect of other countries of the world are also published by it in its annual publication Fertilizer Statistics.

8.32. The Association was set up in 1955 as a non-profit making body registered under the Indian Company's Act. Its membership includes both the public and private sector industries, and the coverage of its activities includes producers, importers|exporters and distributors of nitrogenous, phosphatic, potassic, complex and mixed fertilizers, as well as of raw materials. The Association has four regional offices at Madras, Bombay, Calcutta and New Delhi. It has an elected Board of Directors consisting of representatives of nitrogenous, phosphatic, complex and mixed fertilizer manufacturers.

8.33. It has been stated that the Association maintains a close and cordial relationship with the Government both at the Centre and at the State levels, and is represented in several important high level official committees relating to the fertilizer industry both at the Centre and the States.

8.34. Government have recently entrusted the Association with the task of fixing the price of super-phosphate produced in the country on the basis of a quarterly review of the costs of production.

8.35. In the context of the programme of massive increase in fertilizer production in the country during the next five to ten years, the Association felt the need for a proper forum for fertilizer technologists to meet and keep abreast of developments in the field of production technology, and to this end, has created a Fertilizer Institute Division. The objectives of the Institute are to promote collection, study and dissemination of information, particularly with reference to the technological and related aspects of fertilizer production. Besides the activities outlined above, the Association also initiates, undertakes and promotes, on its own and in association with other recognised institutions, investigations on problems relating to the fertilizer industry, including agronomic studies in the application of fertilizers.

8.36. The information so assembled by it from different Government bodies, research institutions and the fertilizer industry itself—both in India and abroad—is disseminated through its various publications which have a wide circulation and through replies to enquiries from all over the world. The Association's annual publication, "Fertilizer Statistics" enjoys a high reputation in India and abroad for its coverage and authenticity of data presented. The last two editions of this book for the years 1965-66 and 1966-67 have been enlarged in scope, and more information on fertilizer raw materials, subsidies, off-season rebates, analysis of various grades of rock-phosphate, fertilizer recommendations in the different States of India, etc. have been added. Information in this book also pertains to cropping pattern, manuring seasons, etc. At the end of every agricultural year, the Association publishes an "Annual Review" giving details of fertilizer production and consumption in the country along with estimates for the ensuing year.

8.37. Besides these major annual publications, the Association is stated to have in the last two years released the following publications:

- (i) Fertilizer Handbook—This book which contains valuable agronomic information on fertilizer use, been highly appreciated by extension workers, both in the Government, as well as in the industry.
- (ii) Estimates of Fertilizer Consumption in India in 1970-71 by Dr. R. L. Donahue—This publication presents detailed estimates of fertilizer consumption in India in 1970-71.
- (iii) A Fertilizer Credit Committee set up by the Association under the chairmanship of Mr. B. Venkatappah, Member, Planning Commission, has after extensive field investigations submitted a Report on Fertilizer Credit.

- (iv) In addition, numerous *ad hoc* publications on fertilising various crops have been put out as crop pamphlets.
- (v) The monthly journals Fertilizer News and Khad Patrika (Hindi) published by the Association at its headquarters and similar quarterly journals issued by the regional branches in the respective regional languages, contain useful articles from recognised authors on various aspects of the use of fertilizers as well as those relating to production and distribution. Brief information about current happenings relevant to fertilizer development in India—is also published in these journals.
- (vi) Since 1965, the Association has been organising seminars in conjunction with its annual general meetings, on specific and important aspects of fertilizers. The proceedings of the seminars including papers presented by the participants both from India and abroad, the discussions and final recommendations made in each seminar are regularly published.

The conclusions of the seminars are forwarded to concerned departments of the Government for their consideration and follow-up action. The Association provides statistical and other information to different Ministries, State Governments and the industry itself, in response to enquiries from them, and also through voluntary representations or memoranda.

8.38. According to the information furnished to the Committee the Association exchanges regularly the results of studies on fertilizers in India and other publications issued by it with other countries/overseas organisations, through its Overseas Associate Members and through other firm contacts, of which a representative list is given below:—

- (i) Food and Agriculture Organisation, Rome.
- (ii) International Super-phosphate Manufacturers' Association, London.
- (iii) British Sulphur Corporation, London.
- (iv) National Fertilizer Development Centre, Tennessee Valley Authority, Muscle Shoals, Alamba, U.S.A.
- (v) American Sulphur Institute, U.S.A.
- (vi) National Plant Food Institute, Washington, U.S.A.
- (vii) European Nitrogen Association, Paris.
- (viii) Organisation of the European Community Department, Paris.
- (ix) The Fertilizer Society (U.K). London.
- (x) Japan Ammonium Sulphate Association, Tokyo.
- (xi) International Rice Research Institute, Manila, Philippines.

- (xii) American Potash Institute, U.S.A.
- (xiii) American Agricultural Chemicals, U.S.A.
- (xiv) Woodward & Dickerson, Philadelphia, U.S.A.
- (xv) Central Resources Corporation, New York, U.S.A.

8.39. The Committee note the growth of Fertilizer Association of India as a representative body of the fertilizer interests in the country voicing the views of the industry. They are given to understand that the Association is the only forum for organizing seminars, symposiums etc. on problems of common interests to both the public and private sectors in the matter of cost, financing, design, engineering, construction and operation of fertilizer projects and production, pricing and distribution of fertilizers. The Association is thus rendering useful service in making the country conscious of fertilizers and in focussing the attention of the industry and the Government to the various problems of the fertilizer industry. The Committee are not aware of the facts and circumstances under which the responsibility for fixing the price of super-phosphate has been entrusted by Government to the Association. As the Association largely represents the producers of fertilizers and not the large mass of consumers throughout the length and breadth of the country, the Committee consider it desirable that due representation should also be given to the consumers in the matter of fixing the price of super-phosphates. They hope that appropriate steps would be taken by Government to ensure that the interests of farmers are safeguarded in the matter of pricing and distribution of fertilizers.

8.40. The Committee are glad that the Association have also taken initiative for setting up the Fertilizer Institute to promote collection, study and dissemination of information with particular reference to technological and other related aspects of fertilizer production and also agronomic studies in the application of fertilizers. While welcoming this move the Committee trust that the Institute would try to establish cooperative working relationship with such organisations and institutions as are already engaged in solving technological designing and engineering problems of the fertilizer industry as also the agricultural research institutions now functioning in the country under the Central and State Governments.

IX CONCLUSION

9.1. India is at present passing through a critical period on the food front which has become the most pressing problem facing the country. While on the one hand the population of the country is increasing, at a very fast rate, on the other the area of arable land *per capita* is decreasing. It is clear that if this population is to be fed, more food, fibre and other agricultural products must be produced from an acreage, that cannot increase or at any rate can increase slowly. This leaves us only with the last alternative of increasing the productivity of land. It has been proved that together with modern agricultural practices and better farm management the application of fertilizers which contain the nutrients required for plant growth, can go a long way to raise productivity and production of agricultural commodities to meet the growing demands. In other words it is a question of replacing soil nutrients depleted by centuries of cultivation and at the same time adding more to ensure higher yields from every acre.

9.2. The role of fertilizers in agricultural production and economic development has been amply proved by the practices of several developed countries. The need of the hour is more production which means more fertilizers. Achievement of self-sufficiency in food has been set as the objective of the Fourth Plan. Many steps are being taken in an integrated manner in that direction and it is now accepted that chemical fertilizers constitute the most effective input.

9.3. The world consumption of fertilizers has increased rapidly in recent years and is expected to maintain this growth during the next decade. India is still far below the world average in the use of the three plant nutrients i.e. Nitrogen, Phosphorus and Potash. Not only the consumption of fertilizers in India is low as compared with European countries and several of the Asian countries but is also substantially below the average world consumption. With the introduction of high yielding varieties of crops which remove from the soil a proportionately larger amount of plant nutrients, the dosages of fertilizers to replenish the soil will have to be substantially higher.

9.4. The use of fertilizer on an intensive scale is one of the keynotes of the strategy for agricultural development adopted by Government in its effort to achieve national self-sufficiency in the production of foodgrains by 1970-71. Application of an intensive dosage of fertilizer is one of the essential features of the programme of cultivation of high yielding varieties

of foodgrains, as also of the drive for developing cash crops such as sugarcane, oil seeds and jute etc. Government have estimated, on the basis of the projected requirements of the programme of high yielding varieties of foodgrains and increased targets of cash crops envisaged in the Fourth Plan, the fertilizer needs of Indian agriculture in 1970-71 as 2.4 million tonnes of Nitrogenous (N), 1 million tonnes of Phosphatic (P_2O_5) and 0.7 million tonnes of Potassic (K_2O).

9.5. As the fertilizer industry is a highly capital-intensive one, it is not possible, financially as well as organisationally, either for the private sector or the public sector alone, to take upon itself the entire load. Both the sectors have to be simultaneously geared up to it—a fact recognised by Government. For an all-out effort to increase the food production Government have felt the need of enlisting foreign assistance. In order to attract foreign capital Government have offered a number of concessions on financing and management of plants, marketing and pricing of fertilizers. In response to this offer, certain foreign investors have come forward to set up fertilizer plants. It is the result of the new policy of the Government that the private sector projects at Kanpur, Kota, Goa and Mangalore are now definitely on the ground and can be relied upon as among certainties. The Committee would like Government to process expeditiously all the other offers received by the 31st December, 1967 so that the plants are set up within the next 2-3 years. Government should also take steps now to plan for increased fertilizer production during the Fifth Plan period. Unless Government addresses itself to this problem right now, it will be difficult to meet the requirements of fertilizers which have been estimated at 4.0 million tonnes N, 2.0 million tonnes P and 1.0 million tonnes K by 1975-76.

9.6. The Committee are glad to note that fertilizers are much in the news during recent years. The recent crisis on the food front has focused the attention on the country to the causes of her agricultural backwardness. Even the misfortune of two successive years of drought has had a silver lining as it drove home a valuable lesson to those who plan development priorities and has made them realise the critical importance of chemical fertilizers as the major input for increasing agricultural productivity. The demand for fertilizer is going up rapidly and supply is limited. At present it is the question of putting to optimum use the limited supplies available. But the increase in production of fertilizers envisaged during the coming years will throw up a number of problems—like distribution, marketing, credit facilities, extension service, training, soil testing and other allied agronomic practices, developing in the farmer a consciousness towards the use of fertilizers and the benefits that will accrue from their use. These and other problems must receive Government's attention now so that fertilizers are made available to the farmer at right time, in right quantity and quality and at reasonably low price.

9.7. Almost all the nitrogenous fertilizer projects presently under construction or contemplation are based on naphtha as the raw material with the exception of Namrup where natural gas is the feed-stock. Since traditionally coal has been the basic raw material for the production of nitrogenous fertilizers and the fact that coal is abundantly available in the country, the Committee would like Government to keep track of the recent improvements said to have been made in other countries in local gasification technology and weigh the pros and cons of setting up a coal based plant in specified locations before finally discarding the proposal in favour of naphtha.

9.8. As regards phosphatic fertilizers while rock-phosphate and sulphur should be imported on a priority basis Government should make concerted and vigorous efforts to prospect, prove and exploit rock phosphate and sulphur deposits in the country. Continued and intensive investigations on the detailed exploration and exploitation of rock-phosphate and pyrites deposits are a prime necessity. The Committee expect that similarly work on the recovery of potash from salt bitters will continue to receive the earnest attention of Government.

9.9. The Committee are happy that in order to equip the country in fertilizer technology and to accelerate the process of self-reliance, the Fertilizer Corporation of India and FACT have developed full fledged Planning, Design and Engineering Organisations. The Committee hope that continued efforts would be made to improve upon the know how, so far developed in these organisations so that they are fully competent to undertake the entire execution of a fertilizer project with indigenous talent and capabilities. This will not only ensure fabrication of equipment and machinery within the country but would also result in saving in foreign exchange.

9.10. The Committee would like to observe that the present campaign for and stress on chemical fertilizers should not make the country oblivious about organic fertilizers and their role in soil fertility. The main organic fertilizers of economic significance are farm-yard manure, green manure, compost, sewerage etc. The importance of organic fertilizer arises not so much in the small quantities of plant nutrients these provide as in their role as a soil conditioner and as a catalytic agent to provide optimum condition for the efficient and maximum utilisation of synthetic fertilizer applied to soil. The massive application of inorganic fertilizers is no substitute to organic fertilizers. On the other hand the very fact of increasing supplies of inorganic fertilizers to soil make it all the more important to devote greater attention to organic fertilizers in order to keep the soil conditions conducive to obtaining maximum benefit from the application of large doses of inorganic fertilizers. Thus the role of organic manure is complementary to that of

chemical fertilizers. The Committee, therefore, suggest that adequate attention should also be given to the utilisation of the basic organic fertilizers much of which are currently being wasted.

9.11. In Chapter VIII it has been discussed how more than half a dozen Ministries at the Centre are concerned with various aspects of fertilizers produced in the public sector. Apart from this according to the present programme more than half of the total requirements of fertilizers will be produced in factories in the private sector by the end of 1970-71. In the matter of promotion of fertilizer use and provision of credit facilities to farmers, besides the Central Government, the State Governments, manufacturers, banking institutions also come in the picture.

The multiplicity of authority dealing with fertilizers underlines the complexity of the task and the need for close coordination among the various agencies involved. The Committee hope that efforts will be made by Government to rationalize the present multiplicity of authority in the sphere of fertilizers in such a manner that the functions relating to production, distribution and import of fertilizers are entrusted to a single authority/agency as far as possible, keeping in view the recommendations made by the Sivaraman Committee and the Study Team recently appointed by the Ministry of Petroleum and Chemicals.

NEW DELHI:

April 5, 1968.

Chaitra 16, 1890 (Saka).

P. VENKATASUBBAIAH,

Chairman,

Estimates Committee.

APPENDIX I

(Vide Para 2·18)

List of Soil-testing laboratories

A. Old Laboratories

Andhra Pradesh	1. Hydrabad.
	2. Bapatla.
	3. Rajamundhry (for Tobacco only).
Assam	4. Jorhat.
Bihar.	5. Sabour.
	6. Hazaribagh (with the D.V.C.)
Gujarat.	7. Junaga h.
Kerala.	8. Trivandrum.
Madhya Pradesh.	9. Gwalior.
	10. Jabalpur.
Madras.	11. Coimbatore.
Maharashtra.	12. Poona.
	13. Nagpur.
Mysore.	14. Bangalore.
	15. Mysore (for Coffee only).
Orissa.	16. Sambalpur.
Punjab	17. Ludhiana.
Haryana	18. Karnal.
Rajasthan.	19. Jodhpur.
Uttar Pradesh.	20. Kanpur.
West Bengal.	21. Calcutta.
Delhi.	22. I.A.R.I. New Delhi.
Tripura.	23. Agartala.
Himachal Pradesh.	24. Simla.

B. I.A.D.P. Laboratories

Andhra Pradesh.	1. Tadepalligudem (West Godavari District)
Assam	2. Silchar (Cachar District).
Bihar.	3. Arrah (Shahabad District)
Gujarat	4. Bardoli (Surat District).
Kerala	5. Pattambi (Palghat District)
	6. Alleppey (Alleppey District).

Madhya Pradesh.	.	.	7. Raipur (Raipur District).
Madras.	.	.	8. Aduthurai (Thanjavur District)
Uttar Pradesh.	.	.	9. Aligarh (Aligarh District)
West Bengal.	.	.	10. Burdwan (Burdwan District).

C. States Laboratories

Bihar	.	.	.	1. Pusa.
				2. Patna.
Jammu & Kashmir	.	.		3. Srinagar
Madhya Pradesh	.	.		4. Indore
Madras	.	.		5. Kovalpatti
				6. Cuddalore
Maharashtra	.	.		7. Dhulia
				8. Akola
Mysore	.	.		9. Manipal
Orissa	.	.		10. Bhubaneswar
				11. Behrampur
Punjab	.	.		12. Palampur.
Haryana.	.	.		13. Hissar.
Manipur.	.	.		14. Imphal.
Himachal Pradesh.	.	.		15. Surde nagar.
				16. Chamba.

APPENDIX II

(Vide Para 2.30)

Statement showing number of National Demonstrations allotted to States.

Name of the State	No. of demonstrations allotted				Funds earmarked (Rs.)		
	1965-66	1966-67	1967-68	1965-66	1966-67	1967-68	
I	2	3	4	5	6	7	
1. Andhra Pradesh	34	170	165	17000	34000	82500	
2. Assam	10	64	62	5000	12800	31000	
3. Bihar	20	68	140	10000	13600	70000	
4. Delhi.	18	18	11	9000	3600	5500	
5. Gujarat.	34	72	72	17000	14400	36000	
6. Himachal Pradesh.	19	10	13	9500	2000	6500	
7. Jammu & Kashmir.	27	18	23	13500	3600	11500	
8. Kerala.	12	30	20	6000	6000	10000	
9. Madhya Pradesh.. . . .	25	245	253	12500	49000	126500	
10. Madras.	25	122	121	12500	24400	60500	
11. Maharashtra.	25	162	169	12500	32400	84500	
12 Mysore.	41	130	111	20500	26000	55500	

	1	2	3	4	5	6	7
13. Orissa.	.	25	159	127	12500	31800	63500
14. Punjab.	.	29	118	128	19500	23600	64000
15. Rajasthan .	.	44	140	136	22000	28000	68000
16. Uttar Pradesh.	.	46	297	286	23000	59400	143000
17. West Bengal.	.	17	134	134	8500	26800	67000
18. Manipur.	.	..	4	4	..	800	2000
19. Tripura.	.	..	5	5	..	1000	2500
20. Nagaland.	.	..	2	2	..	400	1000
21. N.E.F.A.	.	..	2	2	..	400	1000
22. Goa.	.	..	2	2	..	400	1000
23. Pondicherry.	.	..	1	1	..	200	500
24. Andaman & Nicobar.	.	..	2	1	..	400	500
25. Haryana	.	..	22	..	..	4400	..
Total Provision.							
		3.39 lakhs.	3.39 lakhs.	10.00 lakhs.

APPENDIX III

(Vide Para 2.30)

*Allotment made to States/Union Territories for implementation of the
Fertilizer Demonstration Scheme*

(Amount in Rs.)

Sl. No. 1	Name of the State/U. Ts. 2	1964-65 3	1965-66 4	1966-67 5
1.	Andhra Pradesh	3,58,200	3,58,000	1,80,000
2.	Assam	1,42,200	95,000	57,000
3.	Bihar	2,61,640	2,68,700	1,40,000
4.	Gujarat	2,18,000	2,15,400	1,00,000
5.	Jammu & Kashmir]	1,67,900	59,000	47,000
6.	Kerala	2,67,000	1,52,950	90,000
7.	Madhya Pradesh	2,78,000	2,85,500	1,55,000
8.	Madras	3,27,300	1,65,670	90,000
9.	Maharashtra	3,02,000	3,02,000	1,50,000
10.	Mysore	2,66,000	1,90,000	1,00,000
11.	Orissa]	3,96,000	3,72,800	1,60,000
12.	Punjab]	3,19,100	2,69,670	1,44,000
13.	Rajasthan	2,16,460	1,13,612	75,000
14.	Uttar Pradesh	4,22,400	4,26,660	2,60,000
15.	West Bengal	2,17,300	2,41,680	1,02,000
16.	Himachal Pradesh	1,01,000	94,200	50,000
17.	Tripura	15,800	11,200	7,000
18.	Manipur	15,300	23,571	15,000
19.	Nagaland	16,440	21,000	14,000
20.	Laccadive & Minicoy	6,300	5,245	7,000
21.	Andaman & Nicobar Islands	15,300	14,000	12,300

1	2	3	4	5
22. Delhi	24,100	20,000	..
23. N.E.F.A.	16,440	..	..
24. Dadra & Nagar Haveli	5,000
25. Pondicherry	15,300	..	..
26. Goa	25,560	..	..
GRAND TOTAL	41,52,040	36,47,858 *59,000	19,60,300
			37,06,858	

*Amount for which administrative approval was issued. Allotment of funds are made on the quantum of budget provision approved for a particular year. The sanctions are issued to the States on their indications of likely expenditure taking into account the balance of unutilised grant-in-aid in the previous year. (This explains the difference between the earlier figures given in the statement attached to Point 6 and this statement).

APPENDIX IV

(Vide Para 3.2—page 32)

Note showing Projects in Private Sector which were abandoned during the Third Plan period

MADHYA PRADESH

A licence was issued in March 1961, to M/s. Khandewal Brothers for the establishment of a factory for a capacity of 50,000 tonnes of Nitrogen in the form of Urea. According to the time schedule originally envisaged the fertilizer project was expected to be completed by the year 1964-65. The foreign collaborators with whom the firm was negotiating wanted assurances from the Government that the entire output of the factory will be taken over by Government and that reasonable return on capital investment will be given while fixing selling price for the product. The question was carefully considered by the Ministry of Food and Agriculture and on 20th February, 1962 they informed the party that unless the State Government of Madhya Pradesh could also ensure the offtake it is not possible for Central Government to guarantee sales from the Pool for a period of 5 years and that the Pool is not in a position to guarantee any price higher than the general level of prices for the products of similar other factories. The Madhya Pradesh Government also informed the party on 4th April, 1962 that no further facilities or concessions could be promised by State Government. The party replied, on 25th April, 1962, that as the profitability of the project is very much in doubt they were unable to proceed with the scheme.

FERTILIZER PROJECT AT HANUMANGARH (RAJASTHAN)

According to the time schedule given in the 'Programmes of Industrial Development—1961-66', the Hanumangarh Fertilizer Factory was to be completed by 1964-65.

An industrial licence was issued to Shri B. L. Jalan, in March 1961 for establishment of a fertilizer factory at Hanumaagarh (Rajasthan). In July, 1961 the party asked for a number of assurances. At a meeting held on 14th July, 1961 in the Ministry of Commerce and Industry, attempts were made to dispel the misgiving of the American collaborators of Shri Jalan viz. the Metro Corporation of America and the Continental Oil Company in regard to the priority that would be attached to the project, the offtake of the entire output of the factory and the price factor. But there was

no response from the collaborators. In July, 1961, the party wanted to switch over to Naphtha as raw material for the project instead of lignite or coal as originally indicated by them. Subsequently in 1962, the Ministry of Commerce and Industry suggested to the party to consider the possibility of changing the site from Hanumangarh in view of the fact that the factory will utilise Naphtha and natural gas as raw material. The party was not agreeable to shift the site, but subsequently in December, 1963 they applied for the change of location to Kotah. The licence was accordingly amended for the change of location on 14th December, 1964.

Meanwhile, the party submitted another collaboration agreement with M/s. Stamicarbon N. V., A.I.O.C. and M/s. Bechtels in February, 1965. One of the collaborators was not in a position to provide finance for the Kotah project in view of its heavy commitment for the Madras Refinery and Fertilizers. The party was also unable to make necessary arrangements for the rupee finance. The party took time on several occasion to try alternatives and fanalise the arrangements, but as no satisfactory progress was noticed, the licence was revoked on 4th April, 1967 after giving due notice.

The party was given two extensions for taking effective steps (1) upto 30th March, 1965 and (2) the other upto 31st May, 1966.

KOTHAGUDAM FERTILIZER PROJECT (ANDHRA PRADESH)

In accordance with the time schedule given in the "Programmes of Industrial Development—1961—66", the Kothagudam Project was expected to be completed by the year 1964-65. But due to various delays narrated below, the Project was not taken up for implementation.

M/s. Andhra Sugars Ltd. were given a licence on 28th April, 1961 for establishment of a fertilizer plant at Kothagudam for the manufacture of 16,000 tonnes of Urea per month. A new company known as Hindustan Allied Chemicals was formed for implementing the project. The proposal originally envisaged for the establishment of a factory utilising coal available from the Singarani Collieries, as a raw-material. When the financial negotiations were about to be finalised the company sprang a surprise on 6th April, 1965 that they would like to switch over to a Naphtha based plant as it would require less capital say about Rs. 4 crores. The revised proposal was also accepted by Government on 12th November, 1965. The collaborators M/s. Allied Chemical Corporation, U.S.A. were not keen finalising the negotiations as it appeared that they were awaiting the Government policy decision in regard to the import of Ammonia. The collaborators were keen to supply liquid Ammonia from the plant which they are setting up in Iran. After repeated reminders the firm informed the Ministry on June, 1967 that the collaborators have regretted their inability to proceed with the project for the reason that requisite foreign loan could

not be arranged. The firm surrendered the licence on 29th July, 1967.

DURGAPUR FERTILIZER PROJECT (WEST BENGAL)

In accordance with the time schedule given in the "Programmes of Industrial Development—1961—66", the Durgapur Project is to be completed by 1965-66. But due to various reasons given below, there has been delay in the implementation of this project:

(1) *Failure of the private party.*—On 21st August, 1962, licence was granted to Durgapur Fertilizers and Chemicals Limited for the establishment of this project which was initiated by the State Government of West Bengal. It was expected that the State Government would hold minority of shares in the company and the company could secure the necessary foreign collaboration. But, unfortunately, the State Government's efforts to obtain foreign collaboration with various parties did not succeed. Meanwhile, the financial position of the State became tight. They had to find additional resources of about Rs. 23 crores to finance additional power projects and also to meet additional expenditure due to national emergency. They approached Central Government, in February 1963, for taking up the project through the F.C.I. on the ground of their inability to finance the project. The project has since been approved by Government for execution of Fertilizer Corporation of India. It is now under construction.

VARANASI (U.P.) EXPANSION

SAHU CHEMICALS:

In the time schedule given in the "Programme of Industrial Development—1961—66", it has been mentioned that M/s. Sahu Chemicals, Varanasi will complete their project during 1965-66.

The firm was granted a licence on 7th January, 1960, for effecting substantial expansion to their existing undertakings at Varanasi for the manufacture of Soda Ash and Ammonium Chloride. This factory has been in operation for the last 5 years, but they have not been able to produce more than 50 per cent of the licensed capacity due to certain technical reasons. As they did not take effective steps to achieve substantial expansion, the licence was revoked on 9th June, 1965.

MYSORE (MANGALORE)

In accordance with the time schedule given in the "Programmes of Industrial Development—1961-66", it has been mentioned that a project in Mysore State should be established during the Third Five Year Plan period.

Failure to get foreign collaborator.—M/s. Shaw Wallace and Company Ltd., was given a letter of intent on 27th December, 1961, for the estab-

lishment of a fertilizer factory at Mangalore, in participation with M/s. Rallis India Limited. The firm had negotiations with M/s. Dutch States Mines, Holland for collaboration in this project. After protracted negotiations, the firm intimated on the 22nd March, 1965 their inability to assist M/s. Shaw Wallace & Company Ltd. in the Project.

TUTICORIN FERTILIZER PROJECT

A licence was granted on 2nd November, 1961 to M/s. Kothari and Sons for the establishment of a fertilizer factory at Tuticorin in Madras for the manufacture of 198,000 tonnes of ammonium phosphate in the first stage and 396,000 tons in the second stage. It was intended that the party will find necessary foreign exchange for the project partly by foreign equity participation and partly by foreign loans. They were having negotiations for some time with M/s. Armour & Company, U.S.A. and later with Gulf Oil Corporation, Koppers International etc. The company was given extension of time for finalising the negotiations from time to time. On 15th January, 1964, a notice for revocation of the licence was given to the company. The Company replied that they wanted some more time to finalise the negotiations. On 20th April, 1964, the company surrendered the licence as they could not persuade any foreign collaborator for investment in the project.

APPENDIX V

(Vide Para 3.8)

Salient features of the Rationalisation Scheme for Sindri Fertilizer Factory

Fertilizer Corporation of India have been considering various alternatives, aimed at improving operating economics and production pattern at Sindri. The deteriorating quality of Rajasthan Gypsum and exhaustion of the mines, the increase in its delivered cost at Sindri both due to increase in mining costs and increase in freight rates and lower Ammonia efficiency due to the progressively poor quality of Gypsum have all adversely affected the production economics at Sindri.

The Sindri Rationalisation Scheme has been formulated keeping the above aspects in view. The proposal aims at production of Phosphatic Fertilizers and replacement of Rajasthan gypsum with by-product gypsum from the proposed Phosphoric Acid Plant.

Salient features of the scheme are:—

- | | |
|--------------------------------|-------------------|
| (1) Total estimated cost | Rs. 2295.88 lakhs |
| (2) Foreign exchange component | Rs. 593.73 lakhs |
| (3) Products (Tonnes/year) | |

	Before Rationalisa- tion	After Rationalisa- tion
Ammonium Sulphate	3,20,000*	3,10,000
Urea	20,500*	21,000
Double Salt	87,000*	72,000
Ammoniated TSP . . . . .	..	283,000
TSP-Sulphate . . . . .	..	205,000
Ammonia . . . . .	..	8,000
Ammonium Nitrate . . . . .	..	9,000

(*Attainable Capacities)

- (4) Sulphuric acid will be produced from pyrites-indigenous Amjhore and imported-and utilised for manufacture of phosphoric acid. The by-product gypsum so produced will be

used in Sulphate Plant for manufacturing Ammonium Sulphate replacing the Rajasthan gypsum now used. Complex fertilizers and TSP will be produced.

The project when operated at full capacity will produce additional 156,000 tonnes of P₂O₅ and will save approximately Rs. 18 crores in foreign exchange for import of an equal quantity of P₂O₅. As against this, the foreign exchange requirements (excluding working capital) for the entire Project are estimated at Rs. 3.11 crores.

(b) The scheme has been under active consideration by the Fertilizer Corporation of India since 1964 onwards. The first report was prepared in June, 1964. After a thorough scrutiny of all the available alternatives in detail, the scheme was forwarded by the Corporation to the Government on 17th April, 1967. It was approved by Government on 8th December, 1967.

The scheme is expected to be completed in 30 months from the date all clearances are given and financing arrangements finalised.

APPENDIX VI

(Vide para 3.31)

Statement showing the quantity of each Type of Fertilisers imported during each Plan Period and their value.

	1	2	3	4	5	6	7	8
	Ammonium Sulphate	Sodium Nitrate	Ammonium Phosphate	Nitro-Phosphate	Urea	Triple super-Phosphate	Ammonium Nitrate	Ammonium Sulphate Nitrate
Ist Plan Qty. (L.T.)	692657	89	4507	1516	27623	4550	3137	24501
Value (Rs.)	211971730	26990	2509172	716667	18347791	1824256	1972277	9225196
2nd Plan Qty. (M.T.)	1482346	..	10871	11335	277026	4532	1414	208645
Value (Rs.)	359927666	..	5640091	3843567	154890059	1589054	687792	64580165
3rd Plan Qty. (M.T.)	2583884	..	181760	67898	1156084	..	..	29076
Value (Rs.)	656735483	..	93026184	22905137	492640646	..	..	6861913

APPENDIX VI—contd.

	9	10	11	12	13	14	15	16
	Murate of Potash	Cal. Amm. Nitrate	Mono Ammonium Phosphate	Mixed Fertiliser	Ammo-nium triple Sup.	Di-Amm. Phosphate	Ammo-nium Chloride	Total
Ist Plan Qty. (L.T.)	506	2037	..	..	..	..	..	761123
Value (Rs.)	151905	675963	..	..	..	..	..	247421942
2nd Plan Qty. (M.T.)	307	208475	373	356	3071	315	..	2209069
Value (Rs.)	100155	4565884	210068	184993	1593809	258110	..	639163973
3rd Plan Qty. (M.T.)	..	61785	8117	4088604
Value (Rs.)	..	11896024	1391527	1285456914

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Note.—1. The quantity figures for the 1st Plan are in L. Tons while the other are in M. Tons.

2. The quantity and value figures for the first two Plans have been taken from the records of this Ministry, while those for the 3rd Plan have been taken from the audited proforma accounts.

3. The value includes foreign exchange involved and payments made in rupee currency. Separate figures of foreign exchange are not readily available.

APPENDIX VII

(Vide para 4.15)

No. F.1-13/57-M.A.

New Delhi, Dated the 19th February, 1958

Note from the Ministry of Food and Agriculture (Department of Agriculture) regarding Reserve Pool of Fertilisers.

The Ministry of Food and Agriculture is running a State Trading Scheme on "no profit no loss basis" for the purchase and distribution of chemical fertilisers with a view to popularise their use and making them available to the cultivators at reasonable rates in the interest of maximising agricultural production. The requirements of State Governments as well as other interests or fertilisers are first collected and the excess demand over availability from estimated production in the country, is calculated. The procurement of the deficit is arranged through the Ministry of Works, Housing and Supply on global basis. The Fertilisers from all sources are pooled together and sold at a uniform rate throughout the country. Of the chemical fertilizers handled by the pool, Sulphate of Ammonia is the only one produced in the country so far and is very popular with and largely used by the cultivators. The method of fixing pool price for Sulphate of Ammonia and other fertilisers is the same.

2. The main items which are taken into account while fixing the uniform price are as follows:—

- (i) The purchase costs of the material from various sources, (internal as well as external).
- (ii) Handling charges at the ports.
- (iii) Departmental charges levied by the purchasing organisations.
- (iv) Indirect charges incurred by the Ministry (Namely interest on capital and salary of staff employed at the centre and the ports for running the fertilizer pool).
- (v) Internal transport charges based on average freight paid during the previous years from the sources of supply to various centres.
- (vi) In addition to the above usual items a further ad hoc provision was made in 1957-58 to cover an unusual expenditure ne-

cessitated by the closure of the Suez Canal, such as demurrage, diversion, shortage, rebagging etc. charges.

3. After arriving at a tentative pool price, the price at which it would be economical to the cultivator is also investigated in consultation with the Statistical and Economic Adviser to the Ministry of Food and Agriculture. The final Pool price is then fixed with suitable adjustments with the approval of the Ministry of Finance. Accordingly the pool price of Sulphate of Ammonia for 1957-58 was fixed at Rs. 350 per ton to States effective from 26th March, 1957. The State Governments are allowed to add a maximum of Rs. 30 per ton, over the Central Pool price, to meet their handling and distribution expenses.

The attached statement illustrates the basis on which the pool price of Sulphate of Ammonia was fixed for the year 1957-58 effective from 26th March, 1957.

This note has been seen by the Director of Commercial Audit.

T. C. PURI,
Joint Secretary-

APPENDIX VIII

(Vide Para 4.22)

Statement showing demand, allotment and supply of pooled fertilisers made to States for the year 1966-67

(Figures in tonnes)

Sl. No.	Name of State/ Others	Kind of fertiliser	Demand for 1966-67	Allotment for 1966-67	Supply made during 1966-67
1	2	3	4	5	6
1	Andhra Pradesh	S/A	300000	294319	309153
		Urea	100000	155850	155645
		A/S/N	45000	12907	10592
		C/A/N	126500	52994	50950
		Am/Chl.	4000	7800	7017
		Di. Am./Ph. . . . .	..	2080	9523
		Am./Ph.	140000	..	..
2	Assam	S/A	20000	17871	16879
		Urea	700	2143	759
		C/A/N.	400	..	..
		Nitro/Ph.	500	..	..
		Am/Ph.	500	..	..
3	Bihar	S/A	240000	167198	156715
		Urea	30000	38412	28560
		A/S/N . . . . .	..	14242	13946
		C/A/N	15000	21053	18769
		Di. Am/Ph. . . . .	..	34740	23482
		Am/Ph.	15000	23700	24700
4	Goa	S/A	3000	6021	2903
		Urea	500	414	677
		Am/Ph.	500	1500	1500
		C/A/N	250	..	..
		Nitro/Ph.	500	..	..
5	Delhi	S/A	348	814	1042
		Urea	257	300	240
		C/A/N	3895	4158	3420
		Di. Am./Ph. . . . .	..	250	250

1	2	3	4	5	6
6	Gujarat	S/A	136500	88018	81559
		Urea	400000	44328	34724
		G/A/N	20000	7000	7792
		Am./Ph.	30000	5000	5000
		Di. Am./Ph.	..	19870	19870
		S.O.P.	..	2400	1926
		A/S/N	10000	..	..
7	Himachal Pradesh	Nitro/Ph.	50000	..	..
		S/A	1000	400	477
		Urea	50	22	22
		G/A/N	7600	13010	6865
8	Jammu & Kashmir	S/A	7875	20582	20414
		Urea	250	240	240
		G/A/N	7875	2000	1330
9	Kerala	S/A	90000	83383	57583
		Urea	13400	32695	29128
		C/A/N	29000	9383	12278
		B/Slag	..	7000	1549
		A/S/N	800	..	..
		Am/Ph.	4000	..	..
10	Madhya Pradesh	S/A	80000	15951	24394
		Urea	30000	3340	6865
		Am./Ph.	3000	13500	5393
		C/A/N	20000	..	3800
		Am/Chl.	1000	..	..
		Nitro/Ph.	3000	..	..
11	Manipur	S/A	..	..	..
		Urea	800	672	260
		C/A/N	100	1120	1025
		Am./Ph.	1500	..	..
12	Maharashtra	Nitro/Ph.	150000	..	..
		S/A	300000	209199	209199
		Urea	100000	931144	77714
		A/S/N	33750	16985	13627
		C/A/N	49757	17464	16665
		Am./Ph.	..	8300	8300
		Am/Chl.	..	9720	8252
		Di. Am/Ph.	..	44754	20634
		S.O.P.	..	2500	2368
		B/Slag	..	5000	..
13	Madras	S/A	264460	138669	126485
		Urea	150045	94449	91704
		A/S/N	40120	9621	7747
		C/A/N	20790	43475	16761
		Am/Ph.	..	5000	5000
		Di. Am./Ph.	..	22826	21695

1	2	3	4	5	6
14 Mysore	S/A		171936	91849	82791
	Urea		60565	53236	50683
	A/S/N		27469	5538	5393
	C/A/N		45868	11068	13535
	Am/Ph.		15000	11500	11500
	Am/Chl.		3600	3200	3200
	Di.Am/Ph.		..	5867	3487
15 Orissa	Nitro/Ph.		7337	..	..
	S/A		10000	23445	19567
	Urea		500	504	4559
	C/A/N		119500	26449	31390
	Am./Ph.		20000	12000	11447
	Di. Am/Ph.		..	13167	12841
16 Pondicherry	S/A		5000	2663	2498
	Urea		1500	539	804
	Am/Ph.		500	750	750
	A/S/N		200	..	..
17 Punjab	S/A		130000	22624	20632
	Urea		50000	12881	8764
	C/A/N		250000	216502	200645
	Am./Ph.		..	14250	..
	Di. Am./Ph.		..	12606	11109
	A/S/N		8000	..	..
18 Haryana	S/A		..	5555	616
	C/A/N		..	33331	31886
19 Rajasthan	S/A		20000	37338	29782
	Urea		7000	4989	2708
	C/A/N		400000	28643	27376
	Am/Ph.		6100	5000	5000
	Di. Am./Ph.		..	6521	6521
	S.O.P.		..	100	96
	A/S/N		7000	..	..
20 Tripura	Nitro/Ph.		6000	..	..
	Urea		..	100	96
	C/A/N		1200	..	..
21 Uttar Pradesh	S/A		262000	208311	151613
	Urea		64000	102120	55290
	A/S/N		25000	15546	16551
	C/A/N		350000	83503	88250
	Am/Ph.		..	22173	17850
	Di. Am./Ph		..	50744	43969
	Nitro/Ph.		25000	..	..
22 West Bengal	S/A		145000	76689	82166
	Urea		40000	37021	24644
	A/S/N		..	4000	2566

1	2	3	4	5	6
		C/A/N .	5000	19634	4962
		Am/Ph. .	100000	10500	7419
		Di. Am./Ph	..	4561	2219
		Nitro-/Ph. .	25000	..	..
23	Dadar Nagar Haveli	S/A .	..	750	..
		Urea .	..	550	144
		Am/Chl.	..	500	446
24	Coromondal Fertilisers (Andhra Pradesh)	Am/Ph.		100000	87977
25	F.C.I., Madras. Andhra Pradesh .	S/A . .	..	6882	6792
	Madras . . .	S/A . .	..	2432	1943
		Urea . .	..	671	617
	Mysore	S/A . .	..	2208	..
		Urea . .	..	1000	584
26	Tea (North East India)	S/A . .	121596	92500	87195
27	UPASI, Madras .	S/A . .	52656	43438	43702
		Urea . .	..	4100	4384
		Urea . .	..	522	522
		S/A/N . .	..	1772	1116
28	Coffee Board .	S/A . .	2000	13500	19891
		Urea . .	4300	8854	5548
		A/S/N . .	13800	10973	12536
		C/A/N . .	18000	18580	14043
		Nitro/Ph.	3000	..	..
		Am/Ph.	10000	..	..
29	Rubber Board .	S/A . .	9000	10170	7451
		Urea . .	200	150	100
		A/S/N . .	1000	600	436
30	Seeding Programme : Gujarat .	Am/Ph. .	..	120000	10948
		Urea . .	..	3500	..
31	Sikkim .	S/A . .	..	117	70
32	National Seeds Corporation :				
	Andhra Pradesh .	S/A . .	..	2000	1840
		Di. Am./Ph.	..	100	..
	Uttar Pradesh .	C/AN . .	..	150	..
33	Andamans & Nicobar Islands .	S/A . .	40	135	..
		Urea . .	90	90	..
		Am/Ph. .	10	10	..
34	Nepal .	S/A . .	..	2460	2453
35	Bhutan .	Urea . .	..	45	45

1	2	3	4	5	6
36	Industrial Users .	S/A .	17000	2794	2406
		Urea .	9000	513	400
37	Nagaland .	S/A .	..	90	..
	Total .	S/A .	2416911	1690375	1565153
		Urea .	705147	701542	586448
		A/S/N .	220139	90934	83914
		C/A/N .	1121735	611139	552858
		Am/Chl. .	8600	21220	19312
		Di. Am./Ph. .	..	217986	168157
		Am/Ph. .	342330	245183	213158
		S.O.P. .	..	5000	3808
		B/Slag. .	..	12000	1549
		Nitro/Ph. .	270337	..	..

NOTE : It has been stated that the original requirements have been indicated in the statements. Later on at the Chief Ministers' Conference, the State Governments were informed that their requirements will be met from the Pool including free sales by the factories to the tune of 9.90 lakh tonnes Nitrogen. The details of requirements of individual States may be seen in the attached statement.

APPENDIX IX

(Vide para 4.54)

Study Team on Fertilizers appointed by Ministry of Petroleum and Chemicals

The Study Team was appointed by the Ministry of Petroleum and Chemicals, Government of India, in the Office Memorandum No., Ferts. II|51(22)|67 dated the 7th October, 1967. It is reproduced below:—

In the public sector, there are, at present, two corporations whose main activity is production of fertilizers and development of fertilizer technology. In view of the important role these corporations have been playing and are required to play in the future, it has been considered necessary to study their organisation, structure, etc., and determine the measures to be adopted for enabling them to meet effectively the problems and challenges that the rapidly rising fertilizer needs of the country are likely to throw up. For this purpose the services of four experts have been secured from the TVA, USA under the Indo-U.S. Technical Cooperation Programme.

2. The Study Team will consist of the following:—

Shri M. Ramakrishnayya—Convenor.

- (i) Mr. W. F. Emmons,
- (ii) Mr. L. W. Gopp.
- (iii) Mr. E. J. Best,
- (iv) Mr. R. D. Grisso,
- (v) Dr. Kamla Chaudhri,
- (vi) Mr. K. C. Sharma,
- (vii) Mr. D. G. Rao,
- (viii) Mr. R. N. Warriar,
- (ix) Mr. B. K. N. Murthy.

3. The Study Team will address themselves to the following questions in particular.

1. Should there be one, two or possibly several public sector corporations? What should be the optimum size of a Corporation?
2. Should the system be aimed at developing the corporations along the lines of European Government Corporations such as ONIA

and Dutch State Mines (which are quite successful and appear to have a high degree of autonomy) of TVA, of private industry, or through some combination of these? What should be the top managerial set up for the recommended form of organisation?

3. Are any changes necessary in the powers enjoyed by the public sector corporations?
4. What changes, if any, are necessary in the organisational features of the present corporations for dealing with future plant?
5. What should be the relationship of the designing and engineering groups with production units?
6. Should the two present design and engineering groups be combined into one?
7. Is the separate engineering by FCI and FACT of various units at one project a feasible arrangement?
8. Do the existing operation control systems require any change for maximising production in present and future plants?
9. What further steps can be taken to develop design, engineering, fabrication and construction competence in India and make it competitive with or replace foreign sources?
10. What procedures or arrangements should be followed for expediting construction and avoiding delays?
11. On the basis of the general future organisation recommended for expediting construction and avoiding delays?

APPENDIX X

(Vide para 6·2)
Statement showing Pattern of Feedstock Utilisation for Nitrogenous Fertiliser Production.
 (Tonnes of N₂/year)

Sl. No.	Feedstock	Electro-lysis	Coal & Lignite	Coke oven gas and by-product refinery C.O.G. gas	Naphtha and gas	Natural gas	Imported Ammonia
1	2	3	4	5	6	7	8
A. In production :							
1	Sindri	..	64,200	37,300	15,500	..	..
2	Nangal	..	80,000	..	..	..	..
3	Trombay	..	..	..	90,000	..	..
4	Gujarat	..	..	..	48,000	48,000	..
5	Varanasi	..	10,000	..	..	..	..
6	F.A.C.T.	..	..	..	92,000	..	..
7	Neyveli	..	70,000	..	..	..	..
8	Belagula	..	1,300	..	..	..	..
9	Ennore	..	..	..	8,000	..	..

10	Rourkela	..	..	..	90,000	30,000	..	..
11	Miscellaneous	..	..	..	20,000	..	..	..
TOTAL of 'A'		..	81,300	144,200	147,300	283,500	48,000	Nil

B. Under Construction:

1	Gorakhpur	..	..	..	..	90,000	..	..
2	Namrup	..	..	..	..	..	45,000	..
3	Namrup expn.	..	..	..	..	..	145,000	..
4	Durgapur	..	..	..	..	145,000	..	..
5	Barauni	..	..	..	..	145,000	..	..
6	Kanpur	..	..	..	..	200,000	..	..
7	Kota	..	..	..	..	130,000	..	..
8	Ennore Expn.	..	..	..	..	8,000	..	..
9	Cochin	..	..	..	..	145,000	..	..
10	Madras	..	..	..	..	165,000	..	..
11	Visakhapatnam	..	..	..	..	80,000	..	..
TOTAL OF 'B'		..	Nil	Nil	Nil	1,108,000	190,000	..

1	2	3	4	5	6	7	8
---	---	---	---	---	---	---	---

C. *Approved in principle :*

1	Trombay	..	..	..	113,000	..	..
2	Haldia	..	..	..	200,000	..	..
3	Gujarat Expn.	..	..	..	92,000	..	..
4	Gaziabad	..	..	..	145,000	..	..
5	Mangalore	..	..	..	200,000	..	..
6	Goa	..	..	..	160,000	..	..
7	Plants under co-operative sector	..	..	..	245,000	..	..

TOTAL OF 'C'

1155,000

GRAND TOTAL 81,300 144,200 147,300 2,546,500 2,386,000 Nil

Total of Nitrogenous fertilizers from all feedstocks : 3,157,300.

APPENDIX XI

(Vide Para 6.21)

Naphtha Production and Availability

(Million tonnes per year)

	(Million tonnes per year)											
	1	2	3	4	5	6	7	8	9	10	11	12
	Ammonia capacity	Total Naphtha	Bombay	Koyali	Cochin	Madras	Barauni	Haldia	Vizag.	Delhi Punjab	Assam	
Refinery Capacity		22.09	6.25	3.00	2.35	2.50	3.00	2.50	1.04	..	1.45	
Available Naphtha		4.134	1.00	0.22	0.375	0.580	0.576	0.500	0.186	..	0.295	
Gasoline requirement		1.471	0.350	0.140	0.115	0.110	0.100	0.210	0.055	0.239	0.152	
Petro Chemicals		0.861	0.420	0.300	..	..	0.141	..	..	..	..
Export current level		0.515	0.400	..	0.115	..	..	..	..	..	..
Net available Surplus	..	1.287	(-)-0.170	0.182	0.145	0.470	0.335	0.290	0.131	(-)-0.239	0.143	
Trombay (Present)	113,000	0.045	0.045	..	..	..	..	..	..	..	..
(Expansion)	198,000	0.170	0.170	..	..	..	..	..	..	..	..
Gujarat (Existing)	150,000	0.040	..	0.040	..	..	..	..	..	..	..
(Expansion)	150,000	0.120	..	0.120	..	..	..	..	..	..	..
Goa	198,000	0.170	0.170	..	..	..	..	..	..	..	..
Kota (D.C.M.)	150,000	0.122	..	0.122	..	..	..	..	..	..	..
Sindri	20,000	0.018	..	..	..	..	0.018	..	..	..	..
Rourkela	40,000	0.052	..	..	..	..	0.052	..	..	..	..

APPENDIX XII

(Vide Para 7.3.7)

Details of Catalysts to be produced by M/S A.H. Lalji of Bombay in Collobaration with M/S Catalysts & Chemicals of U.S.A.

(All figures in tonnes)

Catalysts	Domestic Demand excluding wholly owned Government fertiliser plant	CCI proposals	
		Restricted sale for 5 years	Possible exports
Zinc Oxide	4692	100	200
Co-Mo hydrodesulphurisation and hydrotreating	175.3	150	50
Reforming	293.7	50	30
CO conversion HT	596.4	400	500
Co conversion LT	658.0		
Methanation	102.6	30	30
Ammonia Synthesis	444.9	100	200
Co Mo hydrodesulphurisation (for gaseous hydrocarbons)	Not estimated	20	20
Co Mo hydrogenation	Not estimated	10	5
Ethylene acetylene selective hydrogenation	42.5	30	20
Plantinum reforming and isomerisation catalysts	48.6	20	10
Value of domestic sales assuming the sale price is equivalent to current CIF			Rs. 300 lakhs.
Value of exports			Rs. 150 lakhs.

APPENDIX XIII

Statement showing summary of Recommendations/conclusions.

Sl. No.	Reference to Para No. in the Report	Summary of Recommendations/Conclusions
(1)	(2)	(3)
1.	1.23	The Committee note with satisfaction that the Sivaraman Committee on Fertilizers in their report submitted to Government on the 2nd September, 1965, has made a number of valuable suggestions on the problems facing the fertilizer industry in India, with particular reference to fertilizer consumption, pricing, distribution, marketing and sales promotion. The Report has provided a basis for fixing targets of fertilizer consumption and production for the Fourth and Fifth Five Year Plans. The report of the Fertilizers Committee had come at a time when the country is passing through a food crisis and the Committee hope that its recommendations will receive the earnest consideration at the hands of Government.
2.	2.12 and 2.13	It is well known that economic survival of India is closely bound with the rapid development of its agriculture and attainment of self-sufficiency in food. The Committee feel that one of the principal reasons for the insufficiency in food production for the growing population of the country is the low per acre yield. To raise the low yield per acre inevitably means using adequate doses of fertilizers. They note from the available data that the consumption of fertilizer per acre of cultivable land in India is one of the lowest in the world whereas the loss of soil

(1)

(2)

(3)

fertility is the same all over the world. The Committee find that India's level of fertilizer consumption in 1965-66 was 4.73 Kg. per hectare* as compared to 349.32 Kg. in West Germany, 321.12 Kg. in Japan, 59.63 Kg. in U.S.A. and 30.55 Kg. in Australia during the same period. The Committee are further distressed to note that though great emphasis was laid during all the three Plans for an organised use of chemical fertilizers, the consumption of nitrogenous fertilizers during the First Plan period was about 69 per cent of the target fixed, and dropped to 57 per cent during the Second Plan period. The progress even in the Third Plan, when the production of fertilizer had increased to a sizeable level, was not satisfactory as they find that the increase in consumption was not as high as anticipated inspite of available supplies. This is evident from the fact that the carryover stocks of nitrogenous fertilizers rose from a figure of about 68,000 tons at the end of 1960-61 to nearly 214,000 tonnes at the end of 1963-64. This low rate of consumption of fertilizers according to the observations of the Fertilizer Committee was attributable to delayed receipt of fertilizers after manuring season, inadequacy of credit facilities for farmers and bottlenecks in the distribution arrangements.

The Committee are convinced that if timely and concerted efforts had been made from the very beginning for promoting the use of fertilizers the country would have been saved from the successive shortfalls in agricultural production, particularly foodgrains and would have been on the road to self-sufficiency long ago. Now that country's requirements for fertilizers have been worked out by the Fertilizer Committee after an exhaustive study of the demand for the Fourth Plan period (1970-71), the Committee hope that no efforts would be spared by the Central Government, State Governments and the manufacturers to raise the consumption of fertilizers

*1 hectre—2.47 acres

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from the level of 1.20 million tonnes in 1966-67 to 4.1 million tonnes of nutrients in 1970-71.

3. 2.14 The Committee agree that one of the basic objectives of planned economic and social development in the country is to ensure balanced growth of the different regions. They consider that the real key to the development of the backward areas lies in strengthening of their agricultural sector along with the development of industries. In the opinion of the Committee the imbalances in agriculture growth in some areas, other things being equal, is largely due to inadequate use of fertilizers as compared to other agriculturally developed areas. The Committee are unhappy to note the wide variation in fertilizer consumption among farmers in various States. They find that farmers in the Southern region are more fertilizerminded than their counterparts in other regions. The uneven consumption of fertilizers is also apparent from the fact that out of 24 States/ Union Territories the consumption of fertilizers in 1965-66 in 11 States viz., U.P., Andhra Pradesh, Madras, Maharashtra, Punjab, West Bengal, Bihar, Mysore, Gujarat, Madhya Pradesh and Orissa has been 83 per cent of the all India consumption, whereas the remaining States/Territories only accounted for 17 per cent *i.e.*, 10 per cent by States and 7 per cent by plantation crops and industrial users. For proper and balanced growth of agriculture in all regions of the country, the Committee urge that Government should undertake intensive studies of the areas where fertilizer consumption has not been upto the mark so as to take necessary remedial measures in this direction.
4. 2.15 The Committee also consider it essential that an intensive fertilizer promotion progamme should be drawn up and put into operation in order to step up consumption of fertilizers to the desired level. To familiarise the millions of cultivators in India with profitable use of fertilizers and to bring home to them

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the potential profit from fertilizer use is a challenge which must be accepted and met by devising suitable promotional measures.

5. 2.25

The Committee regret to note the delay in not providing facilities for soil analysis, extension services and necessary aids for increasing fertilizer consumption in the country. They feel that proper and adequate attention should have been given to provide the above facilities in the beginning of the First Plan itself.

The Committee would like to stress that there should be a network of soil-testing service throughout the country together with continuous research to provide basic data on the best use of fertilizers and the best form of fertilizers for a given agro-climatic condition coupled with the study of soil. They feel that considering the vastness of the country and the fertilizer consumption programme embarked upon during the Third Plan, the number of soil-testing laboratories set up by the end of the Plan was far too inadequate. The Committee regret the lack of interest on the part of Government to expand the service which is so vital to promote the consumption of fertilizers by the farmers. They are, however, happy to note that Government have now a plan to add 26 new laboratories as also 320 mobile soil testing laboratories during the Fourth Plan (1970-71). They hope that the results of field trials by these laboratories will not only provide the scientific information needed for giving reliable guidance to farmers on efficient fertilizer use, but will also provide the basis for formulating national fertilizer policy in relation to agricultural development programme. The Committee also need hardly stress that the technical agronomic studies and research as available from the field trials should be evaluated by experienced agronomists and compared to similar studies made by other countries on similar crops. This would not only help in fulfilling the gaps in specific information but would also tend to provide an overall average of yields *versus* fertilizers treatment.

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6. 2.32
- The Committee on Fertilizer in Chapter VII of their Report have suggested a number of steps for making field demonstrations more effective. The Committee hope that Government will examine the recommendations of the Fertilizer Committee with a view to re-organize and re-orient the demonstration programme as well as soil testing work particularly in backward areas. The Committee feel that the quality of the demonstration can be improved if special and adequate staff with sufficient training is designated for the purpose under an organisation charged specially with this responsibility.
7. 3.15
- The necessity to expand the fertilizer industry in India has been receiving Government's attention from the First Plan period. The Committee are, however, distressed to note the heavy and persistent shortfalls in installing targeted capacity and in achieving production according to installed capacity of fertilizers during each of the three Plan periods. It is surprising that even the installed capacity, both during the Second and Third Plan periods remained largely unutilised when the country was badly in need of regular supply of fertilizer for increasing the agricultural yield. They note that in the Second Plan against an installed capacity of 248,300 tonnes of nitrogenous fertilizers, production actually achieved was 98,000 tonnes, *i.e.*, about 36 per cent. Similarly, in the Third Plan against an installed capacity of 586,500 tonnes, the production was of the order of 233,000 tonnes, *i.e.*, about 40 per cent. What is more regrettable is that the capacity actually installed during these Plan periods was much less than capacity envisaged. While the capacity for nitrogenous fertilizers installed during the Second Plan was 65 per cent of the capacity envisaged, it dropped to about 59 per cent during the Third Plan. This shortfall in installing the capacity as envisaged and under-utilization of the capacity as installed, clearly indicates deficiencies in planning. The Committee feel that correct appraisal was not
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made of the requirements of fertilizers while fixing targets for the succeeding Plan. They consider that for realistic planning, it is necessary that the targets laid down in the earlier plan are reviewed and the reasons for their shortfalls identified and analysed for taking remedial action.

8. 3.16

The Committee are also constrained to note that the indigenous production has not kept pace with the demand for fertilizers. While production of nitrogenous fertilizers during the First Plan was about 84 per cent of the target fixed, it dropped to 34 per cent during the Second Plan and further came down to 29 per cent in the Third Plan. The non-fulfilment of targets during the Second and Third Plans was due to the failure of both the public and private sectors to progress the implementation of the schemes according to schedule. It is a matter of deep concern that the public sector which should have been a pace-setter, has itself lagged behind in this matter. The Committee find that against an increase of 307,000 tonnes in the existing capacity expected to be achieved during the Second Plan, a capacity of 147,000 tonnes only was set up by the expansion of Sindri and FACT (First Stage) and by commissioning of Nangal Factory in February, 1961. The Varanasi factory which was the only project in private sector, though completed in 1959, could not be commissioned due to technical difficulties. The remaining two projects at Rourkela and Neyveli could also not be completed within the Plan period due to foreign exchange difficulties. It is also noted that in the Third Plan, apart from the three continuing schemes viz., Neyveli, FACT (2nd Stage) and Rourkela, there were four new schemes in the public sector, viz., FACT (3rd Stage), Trombay, Namrup and Gerakhpur, with a total capacity of 455,000 tonnes. The capacity actually installed during the Plan was, however, 330,000 tonnes made up of Neyveli (70,000), Rourkela (120,000), FACT (2nd and 3rd Stages) (50,000) and Trombay (90,000).

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Compared to the progress made in the implementation of the schemes in the public sector, the position in the private sector was still worse. The Committee are perturbed to note that while the private sector was expected to execute 10 schemes to create capacity for the production of 6.25 lakh tonnes of nitrogen at the end of the Third Plan, only one scheme at Ennore, with a capacity of 8,250 tonnes was completed during the Plan period itself. Out of the remaining 9 schemes 7 schemes aggregating as much as 442 lakh tonnes were abandoned either by the parties concerned or by their licences being revoked after a period, ranging from one to six years. In respect of the other two projects (*i.e.* Gujarat and Coromandal) with a capacity of 176 lakh tonnes, only construction work was started and the projects were completed and commissioned in 1967-68.

The main reason for abandoning the projects, as indicated by Government, was that promoters could not secure necessary foreign collaboration in the establishment of the respective factories. It appears to the Committee that neither enough care was taken in processing the applications for installation of manufacturing capacity for fertilizers nor was any close watch kept on the progress made by the parties concerned after the issue of letters of intent to make sure that they took effective action to tie up collaboration arrangements and place orders for machinery and equipment. The delay in revocation of licences of the parties concerned has not only resulted in foreclosing the capacity and thus keeping the genuine parties away from coming in the field, but has also affected adversely the production targets of fertilizers to the detriment of national economy. The Committee consider it unfortunate that the inability of Government to catch up with the fertilizer programme has retarded the progress of the country in attaining self-sufficiency in food production.

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| 9. | 3.17 | <p>It is well recognised that intensive cultivation which leads to agricultural self-sufficiency requires ever-increasing application of chemical fertilizers. According to Government programme fertilizer complexes will now be springing up all over the country in response to the urgent need for augmenting the food output. In this context the Committee would like to strike a note of caution that if the projects do not come up as scheduled, self-sufficiency in agricultural production may elude us for many years to come. The time taken to establish new complexes and the time required to bring them to optimum level of production are of no less importance than the economics of the projects themselves. The Committee are convinced that if the projects that have already commenced construction and those approved by Government proceed with speed and according to schedule it should not be difficult to establish a capacity of 2.4 million tonnes of nitrogenous and 1 million tonnes of phosphatic fertilizers as laid down for period ending 1970-71. At the same time the Committee would like Government to ensure that the capacity set up does not remain unutilised for want of raw materials and other feedstock.</p> |
| 10. | 3.18 | <p>The Committee would also like the Government to give thought to the fertilizer production programme of the Fifth Plan so that action is initiated right now to study the raw material requirements, prospective location of new plants and possibility of expanding the existing units.</p> |
| 11. | 3.27
and 3.28 | <p>The Committee are glad to note that after an unsatisfactory performance of the private sector during the Third Plan period, Government have taken a number of measures to stimulate fertilizer production in the country. These measures <i>inter alia</i> include invitation to foreign capital for investment in the fertilizer industry. Government have made special concessions and offered liberal terms to foreign investors for this purpose. It has been agreed to permit</p> |

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majority foreign participation, entrust management control to foreign collaborators, give seven-year price and distribution holiday, apart from other concession like the high priority for the seven-year price and distribution holiday, apart from other concessions like the high priority for the import of raw materials credit facilities, seeding programme, assistance in procuring land and other infra-structure facilities. The Committee note that during the period of 2 years of the announcement of the new policy in December 1965, Government have received offers from only 9 parties. Of these, licence has been granted in one case for a capacity of 240,000 tonnes, letters of intent in six cases for a capacity aggregating 9,22,000 tonnes, while two proposals for a capacity of 660,000 tonnes are still pending consideration. The Committee are of the view that the response to the liberalised terms has not been very encouraging even though the deadline for receiving the offers was extended from 31st March, 1967 to 31st December, 1967. They are further concerned to note that subsequent to the issue of a Letter of Intent on 5-1-1967 the proposal for the Haldia Project has been withdrawn by the foreign collaborator. They hope that the remaining 8 proposals under the new policy would soon fructify. The Committee would urge that with the expiry of the deadline on the 31st December, 1967 Government should now lose no time in processing the proposals. In this connection, they would like to invite attention to the recommendation contained in their 9th Report (Fourth Lok Sabha) on Industrial Licensing that Government should "carefully examine the question of foreign collaborations having regard to the state of development of engineering and design organisations of Fertilizer Corporation and FACT, the need for achieving self-sufficiency in fertilizers at an early date to meet agricultural requirements and the imperative necessity of producing the fertilizers at economic and competitive prices so as to encourage their use on a wide scale in the interest of larger production."

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The Committee would like to emphasize that utmost care should be taken to see that the construction of the projects does not suffer from delays as in the past and that adequate and effective steps would be taken to ensure that they are completed and commissioned according to schedule. It should also be enjoined upon the collaborators that for the construction of the projects they should procure as much of the equipment as possible from within the country.

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3.37

The Committee are constrained to observe that the delay in the implementation of scheduled fertilizer programme and the under-utilisation of the installed capacity, ranging from 30 to 40 per cent, during the Second and Third Plan periods have cost the country heavily in importing substantial quantities of fertilizers. This has not only resulted in heavy drain of foreign exchange which was so vitally required for development of the country in other spheres, but has made the country dependent more and more on others to solve the food problem of the country. The Committee note that fertilizers imported in the country during the First, Second and Third Plan periods amounted to 7.61 lakh tons, 22 lakh tonnes and 40.88 lakh tonnes which cost the country to the tune of Rs. 24.74 crores, Rs. 63.92 crores and Rs. 128.55 crores, respectively totalling Rs. 217.21 crores in foreign exchange. The Committee are given to understand during the course of evidence that during 1968-69 alone the bill of fertilizer import will go upto Rs. 225 crores on account of the high yielding varieties seed programme having come in full play during 1967. The Committee have no doubt that if concerted and determined efforts had been made to put up fertilizer plants in time, the country would have saved considerable amount of foreign exchange which had to be spent on the imports of fertilizers and foodgrains during the Plan periods.

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| 13. | 3.38 | <p>The Committee agree that the recent increase in the tempo of modernisation of farming is largely due to the promise of greatly increased profitability of crop production through the use of high yielding varieties of seeds, coupled with heavy dressings of fertilizers. They hope that this tempo will gather momentum, as this is the only course to take the country to self-sufficiency in food needs before long. In the meanwhile the Committee would urge Government to ensure that the fertilizer plants under construction/contemplation are completed expeditiously so that the deadline set for achieving self-sufficiency, both for food production and fertilizers, is advanced in national interests.</p> |
| 14. | 4.16 | <p>The Committee are constrained to observe that the Central Fertilizer Pool which was originally set up with the object of running the State Trading Scheme on a 'no profit no loss basis' had made substantial profits since its inception in 1944-45 till 1964-65 except in two years <i>i.e.</i> 1946-47 and 1954-55. The profit had progressively increased from year to year from Rs. 671 lakhs in 1944-45 to as much as Rs. 947 lakhs in 1961-62. These were particularly heavy during the years 1957-58 to 1963-64 and amounted to about Rs. 42 crores. The Committee are unable to agree with the Ministry that "the profits were only incidental and accrued generally on account of appreciable fall in the procurement prices of imported fertilizers. . . ." It is apparent that Government made no serious attempts during the period to adjust the prices on their 'appreciable' fall and give the benefit of such fall in prices to the cultivators as an incentive to consume more fertilizer. The Committee fully endorse the views of the Public Accounts Committee expressed in their 23rd Report (1963-64) that this "was not consistent with the object of the Pool, which was never intended to be a revenue earning scheme, but was to serve as an equalisation fund, so that all the imported and</p> |
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indigenous fertilizers could be made available to the consumers at a uniform price throughout the country..." The Committee hope that such a situation will not be allowed to develop in future and that constant thought would be given to review the pricing policy keeping in view the objects of the Pool. The prices of various types of fertilizers should be so fixed that the benefit of lower imported price or reduction in the cost of indigenous production is actually passed on to the consumers to promote their sale and wider use.

15. 4.21

The Committee are glad to note that Government have been reviewing yearly the mode of assessment of the fertilizer requirements of the States from 1965-66 onwards keeping in view the new pattern of agricultural strategy for increasing agricultural production within the shortest possible time from irrigated and assured rainfall areas through the special programmes like the High Yielding Varieties Programme. Intensive Agricultural District Programme etc. They hope that as a result of this annual exercise a near realistic figure of the State's requirement of fertilizers would be available to the Central Government.

16. 4.24

The Committee note that there have been wide variations between demand, allotment and actual supply of fertilizers to States during the period 1961-62 to 1966-67. They find that in certain cases the quantity of fertilizers allotted has been as low as about 40 per cent of the demand, the actual supply being still further less. The Committee are distressed to learn that some of the States were not able to lift fertilizers because of various difficulties about distribution, organisation, etc. The Committee, in this connection, need hardly stress that the tendency of inflating the demand or under-utilising the quantity supplied, particularly in the present period of shortages of fertilizers in the country, should be discouraged as it not only gives rise to infructuous

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expenditure on the transportation and handling of such quantities of fertilizers as cannot be consumed as programmed but also keeps out the genuine consumers who need them most in other areas. The Committee, therefore, consider it desirable that the States should be encouraged to develop through an organised effort a system of realistic assessment. In the opinion of the Committee this can be done only if the States are given the feeling that their demands would be carefully examined with due regard to the actual consumption and that the allocations made would not necessarily be on a uniform *pro rata* basis. It need hardly be stated that reliable advance estimates of the probable demand would help in the timely allocation of necessary foreign exchange, if any of the requirements are to be met through imports.

17. 4.25

Now that the fertilizer units have been given freedom to market 50 per cent of their production in the manner they choose with effect from 1st October, 1967 (to be raised to 70 per cent from 1st October, 1968) the Committee suggest that the State Governments should enter into suitable arrangements direct with the fertilizer units in their respective areas, where existing, for the supply of fertilizer requirements to the extent possible. The Committee feel that such an arrangement would be beneficial and economical both to the manufacturers and the consumers as it would cut down the expenditure on movement and other handling charges besides ensuring quick delivery. The Committee further consider that the requirements over and above the supplies available direct from the fertilizer units should only be met from the Central Pool.

18. 4.26

The Committee also suggest that with a view to ensure regular supply of fertilizer to cultivators in time of need, the State Governments should build necessary buffer stocks of fertilizers with supplies to meet requirements in times of emergency created by

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| | | <p>delay in the receipt of requisite supplies on account of non-arrival of anticipated imports, bottlenecks in clearance from ports or difficulties in transport arrangements or there being a marked fall in the indigenous production. They feel that it should not be difficult to build and maintain such buffer stocks during the off-season of manuring.</p> |
| 19. | 4.39 | <p>The Committee find that in the matter of distribution of fertilizers, States like Andhra Pradesh, Bihar, Gujarat, Madhya Pradesh, Maharashtra, Mysore, Punjab and Rajasthan, have resorted to cooperatives on a monopolistic basis. They are, however, concerned to note from the observations of the Committee on Fertilizers (Sivaraman Committee) that "the performance of cooperative agencies in fertilizer distribution has not been upto expectations in many areas." Considering the large scale involvement of cooperatives in the distribution of fertilizers in the States, the Committee have no doubt as to the usefulness and popularity of the system in the rural areas. In order that the system is made more effective and the distribution of fertilizers is organised on scientific lines, the Committee would suggest that the functions of the cooperatives may not be confined to merely distribution of fertilizers, but that they should rather serve as a multi-purpose institution so as to meet the needs of the farmers for other inputs like seeds, pesticides, agricultural implements etc.</p> |
| 20. | 4.40 | <p>In order to stimulate healthy competition the Committee also feel it necessary that the distribution of fertilizers through other private agencies may be encouraged to the maximum. They hope that in the light of a new fertilizer policy, when at least 70 per cent of the indigenous production will be marketed directly by the manufacturers themselves, the marketing system will be so organised that the manufacturers have adequate control and supervision over their distribution agents to ensure that they actually give the services required by the cultivator in respect of which</p> |

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		<p>an allowance has been made in the distribution margin. The Committee also trust that the industry would extend voluntary vigilance on its part for ensuring adequate supplies of fertilizers to the farmer in time and at reasonable prices with a view to facilitate the Government to work out a realistic pricing and distribution policy.</p>
21.	4.41	<p>As the proper location of supply points largely determines the effectiveness of fertilizer distribution, it is of paramount importance that convenient locations, easily accessible to the farmers, are judiciously selected for the sale of fertilizers. Particular care has to be taken in the location of distribution points in hilly, remote and backward areas where communication and transport facilities are comparatively less developed and the costs involved make it an uneconomic business even for cooperative societies to come forward to undertake this job in such areas.</p>
22.	4.42	<p>The Committee are of the view that in a country like India, where fertilizer has come into use recently, an organised educational and marketing programme is essential to gain general acceptance of the farmers to the use of the product. Besides attempting purely marketing tasks, the Committee therefore consider that the programme should devote its attention to the problem of consumer acceptance and to convincing farmers of the benefits of fertilizer usage. This is all the more necessary in view of the massive programme of production of fertilizers in the coming years, as production without effective marketing, may result in accumulation of stocks and thus jeopardize the national economy.</p>
23.	4.43	<p>The Committee consider that for an organised marketing system emphasis should be laid on the following programme:</p> <p>(a) It should organise a decentralised storage and distribution system. The network should be so organised that no farmer</p>

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need walk long distances to obtain his fertilizer requirements;

(b) It should provide credit to the farmers either through trade channels or through independent agencies like co-operative societies or farm banks;

(c) An organised and efficient agronomic service unit as part of the selling and servicing organisation should be a necessary part of the programme. The agronomic service should be comprehensive and include soil testing facilities, advice on fertilizer application, selection of seeds, use of pesticides, etc.;

(d) Programmes for the education of farmers, using all mass communication media techniques such as fertilizer festivals or fairs, exhibitions, field demonstrations, films, newspapers, etc. are essential to the success of the entire marketing programme. In these programmes, field demonstrations are successful means of convincing farmers of the profitability of fertilizer application. Similarly, mobile audiovisual units could also be used effectively in village programmes.

24. 4.49.

The Committee are unable to appreciate Government's decision in allowing the F.C.I to obtain for two years the services of an expert from America for advising the F.C.I. on matters connected with the marketing of the fertilizers produced by the Corporation. They feel that the Central Fertilizer Pool which has been engaged in marketing and distribution of fertilizers both indigenous and imported since its inception in 1944, would have, by now built up sufficient expertise to advise the units particularly in the public sector, to organise their own marketing and distribution system under the new fertilizer policy.

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Further, FACT, being a dynamic organisation in the fertilizer industry has already built up a satisfactory marketing organisation and has evolved an integrated programme for the distribution, sales, servicing and consumer education. Under the circumstances, the Committee consider that the decision of Government in obtaining the services of a foreigner on marketing has not been a sound one. They are of the opinion that the country should not go in for foreign experts on subjects where indigenous talent is available even though the services of such experts are easily available under some Aid Programme. In the present case, it is doubtful whether a foreigner, howsoever expert he may be in marketing, could have more intimate knowledge of the Indian way of life, particularly of farmers in the villages, than an Indian expert in the field.

The Committee need hardly point out that the country has reached a stage where in many fields India will not be found wanting in expertise knowledge as compared to advanced countries. They would, therefore, emphasise that consistent with the national honour and dignity, Government should, as a matter of policy, not go in for the services of foreigners unless these are very essential in highly technical and scientific fields. Even in such cases the selection should be done only with the approval of the Cabinet.

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4.55.

The Committee note that Government have not so far been able to entrust the functions of marketing and distribution of fertilizers either to a Marketing Corporation as recommended by the Fertilizer Distribution Enquiry Committee in 1960 or to a Fertilizer Promotion Corporation, as recommended by the Committee on Fertilizers in 1965. They are inclined to agree with the observations made by the Fertilizer Distribution Enquiry Committee that the Pool being a section of the Department of Agriculture "has little freedom of action although it is called upon to operate a trading scheme". The Committee on Fertilizers have also emphasised the need for a central agency to handle distribution of pooled fertilizers efficiently on

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business lines. The Committee feel that the formation of a single central agency, would no doubt help in taking coordinated action for planning, procurement, distribution and despatch of fertilizers more efficiently and economically.

The Committee are glad that the Study Team appointed in October 1967 has gone into this aspect again and have *inter alia* recommended that a single marketing division should be established to market the products of all the manufacturing units. The Committee hope that very early action would be taken on the recommendation of the Study Team so that the marketing and distribution of fertilizers of public section features, which is perhaps more difficult a problem than the production of fertilizers itself, it organised on more scientific lines, keeping in view the role which the Public Sector has been called upon to play under the new marketing and pricing policy of fertilizers.

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4.59.

The Committee feel that there is considerable scope for intensification of the quality control programme by drawing a larger number of samples and by providing additional trained staff for this purpose, where necessary. They consider that if adulteration becomes common it would not only have an adverse impact on the yield but would also shake the confidence of the farmers in the effectiveness of fertilizers. In order to protect a large number of farmers against the malpractices of the trade, the Committee feel that there is need for greater vigilance in strictly enforcing the provisions of the law. They consider that regular ~~drawal~~ of samples for test analysis from straight fertilizers as well as mixtures at various stages in their marketing is an effective instrument for enforcing the control over the quality. They suggest that the provisions of the Fertilizer (Control) Order may be suitably amended in the light of past experience so as to provide deterrent punishments in the order to give protection to the farmers against supply of sub-standard materials, high prices through monopolies and combines, false and exaggerated claims for various fertilizers.

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| 27. | 4.60 | <p>Since maintenance of standards of storage and packaging have an important bearing on the maintenance of quality and the prevention of adulteration at all distribution levels, the Committee also suggest that ways and means should be devised to effect improvements in the fertilizers packaging and storage facilities in consultation with the industry.</p> |
| 28. | 4.74 | <p>The Committee need hardly stress that an adequate and timely supply of credit facilities is a pre-requisite for the growth of fertilizer consumption. They feel that for providing the farmer with plant nutrients to the extent of 3.7 million tonnes (indigenous production and imports) by 1970-71, credit facilities both at the farmer's level (credit to farmers) and at the distribution levels (i.e. marketing credits) will have to be augmented. They suggest that the Central and State Governments, banking institutions (Reserve Bank and other commercial banks) and the cooperative institutions and the manufacturers themselves should provide adequate funds so that the cultivator does not suffer for lack of financial resources for the purchase of fertilizers and other agricultural inputs.</p> |
| 29. | 5.7 | <p>Having regard to the acute shortage of fertilizer in the country, the Committee note Government's decision in allowing all fertilizer units licensed on or before the 31st December 1967 the freedom of fixing prices for the sale of their products for a period of seven years from the commencement of commercial production. In order that this concession is translated into action within the minimum period possible, they would like to urge that Government should extend all possible assistance to the manufacturers to ensure the erection and commissioning of the new plants within the stipulated period as longer period of construction would not only result in loss of production but would also enhance the cost of production on account of increased capital costs.</p> |
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30. 5.8 The Committee apprehend the possibility of misuse of the concession of pricing on the part of manufacturers and traders by creating artificial shortages and thereby increasing the price of fertilizer in certain areas. The Committee therefore need hardly stress that effective measures should be taken to ensure adequate and regular fertilizer supplies to match the requirements, so that no situations of shortages are created at any time in any part of the country.
31. 5.9 As regards Government's option to purchase 30 per cent of the fertilizers production from the manufacturers at negotiated price the Committee note that Government have not so far laid down any specific procedure for fixation of the price. They, however, hope that the option will be so exercised by Government that it helps in stabilising the fertilizer prices at a very reasonable level to the advantage of both the consumer and the producer.
32. 5.19 The Committee find that there is wide difference in the ex-factory retention price of indigenous fertilizers and the pool selling price. Even after adding the expenditure on inland freight, incidental charges, sales tax etc. there is still a difference between this price (no-profit-no-loss price) and the pool selling price. For example, one tonne of indigenous urea at the ex-factory retention price of Rs. 582/- after adding the incidental charges to the extent of Rs. 46.35 is sold at the pool price of Rs. 760/- per tonne as against the 'no profit no loss' price of Rs. 628.35 per tonne. Similarly, in the case of certain imported fertilizers it is noted that the 'no profit no loss' prices are more than the pool prices. The committee are therefore constrained to observe that the pool prices have not been correctly fixed in the past. In view of this they feel that there is need for making a fresh review of the basis for fixation of prices both in respect of indigenous and imported fertilizers. The review has become all the
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more necessary in view of the liberalised pricing and marketing policy under which the producers have been given the option to sell atleast 70 percent of their products in the manner and at a price they choose with effect from the 1st October, 1968. They therefore suggest that a committee of experts drawn from the fertilizer industry, commerce and trade, economists, cost accountants, representative of farmers, etc. should be set up to go into the various elements and economics of cost structure so that a uniform price policy, advantageous both to producers and consumers, is laid down under the changed conditions.

33. 5.20 The aforesaid expert committee may also examine the question of introducing cost planning, cost control and cost reduction techniques by installing a cost reduction cell in each organisation, both in the public and private sectors for ensuring economic cost in all the stages of processes of production.
34. 5.42 The Committee are concerned to note the high cost of production of fertilizers in the country. While they agree that the cost of ammonia produced in the existing plants at Sindri, Nangal, Trombay, Rourkela, Neyveli and Alwaye is higher because of raw materials used, old technology, the smaller size units and the high investment, they feel that the high operating costs are also largely due to non-utilisation or under-utilisation of the capacities on account of teething troubles and faulty equipments used. The Committee have no doubt that sustained and continuous efforts would be made to modernise some of the older plants and to improve production by installing additional balancing equipments where necessary so that increased production in these units may result in reduction in costs.
35. 5.43 The Committee are glad to learn that the cost of production in the new units at Namrup, Gorakhpur, Durgapur and Cochin would be lower due to larger capacities and modern technology. They are, however, surprised to note that even in these units the
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costs will vary from unit to unit though the raw material to be used in these units would be the same. As for instance, the cost of urea in Gorakhpur has been worked out to Rs. 469.56 per tonne as against Rs. 343 in Durgapur and Rs. 420 in Cochin. The Committee hope that Government would go into this aspect with a view to bring down the costs to the lowest level and as near to each other as possible.

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5.44

The Committee are also constrained to note that fertilizers are made available to farmer in India at costs much higher as compared to farmers in other countries. They find that the price paid by Indian farmer in 1965-66 for one metric tonne of nutrient—ammonium sulphate, even at the subsidised rates, was Rs. 1804 as compared to Rs. 729 in Pakistan (West), 1257 in Japan, Rs. 1324 in U.S.A. and Rs. 800 in Britain. Due to the impact of devaluation in June 1966 and the removal of subsidy, the price stands at Rs. 2343 per tonne with effect from 1.4.1967. The Committee feel that one of the factors for high costs of agricultural products in India is the high cost of inputs used by the farmers. They consider that the aim of the fertilizer industry should be to manufacture and make available to the farmer fertilizers at the lowest possible price, so that the cost of agricultural products is proportionately brought down at rates competitive with other countries. In the opinion of the Committee the lower costs per tonne of fertilizer for investment, maintenance and labour would be possible by—

- (i) optimum plant equipment and plant lay-out;
- (ii) Construction of standard capacity units instead of tailor-made installations; and
- (iii) increase of unit capacity to the optimum.

The Committee have, no doubt, that cheaper fertilizers for farmers can flow out of the factories if the financial outlays are reduced to the minimum by properly assessing the realistic needs in phase, cutting

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down the time of erection and commissioning of the plants, using largely the raw materials/feedstocks available indigenously, judicious selection of advanced technology, efficient management for controlling and managing the physical distribution aspect of marketing.

The Committee are convinced that if fertilizers are made available in time at economic prices, the Indian farmer would not be lagging behind his counterpart in other countries in making full use of them to step up production and bring the proclaimed goal of self-sufficiency within reach.

37. 6.40

The Committee observe that one of the factors for non-fulfilment of the targets of fertilizer production during the plant periods was the non-availability of raw materials and feed-stocks in required quantity and quality. The shortage of electric power and non-availability of good quality coal which affected the production of FACT and Sindri respectively during the Second Plan period continued to persist during the Third Plan period also. The deteriorating quality of gypsum also inhibited the Sindri factory from attaining the optimum capacity. The production at Rourkela Plant was much below its installed capacity mainly on account of non-availability of coke oven gas. The production at Nangal factory also suffered due to shortage of electric power. All these are indicative of calculations in planning going wrong and failure to take adequate timely measures to ensure the supply of raw materials and feed-stock to these factories. The Committee urge that effective measures should be taken to ensure the availability of raw materials and feed-stock to the existing fertilizer plants so as to ensure that capacity for the production of fertilizers installed in the country is utilised to the optimum.

38. 6.41

The Committee are informed that in view of the deteriorating quality of Rajasthan Gypsum and exhaustion of the mines, Government have decided to

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introduce Sindri Rationalisation Scheme which would produce phosphatic fertilizers and replace Rajasthan gypsum with by-product gypsum from the proposed phosphoric acid plant, at a cost of about Rs. 23 crores, including foreign exchange component of about Rs. 6 crores, The Committee understand that new deposits of gypsum have been found recently in Jaisalmer area in Rajasthan. They would, therefore, suggest that before launching the expensive rationalisation scheme, Government should make a thorough study of the economics of the new deposits to see whether the gypsum available in these deposits can be suitably used under the existing process of production in the Sindri Factory.

39. 6.42

As regards the import of liquid ammonia, the Committee find that the proposal from Messrs Dharmasi Morarji which was rejected by Government a couple of months ago has been accepted on reconsideration and a Letter of Indent issued to the firm on the 7th February, 1958. The Committee understand that the proposal has been pushed through on the consideration that in the coming years there will be growing pressure on the supply and price of naphtha, while ammonia prices are likely to go down.

The Committee also note that the proposal to set up a coal based fertilizer plant at Korba, abandoned in 1965, is now being reconsidered for revival after an infructuous expenditure of Rs. 1.7 crores.

The Committee are concerned to note that Government have not yet been able to take a firm decision on the basic issue as to how much future fertilizer capacity would be based on naphtha, imported ammonia or any other raw materials. They, therefore, feel that it is high time that Govt. take firm and final decision on this vital issue.

40. 6.67

The Committee understand that out of one million tonnes of phosphatic fertilizer which is the target

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fixed for the Fourth Plan period, a considerable portion i.e. about 0.72 million tonnes will be based on imported sulphur and rock phosphate. Hence in order to achieve this target it is imperative that a regular and uninterrupted supply of imported raw materials is made available to the fertilizer factories on a high priority basis. In view of its world-wide shortage the Committee desire that no efforts should be spared by Government to procure sulphur. In this connection they welcome the constitution of the Sulphur Advisory Committee in the Ministry of Commerce and the Fertilizer Raw Materials Committee consisting of representatives of Fertilizer Association of India. Fertilizer Corporation of India and FACT to advise the Ministry of Petroleum & Chemicals. The Committee hope that problems relating to provisioning, import, allocation and distribution of raw materials will be tackled speedily and satisfactorily in the interest of smooth running of the factories and that difficulties which were faced in the recent past in this regard will be solved.

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6.68

India suffers from lack of indigenous sources of sulphur and rockphosphate. It is understood that owing to universal chronic shortage of sulphur various processes for the production of phosphatic fertilizers without the use of large quantities of sulphur are under study in various parts of the world. The Committee suggest that Government should keep themselves abreast and take full advantage of such technological developments so that India may reduce her dependence on imported sulphur to the maximum extent possible. It is, therefore, essential that vigorous and intensive efforts should be made for exploring, prospecting and exploiting the rockphosphate and pyrites deposits in U.P., Madhya Pradesh, Rajasthan and Andhra Pradesh. The Committee are glad to learn that the increasing shortage of sulphur and its high cost has turned Government's attention to the production of nitrophosphates in some of the factories, e.g. Trombay Fertilizer Factory which eliminates the use of sulphur.

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| 42. | 7.5. | <p>The Committee are glad to note that a beginning has been made with the large size plants based on the new single stream principle in ammonia and urea production by setting up the plants at Cochin and Durgapur. They also note that most of the new plants will be producing urea which is the most concentrated nitrogen fertilizer and also complex fertilizers. The larger production of more concentrated fertilizer will also help in reducing transport and distribution costs. Recent advances in the technology of fertilizer production has been phenomenal in the developed countries. The Committee would like to stress the need to keep abreast of the new ideas and techniques in the fertilizer industry and hope that Government will make full use of the fast growing technological advances in this field and use them effectively in the new plants under construction/contemplation.</p> <p>The Committee note that there is some element of over-lapping and duplication in the present activities of the P & D Division of FCI and the FEDO of FACT. They would, therefore, suggest that these organisations should work in close collaboration with each other so that they operate in a complementary manner. Care should, however, be taken to ensure that available know-how and engineering capabilities of each of these organisations are fully utilized and no avoidable payments in foreign exchange are made for acquisition of services which may be available with one or the other of the organisations and which can be put to mutual help in working out schemes. The Committee hope that when the two organisations are placed under the direction of a Technical Director, as recommended by the Study Team set up by the Ministry of Petroleum & Chemicals, necessary improvements would be made to bring about effective co-ordination and liaison between the two organisations.</p> |
| 44. | 7.42. | <p>The Committee are glad to learn that the Planning and Development Division of the Fertilizer</p> |

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Corporation of India and the FACT Engineering and Design Organisations (FEDO) have made valuable contributions to the development of fertilizer industry in the country. They observe that as a result of past experience gained and accumulated by the engineers, scientists, managers and workers of these organisations over the years, in the design, construction and erection of various machinery and plants it has now become possible to organise full-fledged engineering and design organisations, competent to undertake the complete designing and engineering of fertilizer and chemical plants in India itself, a work hitherto undertaken by foreign firms only. The Committee are, however, concerned to note the observations of the Working Group of the Planning Commission that it has not been possible to put to test the capacity of these organisations at practical plane and to identify such deficiencies as might exist, because neither of these two organisations has so far been given responsibility to completely design, engineer and construct a fertiliser project."

The Committee feel that with the experience gained as a result of designing and erecting the two plants at Durgapur and Cochin, the Planning and Development Division and the FEDO would play a greater role and would be able to take over the entire responsibility of designing and engineering of at least two fertilizer plants a year with the know-how developed by them or acquired and purchased from other countries. They have no doubt that the fulfilment of these tasks according to schedule would largely depend on the extent to which the fertiliser production programme can be insulated from the uncertainties of foreign aid and put on firmer ground by greater reliance on domestic capital and equipment and know-how. It hardly needs to be stressed that the utilisation of the indigenous know-how in this vital sector would not only save considerable foreign exchange on design, engineering and know-how expenses, but would also result in maximum utilisation of the indigenous fabrication facilities for equipment.

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45. 7.43. The Committee also feel that with the coming up of a number of new fertilizer plants these organisations, P & D and FEDO, will have to undertake a larger number of assignments in the coming years. They, therefore, suggest that the scope of these organisations should be expanded and strengthened suitably so as to enable them to shoulder the additional responsibilities ahead in the process of rendering on-the-spot expert advice.

46. 7.44. The Committee are unable to appreciate Government's decision to pose the Trombay extension scheme to USAID for assistance particularly when P & D claim that they could undertake this assignment and had amply demonstrated their capabilities by the designing, engineering and installation of the Rourkela Fertilizer group of plants as far as ten years back.

They are of the opinion that projects undertaken with tied foreign loans or on turn key basis often cost much more than similar projects wherein the country is free to utilize its own know-how and equipment to the maximum extent possible.

47. 7.45 As regards the proposal for the manufacture of catalysts by the firm of Laljee in collaboration with M/s. Catalysts and Chemicals of U.S.A., it would be seen from the facts furnished by the Ministry that the preliminary proposal submitted by the firm did not include manufacture of catalysts used for fertilizers. It is not clear to the Committee why this item was included at a later stage. With a view to safeguard the development of the indigenous know-how of P&D against unfair competition, Government propose to incorporate two conditions in the foreign collaboration agreement at the time of according Government approval. The Committee have, however, their own doubts whether Government will be able to ensure

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compliance of the two conditions in actual practice. In these circumstances, anxiety among the scientists and engineers of the P. & D. Division is understandable. The Committee have more than once deprecated the tendency of depending on foreign capital, technical know-how, import of equipment, components and raw materials, without exploring the possibility of finding these services from within the country. They feel that there is an urgent need to give the much needed encouragement and confidence to the indigenous talent.

48. 7.50. The Committee have been informed that only 35 to 40 per cent in terms of value of the total plant and machinery required for a fertilizer plant is now being made available from indigenous sources. They are, however, happy to note that a major breakthrough in the indigenous fabrication of plant and equipment would be progressively achieved in the next five years. The Committee have no doubt that with concerted effort from both the public and private sectors and with the encouragement and vigorous follow up action on the part of Government, it should be possible for India to accelerate and advance the pace of self-sufficiency in the manufacture of plant and machinery for the fertilizer project.
49. 7.51. The Committee also consider that it would be necessary and possible to enforce standardisation as soon as a measure of self-reliance is achieved in the matter of equipment. The Committee would like the Government to impress upon the enterprises in the private sector licensed for producing fertilizers with or without foreign collaboration to incorporate into their design and engineering maximum quantum possible of standard indigenously manufactured plant and equipment.
50. 8.6. The Committee are glad to note that the Railway Administrations are fully alive to the need for the expeditious clearance of fertilizer both imported and
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indigenous as well as raw materials to the factories engaged in the production of fertilisers and have accorded priority for this purpose. They hope that fertilizer units will keep constant watch over their production and take urgent measures in consultation with the Railway to despatch the products so as to avoid accumulation in the factories. The Committee consider that a certain amount of advance planning would be necessary to ensure movement of supplies from the ports/factories to the centres of distribution/consumption. This would be possible if the fertilizer requirements of the various States and other consumer interests are properly assessed to correlate despatches from the ports/factories to avoid unnecessary delays and expenses on movement.

51. 8.14. The Committee note that in implementation of the recommendation of the Sivaraman Committee some States, viz. West Bengal, Orissa, Bihar, Madras, Mysore, Kerala, Maharashtra, Gujarat and Punjab, have set up Advisory Committees on Fertilizers, while others have either not set up or do not feel any need for such committees. As the Advisory Committee consists of persons concerned with the use and distribution of fertilizers, the Committee feel that its constitution would enable the State Government to better understand and resolve the various problems that might arise from time to time during the course of execution of various schemes on fertilizers. They would, therefore, like the Union Government to use their good offices over such of the State Governments/Territories as have not yet set up the advisory committees with a view to persuade them to do so in their respective States/Territories. The Committee also feel that there is need to define the composition and functions of the advisory committees so as to bring uniformity in their outlook in all the States/Union Territories as far as possible.

52. 8.17 The Committee consider that at the present stage of development of fertilizer industry, the need for

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bringing down the cost of production of the plant nutrients is of paramount importance. The interest of the country, as a whole, would be better served if the location of the project is decided by the logic of economic factors so as to maximise production at the most competitive rates as compared to international prices. The choice of plant location should be based on the total economies which can be realised through consideration of all factors involved, such as plant size, availability of raw materials, power and water, transportation and marketing facilities in the context of the infra-structure available. Significant capital savings are possible by judicious selection of the site where important plant units could be located from within the available area. Collection of dependable contour and soil data (for foundations design) is an essential first step. Had these points been taken care of, the wastage of time and money in setting up plants at Namrup and Gorakhpur could have been avoided. In this connection the Committee would also like to draw the attention of the Government to their recommendation on location of industries in paras 3.180 of their Ninth Report (Fourth Lok Sabha) on Industrial Licensing.

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8.22

The Committee are glad to learn that there is complete accord and close consultation amongst the various Ministries concerned with the planning, production, pricing, distribution and import of fertilizers. The Committee, however, consider that in view of the importance of the fertilizer programme in the new strategy of food production it is essential that this team spirit and coordination amongst the various Ministries is not only maintained but further strengthened. They would, further, emphasise that the procedure for consultation should be simplified and streamlined so as to ensure that all procedural delays are eliminated and speedy decisions are taken.

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The Committee note the heavy shortfalls in production in both the Kourkela and Neyveli Fertilizer

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plants. They feel that there is need for keeping a close watch on the production, maintenance and operations in these two plants through regular reports, returns and visits of the technical committee set up for the purpose, and giving the two factories the expertise available with the Ministry of Petroleum & Chemicals. The Committee further recommend that with a view to associate the Ministry of Petroleum & Chemicals more actively in the operation of the two factories, it should be represented in the Board of Directors both at Rourkela and Neyveli.

55. 8.39

The Committee note the growth of Fertilizer Association of India as a representative body of the fertilizer interests in the country voicing the views of the industry. They are given to understand that the Association is the only forum for organizing seminars, symposiums etc. on problems of common interests to both the public and private sectors in the matter of cost, financing, design, engineering, construction and operation of fertilizer projects and production, pricing and distribution of fertilizers. The Association is thus rendering useful service in making the country conscious of fertilizers and in focussing the attention of the industry and the Government to the various problems of the fertilizer industry. The Committee are not aware of the facts and circumstances under which the responsibility for fixing the price of super-phosphate has been entrusted by Government to the Association. As the Association largely represents the producers of fertilizers and not the large mass of consumers throughout the length and breadth of the country, the Committee consider it desirable that due representation should also be given to the consumers in the matter of fixing the price of super-phosphates. They hope that appropriate steps would be taken by Government to ensure that the interests of farmers are safeguarded in the matter of pricing and distribution of fertilizers.

56. 8.40

The Committee are glad that the Association have also taken initiative for setting up the Fertilizer

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Institute to promote collection, study and dissemination of information with particular reference to technological and other related aspects of fertilizer production and also agronomic studies in the application of fertilizers. While welcoming this move the Committee trust that the Institute would try to establish cooperative working relationship with such organisations and institutions as are already engaged in solving technological designing and engineering problems of the fertilizer industry as also the agricultural research institutions now functioning in the country under the Central and State Governments.

57. 9.10

The Committee would like to observe that the present campaign for and stress on chemical fertilizers should not make the country oblivious about organic fertilizers and their role in soil fertility. The main organic fertilizers of economic significance are farm-yard manure, green manure, compost, sewerage etc. The importance of organic fertilizer arises not so much in the small quantities of plant nutrients these provide as in their role as a soil conditioner and as a catalytic agent to provide optimum condition for the efficient and maximum utilisation of synthetic fertilizer applied to soil. The massive application of inorganic fertilizers is no substitute to organic fertilizers. On the other hand the very fact of increasing supplies of inorganic fertilizers to soil make it all the more important to devote greater attention to organic fertilizers in order to keep the soil conditions conducive to obtaining maximum benefit from the application of large doses of inorganic fertilizers. Thus the role of organic manure is complementary to that of Chemical fertilizers. The Committee, therefore, suggest that adequate attention should also be given to the utilisation of the basic organic fertilizers much of which are currently being wasted.

58. 9.11

In Chapter VIII it has been discussed how more than half a dozen Ministries at the Centre are concerned with various aspects of fertilizers produced in

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the public sector. Apart from this according to the present programme more than half of the total requirements of fertilizers will be produced in factories in the private sector by the end of 1970-71. In the matter of promotion of fertilizer use and provision of credit facilities to farmers, besides the Central Government, the State Governments, manufacturers, banking institutions also come in the picture. The multiplicity of authority dealing with fertilizers underlines the complexity of the task and the need for close coordination among the various agencies involved. The Committee hope that efforts will be made by Government to rationalize the present multiplicity of authority in the sphere of fertilizers in such a manner that the functions relating to production, distribution and import of fertilizers are entrusted to a single authority|agency as far as possible, keeping in view the recommendations made by the Sivaraman Committee and the Study Team recently appointed by the Ministry of Petroleum and Chemicals.

APPENDIX XIV
(Vide Introduction)

Analysis of Recommendations/Conclusions contained in the Report

I. CLASSIFICATION OF RECOMMENDATIONS

- A. Recommendations for improving the Organisation and Working:**
Serial Nos. 5, 6, 7, 9, 10, 14, 15, 18, 19, 20, 21, 22, 23, 25, 26, 27, 28, 31, 32, 33, 37, 39, 40, 41, 42, 43, 45, 49, 50, 51, 53, 54 & 58.
- B. Recommendations for effecting economy:**
Serial Nos. 11, 12, 13, 16, 17, 24, 34, 35, 36, 38, 44, 52 and 57.
- C. Miscellaneous Recommendations:**
Serial Nos. 1, 2, 3, 4, 8, 29, 30, 46, 47, 48, 55 and 56.

II. ANALYSIS OF THE RECOMMENDATIONS DIRECTED TOWARDS ECONOMY

Sl. No.	S. No. as per summary of recommendations Appx. XIII.	Particulars
(1)	(2)	(3)
1	11	With regard to the new fertilizer projects Government should carefully examine the question of foreign collaborations having regard to the state of development of engineering and design organisations of Fertilizer Corporation and FACT, the need for achieving self-sufficiency in fertilizers at an early date to meet agricultural requirements and the imperative necessity of producing the fertilizers at economic and competitive prices so as to encourage their use on a wide scale in the interest of larger production.
2.	12	If concerted and determined efforts had been made to put up fertilizer plants in time, the country would have saved considerable amount of foreign exchange

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| | | which had to be spent on the import of fertilizers and foodgrains during the Plan periods. |
| 3. | 13 | Government should ensure that the fertilizer plants under construction/contemplation are completed expeditiously so that the deadline set for achieving self-sufficiency both for food production and fertilizers, is advanced in national interests. |
| 4. | 16 | As far as States are concerned, the tendency of inflating the demand or under-utilising the quantity supplied, particularly in the present period of shortages of fertilizers in the country, should be discouraged as it not only gives rise to infructuous expenditure on the transportation and handling of such quantities of fertilizers as cannot be consumed, as programmed but also keeps out the genuine consumers who need them most in other areas. The States therefore should be encouraged to develop through an organised effort a system of realistic assessment. |
| 5. | 17 | The State Governments should enter into suitable arrangements direct with the fertilizer units in their respective areas, where existing, for the supply of fertilizer requirements to the extent possible as it would be beneficial and economical both to the manufacturers and the consumers in cutting down the expenditure on movement and other handling charges. |
| 6. | 24 | Consistent with the national honour and dignity Government should, as a matter of policy, not go in for the services of foreigners unless these are very essential in highly technical and scientific fields. |
| 7. | 34 | Sustained and continued efforts should be made to modernize some of the older plants and to improve production by installing additional balancing equipments where necessary so that increased production in these units may result in reduction in costs. |
| 8. | 35 | Government should go into the cost of production of fertilizers in each of the new plants with a view to bring down the costs to the lowest level and as near to each other as possible. |

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| 9. | 36 | Cheaper fertilizers for farmers can flow out of the factories if the financial outlays are reduced to the minimum by properly assessing the realistic needs in phase, cutting down the time of erection and commissioning of the plants; using largely the raw materials/feedstocks available indigenously, judicious selection of advanced technology, efficient management for controlling and managing the physical distribution aspect of marketing. |
| 10. | 38 | Before launching the expensive Sindri Rationalisation Scheme, Government should make a thorough study of the economics of the new deposits of gypsum in Rajasthan in order to see whether these deposits can be suitably used under the existing process of production of fertilizers in the Sindri Factory. |
| 11. | 44 | The P&D Division of the FCI and FEDO of FACT should take over the entire responsibility of designing and engineering at least two fertilizer plants a year with the know-how developed by them or acquired and purchased from other countries. The utilisation of the indigenous know-how in this vital sector would not only save considerable foreign exchange on design, engineering and know-how expenses, but would also result in maximum utilisation of the indigenous fabrication facilities for equipment. |
| 12. | 52 | The location of a project should be decided by the logic of economic factors so as to maximise production at the most competitive rates as compared to international prices. The choice of plant location should be based on the total economies which can be realised through consideration of all factors involved, such as plant size, availability of raw materials, power and water, transportation and marketing facilities in the context of the infra-structure available. Significant capital savings are possible by judicious selection of the site where important plant units could be located from within the available area. |
| 13. | 57 | Adequate attention should be given to the utilisation of the basic organic fertilisers much of which are currently being wasted. |

Sl. No.	Name of Agent	Agency No.	Sl. No.	Name of Agent	Agency No.
27.	Bahree Brothers, /188, Lalpatrai Market, Delhi-6.	27	33.	Bookwell, 4, Sant Naran-kari Colony, Kingaway Camp, Delhi-9.	96
28.	Jayana Book Depot, Chapparwala Kuan, Karol Bagh, New Delhi.	66		MANIPUR	
29.	Oxford Book & Stationery Company, Scindia House, Connaught Place, New Delhi -1.	68	34.	Shri N. Chaoba Singh, News Agent, Ramlal Paul High School Annex, Imphal.	77
30.	People's Publishing House, Rani Jhansi Road, New Delhi.	76		AGENTS IN FOREIGN COUNTRIES	
31.	The United Book Agency, 48, Amrit Kaur Market, Pahar Gani, New Delhi.	88	35.	The Secretary, Establishment Department, The High Commission of India. India House, Aldwych. LONDON, W.C.-2.	
32.	Hind Book House, 82, Janpath, New Delhi.	95			