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❖ OF THE TASK FORCE (1) ❖
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REPORT OF THE WORKING GROUP OF THE TASK FORCE (I)
on the
AGRICULTURAL MACHINERY INDUSTRY

New Delhi
January 1973

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AGRICULTURAL MACHINERY INDUSTRY

CONTENTS

- Chairman's note
1. Introduction
 2. The Tractor Industry
 3. Power Tillers
 4. Combines
 5. Agricultural Implements
 6. Research, Development, Testing & Consultancy
 7. IDA Project
 8. Exports
 9. Summary and Recommendations
 10. Appendices
 - I. Members of the Working Group
 - II. Terms of reference
 - III. List of Tractor units licensed
 - IV. List of Tractor units with letter of intents
 - V. Current Tractor prices
 - VIA. Estimate of Investment & Foreign Exchange requirements on capital account for Tractors & Power Tillers during Fourth & Fifth Plan.
 - VIB. Estimate of Foreign Exchange requirements on capital and maintenance account for Tractors & Power Tillers during Fourth & Fifth Plan.
 - VIC. Major inputs required for Tractor industry.
 - VID. Major inputs required for Power Tiller industry.
 - VII. Questionnaire sent to the industry.
 - VIII. Assessment of demand for implements (as estimated by Ministry of Agriculture).

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I have great pleasure in submitting this note on the status of the Agricultural Machinery Industry and its future. I regret, that this note has taken somewhat more time than we had originally anticipated. The area covered and the number of people whose advice and co-operation were sought are so large that we could not finish this within the time that we had set for ourselves.

As will be seen from the body of the note, farm mechanization in this country is of so recent an origin and the parameters that have an effect on it are so uncertain that assessment of the future became very difficult. Because of this there have been many different and honestly held opinions on basic matters such as the demand of tractors, the possible effect of mechanization on labour, etc. We have tried to rationalise and use the best possible advice available to us in arriving at our estimates and at the conclusions that we have reached.

It is clear to us that in view of the social and economic changes which are desired in this country, the pattern of the utilisation of farm equipment will change considerably; and that tractor users rather than tractor owners will be at the forefront of the farm mechanization picture. This obviously will require considerable change in the many inputs that go towards mechanization.

I would like to thank the members of the Committee for their valuable assistance and for the time and trouble they have

- 2 -

taken in attending the various meetings of the Committee and in going through the various background papers.

I am particularly thankful to Mr. R.N. Singh, Convenor for his efforts in co-ordinating the affairs of the Committee.

Bombay
28th December 1972

B.R. Sule
CHAIRMAN

INTRODUCTION

- 1.1 The Planning Commission constituted a Steering Group on Engineering Industries to
 - i) assess the progress made in the various industrial sectors,
 - ii) assess the future potential, and
 - iii) make suitable recommendations regarding demand, capacity production and steps to be taken in the remaining period of the Fourth Five Year Plan and also during the Fifth Five Year Plan period.
- 1.2 The Steering Group for Engineering Industry set-up by the Planning Commission has appointed several Task Forces. Task Force (I) was set up under the Chairmanship of Shri R.V. Subramanian, Additional Secretary (HI), Ministry of ID&IT for dealing with Transport and Allied Equipment.
- 1.3 Task Force (I) was allotted various industries including the Agricultural Machinery Industry to cover tractors, power tillers, combine harvesters and agricultural implements. Among the various Working Groups formed, one was for the Agricultural Machinery Industry. The list of members nominated on this Working Group appears in Appendix I and terms of reference in Appendix II.
- 1.4 The first meeting of the Working Group was held on the 2nd August 1972; following Study Teams were formed to deal with various topics and to submit their notes to the main working Group.

<u>Topic</u>	<u>Convenor</u>
1. Tractors and Combines	Mr. B.K.S. Jain
2. Power Tillers	Mr. V.T. Velu
3. Agricultural Implements	Mr. D.N. Kherdekar
4. Research & Development	Mr. Chandra Mohan

The Working Group at its subsequent meetings discussed the reports of the various Study Teams from which this report has been compiled.

2. THE TRACTOR INDUSTRY

The Status of the Industry

- 2.01 With the rapid growth of population in India, production of food grains has assumed the utmost importance. It is in this context that an ambitious programme for mechanization of agriculture was launched. Initially, the basic need of equipment for mechanization had to be imported. Due to concerted efforts made during the last decade a large number of industries have been set up to manufacture the needed agricultural machinery.
- 2.02 The estimates of demand for tractors in this period varied considerably as evidenced by the requirements assessed by a working group set up by the Planning Commission (Table 1) and as assessed by the Ministry of Agriculture (Table 2). The assessment of the Indian Society of Agricultural Engineers also differed from the above two estimates.

Table 1

The Planning commission had set-up a working group for agricultural equipment to assess the requirement during Fourth Five Year Plan which is as under :

HP Range	69-70	70-71	71-72	72-73	73-74	Total for IV Plan
12- 20	10,000	12,000	14,000	17,000	21,000	74,000
21- 35	22,000	25,000	29,000	33,500	38,000	147,500
Above 50	4,000	5,000	6,000	7,500	9,000	31,500
	36,000	42,000	49,000	58,000	68,000	253,000

Table 2

Department of Agriculture had also separately estimated their demand during the Fourth Five Year Plan period, the break-up of which is as under :

HP Range	69-70	70-71	71-72	72-73	73-74	Total for IV plan
12 - 20	18,000	18,000	20,000	22,000	25,000	103,000
21 - 35	36,000	36,000	38,000	40,000	45,000	195,000
36 - 50	14,000	14,000	15,000	16,000	18,000	77,000
Above 50	2,000	2,000	2,000	2,000	2,000	10,000
	70,000	70,000	75,000	80,000	90,000	385,000

2.03 In order to meet the demand, following licences are issued or are being issued :

Table 3

The HP wise break-up of the different capacities approved/under consideration is given below :

	<u>Upto 25HP</u>	<u>26-35</u>	<u>36-50</u>	<u>Above 50</u>	<u>Total</u>	<u>No. of Units</u>
a) Units licensed (Appendix III)	48,500	46,000	44,500	8,000	1,47,000	17
b) Letters of intent issued (Appendix IV)		10,000	15,000	16,000	41,000	6

2.04 At present the tractor units in production are as follows :

Table 4

Annual licensed capacity of Tractor units in production

<u>Sr. No.</u>	<u>Unit</u>	<u>Collaboration</u>	<u>Annual licensed capacity (Nos.)</u>
1.	Eicher Faridabad	Eicher W. Germany	2000
2.	Escorts Faridabad	Moto-import Poland	16000
3.	Escorts Tractors Faridabad	Ford USA	6000
4.	Hindustan Baroda	Motokov Czechoslovakia	7000
5.	International Bombay	IH, UK	10000
6.	Tafe Madras	MF, UK	7000
7.	HMT Pinjore	Motokov Czechoslovakia	12000
			60000

The total capacity is likely to increase to 75,000 to 80,000 nos. over a period of time.

2.05 During the period 1961-72, tractor availability including imports was as under :

Table 5

Tractor Availability

<u>Year</u>	<u>Indigenous production</u>	<u>Imports</u>	<u>Total Qty. (2 + 3)</u>
<u>1</u>	<u>2</u>	<u>3</u>	<u>4</u>
1961-62	880	2,997	3,877
1962-63	1,414	2,616	4,030
1963-64	1,983	2,346	4,329
1964-65	4,323	2,323	6,646
1965-66	5,714	1,989	7,703
1966-67	8,816	2,591	11,407
1967-68	11,394	4,038	15,432
1968-69	15,437	12,397	27,834
1969-70	17,101	12,701	29,802
1970-71	19,535	16,679	36,214
1971-72	16,750	16,465*	33,215
Total	103,347	77,142	180,489
Percentage	57	43	100

*Estimates

2.06 Estimates of current population of tractors are at 1,73,000 units. The rise in population has been indicated in Table 6.

Table 6
Tractor population 1946-72

<u>Year</u>	<u>No. of Trs.</u>	<u>Rise since last census</u>	<u>Increase % in 5 years</u>	<u>Annual population rise %</u>
1946	4524	-	-	-
1951	8635	4111	91	18
1956	21005	12370	143	29
1961	31016	10011	48	10
1966	54012	22996	74	15
1971	143000	88988	128	26
1972	173000	30000	-	21

It will be seen that there has been a considerable rise in the population of tractors. This has been due to the wide acceptance by farmers in many areas of the need for new technology, the use of high yielding varieties of seeds, the use of chemicals (like fertilizers and pesticides), the extension of irrigation facilities and availability of credit from financial institutions. The minimum commodity prices to the farmers have greatly assisted the mechanization of agriculture.

2.07 The local content achieved by the indigenous tractor manufacturers varies from 50% to 90%. Though ancillary units to cater for tractor production have been set up, there are areas where there are serious shortages. Some such important items are special castings, pistons, rings and liners, steering gears and tyres.

2.08 As may be seen from Table 5, the population of imported tractors in India is estimated at about 77,000 units. These tractors have been mainly imported from USSR, Czechoslovakia, Poland, Yugoslavia, E. Germany and UK. To augment availability of tractors further in the country, the Ministry of Foreign Trade formulated a scheme for import of tractors as

'Free Gifts'. This scheme has now been in force for the last 2 years and at present it has been extended to operate upto 31st March 1973. A small number of tractors is being imported under this scheme and the scheme is reviewed periodically by the Ministry.

- 2.09 Production of over a lakh of tractors during the last 11 years may not be spectacular, but appreciating the difficulties faced by the industry in its first decade, the progress is noteworthy. A sound foundation has been laid and the industry has now geared itself to meet the country's requirements.
- 2.10 It should be noted that tractors have been declared as essential commodity and are under distribution and price control. The current prices of indigenous tractors as notified by Government are given in Appendix V.
- 2.11 Major objectives of the farm mechanization programme in our country are to increase the power availability, raise the cropping intensity and improve farm productivity. President Lyndon Johnson's Science Committee observed that the optimum power input for improved agriculture is 0.8 HP per hectare. This figure was arrived at after a world-wide survey of power availability on farms. For intensive agriculture under conditions in India which often call for lift irrigation, we should aim at an installed power capacity of at least 1 HP per hectare. Taking into account the population of bullocks, engines, electric motors and tractors on our farms, we now have about 0.4 HP per hectare. We are required to multiply the power input on our farms by two and a half times. It is not possible to reach these aims by the use of animal power. We hardly have any choice but to take to mechanical power.

- 2.12 It is most essential that the cropping intensity be raised. With increased irrigation facilities, development of new crop varieties and use of farm chemicals, we can take to multiple cropping. The IARI has evolved a pattern for relay cropping (round the year) for certain areas with favourable conditions. Multiple cropping calls for greater mechanization which means a better and faster farm operation, accuracy and timeliness of operations and less drudgery to the farmer.
- 2.13 Our farm production has to increase, not only to feed the nation but also to improve its standard of living. The calorie in-take per capita has to rise. This calls for a priority in our mechanization programme for important crops such as wheat, paddy, sugarcane, cotton, groundnut (and other oil-seeds) and potatoes. Today we do not have to achieve self-sufficiency only but also have to think in terms of developing exports. Progress of important industries like textiles, sugar, soap and vanaspathi is so much linked to the production of concerned agricultural products. Mechanization improves productivity, reduces cost of operation and improves the farmer's standard of living through higher income.
- 2.14 In fact, there is at present no alternative to mechanization. Power tillers have yet to receive a general acceptance by the farmer. Availability of bullocks is not easy. The cost of buying good draft bullocks and their maintenance has greatly increased. They have to be fed even when not in use. Raising fodder for them means less availability of land for raising crops. There is limitation on out-put of work and its specifications, (like depth of ploughing) in case of bullocks as one pair develops only about 1 HP. Then, nature takes its own time and we cannot embark on a programme for raising more bullocks under a crash programme. Raising cows for milk and other animal

husbandry programmes have priority over substantially increasing the population of draft bullocks. Human and bovine power are no substitute for mechanical power in view of limitations on its performance and quality and quantity of output.

- 2.15 We also have to take into account some social factors. The new generation is impatient for progress. They do not want to work like slaves - a dawn-to-dusk working day. They want to be relieved of the drudgery from farm chores. They want to live a better life - enjoy a better health. A farmer will want a tractor if he can afford it and mobilise resources to own it.

De-mechanization

- 2.16 In some preceding paragraphs, we have identified areas favourable to mechanization. There are certain unfavourable conditions also. A tractor unit requires capital investment of about Rs.40,000/-. The size of holding and an economical work load (of 1000 hrs.) will have to justify this investment. The delay in proposed legislation on ceiling on land holding and uncertainties arising from this step have also affected, at least for the present, the growth of the tractor market. 87.8% of farming households and 38.9% of the area under cultivation are covered by holdings of less than 4 hectares. Field size and its layout, holdings with scattered and small parcels of land are no incentives for the use of tractors.
- 2.17 The cost benefit ratio requires to be studied, specially to determine the optimum farm size or the possible command area per tractor unit. Generally speaking the tractor user, to effectively use the tractor, requires additional inputs such as improved seeds, chemicals, etc. He requires greater skills in efficiently managing his farm. He feels the shortage of labour. His farm operations some-times suffer because of

non-availability of sufficient labour at the required time. This adversely affects his production and his income. He may require to grow cash crops, which give him better returns. Such conditions are obtainable on a limited area.

Labour displacement

- 2.18 There is an impression in some quarters that the use of tractors will displace labour both human and bovine. Studies by the NCAER, the National Productivity Council, the Punjab Agricultural University and the UP Agricultural University reveal that on farms using tractors, labour requirements have increased. In Punjab, comparatively a mechanised state, there is no unemployment of farm labour. In fact farm labour is better off with higher wages and more work. Any labour displaced under certain conditions may be effectively utilised on small farms. At the stage of mechanization it appears that there is no fear of large scale displacement of human and bovine labour by use of tractors, power tillers and agricultural implements. Comparatively, a combine may displace some labour but at present, its use is confined to areas where there is scarcity of labour during the harvesting season.
- 2.19 Reproduced below is an extract from a recent article by the noted Economist Dr. A. M. Khusro of the Indian Institute of Economic Growth. The article appeared in the Times of India of 15th August 1972 under the title 'Problems of the Green Revolution'.
- "There is some evidence that farm mechanization has not reduced labour use per acre, but in fact has increased it. As the new technology of intensive input use definitely increases employment per acre, any adverse effect of tractors and machines on employment has been more than offset by the favourable effects of the new technology. In any case mechanization has come only where owing to a

shortage of labour, at any rate in peak periods, wages have risen sharply, making it profitable to introduce the machine. Far from displacing labour therefore, mechanization seems to have eased the labour shortage."

Demand for Tractors

- 2.20 Estimates of annual demand for tractors by 1973-74 have varied from 52,000 by ISAE to 90,000 by Ministry of Agriculture. The Planning Commission came out with a compromise figure of 68,000 units. On recommendations by the Development Council, Ministry of Industry, ISAE and other agencies, the Ministry of Agriculture has asked the National Council of Applied Economic Research (NCAER) to assess the demand for tractors. NCAER is now working on this assignment and its report is likely to be available later this year.
- 2.21 Working out the demand is quite a complex problem. A host of factors are to be taken into account such as the area under cultivation by holdings of 4 hectares and above, the area under irrigation, the area under important crops, the area under high yielding varieties, the targets of production, commodity and equipment pricing, wage rates and availability of labour, impact of ceiling on land holdings, the command area per tractor unit, the availability of finance, providing logistics to mechanization, the cost benefit ratio, the current tractor population and rate of obsolescence. The task becomes more difficult in absence of required data and trends.
- 2.22 The NCAER has now completed the study and is in the process of working on their report to the Ministry of Agriculture. Of the various models studied by them, the models which have been selected, are based on following para-meters.
1. Agricultural output (taking into account rise @ 5% p.a.)
 2. Relative pricing of inputs and outputs (assuming that the relative product pricing will remain constant).
 3. Total cultivated area (assuming area remains constant).
 4. Area under irrigation (assuming an increase @ .5% p.a.).

2.23 The tentative estimates of NCAER study are that in 1973-74, the demand for tractors will be about 35,000 units. This figure will rise to 80,000 units by 1979-80. During discussions in the Working Group, the NCAER estimates of a demand of 35,000 units by 1973-74, were acceptable to all. However, views were expressed that by the end of Fifth Five Year period, i.e. 1978-79, tractor demand may rise only to level varying from 40,000 to 60,000 units. For the purpose of planning resources and other related matters, it was suggested that the group consider the NCAER estimate of 80,000 units by 1979-80.

2.24 Based on the above data, the pattern of tractor availability may be planned as under :

Table 7

<u>Year</u>	<u>Suggested Annual Availability</u>
1973-74	40,000
1974-75	46,000
1975-76	53,000
1976-77	61,000
1977-78	70,000
1978-79	80,000

The above pattern of availability has been suggested taking into account a compound growth rate. Such a gradual increase will permit better organization of supporting services including finance, fuels, trained personnel and other inputs. It is expected that by 1978-79, tractor population will be about 5 lakh units.

2.25 Against an annual demand of 80,000 units by 1979-80, an annual capacity to produce 1,47,000 units has already been licensed. No further capacity should be sanctioned. It should be ensured that indigenous production is stepped up to keep it at a level that meets the requirements from year to year. There is an in-built capacity to step up production at short notice to meet unexpected increase in demand and the needs of export market. Should it become necessary to plan additional capacity or should some of the presently licensed units not avail of the

sanctioned capacities, only existing manufacturers should be allowed to increase the production by expansion.

- 2.26 Factors like the impact of accelerated pace of mechanization, imposition of ceiling on land holdings, commodity pricing and many others will have to be carefully watched. No attempt, therefore, has been made at this stage to assess the demand of tractors during the Sixth Plan period.
- 2.27 Attempts have been made to estimate the break-up of requirement by 1978-79 according to tractor size as follows:

Table 8

Tractor size (Engine HP)	Break-up of requirement by 1978-79
25 and below	15 to 20%
26 to 40	50 to 60%
41 and above	25 to 30%

- 2.28 There is an erroneous feeling that because of small size holding, there will be large demand for small tractors. In fact, the demand is not necessarily for small tractors but for tractors at lower prices. Studies have shown that difference in price of a 35 HP tractor and that of a 20/30 HP may not be much, with the result that it may be advantageous for the farmers to buy the 35 HP size. Smaller size tractors will have limitation on output and certain specifications of work, like depth of ploughing. The market for higher HP tractors is likely to grow because of the need for higher output as in case of custom work and in conditions like sugarcane cultivation and working in black cotton soils, etc.

Inputs

- 2.29 By 1978-79, tractor population may rise to about 5 lakh units and the annual demand is expected to be about 80,000 units. The industry would have a capacity for

over 1 lakh units. Taking these figures into account, the ancillary industry should work out the requirement for various components, both for original equipment application and that for replacement market (spare parts). To these requirements, the ancillary industry can add the requirements of the automobile industry, earthmoving industry, internal combustion engines etc. to arrive at the gross demand figures and plan production accordingly.

- 2.30 Appendix VI presents in a tabular form annual requirements for important inputs for the tractor and power tiller industry of items like steel raw materials, major ancillary items, capital investment, foreign exchange and requirements for fuels and oils and spare parts as also the power requirements. The data has been compiled from replies received from the industry to a specially prepared questionnaire (Appendix VII).

Employment

- 2.31 It is estimated that the industry at present provides a direct employment to over 2,00,000 persons, besides a large number employed by the ancillary industries, academic institutions and suppliers of various other services.

The employment potential by 1978-79 is expected to increase to over 7,00,000. The above figures are based on an estimate of a direct employment potential in the ratio of 1:5 for every tractor.

SOME IMPORTANT ASPECTS OF THE TRACTOR INDUSTRY

Finance

- 2.32 Financial requirements of the manufacturers, the marketing network and the farmers are to be met. It is felt that aggregate finance required may not readily be available.

Processing of loan applications should be prompt (volume of applications to be handled is substantial) and procedure requires to be simplified. Farmers are increasingly depending on borrowed finance.

- 2.33 Finance required by the tractor manufacturers varies from company to company. Tractor manufacturers have felt that their working in the 'Core' sector demands speedy disposal of their applications for finance by the financial institutions and Banks on priority basis. The industry should introduce sale of tractors under hire-purchase arrangement similar to trucks. Banks should meet industry's requirements of finance for this activity as well as for financing of agro-services like custom work.

Working Capital Finance.

- 2.34 a) Commercial banks take more than 6 months to study the requirements of manufacturers and as such manufacturers have to manage within the existing inadequate cash credit facilities at their disposal.
- b) Commercial banks give cash credit facilities based on standard inventory formulae. But these facilities are normally not adequate as manufacturers are required to carry inventories much in excess of the normal requirement because of following reasons :-
- 1) A reasonable stock of imported components has to be maintained to face the situation if imported packs do not reach in time due to various reasons.
 - ii) Local raw materials and steel are to be purchased as and when available because of uncertain market conditions.

iii) Firm schedules are to be given to the ancillary suppliers well in advance and there is hardly any scope for revision of these schedules even if production schedule of manufacturers is curtailed for reasons beyond their control.

iv) Irregular supply of railway wagons for equipment despatches.

Funds required for capital expenditure for increasing the capacity of manufacturers :

2.35 Tractor Manufacturers should invest at a faster rate so as to achieve their licensed capacity as early as possible. If necessary they should raise their equity capital through issue of shares to general public.

Financing is usually catered by financial institutions like Industrial Development Bank of India, ICICI, IFC, SICOM, etc. These institutions take a long time to sanction the loans applied for. Being a core and price controlled industry, priority should be given to the needs of this industry.

Ancillaries :

2.36 Some important components have been in short supply either due to inadequate capacity, non-availability of raw materials and other reasons. Such items include pistons, rings and liners, special castings, steering gear and tyres. Action taken so far has yet to show its effect. Often situation requires to be reviewed on all ancillary items so that items available today may not be in short supply tomorrow. It is necessary to create adequate production capacity not only to meet the original equipment requirements but also of the replacement market.

Production capacity :

2.37 In view of the Licences and Letters of Intent issued so far,

there is no need to issue further letters of intent in the industry. We have invested scarce resources in the existing manufacturing units and it is important that maximum utilisation is made of the facilities already created or being created. There are at present 17 licensed units; in addition 8 units have been given letters of intent. If they are sanctioned, there will be 25 units with a total annual capacity of 1,88,000 tractors. Therefore, no further capacity should be licensed, particularly with foreign collaboration.

Imports :

- 2.38 It is true that in early stages, import might have been necessary to take care of excess demand because of low indigenous production, but now this is not so. Today the industry has geared up to take care of internal demand as well as export. Therefore, any further imports of tractors either through World Bank loan, general imports or through gift scheme is very detrimental to the tractor industry. Therefore, it is suggested that imports of complete tractors in any form must be stopped henceforth. Some members have expressed their opinion that there should not be a total ban on imports.

Training :

- 2.39 Training of operators, be they owners of equipment or hired employees, in proper operation and maintenance is essential. It will ensure longer equipment life, lower costs of operation and better equipment availability (less down time). For the number of tractors available by 1979-80, we will require 1,00,000 operators a year. In addition, we must train mechanics in proper servicing and repairs, demonstrations and extension works. Training will have to be on a mass scale. All available resources with the Government, the industry, the academy and the farming community will have to be pooled.

2.40 Some urgent steps suggested are :

- (i) Ministry of Labour and Ministry of Agriculture should work out a crash programme for mass training of operators and mechanics.
- (ii) We require a number of Training Centres. These Centres should be adequately equipped and properly staffed, so as to handle intensive training on various equipment.
- (iii) Agricultural Institutions can significantly contribute in organizing training programmes for higher level personnel on a massive scale. This could include trainees from developing countries.
- (iv) Films Division should prepare on a priority basis documentary films on various aspects on farm equipment operations. In view of the literacy level and the urgency of the problems, this would be an ideal medium for spreading this education.
- (v) Co-operation could also be sought from agencies like UNIDO, ILO and FAO. They could be requested to make available educational films and other training material and aids on farm equipment operations. These agencies may also help in training our personnel abroad in developed countries.
- (vi) Tractor manufacturers, distributors and dealers should supplement their existing services by offering to the users of the equipment training programmes. The industry has a responsibility for proper training on on equipment uses and its efforts require to be greatly increased.
- (vii) While operators require to be trained, we would also have to take into account training of way-side garage mechanics who have sprung up in the rural areas.

Insurance:

- 2.41 There is great scope for underwriting in agricultural machinery. Financing institutions need cover for the risk of default in payments by the borrowers. If such a risk can be covered, financing procedure may be simpler. We recommend study in depth of the under-writing problems of the industry by LIC and the nationalised general insurance companies.

Safety:

- 2.42 With greater use of agricultural machinery, hazards will increase. User education is important. Safety consciousness will have to be aroused as a mass movement. Programmes in the field of training and R & D will have to include safety as an essential element. Some areas requiring attention include noise, vibrations and overturning.

Rail despatches:

- 2.43 Despatches by rail present frequent problems such as shortage of railway wagons and booking restrictions. Agricultural machinery should be assigned a high priority C for rail bookings (instead of priority E at present). Tractors are mostly despatched in BFR and KF type wagons. These wagons are in short supply. Keeping in view the large countrywide movement of agricultural machinery, railways should increase its rolling stock in the specific category. During agricultural seasons, agricultural machines should be moved to their destinations at top speed without any loss or damage during transit.

Control Orders:

- 2.44 There should be a mechanism to arrive at a fair price of tractors promptly. The need to review these prices from time to time should be recognised. It must be remembered that development of rural markets to accept new technologies is expensive. The industry should be allowed a return on capital in line with other comparable industries.

- 2.45 The Distribution Control Order on tractors has perhaps served its purpose. It is time to review both the Price and Distribution Control Orders in the light of the improved availability of tractors.

Agro-Industries Corporation

- 2.46 The Agro-Industries Corporations were set up in different States to develop agro-industries. They were earlier called Agro Industries Development Corporation. Instead of directing all their efforts to development of agro-industries and development of the rural interior, the Corporation have been concerned in a major way in the sale of tractors and equipment. By doing so the Corporations have not broken any new area but have engaged in the traditional practice of retailing tractors and other items of farm equipment. In fact, some of them have been considering the idea of commencing manufacture of tractors, power-tillers and other such items.
- 2.47 As has been said earlier, enough manufacturing capacity has been licensed in the country. The Corporations, therefore, need not invest scarce resources in setting up new manufacturing facilities for tractors, power-tillers, pumpsets and such items.
- 2.48 There is unfortunately a tendency to develop a narrow outlook and take a view that almost every State should be self-sufficient in farm equipment items and should manufacture the equipment to meet the needs of the State. Equipment does not vary with the language of a region. Such a feeling has already harmed the diesel engine and the electric motor industry considerably. We recommend that such regional approach should be discouraged and manufacturers throughout India should be free to sell their products in all parts of the country. The farmer should also be free to buy equipment of his choice. By encouraging free competition, the user is assured of better products and services.

2.49 The Agro-Industries Corporations have a useful role to play. Some of them have quite successfully organised custom hiring services and agro services centres. This is a welcome activity. Because of increased emphasis on irrigation, land levelling and proper layout of fields have become important. Corporations can undertake on custom basis land survey, levelling and development work. Corporations can also go into lift irrigation schemes on a turn-key basis and offer complete services from locating water to selling it to the farmer at the point of use. They can also undertake custom work in drilling of tube wells and renovation of old wells coupled with more efficient utilization of water for irrigation from such sources. Fields like post harvest technology and processing of agricultural produce can also engage their due attention.

Taxes and levies

2.50 The import duty of 43% on tractors and components is welcome to the extent it affords greater protection to the indigenous industry. It, however, does not hold true for items of new technology like combines, etc. There is need to popularise items like combines and it is, therefore, suggested that such machines are exempted from import duties. Similarly, items of new technology and prototypes brought for evaluation and as samples for possible local manufacture should also be allowed to be imported duty free.

2.51 Sales tax on farm equipment varies from State to State. This leads to unnecessary inter-state movement of equipment. It is suggested that the existing taxation on various items of farm equipment by different States is studied in depth and a rational policy, preferably on an uniform basis, be adopted. Similarly, registration charges on tractors and trailers vary widely from State to State. In some States in particular, charges for registration of trailers are exorbitant. Here

again a rational approach is recommended. It may be appreciated that the trailer is primarily meant for transport of agricultural produce and heavy taxation on an item like this only results in penalising the farmer.

- 2.52 There is a wrong impression that the tractor is used only by rich and large holding farmers and, therefore, can bear heavy taxation at all levels. This is not true. Tractors now are bought by small farmers. Hiring of Tractors by farmers is very popular and tractors are increasingly being used for servicing the weaker section of the farming community. Tractors and items of farm equipment are essential tools from which the farmer makes a living. They are not items of luxury. It may be appreciated that heavy taxation will only result in higher cost of agricultural commodities. A complete study of all items of taxation and levies like import duty, excise, octroi, central and state sales tax, etc. is important with a view to evolving a rational approach, appreciating the important role farm equipment now plays in improving agricultural productivity.
- 2.53 Prices of tractors and power-tillers are quite high at point of use. One of the reasons is high incidence of taxation - excise duty and sales tax. Entire taxation structure may be reviewed to bring down the pricing.

3. POWER TILLERS

3.01 Status of the Industry:

Power Tillers, which are essentially 2 wheeled walking type tractors, are a new technology on Indian farms. The Indian farmer is gradually accepting this source of power. The rate of acceptance by the farmers, it must be admitted, is lower than anticipated. It is expected that power tillers will find acceptance in applications such as paddy cultivation, farming in hilly regions, orchards, vegetables and small holdings.

3.02 The working Group of the Planning Commission on Agricultural Machinery and Implements had assessed the demand for power tillers for the Fourth Plan period. To meet the demand which was estimated at 80,000 Nos. by 1973-74, following capacities have been created by way of issuance of industrial licences:-

T A B L E - 9

Licensed Units:

Name of the Unit, Location and Collaboration	HP Range		
	5 - 7 HP	8 - 12 HP	Total
1. Kirshi Engines Ltd. Hyderabad (AKITU), JAPAN.	3000	-	3000
2. VST Tillers Tractors Ltd. Bangalore (Mitsubishi), JAPAN	-	5000	5000
3. J.K.Satoh Agricultural Machines Ltd. Kanpur (Satoh), JAPAN.	6000	-	6000
4. Kerala Agro-Industries Corp.Ltd. Trivandrum (Kubota), JAPAN	-	12000	12000
5. Indequip Engg. Ltd. Ahmedabad (Iseki), JAPAN	10000	-	10000
6. Maharashtra Co-op.Engg.Society, Shiroli (Yanmar), JAPAN.	-	4000	4000
	19000	21000	40000

3.03 The present population of Power Tillers is estimated at about 10,000 Nos. The indigenous production of Power Tillers commenced in 1965 and the production during the last 7 years is as under :-

T A B L E - 10

Availability of Power Tillers:

Year	Indigenous production	Imports under Yen Credit	Total availability (2+3)
1	2	3	4
1965	266	412	678
1966	261	611	872
1967	264	567	831
1968	228	1291	1519
1969	219	2226	2445
1970	361	2900	3261
1971	146	-	146
1972 (up- to Nov.)	152	-	152

3.04 Only one unit has been in production and 2 more units have lately commenced assembly and are likely to start regular production shortly. Indigenous content has risen from 64% to 95%. Import of Power Tillers had been from Japan under the Yen Credit.

3.05 Indigenous production has yet to pick up. An important reason for such a low level of indigenous production has been the lack of demand. The item, being a new technology, requires lot of institutional advertising followed by extensive demonstrations. It is also necessary to establish an infra-structure for prompt and efficient

after sale services, training etc. It is to be appreciated that the development of market for such an item of new technology is a slow and expensive process.

3.06 Some other reasons for a slow rate of popularisation appear to be as follows :-

- i) A power tiller unit (complete with a set of required attachments) costs the farmer about Rs.15000/-. As this machine is mainly meant for small farmers they are unable to purchase at this cost. Present loan being given by financing institutions of Rs.5000/- is inadequate.
- ii) Perhaps, Petrol/Kerosene engine version tiller may reduce cost and weight. This may help in introducing the product in hilly areas and some other regions.
- iii) Indian farmer is used to a dual purpose prime-mover for haulage and tillage. Bullocks and tractors both serve this dual purpose. Haulage capacity of power tiller on village roads due to less ground clearance, is limited. This may call for looking into the design of the machine.
- iv) Ground working tools will have to suit our local operating conditions in wet and dry cultivation. This again calls for design of suitable equipment.
- v) A Power tiller operator, walking behind the machine and steering it in paddy fields having heavy soils and undulating terrain may get tired. Design may require to be studied to reduce fatigue.

3.07 Assessment of Demand:

Working Group of the Planning Commission on Agricultural Machinery and Implements, assessed the demand for power tillers for the Fourth Five Year period as under.

Estimates prepared by the Indian Society of Agricultural Engineers are also indicated in the same table:-

T A B L E - 11

Year	Assessment of demand by	
	Planning Commission	ISAE
1969-70	20,000	2,000
1970-71	30,000	4,000
1971-72	40,000	8,000
1972-73	60,000	16,000
1973-74	80,000	20,000
	<u>2,30,000</u>	<u>50,000</u>

3.08 The estimate of demand for Power Tillers has been discussed at various levels. The latest estimate is now available from the report of the Panel for Power Tillers set up by the Development Council. The Panel estimates that the annual demand will rise to 20,000 Nos. by the end of the Fifth Plan period, i.e. by 1978-79. As against this, capacity for 40,000 Nos. has already been licenced. If the demand exceeds this figure during the Sixth Plan Period, the existing manufacturers may be given the option of expanding production or entering into sub-licence arrangements. Assessment of demand is a continuous process and it should be reviewed periodically.

3.09 Current retail prices for two makes of power tillers ex-indigenous production are as under. Prices are Ex-works excluding taxes, levies, attachments and implements.

	<u>Make</u>	<u>Unit Price</u>
1.	Krishi	Rs.6,390/-
2.	V.S.T.	Rs.9,318/-

3.10 The main reason for the high prices for these products at present are the duty element on imported components and high prices that they have to pay for procuring some indigenous items. Perhaps the high prices may be off-set to some extent if volume of production is sufficient for an individual unit.

3.11 Heavy investments have been made on production facilities. The market being small, the volume of production is low. Production, therefore, is uneconomical. Yet, the industry must invest in Research & Development and in development of markets for popularization of power tillers. Suitable incentives should be granted to the industry for such activities. The industry will have a difficult time for quite a few years. They can of course diversify and introduce economies by widening the product-mix and offering the farmers other items of farm equipment.

3.12 Power tillers are also being popularised in other South East Asian countries. We may be able to develop export markets. The subject of export pricing and other related matters requires to be studied in depth.

4. COMBINES

4.1 There are two types of combines:

1. Self Propelled.
2. Power-Take-off (PTO) operated.

Of the PTO operated types, we have two varieties in India:

1. Trailing combine which is also called pull type combine as it is pulled behind a tractor,
2. Tractor mounted combine which is mounted on the tractor itself (e.g. Vicon).

4.2 It is estimated that there are about 500 combines now in India. Of these, about 300 are tractor mounted PTO operated combines, indigenously assembled. Self propelled combines now cost about Rs.2,00,000 each and are at present imported from countries like Germany (both West and East) Japan Italy and USSR. The width of cut is 10' to 14' with output of 20-30 acres a day. The machine can service an area of 600 to 1000 acres in a season. The PTO operated combine costs Rs.40,000 to Rs.50,000 has a 5' to 6' cutter bar and the output is about 10 acres a day. Command area of the machine is 300 to 400 acres in a season.

4.3 Combines have been mostly used so far on wheat. With high yielding varieties, timeliness of harvesting is important. A combine can increase the span of the harvesting period as harvesting can commence earlier at comparatively a higher moisture content. Experience gained shows that with use of a combine, crop losses are reduced and cost of harvesting is also less. With unfavourable weather during harvesting and threshing period, use of a combine

becomes more valuable. Combines are now being used on paddy crop also and it is expected that its use on paddy will gain wider acceptance. A combine can also handle crops like Jowar, Bajra, Maize, Gram, Soyabean, etc. As we gain more experience on combines, more crops and larger acreage will be serviced by these machines.

- 4.4. Some difficulties being encountered on combines include small size of fields (scattered and small parcels of land), small size of holdings, lack of trained personnel for efficient use, maintenance and repairs of the machines and availability of spare parts. Despite these difficulties, every season combines are gaining more popularity and it is expected that their use as custom machines will become popular. Current estimates of annual demand are about 200 self propelled machines and an equal number of PTO operated machines. As a custom machine, however, the self-propelled machine will gain a greater popularity. The Ministry of Agriculture had at one time assessed the demand for self-propelled combines at about 1000 Nos. per annum. However, doubts have been expressed about this demand. The NCAER study on the demand of combines and its impact on the displacement of labour might clarify the issue.
- 4.5 A number of manufacturers have shown interest in manufacture of combines but only one manufacturer has so far gone into production (Vicon). Fears have been expressed that combines displace labour but fact is that during harvesting season, in major grain producing states, labour is in short supply and wage rates take to steep rise.
- 4.6 The Vicon unit, which has gone into production, has a licenced capacity of 1200 Nos. per annum. A letter of intent has been issued to M/s. Larsen & Toubro for manufacture of John Deere

Self-propelled combines. A few other proposals are being examined and a decision may be taken by the Ministry after studying the NCAER report.

- 4.7 As an alternative to combines, the industry can offer to Indian farmers reapers, binders and threshers. Attempts have been made by the small scale manufacturers to introduce reapers but lot of R & D efforts are yet to be put in for acceptable machine. Binders are not yet available. Threshers are manufactured and sold in good numbers (estimated at about 30,000 a year) by the small scale industry. There is too much stress on price. Thresher design does require scientific study to save excessive power loss and improve the efficiency of the machines.
- 4.8 NCAER estimates of demand will be available towards the end of the year. It is felt that a minimum of two manufacturers are licenced to produce each type of combines - 1) self-propelled, and 2) P.T.O. operated. Adequate capacity should be installed to cater to the domestic demand as well as the export market.

5. AGRICULTURAL IMPLEMENTS

5.1 Most of the existing tractor manufacturers are manufacturing matching agricultural implements. Their annual capacity is about 30,000 tonnes in terms of steel. Apart from the large sector, agricultural implements, manual and animal operated as well as power operated are produced in substantial quantities by about 2000 small-scale and cottage industries. The existing units in both the large and small-scale sectors are manufacturing a wide range of implements such as ploughs, harrows, ridgers, planters, seed and fertilizer drills and agricultural hand tools like shovels, spades, pick axes, rakes and a variety of garden tools. In addition, the units also manufacture animal drawn machinery for processing agricultural products for example Oil Ghanis, Cane Crushers, Groundnut decorticators etc. Processing machinery has been excluded from the scope of the present study. There is adequate capacity in the country to meet the requirement. Import is being allowed as and when necessary for specialised items like Reapers, Binders, Combine Harvesters, Rotovators, etc. in limited quantities. Capacity is being created for such items also. The country is also exporting various types of agricultural implements to the extent of Rs.10 million per annum.

5.2 Capacity is also being established for special type of equipment, in collaboration with renowned manufacturers for items like Rotovators, Power Harrows, Tractor drawn and Self Propelled Combines etc. The value of production of various agricultural implements produced by the existing tractor manufacturers has been as under :

<u>Year</u>	<u>Value (Rs.lakhs)</u>
1963	15.30
1964	22.14

1965	41.85
1966	110.00
1967	190.00
1968	223.00
1969	250.00
1970	312.00
1971	221.84

5.3 At present there are a few firms manufacturing agricultural Discs in the country. One firm has a collaboration with Tyzak of UK. Other manufacturers have developed the manufacturing technique for such discs from the indigenous know-how. Many other firms have been approved without foreign collaboration to take up the manufacture of agricultural discs. An annual production capacity of nearly 12.00 lakhs numbers is being created. Though at present the raw-material required is not available in the country, it is expected that it would be manufactured in the country soon.

5.4 At present there are five units registered/licensed with DGTD for manufacture of high carbon steel discs. The details in respect of these units are as under :

Name of the Unit	Licensed capacity (nos.)	Production		
		1969	1970	1971
Dates Discs (P) Ltd. New Delhi.	2,00,000	12,213	Transfe- rred to SSI	22,000
Agricultural Discs (I) Ltd. Bombay	1,00,000	nil	32,188	71,046
Gromore Tools (P) Ltd. Meerut	1,50,000	33,669	48,529	23,538
Murrarka Engg.Works New Delhi	30,000	nil	nil	nil
Watkin Mayor & Co. Jullunder City	Capacity not indicated			nil

- 5.5 Tractor and power tillers being only prime-movers, their efficient utilization for different farm operations depends upon the availability of suitable implements. At present tractor use is confined to tillage operations and farm haulage. Production of conventional items has already been taken by some of the tractor manufacturers and also by a large number of firms in the small scale sector. With the increasing sophistication of farm mechanization, a wide range of machines would be needed. It would be possible for the existing manufacturers in the organized sector and the small scale sector to step up production of items currently used in the country and also in taking up production of new items.
- 5.6 Manufacturing capacity will have to be organized for some specialised items like Reapers, Binders, tractor mounted and tractor drawn pull type Combine Harvesters, self-propelled Combine Harvesters, Roto tillers and Seed & Fertilizer distributing machines. It is likely that with advanced fertilizer technology, we may have to develop suitable machines for injecting liquid fertilizers. Intending manufacturers will have to be encouraged by way of import of sample machines for trials, development, evaluation and popularization in the country. Besides assisting in research and testing such entrepreneurs should be assisted in the importation of samples and prototypes. It is recommended that no custom duty/taxes should be levied on such imports provided such equipment is not for sale but for development purpose only.
- 5.7 There is a need to go into details of requirements of attachment, implement and power operated agricultural machinery. The Ministry of Agriculture has worked out some figures (as per Appendix VIII). This list requires to be further discussed at a meeting/meetings with representatives of the

Ministry of Industrial Development, Planning Commission, the Industry and the Academy. This list does not include replacement market requirement during each year of the Plan.

- 5.8 We should develop set of implements so as to mechanise cultivation of some important crops such as Wheat, Paddy, Sugercane, Cotton, Groundnuts and Potatoes. Problem areas requiring greater attention are sowing/planting, harvesting operations and post-harvest technology (including handling, storage and processing).

6. RESEARCH, DEVELOPMENT, TESTING AND CONSULTANCY

- 6.1 Considerable attention has been paid to the Research and Development in certain fields of agricultural inputs like seeds, fertilizers, etc. This situation is not reflected in agricultural machinery.
- 6.2 It would appear that immediate attention is needed towards research and development which will result in locally manufactured equipment being fully adapted to conditions as they obtain in India. This would mean that designs of such equipment - most of which particularly in the case of prime movers - are of foreign origin should be altered to suit our conditions of climate, soil and technology. Attention must be paid to the use of local material - ferrous and other, and standardization of material, pursued vigorously and with imagination. The need to adapt designs so that products of established ancillary industry can be made use of, should also be recognised.
- 6.3 In the case of implements there is an enormous amount of work to be done not only in the development of new implement but also in their adaptation to the large variety of soils and other conditions that obtain in the country.
- 6.4 It is essential that the industry both individually and collectively consciously put aside a portion of their income towards these matters.
- 6.5 It is suggested that a National Farm Equipment Institute/Council may be set up. The main aims and objectives of this institute/council would be as under:
- a) Collect and disseminate information and act as a bureau of statistics,
 - b) assist the industry in its growth through technological forecasting, market survey and assessment of demand,

- 38 -

- c) assist the industry in the development of attachments, accessories, implements and services and
- d) provide an effective liaison among the Industry, the Small scale manufacturers, the marketing organizations, the Government, the Academy and the Farmers.

7. IDA PROJECTS

- 7.1 The International Development Association (IDA) has extended loans to various State Governments in India for specific agricultural development projects. These loans are popularly known as "WORLD BANK PROJECT". The IDA loans can be utilized for import of agricultural tractors from countries who are members of the International Bank for Reconstruction and Development (IBRD). Gujarat State has already imported 800 tractors under this scheme. The IDA has already approved similar schemes for Punjab, Haryana, Mysore, Maharashtra, Andhra Pradesh and Tamil Nadu.
- 7.2 These programmes were initiated some time in 1967-68 when World Bank Study Teams had visited India for preparing the projects during the period 1967 to 1970. At that time, tractor availability was low and there was a sizeable backlog of pending orders. Tractors were in short supply and it was then anticipated that a farmer in a State like Punjab may have to wait 5 to 7 years for his turn of allotment of a tractor. Such a situation prevailing then, perhaps resulted in a greater emphasis on the subject of tractors and it was suggested that tractors be imported in large numbers as an essential part of farm mechanization programmes under the World Bank Scheme.
- 7.3 The situation since then has considerably changed. The availability of tractors has greatly improved. With imposition of import duties, prices of imported tractors are no more attractive. Most of the indigenous tractors are available from ready stocks. This change in situation has greatly dampened the enthusiasm of the farming community for imported tractors.
- 7.4 Taking stock of present situation, we recommend that there should be no import of tractors under IDA Credits. Finance available under the credit could be utilized for increasing indigenous production as has been done in the case of the

- 40 -

manufacture of agricultural discs. All facilities and terms which are to be extended to farmers for the purchase of imported tractors under this scheme, should now be extended to cover indigenous makes.

8. EXPORTS

- 8.1 As pointed out earlier, the present production capacity of tractors in this country is of the nature of 45,000 units per annum. This will soon rise to 80,000 units per annum. Such a volume of production is comparable to the volumes of tractor production in the more developed countries. Considering that a large part of tractor production costs are involved in the machining of heavy castings and considering that castings in India should, in general, be competitive with those in developed countries, tractors and agricultural implements in general, from a technical point of view, offer a very promising field of export. It should be noted, however, that an important part of the price of the tractor is made up of items such as tyres, electrical items, which are bought from ancillary industries where the volume of production in the country does not compare to the volume of production in the developed countries. This is, therefore, liable to be a disadvantage in the ultimate cost of the tractor as compared to the costs of tractor in more developed countries.
- 8.2 There is a trend in developed countries towards more sophisticated and more expensive tractors. Such tractors may not be suitable to developing countries in view of the costs and the more sophisticated technologies involved. The tractor and farm equipment industry would be well advised to study the needs of the other developing countries by way of design of tractors and farm equipment in order to cater for the peculiar needs of such countries, particularly in view of the considerable similarities that exist in the field conditions of agriculture between India and many developing countries.
- 8.3 A large number of students from Asian and African countries go to western countries for studies in agricultural engineering (including farm mechanization). As a supporting step for developing exports, students, young farmers, Government officials

from developing countries can be encouraged to come to India for studies and training at some of our agricultural Universities like the U.P. Agricultural University, Pantnagar.

8.4 India, as one of the major contributors to 'Colombo Plan' is in a position to promote the offtake of indigenous tractors and agricultural implements by the Plan recipients.

8.5 At present, Government offers the following export incentives for export of tractors:

- i) 20% import licence and 10% cash assistance.
- ii) Benefit of refund of duty drawback, railway and shipping freight concession and supply of indigenous steel at international prices

8.6 There are incentives as they apply to mechanical engineering goods and no special incentives have been worked out for tractors and farm equipment as such in view of the fact that local demand for such equipment was not being met. When exports do take place, the cost of this industry and the incentives required should be studied intensively so as to make the Indian product competitive in the world market. This is particularly so, because with greater indigenisation, current costs may not be relevant. Specifically an important factor in the cost of tractors and farm equipments would be the supply of steel at international prices. It should be further remembered that considerable effort and finance will be required to introduce Indian Farm Equipment into the World market and gain acceptance in this market.

9. SUMMARY AND RECOMMENDATIONS

9.01 In view of the demand of the new technology required for the efficient production of food, the Agricultural Machinery Industry in the country has a crucial role to play. It is estimated that the industry at present employs over 2,00,000 persons. The direct employment potential will rise to over 7,00,000 by the end of the Fifth Plan period (1978-79). An investment of Rs25 crores has already been made in the industry. It is estimated that about Rs.600 crores are currently being invested every year in the purchase of agricultural machinery. While these figures underline the importance of the industry, it is essential to remember that any lacunae in the supply and service of agricultural machinery will have consequences far beyond the immediate finances involved. All aspects of the industry therefore, must be under constant study and all efforts must be made to ensure that the industry in its widest sense performs its task of producing, selling and servicing agricultural machinery in the most efficient manner.

9.02 The current population of tractors is estimated at about 2,00,000 units, which will rise to about 5,00,000 by 1978-79. The population of 10,000 Power Tillers now is estimated to rise to 1,00,000 and the Combine population may rise to 3000 units in the same period. In addition, it is anticipated that there will be a considerable rise in the population of other items of farm equipment such as pumping sets, threshers, processing equipment and other agricultural implements. The annual current estimate of demand for tractors will rise from 35,000 units a year now to 80,000 units by 1978-79. The Power Tiller demand is expected to rise from 3500 units to 20,000 and for the Combines the demand may be at the rate of 400 units a year during the Plan period. These figures illustrate the growth potential of the industry.

- 9.03 There is already an installed capacity for an annual production of 45,000 tractors and 10,000 Power tillers. It is important that the capacity already installed is fully utilised. Availability of raw materials and some ancillary items is a serious production bottleneck. Each item of raw materials for the industry and its ancillaries requires to be studied in detail so that indigenous industry requirements are met not only to achieve fuller production but to meet rise in demand. The industry already licensed has inbuilt capacity to achieve much higher production to take care of the increase in domestic demand as well as the demand from export market.
- 9.04 A study of data on sanctioned capacities for production of tractors and power tillers and their respective demand shows that the industry has already been overlicensed. Current assessment indicates that some of the sanctioned units may not go into production. IT IS RECOMMENDED THAT NO FURTHER MANUFACTURING CAPACITY SHOULD BE CREATED FOR TRACTORS AND POWER TILLERS AND THE EXISTING UNITS BE ASKED TO INCREASE THEIR PRODUCTION TO FULL CAPACITY. ALTERNATIVELY, THESE UNITS MAY BE ASKED TO SUB-LICENSE SO AS TO MEET THE COUNTRY'S DEMAND.
- 9.05 Heavy investments have already been made in creating production capacity for items like tractors and power tiller. Our first task should be to make fuller utilization of the capacity. The indigenous industry has already come to a stage where it is in a position to meet the country's requirement for tractors and power tillers. THEREFORE, THERE SHOULD BE A BAN ON IMPORTS OF COMPLETELY BUILT-UP TRACTORS AND POWER TILLERS IN ANY FORM.

It is becoming increasingly clear that the demand for tractors and other agricultural equipment is not as high as had been anticipated. It is also clear that the nature of this demand will undergo changes because of the changes in the ownership of agricultural land.

- 9.06 IMPORTS, IF COMMITTED, UNDER PROJECTS LIKE WORLD BANK, SHOULD BE UTILISED TO IMPORT CAPITAL EQUIPMENT AND COMPONENTS TO ACCELERATE THE INDIGENOUS PRODUCTION. It must be brought out that such a policy imposes upon the local industry the obligation to provide equipment of quality at reasonable prices and to see to it that such equipment does not suffer from a lack of spare parts and of servicing facilities:
- 9.07 To accelerate the growth of the agricultural machinery industry in the country to the levels mentioned in the report, logistics and supporting services are to be adequately organized to deal with all connected aspects. THEREFORE, FOR BETTER PLANNING AND DEVELOPMENT, IT IS RECOMMENDED THAT A SEPARATE DEVELOPMENT COUNCIL FOR FARM EQUIPMENT MAY BE SET UP.
- 9.08 Presently various agro-industrial sectors such as Tractors (both wheel and crawler), Engines, Pumps, Threshing Equipment, Plant protection equipment, animal drawn equipment, water conservation equipment, grain process and storage equipment, etc. are being handled by various sections of the Directorate-General of Technical Development as well as in DC(SS). FOR BETTER CO-ORDINATION, PLANNING AND DEVELOPMENT, IT IS RECOMMENDED THAT DIRECTORATE GENERAL SHOULD HAVE A DIVISION FOR AGRO-INDUSTRIES SO AS TO HANDLE ALL THE ITEMS IN A CONSOLIDATED WAY. SIMILARLY, THE AGRICULTURAL MINISTRY SHOULD HAVE A DIRECTORATE OF AGRICULTURAL ENGINEERING ON THE LINES OF THE DIRECTORATE OF PLANT PROTECTION AND DIRECTORATE OF SUGAR AND VANASPATHI. LIKEWISE, THE OFFICE OF THE CHIEF CONTROLLER OF IMPORTS & EXPORTS AND OTHER CONCERNED MINISTRIES SHOULD HAVE SPECIAL CELLS SOLELY TO DEAL WITH MATTERS CONNECTED WITH THE AGRICULTURAL MACHINERY INDUSTRY.

- 9.09 With the proposed land reforms, demand for services from inputs like tractors and power tillers will not only continue but will substantially increase. Equipment ownership may undergo a change. In addition to individual ownership, equipment may be owned by co-operative institutions as well as by local bodies like Zilla Parishads and Gram Panchayats. It is also envisaged that there will be greater equipment utilisation because of increase in demand for custom work. INSTITUTIONS IN THE FORM OF AGRO-SERVICE CENTRES NEED TO BE ORGANISED ON A LARGE SCALE BY LOCAL BODIES AS WELL AS BY THE INDUSTRY. PROBLEMS ARISING OUT OF CHANGES IN PATTERN OF OWNERSHIP OF EQUIPMENT REQUIRE TO BE EXAMINED IN DEPTH.
- 9.10 Agro Industries Corporation in various States are now playing a useful role in farm mechanisation scene by popularising custom services for small farmers. They should continue to lay stress on offering services to farmers in the field of hiring of equipment, land levelling, lift irrigation and developing agro-industries in the field of processing. Corporations should be discouraged from setting up new manufacturing facilities for tractors and power tillers requiring heavy capital investment as enough capacity already exists in the country.
- 9.11 There is wide variation in state sales taxes which results in unnecessary inter-state movements. Central/State sales tax paid by the farmer on one make of basic tractor varies from Rs 701/- in Maharashtra to Rs 3,322/- in M.P. IT IS RECOMMENDED THAT TAX STRUCTURE BE EXAMINED WITH A VIEW TO RATIONALISING IT.

- 9.12 Research and Development in agricultural industry is yet to be properly organised. The Government and the industry as well as the academic institutions will have to devote due attention to this important aspect for accelerating the development of the industry. We are required to develop equipment not only to suit our conditions but also for export markets in developing countries. Certain farm mechanisation problems (for example, paddy puddling) are peculiar to developing countries in the tropics. Our research and development efforts, therefore, will have to be utilised to meet such local conditions. IT IS RECOMMENDED THAT A NATIONAL INSTITUTE FOR RESEARCH AND DEVELOPMENT ON AGRICULTURAL MACHINERY (NIRA/DAM) BE ESTABLISHED. The new institute should be so organised that besides catering to our own requirements we may offer facilities to the other developing countries in the region.
- 9.13 There is great scope to study in depth the standardisation on various raw materials, components and sub-assemblies. This will bring down the cost of procurement and production and will facilitate inter-changeability of components. It is also necessary that components are manufactured to established International Standards. IT IS RECOMMENDED THAT ISI SET UP A SEPARATE DIVISION ON AGRO-INDUSTRIES. INDUSTRY SHOULD BE ASKED TO ADOPT APPROVED STANDARDS AND PAY MORE ATTENTION TO QUALITY CONTROL.
- 9.14 NO IMPORT DUTY SHOULD BE LEVIED ON ITEMS IMPORTED AS PROTOTYPE SAMPLES FOR RESEARCH AND DEVELOPMENT FOR INDIGENOUS MANUFACTURE AND/OR EVALUATION.

- 9.15 INDUSTRY SHOULD SET APART A CERTAIN PERCENTAGE OF THEIR TURNOVER EXCLUSIVELY FOR R & D TO SET UP THEIR OWN FACILITIES TO SOLVE THEIR INDIVIDUAL PROBLEMS AND TO CONTRIBUTE TO THE NATIONAL R & D INSTITUTE REFERRED TO ABOVE FOR SOLVING PROBLEMS COMMON TO THE INDUSTRY.
- 9.16 Ministry of Labour and Ministry of Agriculture should work out a crash programme for mass training of operators and mechanics. Besides some I.T.I. centres, there are about 100 workshop-wings in the country. ALL THESE CENTRES SHOULD BE ADEQUATELY EQUIPPED AND PROPERLY STAFFED SO AS TO HANDLE INTENSIVE TRAINING ON VARIOUS FARM MACHINERY EQUIPMENT AND TO TRAIN ABOUT 1,00,000 PERSONNEL ANNUALLY. FARM EQUIPMENT MANUFACTURERS, DISTRIBUTORS AND DEALERS SHOULD SUPPLEMENT THEIR EXISTING SERVICES BY OFFERING TO THE USERS OF THE EQUIPMENT TRAINING PROGRAMMES. THE INDUSTRY HAS A RESPONSIBILITY FOR PROPER TRAINING OF EQUIPMENT USERS and its efforts require to be greatly increased.
- 9.17 FILMS DIVISION SHOULD PREPARE, ON A PRIORITY BASIS, DOCUMENTARY FILMS ON VARIOUS ASPECTS OF FARM EQUIPMENT OPERATIONS. In view of the literacy level and the urgency of the problem, this would be an ideal medium for spreading this education. Co-operation could also be sought from agencies like UNIDO, ILO and FAO. They could be requested to make available educational films and other training material and aids on farm equipment operations.
- 9.18 IT IS IMPORTANT THAT PROVISIONS ARE MADE TO MEET THE CREDIT REQUIREMENTS OF MANUFACTURING AND MARKETING ORGANISATIONS AS WELL AS THE FARMERS. It is estimated that during 1978-79, capital requirements for manufacturing, marketing and maintenance of tractors, power tillers and combines etc. would be to the tune of Rs.1,000 crores. Processing of LOAN APPLICATIONS SHOULD BE EXPEDITED BY SIMPLIFYING PROCEDURES.

- 9.19 Though more and more institutional financing will be available to farmers for purchase of farm equipment inputs, IT IS IMPORTANT THAT THE INDUSTRY ALSO ORGANIZES FACILITIES FOR SALE OF EQUIPMENT ON HIRE PURCHASE BASIS, AS IN CASE OF TRUCKS. Financing institutions should make finance available to the industry for such services. RELEVANT LEGISLATION MAY REQUIRE TO BE REVIEWED SO THAT IT PERMITS ATTACHMENT OF EQUIPMENT IN CASE OF DEFAULT. It is also necessary to examine the possibility of covering the risk of default in repayment of underwriting.
- 9.20 Farmers find it difficult to arrange for margin money which is as high as 25% now. Earlier co-operative financing institutions were asking for a margin money of only 5%. IT IS THEREFORE, RECOMMENDED THAT ALL FINANCING INSTITUTIONS SHOULD UNIFORMLY ASK FOR A MARGIN MONEY OF 10% ONLY.
- 9.21 Repayment period in case of commercial banks is 3 to 5 years while in case of co-operative financing institutions it is upto 7 years. IT IS SUGGESTED THAT REPAYMENT PERIOD SHOULD BE UNIFORM FOR A PERIOD OF 7 YEARS. SCHEDULING OF REPAYMENTS SHOULD ALSO BE IN SUCH A MANNER THAT THE PAYMENTS FALL DUE AFTER HARVEST. THERE SHOULD BE A MORATORIUM OF ONE YEAR.
- 9.22 Farmers find it difficult to provide guarantors which are asked for by most of the banks. As bank has lien of the equipment it will greatly simplify matters IF THE CONDITIONS OF PROVIDING GUARANTORS BE WAIVED.
- 9.23 While determining loan amount, size of the holding and land value are taken into account. In view of the proposed legislations on ceiling on land holdings these calculations may not permit grant of loan upto Rs.40,000/- and Rs.15,000/- which are required for buying a tractor and power tiller outfit. THE BASIS OF CALCULATIONS CAN, THEREFORE, BE REVIEWED AS THE EQUIPMENT ITSELF IS HYPOTHECATED TO THE BANK. LAND VALUE AND SIZE OF THE HOLDING CAN BE CONSIDERED AS PART SURETY OR NEED NOT BE CONSIDERED AT ALL. MAIN CONSIDERATION SHOULD BE UTILISATION OF THE EQUIPMENT.

- 9.24 Several commercial banks have a loan limit of Rs.20,000/- for tractor and Rs.5,000/- for power tiller. This is inadequate. A tractor outfit costs about Rs.40,000/- and power tiller outfit costs about Rs.15,000/-. THE LOAN LIMIT THEREFORE, SHOULD BE INCREASED TO RS.40,000/- AND Rs.15,000/- RESPECTIVELY AFTER CONSIDERING REVISED MARGINAL DOWN PAYMENTS SUGGESTED TO ABOVE.
- 9.25 To avoid delay in sanctioning loans to farmers, it is suggested that POWERS OF THE LOCAL BANK MANAGERS BE INCREASED. Instead of referring matters to their Head Quarters, they should be able to decide at the branch level.
- 9.26 Commercial banks generally operate in a 10 mile radius. Such a limit leaves lot of areas uncovered by any bank. It is important that such a LIMIT ON A RADIUS OF OPERATION BE KEPT FLEXIBLE DEPENDING UPON LOCAL CONDITIONS. THE LOCAL BANK MANAGER SHOULD HAVE THE DISCRETION OF GRANTING LOAN EVEN IF THE BORROWER IS SITUATED OUTSIDE A SPECIFIC RADIUS OF OPERATION.
- 9.27 The present legislation does not allow legal attachment of agricultural implements (including tractor) as they are essential tools for farmers' livelihood. THE RELEVANT LEGISLATION REQUIRES TO BE CAREFULLY REVIEWED.
- 9.28 The industry regularly faces difficulty in transporting of the equipment from factory to farm. To take an example of tractor, availability of railway wagons is a problem for most of the time. THE PRODUCTION OF BFR AND KF TYPE OF WAGONS SHOULD BE INCREASED. AGRICULTURAL MACHINERY SHOULD BE ASSIGNED A HIGHER PRIORITY AT 'C' INSTEAD OF 'E'.

- 9.29 There is scope for developing export of agricultural machinery particularly to the developing countries in Asia, Africa and Latin America. There is now a strong base of domestic demand and industry has come to a stage where production can be increased at a short notice to take care of export demand. We are also at an advantage in developing the equipment specially suited for conditions in developing countries taking into account their operating conditions, literacy level and other local factors. It may also be possible to cater to the requirements of some developed countries as for certain items, production of volume may be too low for them. In view of all this, it is very essential that industry may be asked to develop exports. ALL NECESSARY ASSISTANCE SHOULD BE GIVEN BY THE GOVERNMENT.
- 9.30 There are a large number of polytechnics and other technical institutions, whose resources can be mobilised to develop training facilities on agricultural machinery and in training artisans/operators for gainful employment including self-employment. It is suggested that some central body should be there to co-ordinate the activities regarding training trainers, developing syllabus and training aids and maintain effective liaison with all concerned agencies and institutions. Therefore, it is recommended that A NATIONAL INSTITUTE FOR TRAINING IN AGRO SERVICES (NITA) is set-up.
- 9.31 It is suggested that a National Farm Equipment Council may be set up. The main aims and objectives of this Council would be as under :
- a) Collect and disseminate information and act as a bureau of statistics,
 - b) assist the Industry ~~in~~ its growth through technological forecasting, market surveys and assessment of demand,

- c) assist the Industry in the development of attachments, accessories, implements and services and
- d) provide an effective liaison among the Industry, the Small scale manufacturers, the marketing organisations, the Government, the Academy and the Farmers.

9.32 It is estimated that annual requirement of fuels and lubricants for farm prime-movers will soon exceed Rs.300 crores for the current installed horse-powers exceeding ten million. Power input is likely to multiply four times by the end of the Fifth Plan; hence the importance of an effective fuel service. It is important that fuels and lubricants are available in adequate quantities at the proper time and place of use. Adulteration is a menace and should be curbed with deterrent punishment. It ruins the equipment, increases maintenance cost and results in more down time. Lubrication charts and guides should be freely available. Light diesel oil (LDO), which costs about half as much as high speed diesel (HSD) is not freely available for use on farm prime-movers. IT IS RECOMMENDED THAT A FARM FUELS ADVISORY SERVICE (FFAS) BE SET UP TO TAKE CARE OF ALL FUEL PROBLEMS FOR FARM PRIME-MOVERS.

APPENDIX I

LIST OF MEMBERS OF THE WORKING GROUP ON THE
AGRICULTURAL MACHINERY INDUSTRY

CHAIRMAN:

1. Shri B. R. Sule
Vice-Chairman
International Tractor Co. of India Ltd.
Bombay 400-001.

MEMBERS:

(Alphabetical order)

2. Shri P. S. Bannerjee
General Manager
Hindustan Machine Tools Ltd.
Pinjore.
3. Dr. C.D. Datey,
Chief Officer, Agricultural Credit
Department,
Reserve Bank of India,
Bombay.
4. Shri B.K.S. Jain
Voltas Limited
Bombay 400-001.
5. Shri C. S. Kirloskar
Managing Director
Kirloskar Cummins Ltd.
Poona.
6. Shri S. S. Kapur
Deputy Secretary
Ministry of Agriculture
New Delhi.
7. Shri D. N. Kherdekar
Joint Commissioner (MY)
Department of Agriculture
New Delhi.
8. Shri P. R. Latey
Chief (Engineering)
Planning Commission,
New Delhi.

9. Shri Chandra Mohan
Managing Director
Punjab Tractors Limited
Chandigarh.
10. Shri H. P. Nanda
President
Escorts Limited
New Delhi.
11. Shri S. Panikar
Secretary
All India Automobile & Ancillary
Industries Association
Bombay.
12. Dr. B. S. Pathak
Head of Department of Agri.Engg.
Punjab Agricultural University
Ludhiana.
13. Shri K. S. Prabhakar
No.12 CITB Model House
Vivekanand Road, Yadavgiri
Mysore 2.
14. Shri N. Radhakrishnan
Deputy Secretary
Ministry of Industrial Development
New Delhi.
15. Shri V. T. Velu
Managing Director
VST Tillers Tractors Limited
Bangalore.

CONVENOR:

16. Shri R. N. Singh
Development Officer (Agro)
Directorate Gen. of Tech.Development
New Delhi.

CO-OPTED MEMBERS:

1. Dr. T. R. Rao
National Council of Applied Economic
Research
Indraprastha Estate
New Delhi.
2. Shri R. K. Gupta
Chief Engineer
State Farm Corporation of India Ltd.
New Delhi.

APPENDIX II

TASK FORCE - AGRICULTURAL MACHINERY INDUSTRY

TERMS OF REFERENCE

1. To review the present status of the industry and to assess the trends in demand, capacity and production.
2. To carry out a survey of the existing capacity in industry based on optimum utilization of installed plant and equipment.
3. To make an estimate of the likely position by the end of the Fourth Plan in terms of demand, capacity, production and imports.
4. To make an estimate of demand for different types of equipment by the end of the Fifth Plan period, namely 1978-79, taking into account the likely development in related sectors during the period.
5. To make an estimate of the exports of goods and services taking into account past performance, present trends, pattern of World trade and the specific advantages of Indian Engineering Industry.
6. To work out the broad perspective of the industry in relation to the likely levels of demand, capacity and production by 1983-84 especially with respect to items of long gestation period.
7. To suggest capacities and production targets that will need to be set for the industry by 1978-79 having regard

to the indigenous and export demand and the longer term perspective set out as above and taking note of any constraints in respects of indigenous production.

8. Take make specific recommendations in regard to the more important projects and programmes both in the public and private sectors with indication of salient features of these projects and programmes.
9. To suggest the most advantageous way of securing the above objectives whether in terms of expansion of existing units through establishment of new units or through diversification with due regard to technological developments in the engineering industries.
10. To make an estimate of investments necessary for achieving the above capacities, in total and in terms of foreign exchange, indicating separately investment required in respect of major programme and projects.
11. To estimate the requirements of raw materials, particularly steel and non-ferrous metals, both indigenous and imported and of imported components.
12. To assess the employment potential likely to be provided by the engineering industries during the Fifth Plan period and to work out technical man-power requirements in different categories drawing attention to any significant gaps in such requirements and of the related training facilities.
13. To make a comprehensive review of the current status of design, engineering and consultancy facilities in the

country and to recommend specific measures of strengthening such facilities consistent with the programme of production and exports envisaged by the end of Fifth Plan.

14. To assess the current status of the Research & Development activities in the engineering industries and to formulate specific schemes and programmes for research and development in public, private and co-operative sectors necessary to support and sustain continuing growth of the engineering industries.
15. To give a broad indication of the infrastructure requirement of the industry in terms of electricity, fuel and transport facilities.
16. To recommend measures by which more effective co-ordination can be brought about between the production programmes in the engineering industries and the investment programmes in the user sectors, between design, manufacturing and construction activities and to suggest appropriate organisational or institutional measures for resolving problems of such nature on a continuing basis.
17. To make such other recommendations as may be appropriate.

APPENDIX III

LIST OF LICENSED UNITS

Sr. No.	Name of the Unit	Make/ Model	HP Range				Total	Re- marks
			Upto 25	26-35	36-50	Above 50		
1.	Tractor & Farm Eqpt. Ltd., Madras in collaboration with P/s. Massey Ferguson of UK.	MF 1035 IME/555/ 558	-	7000	-	-	7000	In Prod.
2.	International Tractor Co. of India Ltd., Bombay in collaboration with IH., U.K.	B-275 434	-	10000	-	-	10000	-do-
3.	Eicher Tractors India Ltd., Faridabad in collaboration with Eicher of W. Germany	DBHP 20-30	-	2000	-	-	2000	-do-
4.	Hindustan Tractors Ltd. Baroda, in collaboration with Motokov of Czechoslovakia.	Zetor 3011 Super 50	-	2000	5000	-	7000	-do-
5.	Escorts Ltd., Faridabad in collaboration with Motoimport of Poland	E-37/ 3036	-	16000	-	-	16000	-do-
6.	Escorts Tractors Ltd. in collaboration with Ford Motor Co., USA.	Ford 3000	-	-	6000	-	6000	-do-
7.	Kirloskar Tractors Ltd. Nasik in collaboration with Klockner Hamboldt Deutz, W. Germany	D 3006 D 4006 D 6006 D 10006	2500	4000	3000	500	10000	Assy. started.
8.	Harsha Tractors Ltd. New Delhi in collaboration with Prommeshexport of USSR.	T-25	-	10000	-	-	10000	-do-

9.	United Auto Tractors Ltd. Hyd. in collaboration with Industrial Export of Rumania	U 500 U650 M	-	-	2500	2500	5000	Assy. started.
10.	Hindustan Machine Tools Ltd. Pinjore in Collaboration with Motokov of Czechoslovakia.	Zetor 2011 2511	12000	-	-	-	12000	-do-
11.	Perfect Tractors Pvt. Ltd. Patiala in collaboration with Pheninstall Hanomag of W. Germany	Hanomag	-	5000	-	-	5000	Not in prod.
12.	Punjab Tractors Ltd. Chandigarh (indigenous)	Swaraj	12000	-	-	-	12000	-do-
13.	Steyr India Ltd. N. Delhi in collaboration with Steyr Daimler of Austria	Steyr 540	-	-	12000	-	12000	-do-
14.	Premier Irrigation Eqpt. Ltd. Calcutta in collaboration with David Brown of UK.	David Brown 990	-	-	-	5000	5000	-do-
15.	Eyford Tractors Ltd. New Delhi in collaboration with Ishikawajima Harima HI of Japan.	Shibaura S 2000	-	-	6000	-	6000	-do-
16.	Raja Bahadur Motilal Poona Mills Ltd., Poona.	indi- genous	-	-	10000	-	10000	-do-
17.	Automobile Products of India Ltd., Bombay in collaboration with British Leyland.	Leyland 154	12000	-	-	-	12000	-do-
Total			38500	56000	44500	8000	147000	

APPENDIX IV

UNITS ISSUED WITH LETTER OF INTENT

Sr. No.	Name of the Unit, Make of Tractor & location	HP Range				Total
		Upto 25	26-35	36-50	Above 50	
1.	Rajasthan State Ind. Dev. Corpn. Ltd., Jaipur Renault - 46 H.P.	-	-	5000	-	5000
2.	Bharat Industries & Commercial Corpn. Calcutta UEI-35 (35HP) UEI-45 (45 HP) Bharatpur (Rajasthan)	-	5000	5000	-	10000
3.	Larsen & Toubro Ltd. Bombay (Ghaziabad UP) John-Deere 52-82 HP Model 2020	-	-	-	6000	6000
4.	Burn & Co. Limited Calcutta - Indigenous 25-50 HP	-	2500	2500	-	5000
5.	Danda Engineering Ltd. Faridabad (25-50HP)	-	2500	2500	-	5000
6.	International Tractor Co. of India Ltd., Bombay New Model 454 (52 HP)	-	-	-	10000	10000
		-	10000	15000	16000	41000

CURRENT TRACTOR PRICES, FEBRUARY 1972

(As fixed by Govt. of India under Tractors Price Control Order)

Sr. No.	Description of the Tractor model & make	HP & basic feature of the engine	Name of the manufacturer.	Sale price (FOR Destination Rail Head)
				Rs.
1.	Hindustan Diesel Engine Driven tractor model HWD-50 fitted with 6.50 x 20 front tyres and 14 x 28 rear tyres	50 HP, 4 cylinder water-cooled	Hindustan Tractors Ltd. Baroda.	32,900
2.	Hindustan Diesel Engine driven tractor model 35 fitted with 5.50/6.00 x 16 front tyres and 10.00/11.00/12.4 x 28 rear tyres	35 HP, 3 cylinder water-cooled	Hindustan Tractors Ltd. Baroda	24,100
3.	Massey Ferguson Diesel Engine driven tractor model MF-1035 fitted with 5.50/6.00 x 16 front tyres and 10.00/11.00/11.2/12.4 x 28 rear tyres	35 HP, 3 cylinder water-cooled	Tractors and Farm Eqpt. Ltd. Madras	26,300
4.	McCormick International Diesel Engine driven Tractor model B-275 fitted with 5.50/6.00 x 16 front tyres and 10.00/11.00/11.2/12.4 x 28 rear tyres	a) 35 HP, 4 cylinder water-cooled b) 44 HP model 434	International Tractor Co. of India Ltd., Bombay.	26,300 29,600
5.	Escorts Diesel Engine driven tractor model 37 fitted with 5.50/6.00 x 16 front tyres and 10.00/11.00/11.2/12.4 x 28 rear tyres	34.5 HP, 1 cylinder air-cooled	Escorts Ltd., Faridabad	25,200
6.	Eicher Diesel Engine driven tractor model 115/8 fitted with 5.50/6.00 x 16 front tyres and 10.00/11.00/11.2/12.4 x 28 rear tyres	26.5 HP, 1 cylinder air-cooled	Eicher Tractors Ltd., Faridabad	25,200
7.	Zetor diesel engine driven tractor model 2011/2511	25 HP	Hindustan Machine Tools Ltd., Pinjore	21,500

Remarks: The sale price in col.5 includes the price of the following accessories attachments which shall be supplied with every tractor:

a) Hydraulic Lift b) 3-Point linkage c) Power take-off
d) Lighting equipment, consisting of head light, tail light & Plough light
e) A set of tools & f) Electric Horn.

APPENDIX VIA

ESTIMATE OF INVESTMENT AND FOREIGN EXCHANGE REQUIREMENT ON CAPITAL ACCOUNT FOR
TRACTORS & POWER TILLERS DURING THE DIFFERENT YEARS OF FOURTH AND FIFTH PLANS

(Rupees in lakhs)

	1973-74	74-75	75-76	76-77	77-78	78-79	Total for 5 years (5th Plan)
<u>1. Tractors</u>							
a) Investment on capital equipment in plant & machinery	1000	1500	1600	1000	330	180	4610
b) Foreign exchange for capital equipment	316	721	472	135	50	60	1438
<u>2. Power Tillers</u>							
a) Investment on capital equipment	43.73	40	5.50	1.50	6.50	-	53.50
b) Foreign exchange for capital equipment	18.90	6.45	-	-	-	-	6.45

APPENDIX VI B

ESTIMATE OF FOREIGN EXCHANGE REQUIREMENT ON CAPITAL AND MAINTENANCE ACCOUNT
FOR TRACTORS & POWER TILLERS DURING DIFFERENT YEARS OF FOURTH & FIFTH PLANS

(Rupees in lakhs)

	1973-74	74-75	75-76	76-77	77-78	78-79	Total for 5 years (5th Plan)
1. <u>Tractors</u>							
a) Foreign exchange for capital equipment	316	721	472	135	50	60	1438.00
b) Foreign exchange for components, raw materials, cutting tools, spare parts for tractors and machinery spares	2726	2460	2069	1645	1360	1419	8953.00
2. <u>Power Tillers</u>							
a) Foreign exchange for capital equipment	19	7	-	-	-	-	7.00
b) Foreign exchange for components, raw materials, cutting tools, spare parts for power tillers and machinery spares.	222	270	272	184	100	100	926.00

MAJOR INPUTS REQUIRED FOR TRACTOR INDUSTRY

	1973-74	74-75	75-76	76-77	77-78	78-79
Estimated Production (Nos.)	40,000	46,000	53,000	61,000	70,000	80,000
1. Plant & Machinery (Rs. in lacs)	1,000	1,500	1,600	1,000	330	180
2. Machinery spares (1% of Plant & machinery (Rs. in lacs)	10	15	16	10	4	2
3. Components (Rs. in lacs)	8,000	9,200	10,600	12,200	14,000	16,000
4. Raw Materials -do- -	360	450	570	680	730	770
5. Cutting Tools -do-	70	100	110	140	145	150
6. Castings (700 kg/tractor) (in M. Tons)	28,000	29,200	37,100	43,700	49,000	56,000
7. Forgings (250 kg/tractor) (in M. Tons)	10,000	11,500	13,250	15,250	17,500	20,000
8. Electricity per annum (KVA)	70,000	82,000	98,000	110,000	129,000	146,000
9. Fuels (in Kilo litres)	193,200	251,600	304,000	354,400	389,200	408,000
10. Tyres (nos.)*	160,000	184,000	212,000	244,000	280,000	320,000
11. Spares (5% of components)(Rs. lacs)	400	460	530	610	700	800

* Replacement requirements not included.

APPENDIX VI D

MAJOR INPUTS REQUIRED FOR POWER TILLER INDUSTRY

	1973-74	74-75	75-76	76-77	77-78	78-79
Suggested Availability	5,000	10,000	15,000	20,000	20,000	20,000
1. Plant & Machinery (Rs in lacs)	44	40	5.50	1.50	6.50	-
2. Machinery Spares (1%) "	.44	.40	.05	0.02	.08	-
3. Components "	400	800	1,200	1,600	1,600	1,600
4. Paw Materials "	15	27	31	30	30	30
5. Cutting Tools "	5	6	9	12	12	12
6. Castings (250 kg/tiller)(in M-Tons)	1,500	3,000	4,500	6,000	6,000	6,000
7. Forgings (100 kg/tiller) "	500	1,000	1,500	2,000	2,000	2,000
8. Electricity (in KVA)	650	1,300	1,950	2,600	2,600	2,600
9. Fuels (in kilo litres)	7,500	15,000	22,500	30,000	30,000	30,000
10. Tyres (nos.)	29,800	49,500	79,000	118,200	157,000	195,500
11. Spares (Rs in lacs)	20	40	60	80	80	80

APPENDIX VII

QUESTIONNAIRE SENT TO THE INDUSTRY

1. Name of firm
2. Address
3. Licensed Capacity
4. Present installed capacity
5. Capital Structure (As per proforma given below)

(I) EXISTING EQUITY PREFERENCE

- Authorised
- Subscribed..
- Paid-up
- of which
- Foreign participation
- Borrowing

(II) PROPOSED

- Authorised
- Subscribed
- Paid-up
- (a) Foreign Participation
- (b) Indian holding

6. Production Programme:

YEAR							
Make, Model and H.P.	1972-73	73-74	74-75	75-76	76-77	77-78	78-79
Total							

7. Fixed Assets

Item	Year	Present	Proposed						
			1972/73	73/74	74/75	75/76	76/77	77/78	78/79
Land									
Building									
Machinery (Imported)									
Machinery (Indigenous)									

8. Raw Materials consumed during last 3 years

Raw Materials	Indigenous or imported	Consumption in Tonnes (Value)		
		1969/70	1970/71	1971/72
Sheets/Plates				
Flats				
Bar Products				
Angles/Channels				
Non/Ferrous				
Others				

9. Raw Materials (Estimated consumption)

Raw Materials	Estimated consumption in Tonnes (Value)						
	1972/73	73/74	74/75	75/76	76/77	77/78	78/79
Sheets/Plates							
Flats							
Bar Products							
Angles/Channels							
Non-Ferrous							
Others							

10. Components and Cutting Tools (Consumption during last 3 years)

	Consumption (in terms of value)		
	1969/70	1970-71	1971-72
Components Imported			
Components indigenous			
Cutting tools imported			
Cutting tools indigenous			

11. Components & Cutting Tools (Estimated consumption)

	Estimated Consumption (in terms of value)						
	1972/73	73/74	74/75	75/76	76/77	77/78	78/79
Components Imported							
Components Indigenous							
Cutting Tools imported							
Cutting tools indigenous							

12. Machinery Spares (consumed during last 3 years)

	Actual consumption (in terms of value)		
	1969/70	1970/71	1971/72
Machinery Spares indigenous			
Machinery Spares Imported			

13. Machinery Spares (estimated consumption)

	Estimated consumption (in terms of value)						
	1972/73	73/74	74/75	75/76	76/77	77/78	78/79
Machinery Spares Indigenous							
Machinery Spares Imported							

14. Chemicals, R&D etc. (Figures for last 3 years)

	Actual amount spent		
	1969-70	1970-71	1971-72
Chemicals			
R & D			
Others			

15. Chemicals, R & D etc. (estimated amount)

	Estimated amount						
	1972/73	73/74	74/75	75/76	76/77	77/78	78/79
Chemicals							
R & D							
Others							

16. Service facilities (Actual consumption)

	Actual consumption		
	1969/70	1970/71	1971/72
Electricity in KW			
Water in Kilolitres			

17. Service facilities (estimated)

	Estimated consumption						
	1972/73	73/74	74/75	75/76	76/77	77/78	78/79
Electricity in KW							
Water in Kilolitres							

18. Railway Wagons (past requirement)

	1969/70	1970/71	Actual record	1971/72
For incoming raw materials				
For finished Products				

19. Railway Wagons (Estimated future requirements)

	Estimated future requirements						
	1972/73	73/74	74/75	75/76	76/77	77/78	78/79
For incoming raw materials							
For finished products							

20. Man Power (Actual past employment)

	Actual employed		
	1969/70	1970/71	1971/72
Managerial			
Supervisory Technical			
" Non-technical			
Clerical			
Labour skilled			
Labour semi-skilled			
Labour un-skilled			

21. Man Power (estimated future requirements)

	Estimated future requirements						
	1972-73	73-74	74-75	75-76	76-77	77-78	78-79
Managerial.							
Supervisory technical							
Supervisory Non-Technical							
Clerical							
Labour skilled							
Labour semi-skilled							
Labour un-skilled							

22. Any other information.

APPENDIX VIII

ASSESSMENT OF DEMAND FOR IMPLEMENTS

Sr. No.	Anticipated requirement	1973-74	74-75	75-76	76-77	77-78	78-79
1.	Tractors (Estimated production)	40,000	46,000	53,000	61,000	70,000	80,000
2.	Mould Board Plough (10%)	4,000	4,600	5,300	6,100	7,000	8,000
3.	Disc Plough (10%)	4,000	4,600	5,300	6,100	7,000	8,000
4.	Cultivator (40%)	16,000	18,400	21,200	24,400	28,000	32,000
5.	Disc Harrow (30%)	12,000	13,800	15,900	18,300	21,000	24,000
6.	Seed cum Fert.drill (10%)	4,000	4,600	5,300	6,100	7,000	8,000
7.	Seeding attachment (10%)	4,000	4,600	5,300	6,100	7,000	8,000
8.	Planter with Fert. attachment (5%)	2,000	2,300	2,650	3,050	3,500	4,000
9.	Dozer front (2%)	800	920	1,060	1,220	1,400	1,600
10.	Scraper (1%)	400	460	530	610	700	800
11.	Levelling Blade (5%)	2,000	2,300	2,650	3,050	3,500	4,000
12.	Leveller (2%)	800	920	1,060	1,220	1,400	1,600
13.	Tractor mounted Sprayers Dusters, etc. (3%)	1,200	1,380	1,590	1,830	2,100	2,400
14.	Tractor mounted liquid Fert. applicator (1/2%)	200	230	265	305	350	400
15.	Fert.spreader (2%)	800	920	1,060	1,220	1,400	1,600
16.	Rotavator (2%)	800	920	1,060	1,220	1,400	1,600
17.	Snake Tooth Harrow (3%)	1,200	1,380	1,590	1,830	2,100	2,400
18.	Chisel Plough (2%)	800	920	1,060	1,220	1,400	1,600

Sr. No.	Anticipated requirement	1973-74	74-75	75-76	76-77	77-78	78-79
19.	Mower (1%)	400	460	530	610	700	800
20.	Clot crusher (1%)	400	460	530	610	700	800
21.	Wind rower (½%)	200	230	265	305	350	400
22.	Maize sheller	5,000	7,000	8,000	9,500	11,000	12,000
23.	Forage Harvester (½%)	200	230	265	305	350	400
24.	Baler (½%)	200	230	265	305	350	400
25.	Chaff Cutter (2%)	800	920	1,060	1,220	1,400	1,600
26.	Fodder Mill/Feed Grinder (1%)	400	460	530	610	700	800
27.	Ground-nut digger(1%)	400	460	530	610	700	800
28.	Groundnut decorticator (1%)	400	460	530	610	700	800
29.	Potato Harvester (2%)	800	920	1,060	1,220	1,400	1,600
30.	Potato Planter (2%)	800	920	1,060	1,220	1,400	1,600
31.	Dryers (½%)	200	230	265	305	350	400
32.	Trailers (50%)	20,000	23,000	26,500	30,500	35,000	40,000
33.	Seed Cleaners (1%)	400	460	530	610	700	800
34.	Threshers	30,000	35,000	40,000	45,000	50,000	55,000
35.	Mounted Pumping Sets (2%)	800	920	1,060	1,220	1,400	1,600
36.	Loaders and Lifters (½%)	200	230	265	305	350	400
37.	Sugarcane Planter (2%)	800	920	1,060	1,220	1,400	1,600
38.	Sugarcane Harvester			On Experimental basis			

Sr.No.	Anticipated requirement	1973-74	74-75	75-76	76-77	77-78	78-79
39.	Blade Harrow			On experimental basis			
40.	Farmer stroke Picker (2%)	800	920	1,060	1,220	1,400	1,600
41.	Cotton Picker ($\frac{1}{2}$ %)	100	115	132 $\frac{1}{2}$	152 $\frac{1}{2}$	175	200
42.	Soya bean Harvester ($\frac{1}{4}$ %)	100	115	132 $\frac{1}{2}$	152 $\frac{1}{2}$	175	200

Note: In addition to above these items will be required as replacement too.

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