

REPORT
ON
IMPROVED AGRICULTURAL
IMPLEMENTS
IN
MAHARASHTRA STATE



AGRICULTURE TEAM
COMMITTEE ON PLAN PROJECTS
PLANNING COMMISSION
GOVT. OF INDIA, NEW DELHI
Sept. 1965

CONTENTS

<i>Chapter</i>	PAGES
I. Physical and Economic Features	1
II. Programmes and Problems	12
III. Requirements	35
IV. Perspective Planning	38
Summary of Recommendations	44
Terms of Reference	49
Annexures	51

CHAPTER I

SOME PHYSICAL AND ECONOMIC FEATURES OF THE STATE WITH REFERENCE TO AGRICULTURAL IMPLEMENTS

Physical Features :

1.1 *Geographical position :* The State of Maharashtra, with an area of 3,07,906 square kilo-metres, lies below the Tropic of Cancer, between the northern latitudes of 16.4 and 22.1 degrees and eastern longitudes of 72.6 and 80.9 degrees. The State is, thus, situated entirely in the tropical region but due to higher altitude and proximity to the Arabian sea, its western parts have some-what milder summer than that of the eastern parts.

1.2 *Physical divisions :* On the basis of topography, the State can broadly be divided into two natural regions—the Konkan and Mara in the west and the Deccan Plateau in the east. The demarcation line for these regions is the *Sahyadri* Range, which lies almost parallel to the sea-coast, at a distance of 15—25 miles. By and large, most of the hills in Sahyadri Range are not more than 2,000 ft. high, but a few of them attain a height of about 4,500 feet. The districts of Thana, Kolaba and Ratnagiri constitute the Konkan region, which is mostly hilly and undulating, with sharp slopes towards the sea and cut up by numerous short streams. The elevated table land of Deccan Plateau slopes gradually from the west to the east with an elevation of about 2,000 ft., near the *Sahyadri* Range, 1,400 ft., in Marathwada and 900 ft. in the south-eastern Vidharba. A number of rivers and streams run through this region; the most important being Godavari, Bhima and Krishna. While the western portion and a hallow belt along the eastern slopes of *Sahyadri* Ranges are hilly and highly undulating, the rest of the plateau is mildly undulating to comparatively flat.

1.3 *Soils :* The soils of the State can broadly be classified into five categories; namely : (a) Alkaline soils; (b) *Khar* and *Khajan* lands; (c) Red soils; (d) Laterite soils; and (e) Black soils. Alkaline soils are found all over the State and *Khar* and *Khajan* lands in the coastal areas. The laterite soils are met with in the high rainfall tract of Ratnagiri and parts of Kolhapur, Chanda and Bhandara districts. Excepting the southern areas of the State and the narrow strip of coastal alluvium, which are reddish or brownish in colour, the rest of the Deccan Plateau is covered by black soils.

1.4 The physical characteristics of the soils, such as structure, texture, depth etc., which have a direct bearing on cropping, agricultural practices and type of farm implements and tools, vary greatly in the State, not only from region to region but also in the same locality or catchment area. Generally speaking coarser and shallow soils are found in the uplands or on the ridges, and heavy, deep and black soils in the valleys, near the river

banks and drainage lines. Loam to medium soils are located in the intermediate position. While the lighter and shallow soils have low water-holding capacity, and can thus support only non-irrigated *kharif* crops, heavy black soils are used for growing *kharif* as well as *rabi* crops.

1.5 *Climate* : Apart from its geographical position, the climate of Maharashtra State is largely governed by the south-western monsoon, which brings in abundance rainfall and humidity during rainy season. Usually, the rains start early in June in the coastal region and spread over the whole State by the end of the month. They continue up to September and recede in October. The winter (October to February) is practically dry as the north-eastern monsoon brings very little rain to this State; only a few light showers, with total precipitation of less than 2" (5 cms.) are received during this period, but they are most welcome and greatly benefit the non-irrigated *rabi* crops. In the pre-monsoon period or summer season, it is quite usual to get some thunder showers; some of which are quite heavy and helpful for early sowings.

1.6 The total average annual rainfall in the State is about 42" (105 cms.), but, as is characteristic of the monsoons in India, its distribution is highly uneven in different seasons as also in various regions. While at some places, in the western *ghats* the precipitation is as high as 250" (625 cms.), in the scarcity areas it is only 20—25" (50—62½ cms.). From the crest of the *Sahyadris*, the rainfall decreases rapidly, both on the western side to the sea-coast as well as on the eastern side, the fall being highly pronounced in the case of latter. In fact, only at a distance of 100 miles or so from *Sahyadris* in the east, lie the problematic scarcity areas of the State, where inadequate rainfall, with frequent dry spells, often results in partial or complete failure of crops. Beyond this tract, the rainfall gradually increases as one moves on to the east. In the major portion of the State, the rainfall is inadequate and the farmers have to make every effort to conserve moisture by adopting suitable cultural practices for the successful raising of the crops, such as bunding, ploughing in *kharif* and keeping the land fallow with frequent harrowing.

1.7 *Agro-climatic regions* : Farm practices and cropping in any area is largely determined by the type of soil, total rain-fall, its distribution, dates of the onset of rainy season and frequency and distribution of wet and dry spells. Based on these considerations, the State can broadly be divided into six agro-climatic regions :—

(a) *The Western heavy rainfall region* : It comprises three districts of Ratnagiri, Kolaba and Thana and extreme western parts of Nasik, Poona, Satara, Sangli and Kolhapur. The rain-fall in this region varies from 80" (200 cms.) along the sea-coast to over 140" (350 cms.) on the eastern side. The main crop of the region is paddy in the *kharif* season and *Val* in

the *rabi* season, the latter being grown only on lands with higher water-holding capacity. In the coastal alluvium soils such plantation crops as bananas, arcanut and coconut are extensively grown.

(b) *Transition region* : It lies between the high rainfall coastal region in the west and arid region in the east, and includes the eastern parts of Kolhapur and western parts of Sangli, Satara, Poona, Ahmednagar and Nasik districts. The rainfall in this region varies from 75" (187½ cms.) in the west to 40" (100 cms.) in the east. It is predominantly a *kharif* tract, *jowar* and *bajra* being the important crops. In the low-lying areas, wheat and *rabi jowar* are also grown to some extent.

(c) *Arid to Semi-arid region* : It includes, for the greater part, the scarcity tracts of western Maharashtra and middle and the eastern parts of Dhulia, Nasik, Ahmednagar, Poona, Satara and Sangli districts. The rainfall in this region varies from 20" (50 cms.) to 40" (100 cms.). It is a *kharif-cum-rabi* tract, the main crops being *bajra*, *tur* and groundnut in *kharif* season and *rabi jowar* in the winter season. Wherever irrigation is available, wheat is also grown.

(d) *Assured rain-fall region* : It includes eastern parts of the districts of Western Maharashtra (Dhulia, Jalgaon, Ahmednagar and Sholapur), the greater part of Marathwada region and Western parts of Vidharba districts (Yeotmal, Amraoti, Akola and Buldhana). The rainfall varies from 25" (62½ cms.) in the west to 35" (87½ cms.) in the east. While the eastern part of this region receives assured rainfall only in *kharif* season and is thus a predominantly *kharif* tract with *jowar* and cotton as the most important crops, the western part normally gets rains, both in *kharif* as well as *rabi*. It is, therefore, classified as *kharif-cum-rabi* tract.

(e) *Moderately high-rainfall region* : This tract covers Nanded district and eastern parts of Parbhani and Osmanabad, Amraoti and Akola districts, practically whole of Wardha, Yeotmal and Nagpur districts and Western parts of Bhandara and Chanda districts. This tract may be divided in two parts : viz., (i) Extreme Eastern and (ii) Extreme Western Part. On the eastern side, the rainfall is about 55" (137½ cms.) and on the western side about 35" (87½ cms.). The western part is predominantly a *kharif* tract; cotton and *kharif jowar* being the principal crops. The eastern part where rainfall is heavier, paddy is extensively grown.

(f) *The Eastern high-rainfall region* : This forms the eastern parts of Maharashtra and includes the eastern Taluqas of Chanda and Bhandara districts. The rainfall varies from 55" (137½ cms.) in the west to 65" (162½ cms.) in the east. It is a predominantly *kharif* tract with paddy as the main crop. In the *rabi* season, linseed and wheat are also grown to a certain extent in areas where tank irrigation is available.

Economic and Social Characteristics of Agriculture :

1.8 *Land use* : According to village records, the total area of the State in 1958-59 was 309,57,100 hectares (765 lakh acres). Of this, 95,35,100 hectares (236 lakh acres) or 30.8 per cent was not available for cultivation being under forests, pastures and grazing lands, barren and unculturable land and land put to non-agricultural uses. The rest, 214,21,000 hectares (529 lakh acres) or 69.2 per cent of the total area was available for cultivation which included net area sown (57.7 per cent), current fallows (4.2 per cent), culturable waste (2.8 per cent), other fallows (3.9 per cent) and land under miscellaneous trees and groves (0.6 per cent). It is apparent that only a small percentage of area is under culturable waste and as such scope for lateral expansion of agriculture in the State is limited. Moreover, a large part of this land is not easily reclaimable, because of its serious erosion or heavy infestation with injurious salts. Some of the waste lands lie in the areas of low rainfall where possibility of extension of irrigation is meagre. Then, there are soils under the tidal influences. Such pieces of marginal lands could be brought under the plough only at a considerable expense. By and large, substantial increase in production could be brought about in the State mainly by intensive cropping of the area already under cultivation, including fallow lands, and adoption of improved agricultural practices. At present, only about 5 per cent of the net area sown is double cropped. Paucity of irrigation is the main reason for such a low intensity of cropping. Out of the net area sown (446.10 lakh acres) only 26.72 lakh acres are irrigated. This gives a percentage of 5.9, as against the All-India average of 18 per cent. Most of it is irrigated from wells by an age-old device, called the *mhadte* using bullocks or buffaloes.

1.9 *Crop Pattern* : In the greater part of the State, agricultural economy centres around millet crops; the principal product being *jowar*, which covers nearly 32 per cent of the net area sown. It is grown all over the State, excepting the coastal areas. Its maximum acreage, however, is in Sholapur and Ahmednagar districts. The next food-grain crop is *bajra*, which is sown on nearly 4½ million acres or 10 per cent of the area. Most of it is grown in Ahmednagar, Poona, Satara, Sangli and Sholapur districts of Poona Division, Nasik Dhulis and Jalgaon district of Bombay division. It is entirely a dry crop and at some places is grown mixed with *tur*. Rice is the third most important grain crop of the State with an area of about 3 million acres. It is mainly grown in the heavy rainfall areas of Chanda and Bhandara districts in the east and in the Konkan region in the west. Wheat is mostly grown in Nagpur and Aurangabad Divisions and Nasik and East Khandesh and West Khandesh districts. Among cash crops, cotton is by far the most important and covers an area of about 6½ million acres. It is chiefly grown in Nagpur, Aurangabad, Jalgaon and Dhulia districts. The other cash crop of considerable importance is groundnut, which occupies 2.8 million acres. It is largely grown in Aurangabad and

Poona Divisions. In Ahmednagar and Kolhapur districts, sugarcane is the principal crop in the irrigated areas and is increasing in area.

1.10 *Yield per acre* : The average yields per acre of the major food-grains and cash crops of the State, as compared to the All India figures, are given below :—

Crop	Average yield per acre in lbs. for 13 years (1951 to 1962-63)		Increase (+) or De- crease (-) in lbs. of Column 2 over Column 3
	Maharashtra	All-India	
1	2	3	4
Rice	852	849	+3
Wheat	365	676	-311
<i>Jowar</i>	440	409	+31
<i>Bajra</i>	232	276	-44
Cotton	68	89	-21
Groundnut	570	683	-113
Sugarcane	6,081	3,347	+2,734

It is apparent that except for sugarcane which is an irrigated crop, the yields of all other crops are low. Rice yield is almost the same as the All-India average. The wheat yields are very low, being only 54 per cent. While in the case of *jowar* the yield is slightly higher (8 per cent), the *bajra* and groundnut yields are less by about 16 per cent. Similarly cotton yields are only about 3/4th of the All-India average. Low yields are largely attributed to the dependence of agriculture on rainfall, which is mostly received from June to September, and long dry spell of weather during winter and summer months. But even under these conditions there is a possibility of stepping up crop yields by large scale adoption of dry farming and other improved agricultural practices, including better farm tools and implements.

1.11. *Tillage operations* : The cropping pattern of Maharashtra State is characterised by the predominance of *kharif* millets, cotton and groundnut. The cultural practices for the production of these crops vary greatly from place to place, according to soil and climatic conditions. Except for the irrigated area, which constitutes only 5½ per cent of the net area sown, the rest of the land is entirely dependent on rains for crop production. Usually only one crop either in *kharif* or in *rabi*, is taken. It is only in a very limited area, *rabi* follows *kharif* in the same year.

1.11.1. For the sowing of *kharif* crops, the preparation of land starts soon after harvest of *kharif* or *rabi* crops, according to the cropping pattern. The deep and medium black soils wherein there is some moisture are ploughed or harrowed immediately after the removal of the crop, the other soils, which lose moisture rapidly after harvest and become hard, are left

undisturbed till the summer showers are received. Moreover, it is a common practice to grow a mixture of crops on non-black soils and in some cases the mixture contains a *kharif* and a *rabi* crop. Their ploughing is, thus, undertaken after the *rabi* season on the receipt of first showers of the pre-monsoon rains. After ploughing, the land is given a few harrowings with a blade harrow. Black soils are usually ploughed deep only once in 3-5 years. While the medium soils are ploughed every alternate year, the light soils are ploughed every year. Generally, wooden ploughs are used but iron ploughs are becoming common in some areas. The standard of tillage aimed at depends upon the crops to be grown. For *jowar*, and *Bajra* which is a surface feeder, deep ploughing is not considered necessary, except once in 3-4 years or when the land is infested with deep-rooted weeds. In the case of groundnut a fine seed bed is required for the proper growth and development of the pods. Since cotton is a deep-rooted crop, it is useful to plough the land somewhat deeper, to a depth of 8-9", with an iron plough. The preparatory tillage for the sowing of *kharif* crops has to be completed by the end of June and many a time ploughing operations have to be carried out hurriedly within a limited time after the onset of monsoons. As for the *rabi* crops, the land is ploughed in the month of June after the receipt of first shower of rain and kept fallow in *kharif* season. It is repeatedly harrowed, whenever possible, till the sowing time, so as to kill the weeds, and conserve moisture. Details of the preparatory tillage for some of the important crops are given in Annexure—1.

1.11.2. Sowing of crops is usually done by the indigenous drills. Sometimes dibbling and broadcasting of seed is also resorted to. The drills commonly used are two coultered (Fadko), 3 coultered (Tarfen), and 4 coultered (Chaud). Some farmers have begun to use 5-coultered drills. These drills are operated by one pair of bullocks and two men one as the driver of the bullocks and the other for the dropping of seeds. While the two coultered seed drills are used for sowing cotton or *jowar* which require wider spacing, the three and four coultered drills are used for sowing of crops like *bajra*, *kodra*, wheat, other *rabi* crops and fodder *jowar* etc.

The interculturing and weeding is also carried out by hand. When the crop is ready for harvest, it is cut or removed by hand, except in the case of the spreading variety of groundnut, which is uprooted by bullock-drawn implements. Threshing is done by bullock treading or beating depending upon the crop. In some parts (Karnatak areas) threshing of *jowar* earheads is also carried out by stone rollers, which results in considerable saving of bullock and manual labour.

1.12. *Agricultural Holdings* : There are in all 43.38 lakh agricultural holdings (ownership) in the State, covering an area of 518.28 lakh acres. Thus, the average size of holding is about 12-acres. Their distribution

amongst various size groups and the area owned are given in the following statement :—

Distribution of Holdings in Different Size Groups

Sl. No.	Size groups of holdings	Number of holdings in thousands	Percentage to total number of holdings	Area in thousands acres	%age to total area
1	2	3	4	5	6
1.	Below 2·5 acres	1300·5	29·9	1502·4	2·9
2.	Exceeding 2·5 but not 7·5 acres	1234·9	28·5	5834·4	11·3
3.	Exceeding 7·5 but not 20 acres	1119·7	25·8	13935·8	26·9
4.	Exceeding 20 but not 50 acres	535·2	12·3	16542·5	31·9
5.	Exceeding 50 but not 100 acres	115·0	2·7	7657·7	14·7
6.	Exceeding 100 but not 150 acres	19·2	0·4	2284·1	4·6
7.	Exceeding 150 but not 300 acres	10·1	0·2	2016·4	3·8
8.	Exceeding 300 acres	3·3	0·1	2054·8	3·9
	TOTAL ..	4337·9	100·0	51828·1	100·0

It will be observed that the bulk of the holdings (about 84 per cent) are below 20 acres. About 535 thousand or 12·3 per cent of the holdings are of the size between 20 acres and 50 acres, 115 thousand or 2·7 per cent between 50 and 100 acres, 19 thousand or 0·4 per cent between 150 and 300 acres, and the remaining 3,300 or 0·1 per cent above 300 acres. The number of smaller holding in Bombay Division, particularly in Ratnagiri district, is much higher than in other Divisions. In the Nagpur and Aurangabad Divisions, the holdings are quite larger. The Poona Division comes, more or less, in between the two extremes. A study of the statistics will also reveal that hardly 2/5th of the total area is owned by more than 4/5th of the cultivators, with holdings below 20 acres; nearly 1/3rd of the area is held by 12·3 per cent of the cultivators, with holdings between 20 and 50 acres; about 15 per cent of the area is held by 2·7 per cent of the owners between 50 and 100 acres; and the remaining 12 per cent of the area is owned by the owners of 100-acres and above, who constitute only 0·7 per cent of the cultivators. In the State, there are nearly 1½ lakh owners, who own about 140 lakh acres of land or 27 per cent of the total area, in the form of holding of 50 acres and above.

1.13. *Land Ceilings* : Land in this State is classified into two groups; (a) irrigated land; and (b) dry crop land. In the case of the former, the

ceiling is fixed at 16 acres for perennial irrigated areas, 24 acres for areas getting assured irrigation for two seasons and 48 acres for lands getting assured irrigation only for one season. In the dry crop lands the ceiling limit varies considerably from area to area depending upon their agro-climatic conditions and productivity. While it is 84 acres in some areas of Kolhapur district, it is 156 acres in Thana, Kolaba and Ratnagiri districts and some parts of Chanda and Bhandara, Yeotmal, Nagpur, Nanded, Bhir and Aurangabad.

1.14. *Agricultural workers* : Out of the total population of 395 lakh, 189.5 lakh persons, or 48 per cent, are workers. Of these, agricultural workers engaged in crop production are 132.47 lakh (87.37 lakh as cultivators and 45.10 lakh as agricultural labourers), which means that out of every three agricultural workers, two are cultivators and one is an agricultural labourer. The load of agricultural labour per hundred cultivators comes to 52, which is much higher than the average of 32 for the country. It is evident that there is adequate agricultural labour available in the State. The Team, however, noticed that during some peak periods of harvesting and sowing of crops, shortage of labour is felt and much higher wages than the normal rates have to be paid.

1.15. *Wages* : Agricultural labour is generally engaged on yearly as well as daily basis. Sometimes a labourer is also employed for a season or on piece-meal terms. Usually, casual workers are paid in cash but those employed on seasonal or long-term basis are paid partly in cash and partly in kind. During the year 1963, the average daily wage rate per day for a man was Rs. 2.50 and that for a female worker Rs. 1.50. The wages of casual workers vary with operations. For grazing cattle, a herdsman is usually not given any daily wage. He is employed either on a monthly basis collectively by the villagers or at some fixed monthly wage per animal by the individual owners of cattle. As regards skilled labour, the services of blacksmiths and carpenters are not available in all the villages but wherever they are present and attend to routine work of repair and manufacture of indigenous implements and tools of different cultivators, fixed quantities of grains or bundles of unthrashed produce are given each cultivator at harvest time.

1.15.1. During the last decade, particularly after 1959, wages have shown an upward trend. An increase to the extent of about 40 per cent took place in the wages of male workers. In the case of female labour, whose wages are generally lower than those of the men by about eight annas per day, the increase in 1963 over 1954 was $66 \frac{2}{3}$ per cent. The wages of the monthly-paid Male workers engaged on agricultural farms increased from Rs. 45 in 1958 to Rs. 60 in 1963 i.e. by about 30 per cent. During the year 1964, prices in general have steeply risen and this is gradually reflected in higher wages of the agricultural workers as well.

CHAPTER III

REQUIREMENTS

3.1 During the Third Five Year Plan period, the target fixed by the State Government for the distribution of agricultural implements seems to be too low to have any substantial impact on the general standard of farming within a reasonable period of time. In order to have a clear concept of the magnitude of the problem and the stupendous task that lies ahead, it seems necessary to work out the total requirements on some reasonable basis. It is only then that a systematic and phased programme for covering the entire State within a specified period of time could be framed.

3.2 As has already been mentioned earlier, agroclimatic conditions vary considerably from one region to another. Even in the same region, there are great variations in the types of implements required. As such, the shape and size of local implements and tools like ploughs, drills, harrows, hoes, etc., differ greatly. Apart from such considerations as the nature of soil, sources of irrigation, draft capacity of bullocks etc., the size of holding and crops grown exercise a dominant influence on the types of implements required by the cultivators. The Team, has, therefore, made an attempt to assess the requirements on the basis of these factors.

3.3 *Method adopted* : In working out the total requirements of agricultural implements for different size group of holdings, the Team has adopted some standards which have been given in Annexure V. They have been framed as a result of the enquiries made from the cultivators and the local officers of the Agricultural Department and extension agency. Broadly speaking, it has been assumed that a cultivator in the size group of 7.5 and 20 acres, usually maintains a pair of bullocks and he needs a light iron plough and such other inexpensive and light implements which are within his easy reach financially and suited to the crops grown by him. More or less, similar bases have also been adopted for the holdings of bigger size. For the holdings below 7.5 acres only the requirements of hand-tools have been worked out.

3.3.1 It is admitted that the method adopted or the assumption made, cannot be considered as perfect. As a matter of fact any effort to make an estimate of the requirements of implements on some such bases suffers from a number of drawbacks especially because the circumstances and conditions of individuals cultivators differ widely even within the same size groups. But in the absence of any census or survey, it is only by adopting some yardstick that we can form some idea of the requirements. Within certain limitations such information could form the basis for future programming.

3.4 *Implements Requirements* : On the basis of the number of farmers in different size groups of holdings and the schedule of requirements as assumed in Annexure V, the total requirements of bullock-drawn implements have been worked out, which are shown below :—

Sl. No.	Item	Name of Implements	Total No. of Implements required in thousands	Implements required in fourth plan in thousands	Implements required in fifth plan in thousands
1	2	3	4	5	6
1.	Implements for Land Preparation	1. Light Iron Plough	2,552	1,276	1,276
		2. Heavy M.B. Plough	906	453	453
		3. Entire Blade Harrow	1,659	830	999
		4. Covering Blade Harrow	539	270	270
		5. Leveller	661	330	330
		6. Bund Former	582	291	291
		7. Cotton Plant Puller	754	377	377
		8. Paddy Puddler	229	115	115
		9. Dry Farming Set	168	84	84
2.	Sowing & Inter-culture	1. Two coultered Drill	343	171	171
		2. Three coultered Drill	1,207	603	604
		3. Poona mechanical Seeder	624	312	312
		4. Tine Tooth Hoe	983	492	492
		5. Akola Hoe	807	404	404
		6. Blade Hoe	807	404	404
3.	Harvesting Processing and Transport.	1. Groundnut digger	308	154	154
		2. Groundnut decorticator	20	10	10
		3. Cane Crushers	77	39	39
		4. Olpad Threshers	624	312	312
		5. Maize Sheller	44	22	22
		6. Bullock Cart Axles	1,009	505	505
		7. Chaff Cutters	1,476	738	738
		8. Bullock Driven chaff Cutters	124	62	62
		9. Bullock Cart (Dunlop)	172	86	86
4.	Plant Protection Implements	1. Seed Dressing Drum	906	453	453
		2. Dusters	906	453	453
		3. Sprayers	227	114	114
		4. Fumigating pump sets	185	93	93
5.	Irrigation Equipment	1. Iron Mhote	673	337	337
		2. Rahat	134	67	67
6.	Motorised Equipments Tractors.	1. Power Cane Crushers	5	3	3
		2. Power Threshers	6	3	3
		3. Power Thresher for Millets	64	32	32
		4. Pumping Sets	49	25	25
		5. Tractors	49	25	25

The district-wise figures are given in Annexure VI. This will give an idea about the magnitude of the problem and could form the basis for the assessment of the requirements of iron and steel and drawing up a programme of manufacture and distribution of agricultural implements.

3.4.1 An estimate has also been made of the requirements of handtools which shows that about 13 million spades, 13 million kudalis, about 22 million *khurpis*, 22 million sickles and 44 million axes are needed in the State. Since the number of these tools already with the cultivators is not known, we are not in a position to say as to what quantities of additional handtools are actually required by the cultivators. It will not, however, be far wrong to presume that, by and large, all the cultivators will be in possession of the required number of these tools. The significance of these figures, however, lies only in giving an idea about the requirements in respect of their replacement and repairs. Small handtools usually do not last long; they wear out quickly, depending upon the quality of iron, nature and amount of work. Some of them require replacement every year whereas others may last to 2-3 years or even five years. The requirements of iron and steel could be worked out after taking these factors into consideration.

3.4.2 In addition to the handtools, it is also important to make necessary arrangements for making available some bullock-drawn implements to the small cultivators, as it is neither economical for them nor within their means to make outright purchase of a number of single bullock-drawn implements, each of which is usually required only for a short time in a year. One possible way of making available these implements is through the Panchayats. There are 18,541 Panchayats in the State. If a set of 10 iron ploughs, one millet thresher, 10 dusters, 5 sprayers, 10 fumigating pumps and 10 seed dressing drums is provided to each Panchayat, the total number required will be as follows :

Sl. No.	Name of Implement	Unit to be kept by Panchayats	Total requirements of the State
1.	Iron Ploughs.	10	1,85,410
2.	Millet Thresher.	1	18,541
3.	Dusters.	10	1,85,410
4.	Sprayers.	5	92,705
5.	Fumigating Pumps.	10	1,85,410
6.	Seed Dressing Drums.	10	1,85,410

Some of the bigger Panchayats may require larger numbers.

CHAPTER IV

PERSPECTIVE PLANNING

4.1 *Present set-up* : In Maharashtra, several agencies promote the use of improved agricultural implements. The main agency concerned with the programme is the organisation of Panchayats and Community Development, which is responsible for all extension work in the rural areas, including the popularisation of improved agricultural implements and procurement and distribution of iron and implements. While the iron quota for agricultural purposes is arranged by the Agricultural Officer, Iron and Steel Supply stationed at Bombay, its distribution is done by the Zila Parishad.* The Department of Agriculture is mainly responsible for research. A few other agencies like the Directorate of Industries and private fabricators are also concerned with this programme, particularly in respect of some functions such as the import of high carbon steel, manufacture and distribution of agricultural implements. The Cooperatives do not play any important part either in the distribution of iron or in the manufacture and supply of improved agricultural implements to the cultivators. Very little of the iron out of the agricultural quota is used for the manufacture of agricultural implements as it mainly consists of sheets which are mostly used for the construction purposes and for sheds. The Directorate of Industries, which in some States arranges for or assists in the supply of iron and steel for industrial as well as agricultural purposes, does not play much part in this State : it mainly confines itself to the issue of essentiality certificates for special sections of iron and steel which are not available in the free market. It was, however, surprising to learn that by the end of 1963 no application had been received for sponsoring the import of special type of iron and steel required for the manufacture of implements and machines. Apparently, Kirloskar Brothers who stopped manufacturing chaff-cutters due to non-availability of high quality steel required for the blades did not seek any assistance from this organisation or were unaware of it.

4.2 *Administrative Organisation of the Department of Agriculture* : The administration of the Department of Agriculture is carried on by the Director of Agriculture, with the help of one Addl. Director of Agriculture and four Joint Directors, one each for (1) Research and Education; (2) Soil Conservation and Agricultural Engineering; (3) Agricultural Extension; and (4) Administration, Accounts and Planning. They are assisted by five Deputy Directors of Agriculture and a number of Extension Specialists and Technical Officers at the headquarters. The agricultural activities in each Division are supervised by the Superintending Agricultural Officer assisted by two Deputy Directors of Agriculture (one for Agricultural Engineering and other for Research and Education), and a Personal Assistant

*Iron and Steel products have been since decontrolled.

for extension work. In addition, there are five Subject-matter Specialists for statistics, crop protection, crop campaigns, agricultural engineering, accounts and administration. In each district, the agricultural activities are under the administrative control of Zila Parishad and directed by the Parishad Agricultural Development Officer, who is assisted by the District Agricultural Officer and other technical staff. The Chief Executive Officer of the Zila Parishad exercises over-all control on all staff of the various Departments engaged in agricultural development. There is a special Subcommittee for planning and executing development work, of which the Parishad Agricultural Development Officer is the Secretary. At the block level, the setup follows the general pattern in vogue in the country; the village level worker being the key man at the lowest level. The cadre of the village level workers in the State has been considerably enlarged by including the subordinate personnel of the Departments of Agriculture, Revenue and Cooperative.

4.3 Agricultural Engineering: Since soil and moisture conservation is of particular importance in the State in view of the limited possibility of extension of irrigation, land development and improvement constitutes one of the major activities of the Department of Agriculture, and for this purpose it has an elaborate organisation headed by a Joint Director of Agriculture (Soil Conservation and Agricultural Engineering), who is under the overall control of the Director of Agriculture. The functions of this section can broadly be divided into three parts viz., (1) Soil Conservation; (2) Land Development & Minor Irrigation; and (3) Research on agricultural implements. Soil conservation work has been taken up in all the four divisions of the state. There are in all thirty-two Divisional Soil Conservation Officers and 169 Assistant Sub-divisional Soil Conservation Officers with necessary supporting subordinate staff. Soil Conservation work was started in the State in 1937 and bunding work has been taken up on an extensive scale especially after 1957-58. Terracing and levelling are the other important activities of the land development scheme. For this purpose there are 50 bull-dozers with the Department. For deep ploughing of the land, a fleet of 120 tractors is maintained with one Deputy Director of Agriculture (Engineering) and Agricultural Engineer in each Division of the State. In the Nagpur Division, there are also two Tractor Engineers located at Nagpur and Amraoti. In the Fourth Plan the number of bull-dozers and tractors is proposed to be increased to 116 and 250 respectively with corresponding increase of field engineering staff and workshop facilities. The staffing pattern needs to be coordinated and enlarged for more efficient working.

4.3.1 Agricultural Implements: form only a small part of the engineering section. Its activities are confined only to the Agricultural College, Poona, where a small section for research and a Research-Testing-cum-Training Centre have been set up. For teaching, the staff consists of an Agricultural

Engineer, two Assistant Professors, one geologist, 5 agricultural supervisors and four agricultural assistants but on the research side, the staff is very meagre consisting of only a Research Assistant, a Draftsman, a Tracer and a Mechanic. The Research-Testing-cum-Training Centre, which is in the process of establishment, is under the charge of the Research Engineer in Class I. He has tightened only a small technical staff which is too inadequate for tackling the various problems.

4.4 Suggested Pattern of the Organisation and Programmes at different Levels : The present position in regard to the organisation engaged in research, manufacture and distribution of agricultural implements and training of extension methods and village artisans has been briefly mentioned in the preceding paragraphs. In order to have the desired impact of improved agricultural implements on agricultural development, the organisation and programmes need to be considerably strengthened and the control tightened. The Team notes the following suggestions, which may be adopted with such modification as may be considered necessary.

4.4.1 Research Organisation : The research facilities available in the State for the improved agricultural implements are very meagre. As already stated in paragraph 2.7, it is necessary to reorganise, expand and strengthen the Engineering section at Poona and set up four sub-stations in different agro-climatic regions. It is a well recognised fact that full benefits from research can only be derived if it is fully integrated with teaching and extension. The total provision for the all engineering sections at Poona comes to about Rs. 1,75,000. It should be possible to have a good engineering section both for research as well as education, if the resources of all the sections are pooled and activities fully integrated, with one senior officer incharge of it. By integrating the teaching and research sections, the Research Engineer now incharge of the Research-Testing-cum-Training Centre, could be designated as *ex-officio* Professor of Agricultural Engineering and the services of the second class I officer could be utilised for extension work. Some savings are also likely to occur in the subordinate staff, equipment, buildings etc. Attempt has been made to suggest the set up of the combined section as given in Annexure VII. Financial implications have also been worked out for four sub-research stations and are given in Annexure VII.

4.4.2 Manufacture : At present, the State Department of Agriculture is neither concerned with the manufacture of implements nor with the fixation of their prices, as a result of which there is great variation in the quality and prices of implements manufactured by private fabricators at different places. In order to ensure the supply of only standard tools and implements to the cultivators at reasonable price, it is necessary to exercise a regular check on the quality of implements produced by the fabricators. The first essential step to achieve this objective is to lay down standard specifications for the different implements and supply prototype of these

implements to different manufacturers. This step also requires to be followed up by introducing a Quality Marking Scheme as has been done in some other States. Apart from the Agricultural Engineer at the state level, it will be desirable to have quality marking Inspectors with supporting staff in each district; their number of course could be adjusted according to the manufacturing concerns located in different districts. Since the manufacturing cost is likely to vary from district to district, different prices shall have to be fixed for different districts. It is estimated that the total cost of taking up this scheme is likely to be about Rs. 7,00,000. Details of this scheme are given in Annexure IX. One of the essential measures to exercise check on the quality and design of agricultural implements is the production of some standard vital parts like shares, discs etc., at some central places in Government workshops. It seems that it should be possible to take up this work in one of the workshops at Nagpur. In most of the districts, one or more private manufacturing units are engaged in agricultural implements production. The present capacity of some of the manufacturer is fairly high. The Team, therefore, does not suggest the inclusion of any programme for the manufacture of agricultural implements as such by the State Government. The manufacture of dry farming sets and small implements can be arranged through the village artisans and local fabricators.

4.4.3 Distribution and Extension : Under the present set up, the extension organisation can spare very little time for the distribution and popularisation of agricultural implements on a broadbased scale. Unless special staff is appointed and an active programme for systematic demonstration is launched it is doubtful if cultivators would take to the use of improved agricultural implements on a large scale. It is, therefore, suggested that in each block, one Extension Officer in agricultural engineering may be posted for carrying out demonstration and popularisation of improved agricultural implements. He should be provided with a few trained mechanics to render service to cultivators in the repair and adjustment of improved agricultural implements and machinery. To start with, a Pilot Scheme may be introduced in few of the districts, more or less on the same lines as has been done in the Punjab State. In this task, the cooperation of the fabricators may also be taken. Details of the staff and budget funds required for the purposes are given in Annexure X.

4.4.4 Distribution : At present, there is no organised system of distribution of agricultural implements in the State. The private manufacturers have their own agency. This work can with great advantage be taken up by the Cooperative Societies, which number 28,643 with approximately 37 lakh membership. It will prove to be a great encouragement if all the implements distributed by the Department of Agriculture are supplied through the Cooperative Societies. Some of the important manufacturers may also be prevailed upon to do like-wise. At the state level, one of the Agricultural Engineers rendered surplus as a result of reorganisation of research

and teaching section, may be utilised for planning, procurement and distribution of implements under the guidance of a Senior Agricultural Engineer. He should draw up his programme in consultation with the Superintending Agricultural Officer keeping in view the suitability of the different implements to different areas. With due regard to the total requirements of the district, it will also be necessary to fix yearly targets not only for different blocks but also for the various Village Level Workers circles. In order to make available costly equipment to the cultivators in the villages, it will be desirable to supply a set of such implements and machinery to the Village Panchayats and Cooperative Societies who may hire them to individual farmers. The Team had an opportunity of visiting a society of farmers who had set up oil engines, rice hullers, groundnut decorticators and flour mills. They were also keeping a wheat thresher and a few other important implements. The villagers using it had to pay fixed charges for each operation. Such a system requires to be widely popularised.

4.4.5 Repair and Maintenance : The implements programme cannot go ahead unless well organised facilities for repair and maintenance are available to the cultivators at their doors or within easy reach. This is specially so in the case of some costly implements and machinery. It will, therefore, be desirable to set up small workshops in villages by associating different Panchayats more or less on the lines of the Planning, Research and Action Institute, Kalakankar, Lucknow. The details of the scheme are given in Annexure XI. It may also be desirable to maintain a mobile workshop at some important centres taking into consideration the number of pumping sets, plant protection equipment, tractors and allied machinery used on the agricultural farms.

4.4.6 Training of Village Artisans : Training of village artisans is an important aspect of any implements programme. The effectiveness of this programme depends very much upon how well the artisans is trained to handle improved implements and machinery and the availability of equipment and facility at his shop. To create interest in this programme and to enhance his knowledge in handling and servicing of implements short term refresher courses may be organised by the engineering staff at the Block level, important manufacturing units wherever they come forward and the Gram Sevaks training centres. The main targets should be to have fully trained *mistries* or mechanics for each important village or a group of smaller villages. When called for such a training, the artisans shall have to be paid a minimum allowance of Rs. 5 per day to cover their boarding, lodging and loss of business during the period of training. As the experience shows unless the artisans are compensated for their loss in business to an attractive extent, they would not come for training. This is because they exist at bare substance level in their homesteads. Traditionally the village artisans undertake the responsibility for fitting, repairs and servicing of only the indigenous agricultural implements and they are paid

in kind for this work which varies from place to place. The rates fixed are generally on the lower side but farmers are unwilling to increase these rates. The village artisan thus hesitates to take the additional tasks of servicing improved implement under the old system without additional payment.

Another drawback in the improved implements programme is the difficulty which the farmer faces in servicing and replacement of parts of implements. Many implements remain idle for want of nuts and bolts and replacements of worn-out parts needing replacement. This is a disadvantage in contrast with the local implements for which all parts can be made available by the village artisan from local sources. It is, therefore, felt that the village artisans be supplied with adequate replacement parts so that implements are repaired without delay and in time for the cultivation plans to be followed without a break. It is also necessary to provide assistance to him in the form of easy credits suggested in para 2.10, so that he may equip his smithy and carry sufficient stock of replacement parts.

SUMMARY OF RECOMMENDATIONS

1. A majority of the farmers are still using the age-old chopper, known locally as 'Koyatta', though efforts are being made to replace it by blade-cutter. The rotary fodder cutter which is commonly used by the farmers in the Punjab and some parts of Uttar Pradesh will be highly desirable for adoption in this State. (1.18.1)
2. In order to assess the progress of the introduction of improved agricultural implements and machinery in the State, steps should be taken to enumerate them separately at the time of each quinquennial livestock census. (1.18.2)
3. The trials conducted with Land Master walking tractors of 4.5 h.p. (Petrol engine) have not proved successful for paddy cultivation. It is therefore, desirable to try power tillers in the higher horse power range with diesel fuel. (2.2.2)
4. Investigations on the draft of the implements in relation to the weight, size and quality of cattle under different conditions should be carefully carried out before recommending them to the cultivators. (2.6)
5. Systematic studies on the hitching methods and devices for better utilization of animal power should be undertaken. (2.6)
6. It is essential to have a first class Research Station in Agricultural Engineering with adequate workshop equipment and land facilities, manned by experienced and well-qualified personnel. (2.7.1)
7. There are, at present, two sections of agricultural engineering working at the same place, more or less, independent of each other. It would be of considerable advantage if activities of both the sections are fully co-ordinated and integrated with each other and one Engineer is made over-all incharge of both the sections. (2.7.1)
8. Adequate funds should be made available to the Agricultural Engineer to enable him to keep himself in close touch with the field conditions in different parts of the State. (2.7.1)
9. It is felt that more attention should be devoted to the trial of paddy land implements and power tillers received from Japan to find out their suitability to rice soils as paddy is the main crop in the eastern and western parts of the State. (2.7.2)
10. Special attention should be paid to the designing of a simple contrivance for transplanting paddy seedlings. Some of the transplanters manufactured in Italy and displayed at the International Agricultural

*Terms of Reference of the Agriculture Team in relation to the study of
Agricultural Implements*

The Team will make an appraisal of the various schemes, both of the Central and State Governments, relating to Agricultural Implements and make such suggestions as it may consider necessary with a view to achieving economy, efficiency and expedition in the working of the schemes.

For the purpose of the study by the Team, Agricultural Implements will be divided into the following categories :—

- (a) Bullock drawn implements;
- (b) Small power implements;
- (c) Hand tools and garden implements;
- (d) Irrigation appliances and machinery;
- (e) Plant protection equipment; and
- (f) Supplementary implements and equipment.

2. The Team will study, and report thereon, all aspects of the progress of various schemes, both of the Central and State Governments, and their efficiency and effectiveness in relation to the manufacture, popularisation and distribution of agricultural implements, particularly the following :—

(i) *Research*

- (a) Progress made in research at all levels at the Central and State Research Stations;
- (b) Testing and trials, including the work done at Regional Testing-cum-Training Centres;

(ii) *Manufacture*

- (a) Availability of raw materials with special reference to the quality of iron and steel required for the manufacture of implements;
- (b) Arrangements for quality control of implements;
- (c) Adequacy of organisations, both public and private, in different States and the country as a whole, for the manufacture of improved implements;

(iii) *Training*

- (a) Study of training facilities in agricultural engineering, training standards, number of trainees, scope for their employment, etc.;
- (b) Arrangement for training of village artisans and farmers;

- (c) Follow-up in the field of the training programmes for artisans and farmers;

(iv) *Sale and distribution*

- (a) Review of the methods and organisations employed for the sale and distribution of implements and their effectiveness;
- (b) Role of the cooperatives and departmental seed stores in the distribution of agricultural implements;
- (c) Linking of credit facilities with the distribution of agricultural implements and grant of loans in kind;

(v) *Popularisation*

- (a) Review of the arrangement for demonstrations at the village and block levels, the methods and techniques adopted and need and scope for strengthening of the village and block level set-up;
- (b) Arrangements for repairs and maintenance at the various levels and the role and working of rural workshops;
- (c) Purchase and hiring of implements by Cooperatives and Panchayats;

(vi) *Administrative arrangement*

- (a) Need and scope for strengthening the Agricultural Engineering staff at the District, Regional and State levels;
- (b) Co-ordination among different agencies concerned with research, manufacture, popularisation and distribution of implements.

3. The Team will carry out case studies of the different prototypes of important Agricultural Implements and Hand Tools with a view to judging their efficiency, economy and contribution towards increased production. With a view to facilitating studies and making them realistic, the Team will consult and hold discussions with progressive farmers, manufacturers of agricultural implements and officers and staff of the State Agriculture and other concerned Departments etc. The Team may co-opt representatives of various interests in the fields of manufacture, supply and use of agricultural implements in different States.

ANNEXURE—I

(Ref. Para 1·11·1·)

Tillage operations adopted for important crops in Maharashtra

1. Jowar :

- (i) One ploughing in three years by a heavy plough or a medium plough.
- (ii) Three or four harrowings by Deccan Blade Harrow.
- (iii) Sowing by 12" four coultered seed drill for *kharif* and 18" three coultered drill for *rabi*.
- (iv) Two hoeings by 12" entire blade hoe.
- (v) One weeding by khurpi.

2. Bajra :

- (i) One ploughing in three years by a heavy plough or a medium plough.
- (ii) Two or three harrowing by Deccan Blade Harrow.
- (iii) Sowing by 12" four coultered seed drill.
- (iv) One hoeing by 6" entire blade hoe.

3. Rice :

- (i) One ploughing by light plough.
- (ii) One puddling by light plough.
- (iii) One transplanting by manual labour.
- (iv) Two hoeings by Karjat Hoe or Japanese Hoe.

4. Wheat :

- (i) One ploughing by a heavy plough or a medium plough.
- (ii) One clod crushing by Maind.
- (iii) Two or three harrowings by Deccan Blade Harrow.
- (iv) Sowing by 10" or 12" four coultered seed drill.
- (v) One hoeing by 8" entire blade hoe.

5. Cotton (Irrigated) :

- (i) One ploughing by a heavy plough.
- (ii) One clod crushing by Maind.
- (iii) One harrowing by Deccan Blade Harrow.
- (iv) Preparing ridges and furrows by Jagat ridger.
- (v) Dibbling cotton seed manually at the four corners of a rectangle 4' × 3' in size.
- (vi) Earthing up by Kudali.
- (vii) Hoeing by Baroda Hoe or Victory Plough.
- (viii) Two weedings by Khurpi.

6. Cotton (Dry) :

- (i) One ploughing by a medium plough.
- (ii) One clod crushing by Maind.

- (iii) Two harrowings by Deccan Blade Harrow.
- (iv) Sowing by 18" two coultered seed drill or by Moghan behind 18" seed drill.
- (v) Two hoeings by 12" entire blade hoe.
- (vi) Two weedings by Khurpi.

7. *Groundnut* :

- (i) Two or three harrowing by Deccan Blade Harrow.
- (ii) Sowing by 12" four coultered seed drill.
- (iii) Two hoeings by 15" slit blade hoe in early stage of the crop.
- (iv) Two weedings by Khurpi.

8. *Sugarcane* :

- (i) Two ploughings by heavy plough.
- (ii) Two clod crushing by Norwegian Harrow.
- (iii) Preparing ridges and furrows by Jambo Ridger.
- (iv) Planting of sugarcane setts by manual labour.
- (v) One earthing up by Sabul plough.
- (vi) Two or three hoeings by shovel tooth cultivator.

9. *Tur Mixture* :

- (i) Two or three harrowings by Deccan Blade Harrow.
- (ii) Sowing by 12" drill one line of tur at 3' distance with the help of a Moghan.
- (iii) One hoeing by 6" entire blade hoe.

ANNEXURE—II

(Ref. Para 1·18)

Number of Agricultural Machinery and Implements in Maharashtra State

Sl. No.	District	Ploughs			Carts	Sugarcane Crushers			Oil Engines with pumps for irrigation purposes	Electric pumps for irrigation purposes	Persian Wheel and Rahat	Tractors		
		Wooden	Iron	Total		Worked by power	Worked by Bullock	Total				Govt.	Private	Total
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)
1. G. Bombay	...	575	198	5,588	2,270	3	2	5	26	29	82	8	4	12
2. Thana	..	106,142	249	106,391	36,681	4	25	29	806	633	2,538	1	19	20
3. Kolaba	..	84,468	1,124	84,592	19,740	8	17	25	477	7	2,188	1	4	6
4. Ratnagari	..	225,522	2,024	227,546	4,834	14	24	38	146	12	1,887	—	1	1
5. Nasik	..	137,566	24,385	161,951	70,315	351	983	1,334	6,349	107	1,095	27	39	56
6. Dhulia	..	100,567	13,495	114,062	71,452	126	90	216	3,826	81	77	2	38	40
7. Jalgaon	..	46,975	20,094	687,069	86,886	258	132	390	6,416	292	176	8	51	59
8. Ahmednagar	..	26,223	43,524	69,747	59,707	710	982	1,692	9,812	121	284	8	193	191
9. Poona	..	78,982	30,445	109,427	50,053	386	493	879	4,172	92	506	5	76	81
10. Satara	..	36,262	15,744	52,006	35,723	411	454	865	2,747	39	9	5	82	37
11. Sangli	..	20,996	25,631	46,627	35,954	441	499	940	4,405	91	10	8	14	22
12. Sholapur	..	10,945	27,320	38,265	41,011	437	360	797	380	19	262	—	30	30
13. Kolhapur	..	94,846	7,741	102,587	38,469	1,618	319	1,937	756	233	525	5	98	103
14. Aurangabad	..	10,735	39,157	49,892	62,643	810	1,053	1,863	3,585	157	227	9	64	73

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)
15.	Parbhani	33,558	20,442	55,000	57,340	244	439	683	571	30	98	11	27	38
16.	Bhir	1,771	19,881	21,652	29,678	—	378	3,878	807	31	2,284	—	12	12
17.	Nanded	83,475	4,450	87,925	44,305	191	445	546	636	30	2,934	—	5	5
18.	Osmanabad	20,911	21,413	42,434	34,228	782	918	1,700	2,730	57	73	17	11	28
19.	Buldhana	7,195	25,390	32,585	47,137	124	192	316	1,080	229	64	11	43	54
20.	Akola	13,305	22,897	36,202	69,510	29	56	81	437	504	24	30	98	128
21.	Amaravati	31,937	12,079	44,016	48,442	105	50	155	1,078	1,680	48	6	171	177
22.	Yeotmal	74,327	14,142	88,669	60,956	36	56	92	413	2,822	23	18	50	68
23.	Wardha	32,272	44,587	36,859	80,714	37	14	51	473	644	45	28	28	51
24.	Nagpur	70,027	1,962	71,989	74,230	79	27	106	79	1,714	104	12	26	38
25.	Bhandara	143,977	289	144,266	17,817	24	285	309	136	455	126	2	76	78
26.	Chanda	179,740	427	180,167	124,258	17	853	375	174	21	95	—	20	20
TOTAL : 1961 ..		1,673,499	397,905	2,071,404	1,343,379	7,155	8,616		693,447	7,100	18,751	205	1,220	1,427
1956		2,038,044	330,154	2,368,198	1,242,254	4,805	9,319	1,412	26,617	2,617	—	6	1,685	2,299
1951		1,476,334	270,869	1,746,703	1,238,275	6,024	10,669	16,693	10,669	1,920	—	—	—	752

83747

ANNEXURE—III

(Ref. Para 2·2·)

Progress of work done at Research Engineer's Section Poona in the field of Improved Agricultural Implements

1. *Poona Mechanical Seeder :*

During the sowing operation, an operator walks behind the drill and drops the seed from his hand in the seed bowls that seed then passed through the seed tubes and coulters to the soil and is sown there. To have uniform sowing neither thick nor thin nor with gaps in lives, the operator has to be a skilled one. Such skilled operators being few, the work of sowing is delayed at times for want of them. To obviate the necessity of such operators, a seeder has been prepared which could be fitted on any drill. With its use sowing is done mechanically at desired seed rates of 6, 8 or 10 lbs. of jowar per acre, 30 lbs. of paddy per acre and 40 or 60 lbs. of wheat per acre. In this seeder, the seed flow can be inspected through plastic tubes so that interruption in the seed flow can be removed easily. All its parts can be repaired by village artisans. It has been tried on 200 acres and found to be giving satisfactory work.

This seeder has been awarded the *FIRST PRIZE* of Rs. 1,000 by the Indian Council of Agricultural Research, New Delhi.

2. *Poona Mechanical Jowar Dibbler :*

In the Poona Method of Jowar Cultivation, jowar seed is sown at the four corners of a square with 18" sides, and only vigorous plants are allowed to grow at those corners by selection. This method allows equal opportunity for each plant to obtain moisture from soil and enables inter-culturing to be done both ways. Check row sowing of jowar this way is at present being done manually; consequently it is a time consuming and a costly work. Presently a jowar dibbler has been evolved which can be worked by a pair of bullocks and can sow jowar at the corners of a square with 18 inch sides. It has been tried at the Agricultural College Farm Poona in Kharif 1963 and found to give efficient and satisfactory performance. More such dibblers would now be prepared, and used at different farms next year.

3. *Poona Mechanical Groundnut Dibbler :*

In Maharashtra dibbling of Groundnut at the four corners of a square with 18" sides has been found to be very beneficial. In the absence of a suitable implement, this work is at present being done manually; and manual sowing is very costly. A bullock drawn groundnut dibbler has now been prepared with the help of which groundnut seed can be dibbled at the four corners of a square with 18 inch sides. This implement has been tried at the Agricultural College Farm Poona in Kharif 1963. With small and medium size groundnut seed, it has given quite a satisfactory performance. More such implements would be prepared and used at different farms next year.

4. *Groundnut Digger (Double Bladed) :*

The work of digging groundnut pods of the spreading variety has always been laborious and hence quite a costly one. In order to improve the situation, a double bladed type groundnut digger has been prepared. In that implement, two spring steel blades welded to vertical standards, are fitted on a heavy wooden piece. When

the implement is worked in a field, the two blades uproot all the creepers and leave no pod in the ground.

Six such implements have been prepared upto this time and are working successfully, on receipt of the demand from different officers, such groundnut diggers will be manufactured and supplied to them.

5. Improved Cart Axle :

The axle of the common country cart wears out in a year if the cart is used for transporting heavy loads every day. For improving the life of the axle, an improved cart has been prepared. To this cart, wheels are fitted with cast iron bush bearings which are turned on a lathe. These wheels work around an axle which also has both its ends turned on a lathe. A small tube is fitted to each wheel to store oil and that oil is fed to the bearings continuously. Felt washers fitted to the ends of the bearings prevent entry of dust in them. The axle and bearings of this cart hardly wear even after a year's use on heavy duty. Again the luboil requirements of this cart is half of that of the common cart. The cost of this equipment is only Rs. 80 in comparison to that of the conventional equipment which is Rs. 50.

6. Seed Counting Plate :

Officers at different Research Stations have to count the number of grains produced by different experiments. This work is laborious and time consuming. In order to speed up the work, a seed counting plate was prepared. A small wooden plank with 100 indentations made in it of sizes suitable for holding 100 individual seeds of different crops such as pumar, tur, udid, mug, etc. constitutes a seed counting plate. Nine such plate were prepared and found to be very useful.

Whenever a demand for such seed counting plates is received from Research workers at different farms, they are prepared and supplied.

7. Template for Checking Keni-Bund Size :

For checking the size of bund constructed with a keni, a wooden template is used. Such a template does not keep its sizes for long. Again it is cumbersome for handling. A template out of thin iron pipes using a special joint has been prepared. These templates are easy to handle, light in weight, and can maintain correct size and shape for years.

Forty such templates have been prepared and supplied to the Soil Conservation Training Institutes. Twenty more templates are at present being prepared.

8. Hydraulic Dynamometer :

For measuring draft exerted by bullocks when working implements, spring type dynamometers are used. The pointer of such a dynamometer fluctuates much, and hence it is difficult for an observer to take correct readings. Again accuracy of such instruments is not maintained for long. A new dynamometer using oil in it has been prepared. That oil is compressed when an implement is worked and the pressure is transmitted through tubing to a gauge which the observer keeps in his hand. The pointer of this instrument does not fluctuate and hence clear readings can be obtained unlike the ordinary spring balance.

ANNEXURE—IV

Cash Studies of Manufacturing Units

Kirloskar Brothers Ltd :

History : Established in 1902, the first iron plough manufactured by this was as early as in 1905 and probably this was the first iron plough manufactured in India. It was a very difficult job to convince the farmers in those early years of 1905 to 1919 about the uses of this new plough and as such the plough remained unsold for two years. Thereafter the firm continued manufacturing iron ploughs and distributing them to cultivators for trying in the field free of any cost. These trials proved successful and the manufacture of Agricultural Implements on a large scales was started by the firm since 1919 as an organised industry.

Present programme and capacity : The firm is manufacturing about 19 types of ploughs suitable for various soils in the State and also for the country. These ploughs have been classified into three categories viz. (i) Heavy Ploughs (costing Rs. 104 to 155); (ii) Ridge Ploughs (Rs. 92 to Rs. 102); and (iii) Light Ploughs (Rs. 33 to Rs. 72). Apart from ploughs, the firm is also manufacturing the following agricultural implements :—

(i) Cultivator-cum-Ridger	(Costing from Rs. 42 to Rs. 120)
(ii) Seed Drills	(Costing from Rs. 125 to Rs. 250)
(iii) Sugarcane crushers	(Costing from Rs. 446 to Rs. 360)
(iv) Decorticators	(Costing from Rs. 192 to Rs. 2695)

During the year 1960-61, 18351 ploughs, 2,555 Sugarcane crushers of various types and groundnut Decorticators were manufactured. The present annual manufacturing capacity of the firm is 50,000 light ploughs and 25,000 Heavy ploughs (turn-wrest ploughs). It was gathered during the discussions at Kirloskarwadi, with the firms representatives that they can extend the manufacturing capacity according to need if the present programme of manufacturing is drawn, which is possible on the estimate of requirements of implements in the State. The firm being the pioneer in the line is catering to the major demand of the State, and is also despatching implements to various parts of the country. It was learnt that the implements being manufactured, are getting a ready market for sale, and the farmer is not feeling any difficulty. It is attributed mainly to the good quality and standard design. The firm is engaged in the popularisation of improved and new Agricultural Implements, since 1910 and is oldest standing institution in this line.

Providing servicing facilities and the supply of spare parts etc. are readily made available to the users of implements by the firm.

The implements are distributed in the different parts of the country through Railways, but careless handling in rail transit causes heavy damage of implements and it is one of the important problems with the Railways.

A few of the difficulties the firm is now facing as represented to us are :—

- (i) The firm is running short of supply of pig iron.
- (ii) The firm was manufacturing chaff cutter blades, but had to leave this programme because of the non-availability of the required quality of steel, and it was reported that the qualities of steel required for blades and other cutting parts is not being manufactured in the country.

- (iii) Sales-tax is charged in Maharashtra even on implement spares costing less than Rs. 5. Usually this sales-tax is a burden on the cultivators. Sales tax varies from State to State and this causes much hardship to the cultivator who buys the implement and also its propagation.

2. *American Spring & Pressing Works Private Ltd. :*

History : Established in the year 1943 the firm has specialised in the manufacture of Plant Protection equipments and allied machinery both Power and hand operated. During the year 1960-61 the total number of different implements manufactured and sold by the firm was as follows :—

Implements	No. Sold
(1) Power Dusters	252
(2) Hand Dusters	19,673
(3) Power Sprayers	571
(4) Hand compression Sprayers	13,861
(5) Hand Knapsack sprayers	2,159
(6) Hand Stirrup Pumps	7,130
(7) Hand Nursery Sprayers	3,342
(8) Hand operated seed Dressers	1,261
(9) Foct and Rocking Sprayers	10,699
(10) Hand operated Agrl. Implements	4,424
TOTAL	63,373

The implements and equipments of the firm are reported to be very popular not only in Maharashtra State but throughout India. One special feature of these equipment and machinery manufactured by the firm is that all the parts are numbered serial wise and whenever any part of the implement is required to be replaced, the consumer has just to write number of the parts mentioned on the part of the machinery without giving any details there of. This firm claims that it is meeting 75 per cent demand of plant protection equipment of the country. The problem, the firm is facing, is the shortage of steel and other metal for manufacturing implements. It is reported that during the period of five years (1957 to 1961) as against the total requirement of 1751 tons of Iron and Steel, the firm received only 745 tons of raw-material through proper channel. The balance of 1006 tons was purchased from open market at more than double the controlled prices. This means an increase, in the cost price of implements resulting in higher selling price and a direct burden on the farmer.

Problems :

The main difficulty experienced by the firm is the short supply of iron and steel. During 1957-61, the firm had to purchase 59 per cent of its requirement from the open market at a price more than double that of the controlled rate.

3. *Voltas :*

Voltas is a renowned firm, partly engaged in the manufacture of Agricultural and plant protection implements, both hand and power driven. Some of the important implements manufactured by this firm are :—

- (i) B-275 Diesel Tractor I.H.C.

- (ii) 9R. Rigid cultivators (Trade).
- (iii) 2 Tonne bullock Cart.
- (iv) Puddler.
- (v) Levelling Blade.
- (vi) Disc. Plough.
- (vii) Streerage Hoc.
- (viii) Blade Harrow.
- (ix) Dimoto Pumps.
- (x) Spray Sprinklers.
- (xi) Mist Blower for plant protection.
- (xii) Auto-frame.

It may be mentioned that of all the implements mentioned the Improved Bullock Cart, Auto-frame and the sprinkler rains manufactured by the Voltas have gained much popularity with the well-to-do farmers and estates.

The Improved Bullock Puddler for paddy growers, is of two sizes (55 cms., and 86 cms. working widths). The 55 cms. puddler has two puddling wheels and is a walking type puddler complete with a handle. The 86 cms. Puddler has three puddling wheels with a comfortable seat and foot-rests for the operator. Added weight of the operator makes still better puddling. Both these puddlers have metal bearings with grease nipples for lubrication. Blades are fitted on the disc at a special angle designed to reduce draft, improve penetration, create better churing and eliminate mud logging. This implement has not been adopted so far by the cultivation in general but is used in a modified form in Madras State.

The sprinklers designed and manufactured by the Voltas is an unique achievement in the field as it provides gentle rain like spray for the crops just when the plants need it and in just the right quantity. It thus helps to grow better crops with considerable saving in water, time, and labour.

The two-ton Bullock Cart introduced by Voltas is an improved unit for all types of farm haulage. The Chassis is made of pressed steel. The Cart is mounted on pneumatic tyres to reduce draft and shocks and to make the chores easier for bullocks. Tapered roller bearings have been provided for smoother and friction free operation to cut down extra effort needed to properly the cart. Angle iron side brackets are available as an attachment for increased width and side support. A Brake attachment is available for operating carts over undulating terrain.

The Auto-frame and attachments manufactured is an unique achievement of the firm. It works as a water Tanker, oil Tanker, Garbage body, Cart, and Tonga. It can be used for many purposes in a matter of moments and thus save time and economy. The wheel tread width is adjustable from 3 ft. to 4½ ft. according to haulage conditions. Pneumatic tyres are used to absorb shocks. Tapered roller bearings are fitted to ensure smooth running and reducing rolling friction.

RESUME OF THE WORK UNDERTAKEN AT KRISHI SUDHAR KENDRE, DEGLOOR

1. *The Improved Country Plough—Sulabh Nangar :*

Sulabh Nangar is an improvement over the country plough and is being introduced by Shri Bala Prasad Dhoot after ascertaining its efficiency through a series of trials and experiments. This plough has been tested at the 'Sarva Seva Sangh', Wardha and has been recorded as the best South Indian Plough, because of its efficiency and convenience in handling.

Sulabh Nangar opens the soil more thoroughly without leaving much space in between the two furrows. By putting a slight pressure on the implement it goes deeper, which in the local plough is not practicable. Very little resistance is offered to the body which not only helps in working efficiency but also prolongs the life of the implements.

2. *Improved Country Harrow—Sulabh Bakhar :*

This is an improvement over the country harrow (Bakhar). Mr. Dhoot has introduced this implement at Degloor and this implement is spreading rapidly replacing the country bakhar, in this area. Due to changes in the construction of the body and the blade this implement has proved to be more efficient than the local harrow. The main changes are:—

- (i) The thickness of the body is increased to make it more heavy.
- (ii) The angle between the type and the body is reduced which keeps the blade in a slanting position in the soil. The resistance offered to the blade is minimum.
- (iii) The rings by which the blade is fixed to the type are made flat at the back. They do not rub against the ground when at work.
- (iv) The blade is curved outside. It penetrates into the soil and the land harrowing is done at a uniform depth.

3. *The Improved seed bowl—Sulabh Chada :*

Sulabh Chada differs from the desi seed bowl mainly in regard that :

- (i) The distribution of seeds in each row is uniform and not much skill is required for sowing, as is needed for the desi seed bowl;
- (ii) The seeds fall alternately in row to row, whereas in the desi type of bowl seeds fall side by side in the rows.

In the Desi seed bowl there are two or three holes in the upper pan which open separately in each of the delivery tubes. And for having uniform sowing equal quantity of seed is required to be dropped in each of the holes. As it is not possible to do it conveniently by hand and requires only skilled men that can do this. The Sulabh Chada has only one hole-opening in the upper pan and the seed has to be simply dropped in this hole. The seed falls in the bowls on a point from where it is divided automatically in the respective compartments each opening in a delivery tube. The pan is so designed that, as the seed is dropped it gains speed and falls down in a circulating manner.

Unlike the local seed bowl Sulabh Chada requires special skill for its making. These are being manufactured locally under the supervision of Shri Bala Prasad Dhoot and distributed among the cultivators.

4. *The Improved Chopper—Sulabh Katar :*

This model of the Sulabh Katar is one of the latest works of Shri Dhoot which is a result of the demand from the village farmers. This chopper was designed to improve the efficiency of the desi chaff-cutting system, where a considerable loss of the straw occurs. This design of the chopper is said to have been found to be of great help and efficiency to the farmers of this area.

Method of operations : It is worked by two men. The operator holds the handle in his hand. He puts his one leg on the stand in order to keep the implement in a stationary position. First the lever is raised upwards. The bundle of the straw to be chaffed is kept on the knife. Now the lever is pressed down. As the straw is cut to pieces the bundle is pushed forward and the lever is pressed again. This process is continued till the whole straw bundle is cut. The main uses and benefits that accrue due to it are that :—

- (i) It cuts down the straw into small pieces of convenient size with a minimum effort put in;
- (ii) There is no loss of straw in the cutting and every piece of straw is made available for consumption of cattle;
- (iii) It is also used for cutting the ear-heads of crops like wheat etc.; and
- (iv) The work done in a day is much more than what could be performed by the country chaff-cutter.

ANNEXURE—V

Requirement of Improved Implements for Cultivation of Different size Groups of Holdings and Panchayats

Sl. No.	Name of Implements	7.5 to 20 acres	20—50 acres	50—75 acres	75—150 acres	Panchayats	Area to which these implements are recommended
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
A. Implements for land Preparation							
1.	Light Iron Plough	1	2	3	2	—	All Districts.
2.	Heavy Iron Plough	—	1	1	2	2	} Do. Do. Do. Do. Except, Thana, Kolaba, Ratnagiri, Chanda, Bhandara.
3.	Entire Blade Harrow	1	1	—	—	—	
4.	Covering Blade Harrow	—	1	1	—	—	
5.	Leveller	—	1	1	2	—	
6.	Bund Former	—	1	—	2	—		Do.
7.	Cotton Plant Puller	1	1	3	—	—	Akola, Amravati, Jalgaon, Aurangabad, Parbhani, Wardha, Nagpur and Nanded.
8.	Paddy Puddler	1	1	1	2	—	Thana, Kolaba, Ratnagiri, Chanda, Bhandara.
9.	Dry framing Set	—	—	1	2	—	All Districts except Thana, Kolaba, Ratnagiri, Chanda, Bhandara.
B. Sowing							
1.	Two Coultured Drill	—	1	1	—	—	Buldhana, Akola, Amravati, Jalgaon, Aurangabad, Parbhani, Bhir, Osmanabad, Yeotmal, Wardha, Nagpur, and Nanded.
2.	Three Coultured Drill	1	1	1	—	—	Dhulia, Nasik, Airagar, Poona, Satara, Sangli, Sholapur, Kolhapur.
3.	Poona Mechanical Seeder	—	1	1	—	—	All Districts.
4.	Dibbler	1	—	—	—	—	All Districts (Mainly Kharif areas).
C. Inter Culturing							
1.	Tine Tooth Hoe	1	2	3	—	—	All Districts except Thana, Kolaba, Ratnagiri, Bhandara.

2. Akola Hoe	--	1	2	2	--	All Districts.
3. Blade Hoe	--	1	2	2	--	All Districts.
D. Harvesting, Progressing & Transport.						
1. Groundnut Digger	--	1	1	1	--	Dhulia, Nasik, Satara, Sangli, Sholapur, Buldhana, Akola, Jalgaon, Bhir, Osmanabad.
2. Groundnut Decorticator ..	--	--	--	1	--	Do.
3. Cane Crushers	--	1	1	--	--	Ahmednagar, Kolhapur, Amravati, Nanded.
4. Olpad Threshers	--	1	1	--	--	All Districts.
5. Maize Sheller	--	--	--	1	--	All Districts except Thana, Kolaba, Ratnagiri, Chanda and Bhandara.
6. Bulles Cart Axles	1 (for three holdings)	1	--	2	--	All Districts.
7. Chaff Cutters	1	1	--	--	--	All Districts except Thana, Kolaba, Ratnagiri, Chanda and Bhandara.
8. Bullock Driven Chaff-Cutters	--	--	1	1	--	All Districts.
9. Bullock Cart (Dunlop) ..	--	--	1	--	--	Do.
E. Plant Protection Implements						
1. Seed Dressing Drums	--	1	1	2	1	Do.
2. Dusters	--	--	1	2	2	Do.
3. Sprayers	--	--	1	2	1	Do.
4. Fumigating Pump Sets	--	--	--	--	1	Do.
F. Irrigation Equipment						
1. Iron Mhote	--	1	1	1	--	Do.
2. Rahat	--	--	1	1	--	Do.
G. Motorised Equipments Tractors						
1. Power cane crushers	--	--	--	1	--	Ahmednagar, Kolhapur, Amravati, Nanded.
2. Power Threshers	--	--	--	1	--	All Districts.
3. Power Threshers for Millets	--	1	1	1	1	All Districts except Thana, Kolaba, Ratnagiri, Chanda, Bhandara.
4. Pumping Sets	--	1	1	1	--	All Districts.
5. Tractors	--	1	1	1	--	Do.
6. Power Sprayers	--	--	--	1	1	Do.

Ref. Rule 3.4

ANNEXURE

Statements Showing the Estimated Number of Implements Required

(7.5 Acres to

Sl. No.	Name of Distt.	Major Crops	Number of holdings	Light M.B. Plough
(1)	(2)	(3)	(4)	(5)
1.	Thana	Rice	23,099	23,099
2.	Kolaba	Rice	20,763	20,763
3.	Ratnagiri	Rice	52,370	52,370
4.	Dhuia	Jowar G. Nut	45,421	45,421
5.	Nasik	Bajra & Wheat	60,665	60,665
6.	Ahmednagar	Bajra & Jowar	68,403	68,403
7.	Poona	Jowar & Bajra	59,863	59,863
8.	Satara	Jowar	53,440	53,440
9.	Sangli	Jowar, Bajra and G.Nut	43,588	43,588
10.	Sholapur	Jowar	58,267	58,267
11.	Kolhapur	Jowar	33,242	33,242
12.	Buldhana	Cotton & Jowar	36,819	36,819
13.	Akola	Do.	37,723	37,723
14.	Amravati	Do.	33,223	33,223
15.	Jalgaon	Jowar, Cotton and Gd. Nut.	57,008	57,008
✓ 16.	Aurangabad	Jowar, Bajra and Cotton	61,989 ✓	61,989
✓ 17.	Parbhani	Jowar & Cotton	49,830 ✓	49,830
✓ 18.	Bhir	Jowar & Bajra	48,092 ✓	48,092
✓ 19.	Osmanabad	Jowar	61,610 ✓	61,610
✓ 20.	Yeotmal	Jowar & Cotton	31,077	31,077
21.	Wardha	Cotton & Jowar	25,596	25,596
22.	Nagpur	Do.	40,971	40,971
✓ 23.	Nanded	Do.	49,882 ✓	49,882
24.	Chanda	Rice	41,108	41,108
25.	Bhandara	Rice & Jowar	26,316	26,316
TOTAL			1,120,365 ✓	1,120,365

—VI

for Various Types of holdings in Maharashtra State district-wise
20 Acres)

Blade Harrow	Paddy Puddler	Cotton Plant Puller	Three Coultured drill	Tine Tooth Hoe	Bullock Chain	Bullock Carts Axles	Chaff Cutter
(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
23,099	23,099	..	..	..	23,099	7,700	..
20,763	20,763	..	..	..	20,763	6,921	..
52,370	52,370	..	..	..	52,370	17,457	..
45,421	..	..	45,421	45,421	45,421	15,140	45,421
60,665	..	..	60,665	60,665	60,665	20,222	60,665
68,403	..	..	68,403	68,403	68,403	22,801	68,403
59,863	..	..	59,863	59,863	59,863	19,988	59,863
53,440	..	..	53,440	53,440	53,440	17,613	53,440
43,588	..	..	43,588	43,588	43,588	14,529	43,588
58,267	..	..	58,267	58,267	58,267	16,098	58,267
33,242	..	..	33,242	33,242	33,242	11,081	33,242
36,819	..	36,819	36,819	36,819	36,819	12,273	36,819
37,723	..	37,723	37,723	37,723	37,723	12,574	37,723
33,223	..	33,223	33,223	33,223	33,223	11,074	33,223
57,008	..	57,008	57,008	57,008	57,008	19,002	57,008
61,989	..	61,989 ✓	61,989	61,989	61,989	20,663	61,989
49,830	..	49,830 ✓	49,830	49,830	49,830	19,943	49,830
48,092	..	48,092 ✓	48,092	48,092	48,092	16,031	48,092
61,610	..	61,610 ✓	61,610	61,610	61,610	20,537	61,610
31,077	..	31,077 ✓	31,077	31,077	31,077	10,359	31,077
25,596	..	25,596 ✓	25,596	25,596	25,596	8,532	25,596
40,971	..	40,971 ✓	40,971	40,971	40,971	13,690	40,971
49,882	..	49,882 ✓	49,882	49,882	44,988	1,663	49,332
41,108	41,108	..	..	..	41,108	13,702	..
26,316	26,316	..	26,316	26,316	26,316	8,772	26,316
1,120,365	163,656	485,728 ✓	983,025	983,025	1,120,365	373,455	983,025

ANNEXURE

Statement Showing the Number of Implements Required for

Sl. No.	Name of District	Major Crops	No. of Holdings	Light Iron Plough	Heavy Iron Plough	Covering Blade Harrow
(1)	(2)	(3)	(4)	(5)	(6)	(7)
1.	Thana . . .	Rice	9,533	19,066	9,533	9,533
2.	Kolaba . . .	Rice	55,220	10,460	65,830	5,230
3.	Ratnagiri . . .	Rice	19,457	38,914	19,457	19,457
4.	Dhulia . . .	Jowar and Gd. Nut	21,108	42,206	21,103	21,103
5.	Nasik . . .	Bajra, Wheat and Gd. Nut	20,893	59,786	29,893	29,893
6.	Ahmednagar . . .	Bajra & Jowar	29,408	58,816	29,408	29,408
7.	Poona . . .	Jowar & Bajra	32,633	65,266	32,633	32,633
8.	Satara . . .	Jowar & G. Nut	17,112	34,224	17,212	17,212
9.	Sangli . . .	Jowar, Bajra and G. Nut.	17,694	35,388	17,694	17,694
10.	Sholapur . . .	Jowar & G. Nut	38,445	76,800	38,445	38,445
11.	Kolhapur . . .	Jowar & S. Cane	8,592	17,284	8,592	8,592
12.	Buldhana . . .	Cotton, Jowar & Groundnut	16,345	32,690	16,345	16,345
13.	Akola . . .	Do.	17,712	35,424	17,712	17,712
14.	Amravati . . .	Cotton & Jowar	13,693	27,386	13,693	13,693
15.	Jalgaon . . .	Cotton, Jowar & Gd. Nut.	18,728	37,456	13,728	18.28
16.	Aurangabad . . .	Jowar, Bajra & Cotton	43,838	87,676	43,838	43,838
17.	Parbhani . . .	Jowar & Cotton	38,687	77,374	38,687	38,687
18.	Bhir . . .	Jowar, Bajra & Gd. Nut	31,613	63,226	31,613	31,613
19.	Osmanabad . . .	Jowar & G. Nut	43,388	86,776	13,388	43,388
20.	Yeotmal . . .	Jowar & Cotton	16,788	33,576	16,788	16,788
21.	Wardha . . .	Do.	10,091	20,182	10,091	10,091
22.	Nagpur . . .	Do.	13,344	26,688	13,344	13,344
23.	Nanded . . .	Jowar, Cotton & Sugarcane	28,535	57,070	28,535	28,535
24.	Chanda . . .	Rice	11,250	22,500	11,250	11,250
25.	Bhandara . . .	Rice & Jowar	5,372	10,744	5,372	5,372
TOTAL			488,584	1,077,168	538,584	538,584

VI--contd.

Holdings of 20 Acres to 50 Acres in Maharashtra State

Entire Blade Harrow	Cotton Plant puller	Leveller	Bund Former	Paddy Puddler	Two Coultered Drill	Three Coultered Drill
(8)	(9)	(10)	(11)	(12)	(13)	(14)
9,533	..	..	..	9,533	..	..
5,230	..	..	..	5,230	..	..
19,457	..	..	..	19,457	..	..
21,103	..	21,103	21,103	..	..	21,103
29,893	..	29,893	29,893	..	..	29,893
29,408	..	29,408	29,408	..	..	29,408
32,633	..	32,633	32,633	..	..	32,633
17,212	..	17,212	17,212	..	..	17,212
17,694	..	17,694	17,694	..	..	17,694
38,445	..	38,445	38,445	..	..	38,445
8,592	..	8,592	8,592	..	..	8,592
16,345	16,345	516,345	16,345	..	16,345	..
17,712	17,712	17,712	17,712	..	17,712	..
13,693	13,693	13,693	13,693	..	13,693	..
18,728	18,728	18,728	18,728	..	18,728	..
43,838	43,838	43,838	43,838	..	43,838	..
38,687	38,687	38,687	38,687	..	38,687	..
31,613	..	31,613	31,613	..	31,613	..
43,388	..	43,388	43,388	..	43,388	..
16,788	16,788	16,788	16,788	..	16,788	..
10,091	10,091	10,091	10,091	..	10,091	..
13,344	13,344	13,344	13,344	..	13,344	..
28,535	28,535	28,535	28,535	..	28,535	..
11,250	11,250	11,250	11,250	11,250	..	..
5,372	..	5,372	5,372	5,372	..	..
538,584	217,761	493,114	493,114	50,842	292,762	194,980

ANNEXURE

Statement Showing the Number of Implements Required for

Sl. No.	Name of District	Major Group	Seed Dressing Drum	Poona Mcchl. Seeder	Akola Hoe	Blade Hoe
(1)	(2)	(3)	(15)	(16)	(17)	(18)
1.	Thana	Rice	9,533	9,533	9,533	95,886
2.	Kolaba	Rice	5,230	5,230	5,230	5,230
3.	Ratnagiri	Rice	17,457	17,457	17,457	17,457
4.	Dhulia	Jowar & Gd.Nut	21,103	21,103	21,103	21,103
5.	Nasik	Bajra, Wheat & Gd. Nut.	29,893	29,893	29,893	29,893
6.	Ahmednagar	Bajra & Jowar	29,408	29,408	29,408	29,408
7.	Poona	Jowar & Bajra	32,633	32,633	32,633	32,633
8.	Satara	Jowar & G. Nut	17,212	17,212	17,212	17,212
9.	Sangli	Jowar, Bajra & G. Nut.	17,694	17,694	17,694	17,694
10.	Sholapur	Jowar & G. Nut	38,445	38,445	38,445	38,445
11.	Kolhapur	Jowar & S. Cane	8,592	8,592	8,592	..
12.	Buldhana	Cotton, Jowar & Groundnut	16,345	16,345	16,345	16,345
13.	Akola	Do.	17,712	17,712	17,712	17,712
14.	Amravati	Cotton & Jowar	13,693	13,693	13,693	13,693
15.	Jalgaon	Cotton, Jowar & Gd. Nut.	18,728	18,728	18,728	18,728
16.	Aurangabad	Jowar, Bajra & Cotton.	43,838	43,838	43,838	43,838
17.	Parbhani	Jowar & Cotton	38,687	38,687	38,687	38,687
18.	Bhir	Jowar, Bajra & Gd. Nut	31,613	31,613	31,613	31,613
19.	Osmanabad	Jowar & G. Nut	43,388	43,388	43,388	43,388
20.	Yeotmal	Jowar & Cotton	16,788	16,788	16,788	16,788
21.	Wardha	Do.	10,091	10,091	10,091	10,091
22.	Nagpur	Do.	13,344	13,344	13,344	13,344
23.	Nanded	Jowar, Cotton & Sugarcane.	28,535	28,535	28,535	28,535
24.	Chanda	Rice	11,250	11,250	11,250	11,250
25.	Bhandara	Rice & Jowar	5,372	5,372	5,372	5,372
TOTAL			538,584	538,584	538,584	538,584

VI— contd.:

Holdings of 20 Acres to 50 Acres in Maharashtra State

Ground nut Digger	Oipad Thresher	Chaff Cutter	Cane Crusher	Bullock Cart Axle	Iron Mhote	Duster
(19)	(20)	(21)	(22)	(23)	(24)	(25)
..	9,533	..	..	9,533	9,533	9,533
..	5,230	..	..	5,330	5,230	5,230
..	17,457	..	..	17,457	17,457	17,457
21,103	21,103	21,103	..	21,103	21,103	21,103
29,893	29,893	29,893	..	29,983	29,893	29,893
..	29,408	29,408	29,408	29,408	29,408	29,408
..	32,633	32,633	..	32,633	32,633	32,633
17,212	17,212	17,212	..	17,212	17,212	17,212
17,694	17,694	17,694	..	17,694	17,694	17,694
38,445	38,445	28,445	..	38,445	38,445	38,445
8,592	8,592	8,592	8,592	8,592	8,592	8,592
16,345	16,345	16,345	..	16,345	16,345	16,845
17,712	17,712	17,712	..	17,712	17,712	17,712
..	13,693	..	13,693	13,693	13,693	13,693
18,728	18,728	18,728	..	18,728	18,728	18,728
..	43,838	43,838	..	43,838	43,838	43,838
..	38,687	38,687	..	38,687	38,687	38,687
31,613	31,613	31,613	..	31,613	31,613	31,613
43,388	43,388	43,388	..	43,388	43,388	43,388
16,788	16,788	16,788	..	16,788	16,788	16,788
..	10,091	10,091	..	10,091	10,091	10,091
..	13,344	13,344	..	13,344	13,344	13,344
..	28,535	28,535	28,535	28,535	28,535	28,535
..	11,250	..	..	11,250	11,250	11,250
..	5,372	5,372	..	5,372	5,372	5,372
252,133	538,584	493,114	66,535	538,584	538,584	538,584

ANNEXURE

Statement Showing the Number of Implements Required for

Sl. No.	Name of District	Major Group	No. of Holdings.	Light Iron Plough	Heavy Iron Plough	Dry Forming set.
(1)	(2)	(3)	(4)	(5)	(6)	(7)
1.	Thana . . .	Rice	1,471	4,413	1,471	..
2.	Kolaba . . .	Rice	641	1,923	641	..
3.	Ratnagiri . . .	Rice	2,617	7,851	2,617	..
4.	Dhulia . . .	Jowar & G. Nut	2,446	7,338	2,446	2,446
5.	Nasik . . .	Bajra & Wheat	4,031	12,093	4,031	4,031
6.	Ahmednagar . . .	Bajra, Jowar & Sugarcane	6,167	18,501	6,167	6,167
7.	Poona . . .	Jowar & Bajra	4,295	12,885	4,295	4,295
8.	Satara . . .	Jowar & G. Nut	1,838	5,514	1,838	1,838
9.	Sangli . . .	Jowar, Bajra & G. Nut	2,332	6,996	2,332	2,332
10.	Sholapur . . .	Jowar & G. Nut	6,789	20,367	6,789	6,789
11.	Kolhapur . . .	Jowar & S. Canç	714	2,142	714	714
12.	Buldhana . . .	Cotton, Jowar & G. Nut.	3,113	9,339	3,113	3,113
13.	Akola . . .	Do.	3,475	10,425	3,475	3,475
14.	Amravati . . .	Cotton & Jowar	2,583	7,749	2,583	2,583
15.	Jalgaon . . .	Cotton, Bajra & G. Nut.	2,263	6,789	2,263	2,263
16.	Aurangab d . . .	Jowar, Bajra & Cotton.	8,133	24,399	8,133	8,133
17.	Parbhani . . .	Jowar & Cotton	7,044	21,132	7,044	7,044
18.	Bhir . . .	Jowar, Bajra & G. Nut.	5,623	16,869	5,623	5,623
19.	Osmanabad . . .	Jowar & G. Nut	7,607	22,821	7,607	7,607
20.	Yeotmal . . .	Jowar & Cotton	3,296	9,888	3,296	3,296
21.	Wardha . . .	Do.	1,697	5,091	1,696	1,697
22.	Nagpur . . .	Do.	1,934	5,802	1,934	1,934
23.	Nanded . . .	Jowar, Cotton & Sugarcane.	3,748	11,244	3,748	3,748
24.	Chanda . . .	Rice	1,252	3,756	1,252	..
25.	Bhandara . . .	Rice & Jowar	666	1,998	666	..
TOTAL . . .			85,775	257,325	35,775	79,128

VI—contd.

Holdings of 50 Acres to 75 Acres in Maharashtra State

Cotton Plant Puller	Level- ler	Paddy Puddler	Two Coultered Drill	Three Coultered Drill	Seed Dressing Drum	Poona Mechan- ical Seeder
(8)	(9)	(10)	(11)	(12)	(13)	(14)
--	--	1,471	..	..	1,471	1,471
64	--	641	..	..	641	641
..	..	2,617	..	..	2,617	2,617
..	2,446	--	--	2,446	2,446	2,446
..	4,031	--	--	4,031	4,031	4,031
..	6,167	..	--	6,167	6,167	6,167
..	4,295	..	--	4,295	4,295	4,295
..	1,838	--	--	1,838	1,838	1,838
..	2,332	..	--	2,332	2,332	2,332
..	6,789	..	--	6,789	6,789	6,789
..	714	--	..	714	714	714
3,113	3,113	..	3,113	--	3,113	3,113
3,475	3,475	--	3,475	--	3,475	3,475
2,583	2,583	--	2,583	--	2,583	2,583
2,263	2,263	--	2,263	--	2,263	2,263
8,133	8,133	--	8,123	..	8,133	8,133
7,044	7,044	--	7,044	--	7,044	7,044
5,623	5,623	--	5,623	..	5,623	5,623
7,607	7,607	..	7,607	--	7,607	7,607
3,296	3,296	--	3,296	--	3,296	3,296
1,697	1,697	--	1,697	--	1,697	1,697
1,934	1,934	--	1,934	..	1,934	1,934
3,748	3,748	--	3,748	--	3,748	3,748
--	..	1,252	--	--	1,252	1,252
--	..	666	--	--	666	666
50,516	79,128	6,647	50,516	28,612	85,775	85,775

ANNEXURE

Statement Showing the Number of Implements Required for

Sl. No.	Name of District	Major Crops	Akola Hoe	Blade Hoe	Ground-nut Digger	Olpad Thresher
(1)	(2)	(3)	(15)	(16)	(17)	(18)
1.	Thana	Rice	2,942	2,942	..	1,471
2.	Kolaba	Rice	1,282	1,282	..	641
3.	Ratnagiri	Rice	5,234	5,234	..	2,617
4.	Dhulia	Jowar & G. Nut	4,892	4,892	2,446	2,446
5.	Nasik	Bajra and Wheat	8,062	8,062	..	4,031
6.	Ahmednagar	Bajra, Jowar & Sugarcane	12,334	12,334	..	6,167
7.	Poona	Jowar & Bajra	8,590	8,590	—	4,295
8.	Satara	Jowar & G. Nut	3,676	3,676	1,838	1,838
9.	Sangli	Jowar, Bajra & G. Nut	4,664	4,664	2,332	2,332
10.	Sholapur	Jowar & G. Nut	13,578	13,578	6,789	6,789
11.	Kolhapur	Jowar & S. Cane	1,428	1,428	..	714
12.	Buldhana	Cotton, Jowar & G. Nut	6,226	6,226	3,113	3,113
13.	Akola	Do.	6,950	6,950	3,475	3,475
14.	Amravati	Cotton & Jowar	5,166	6,166	..	2,583
15.	Jalgaon	Cotton, Jowar, and G. Nut.	4,526	4,526	22,63	2,263
16.	Aurangabad	Jowar, Bajra & Cotton.	16,266	16,266	..	8,133
17.	Parbhani	Jowar & Cotton	14,088	14,088	..	7,044
18.	Bhir	Jowar, Bajra & G.Nut	11,246	11,246	5,623	5,623
19.	Osmanabad	Jowar & G.Nut	15,214	15,214	7,607	7,607
20.	Yeotmal	Jowar & Cotton	6,592	6,592	..	2,396
21.	Wardha	Do.	3,394	3,394	..	1,697
22.	Nagpur	Do.	3,868	3,868	..	1,934
23.	Nanded	Jowar, Cotton & Sugarcane.	7,496	7,496	..	3,748
24.	Chanda	Rice	2,504	2,504	..	1,252
25.	Bhandara	Rice & Jowar	1,332	1,332	..	666
TOTAL			171,550	171,550	35,486	85,775

VI—contd.

Holdings of 50 Acres to 75 Acres in Maharashtra State

Bullock Driven Chaff- Cutter	Cane Crusher	Bullock Cart (Dunlop)	Rahat	Iron Mhote	Duster	Sprayer
(19)	(20)	(21)	(22)	(23)	(24)	(25)
..	..	2,942	1,471	1,471	1,471	1,471
..	..	1,282	641	641	641	641
..	..	5,234	2,617	2,617	2,617	2,617
2,446	..	4,892	2,446	2,446	2,446	2,446
4,031	..	8,062	4,031	4,031	4,031	4,031
6,167	6,167	12,334	6,167	6,167	6,167	6,167
4,295	..	8,590	4,295	4,295	4,295	4,295
1,838	..	3,676	1,838	1,838	1,838	1,838
2,332	..	4,664	2,332	2,332	2,332	2,332
6,789	..	13,578	6,789	6,789	6,789	6,789
714	714	1,428	714	714	714	714
3,113	..	6,226	3,113	3,113	3,113	3,113
3,475	..	6,950	4,475	3,475	3,475	3,475
2,583	..	5,166	2,583	2,583	2,583	2,583
2,263	..	4,526	2,263	2,263	2,263	2,263
8,133	..	16,266	8,133	8,133	8,133	8,133
7,044	..	14,088	7,044	7,044	7,044	7,044
5,623	..	11,246	5,623	5,623	5,623	5,623
7,607	..	15,214	7,607	7,607	7,607	7,607
3,296	..	6,592	3,296	3,296	3,296	3,296
1,697	..	3,394	1,697	1,697	1,697	1,697
1,934	..	3,868	1,934	1,934	1,934	1,934
3,748	3,728	7,496	3,748	3,728	3,748	3,748
..	..	2,504	1,252	1,252	1,252	1,252
..	..	1,332	666	666	666	666
79,128	10,359	171,550	85,775	85,775	85,775	85,775

ANNEXURE

Statement Showing the Number of Implements Required for

Sl. No.	Name of District	Major Crops	No. of Holding	Light Iron Plough	Heavy Iron Plough	Dry Farming Set
(1)	(2)	(3)	(4)	(5)	(6)	(7)
1.	Thana	Rice	949	1,898	1,898	—
2.	Kolaba ..	Rice	426	852	852	—
3.	Ratnagiri ..	Rice	1,619	3,238	3,238	—
4.	Dhulia ..	Jowar & Groundnut	1,127	2,254	2,254	2,254
5.	Nasik ..	Bajra & Wheat	1,813	3,636	3,636	3,636
6.	Ahmednagar ..	Bajra, Jowar & Sugarcane	3,219	6,438	6,438	6,438
7.	Poona ..	Jowar & Bajra	2,249	4,498	4,498	4,498
8.	Satara ..	Jowar & G. Nut	934	1,868	1,868	1,868
9.	Sangli ..	Jowar, Bajra & G. Nut	1,297	2,594	2,594	2,594
10.	Sholapur ..	Jowar and G. Nut	4,073	8,146	8,146	8,146
11.	Kolhapur ..	Jowar & Sugarcane	327	654	654	654
12.	Buldhana ..	Cotton, Jowar & G. Nut	2,162	4,324	4,324	4,324
13.	Akola ..	Do.	2,657	5,314	5,314	5,314
14.	Jalgaon ..	Do.	1,069	2,138	2,138	2,138
15.	Amravati ..	Cotton & Jowar	2,121	4,242	4,242	4,242
16.	Aurangabad ..	Jowar, Bajra & Cotton	4,172	8,344	8,344	8,344
17.	Parbhani ..	Jowar & Cotton	3,595	7,190	7,190	7,190
18.	Bhir ..	Jowar, Bajra & G. Nut	2,971	5,942	5,942	5,942
19.	Osmanabad ..	Jowar & Cotton	3,961	7,922	7,922	7,922
20.	Yeotmal ..	Jowar & G. Nut	2,611	5,222	5,222	5,222
21.	Wardha ..	Cotton & Jowar	1,093	2,186	2,186	2,186
22.	Nagpur ..	Jowar & Cotton	1,179	2,358	2,358	2,358
23.	Nanded ..	Jowar, Cotton & Sugarcane	1,754	3,508	3,508	3,508
24.	Chanda ..	Rice	732	1,464	1,464	—
25.	Bhandara ..	Rice and Jowar	418	336	836	—
TOTAL ..			48,533	97,066	97,066	88,778

VI—contd.

Holdings of 50 Acres to 75 Acres in Maharashtra State

Leveller	Bund Former	Paddy Puddler	Tractor	Seed Dressing Drum	Akola Hoes	Blade Hoe	Groundnut Digger
(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)
—	—	1,898	949	1,898	1,898	1,898	—
—	—	852	426	852	852	852	—
—	—	3,238	1,618	3,238	3,238	3,238	—
2,254	2,254	—	1,127	2,254	2,254	2,254	1,127
3,636	3,636	—	1,818	3,636	3,636	3,636	—
6,438	6,438	—	3,219	6,438	6,438	6,438	—
4,498	4,498	—	2,249	4,498	4,498	4,498	—
1,868	1,868	—	934	1,868	1,868	1,868	934
2,594	2,594	—	1,297	2,594	2,594	2,594	1,297
8,146	8,146	—	4,073	8,146	8,146	8,146	4,073
654	654	—	327	654	654	654	—
4,324	4,324	—	2,162	4,324	4,324	4,324	2,162
5,134	5,134	—	2,657	5,134	5,134	5,134	2,657
2,138	2,138	—	1,069	2,138	2,138	2,138	1,069
4,242	4,242	—	2,121	4,242	4,242	4,242	—
8,344	8,344	—	4,172	8,344	8,344	7,344	—
7,190	7,190	—	3,595	7,190	7,190	8,190	—
5,942	5,942	—	2,971	5,942	5,942	5,942	2,971
7,922	7,922	—	3,961	7,922	7,922	7,922	3,961
5,222	5,222	—	2,611	5,222	5,222	5,222	—
2,186	2,186	—	1,093	2,186	2,186	2,186	—
2,358	2,358	—	1,179	2,358	2,358	2,358	—
3,508	3,508	—	1,754	3,508	3,508	3,508	—
—	—	1,464	732	1,464	1,464	1,464	—
—	—	836	418	836	836	836	—
88,778	88,778	8,288	48,533	97,066	97,066	97,066	20,251

ANNEXURE

Statement Showing the Number of Implements Required for

Sl. No.	Name of District	Major Crops	Ground Nut Dicorticator	Power Cane Crusher	Maize Sheller	Power Thresher for Millet
(1)	(2)	(3)	(16)	(17)	(18)	(19)
1.	Thana ..	Rice	—	—	—	—
2.	Kolaba ..	Rice	—	—	—	—
3.	Ratnagiri ..	Rice	—	—	—	—
4.	Dhulia ..	Jowar & Groundnut	1,127	—	1,127	1,127
5.	Nasik ..	Bajra & Wheat	—	—	1,818	1,818
6.	Ahmednagar ..	Bajra, Jowar & Sugar- cane	—	3,219	2,319	3,219
7.	Poona ..	Jowar & Bajra	—	—	2,249	2,249
8.	Satara ..	Jowar & G. Nut	934	—	934	934
9.	Sangli ..	Jowar, Bajra & G. Nut	1,297	—	1,297	1,297
10.	Sholapur ..	Jowar and G. Nut	4,073	—	4,073	4,073
11.	Kolhapur ..	Jowar & Sugarcane	—	327	327	327
12.	Buldhana ..	Cotton, Jowar & G. Nut	2,162	—	2,162	2,162
13.	Akola ..	Do.	2,057	—	2,657	2,657
14.	Jalgaon ..	Do.	1,069	—	1,069	1,069
15.	Amravati ..	Cotton & Jowar	—	—	2,121	2,121
16.	Aurangabad ..	Jowar, Bajra and Cotton	—	—	4,172	4,172
17.	Parbhani ..	Jowar & Cotton	—	—	3,585	3,595
18.	Bhir ..	Jowar, Bajra & G. Nut	2,971	—	2,971	2,971
19.	Osmanabad ..	Jowar & Cotton	3,961	—	3,961	3,961
20.	Yeotmal ..	Jowar & G. Nut	—	—	2,611	2,611
21.	Wardha ..	Cotton & Jowar	—	—	1,093	1,093
22.	Nagpur ..	Jowar & Cotton	—	—	1,179	1,179
23.	Nanded ..	Jowar, Cotton & Sugarcane	—	1,754	1,754	1,754
24.	Chanda ..	Rice	—	—	—	—
25.	Bhandara ..	Rice and Jowar	—	—	—	418
TOTAL ..			20,251	5,400	44,380	44,807

VI—contd.

Holding of 50 Acres to 75 Acres in Maharashtra State

Power Thresher	Bullock Driven Chaff Cutter	Bullock Cart	Rahat	Iron Mhote	Pumping Set	Duster	Sprayer
(20)	(21)	(22)	(23)	(24)	(25)	(26)	(27)
949	—	1,998	949	949	949	1,898	949
426	—	852	426	426	426	426	426
1,919	—	3,238	1,919	1,919	1,919	1,919	1,919
—	1,127	2,254	1,127	1,127	1,127	1,127	1,227
1,818	1,818	3,636	1,818	1,818	1,818	1,818	1,818
—	3,219	6,438	3,219	3,219	3,219	3,219	3,219
—	2,249	4,498	2,249	2,249	2,249	2,249	2,249
—	934	1,868	934	934	934	1,868	934
—	1,297	2,594	1,297	1,297	1,297	2,594	1,297
—	4,073	8,146	4,073	4,073	4,073	8,146	4,073
—	327	654	327	327	327	654	327
—	2,162	4,234	2,162	2,162	2,162	4,234	2,162
—	2,657	5,314	2,657	2,657	2,657	5,314	2,657
—	1,069	2,138	1,069	1,069	1,069	2,138	1,069
—	2,121	4,242	2,121	2,121	2,121	4,242	2,121
—	4,172	8,344	4,172	4,172	4,172	8,344	4,172
—	3,595	7,190	3,595	3,595	3,595	7,190	3,595
—	2,971	5,942	2,971	2,971	2,971	5,942	2,971
—	3,961	7,922	3,961	3,961	3,961	7,922	3,961
—	2,611	5,222	2,611	2,611	2,611	5,222	2,611
—	1,093	2,186	1,093	1,093	1,093	2,186	1,093
—	1,179	2,358	1,179	1,179	1,179	2,358	1,179
—	1,754	3,508	1,754	1,754	1,754	3,508	1,754
732	—	1,464	732	732	732	1,464	732
418	418	836	418	418	418	836	418
6,161	44,807	97,066	48,533	48,533	48,533	97,066	48,533

ANNEXURE—VII

Combined set up for the Research and Education at Poona Agriculture College Cost of Establishments

A. Recurring Expenditure (Staff)

Section	Category	No. of existing post	Average Pay per month including Allowances	Revised set up			Savings in Posts	Savings of Money per year
				Revised, category of Posts	No. of Posts	Scale of Pay		
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Teaching Section & Budget Provision for 1963-64 (Rs. 36,611)	Agricultural Engineer Class I. Senior Scale	1	700—35—30— 650—1200	(1) Research Engineer-cum-Professor for Agrl. Engineering Class I	1+1	700—1200	—	3600.00
	Class I	1	300—1100					
	Asstt. Professor M.A.S. Class II.	1	200—220—15— 400—EB—20— 500—EB—25— 650.	(2) Asstt. Professors of Agrl. Engineering Class II.	2	200—220—15— 400—EB—20— 500—EB—25— 650.	Agrl. Officer—1 (210—10—300)	2520.00
	Geologist	1	170—8½—255 EB—8½—340	(3) Agronomist	1	Do.	Agr.—Supervisors—1 (80—200)	960.00
	Agrl. Officer (Sr. Lecturers)	2	210—10—300	(4) Geologist	1	170—8½—255 EB—8½—340	Senior clerk—1, (100—8—140).	1200.00
	Agrl. Supervisors (Demonstration)	5	80—5—100— 8—140—EB— 10—200.	(5) Agrl. Officer (Senior Lecturer)	1	210—10—300	Peon—1 (30—½—35)	360.00
	Agrl. Assistant	4	100—8—140— 10—170	(6) Technical Assistant.	1	Do.	Research Asstt.—1, (150—375).	800.00
	Senior Clerk	1	100—8—140	(7) Agrl. Supervisors (Demonstrations).	4	80—5—100—8 140—EB—10— 200.	Draftsman—1, (100—170).	200.00

	Junior Clerk	1	55—3—85—LB 4—125—5—130.	(8) Agri. Assistant	4	100—8—140— 10—170.	Attendant—1, (60—75).	720·00
	Peons	2	30—4—35	(9) Senior Clerk	1	145—185.	Junior Clerk (55—130) Additional	660·00
								13,020·00
	Laboratory Boys	3	Do.	(10) Clerk-cum-typist	1	100—170		
Research Section	Research Assistant	1	150—10—375	(11) Junior Clerk	1	55—3—85—EB —4—125—5 —130	Agronomist (200—220—15—400— EB—20—500—EB— 25—650)	2,400·00
								10,620·00
Budget Provision (1963-64) (Rs. 28,491)	Draftsman	1	145—205	(12) Draftsman	1	145—205		
	Tracer	1	100—170	(13) Tracer	1	100—170		
	Jr. Clerk-cum-typist	1	100—170	(14) Fitter	1	145—205		
	Attendant	1	60 fixed	(15) Welder	1	145—205		
	Senior Mechanic	1	145—205	(16) Machinist	1	145—205		
Research Test Test- ing & Trg. Centre (1963-64) (Rs. 1,10,200)	Research Engineer	1	350—1,100	(17) Farm Mechanic	1	145—205		
	Technical Assistant	1	150—375	(18) Store Keeper	1	145—205		
	Senior Clerk	1	145—185	(19) Senior Mechanic	1	145—205		
	Clerk-cum-typist	1	100—170	(20) Blacksmith	1	117—161		
	Peon	1	65—75	(21) Carpenter	1	117—161		
	Watchman	2	65—75	(22) Driver	1	100—170		
	Fitter	1	145—205	(23) Peons	2	65—75		
	Welder	1	145—205	(24) Watchman	2	65—75		
	Draftsman	1	145—205	(25) Laboratory Boys	3	30—4—35		
	Blacksmith	1	117—161		—			
	Driver	1	100—170		36			
	Carpenter	1	117—161					
	Machinist	1	145—205					
	Farm Mechanic	1	145—205					
	Store Keeper	1	145—205					

*The Pay scale may be revised to give higher status equal to that Joint Director Agriculture.

ANNEXURE—VIII

*Establishment of four Sub-research Stations in different agro-climatic regions of the State**Cost of establishment*

Particulars	Cost in Rs.
A. Non-recurring Expenditure :	
1. Building and Workshop	40,000
2. Equipment	45,000
TOTAL	85,000

B. Recurring Expenditure :

Category	No. re-quired	Scale of Pay	Cost per year	Cost for five years*
Astt. Agriculture Engineer	1	200—220—15*—400—EB —20—600—EB—25—650	3000·00	16800·00
Research Assistant	1	150—10—270	1800·00	10200·00
Draftsman ..	1	100—4—120—5—160	1200·00	6480·00
Tracer ..	1	55—3—85—EB—4—125 —5—130	660·00	3660·00
Fitter ..	1	145—10—205	1740·00	9900·00
Welder ..	1	145—10—205	1740·00	9900·00
Blacksmith ..	1	117—4—161	1404·00	7500·00
Machinist or Sr. Mechanic ..	1	145—205	1740·00	9900·00
Farm Mechanics	1	145—205	1740·00	9900·00
Store Keeper ..	1	145—185	1740·00	9900·00
Clerk-cum-typist	1	100—170	1200·00	7200·00
Watchman ..	1	65—75	780·00	4020·00
Attendant ..	1	65—75	780·00	4020·00
Higher start of Rs.	250	TOTAL	19,524·00	1,09,380·00
2. Material & Contingencies			20,000·00	1,00,000·00
Grand Total of A&B				2,94,380·00
Expenditure for the four Sub-research Stations				11,77,520·00

Note.—Fund provided will be utilised for making prototypes, testing, spares and replacements etc.

ANNEXURE—IX

Financial Implications of the Quality Marking Scheme for Improved Agricultural Implements in the State

Staff

Sl. No.	Category of Posts	First Year		Second Year		Third Year		Fourth Year		Fifth Year		Total Expenditure
		No. of Posts	Expenditure	No. of Posts	Expenditure	No. of Posts	Expenditure	No. of Posts	Expenditure	No. of Posts	Expenditure	
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
1.	Agricultural Engineer (at State level under Research Engineer at Poona) Scale—250—850	1	3000·00	1	3180·00	1	3360·00	1	3540·00	1	3720·00	16800·00
2.	Quality Marking Inspectors Scale 200—15—350	5	12000·00	10	24900·00	25	63600·00	25	67500·00	25	71400·00	23940·00
3.	Sr. Mechanics Scale 145—10—205	5	8700·00	10	18000·00	25	45900·00	25	48900·00	25	51900·00	173400·00
4.	Attendant Scale 65—1—75	5	3900·00	10	7860·00	25	19740·00	25	20040·00	25	20340·00	71880·00
B.	Allowances and Honorarium		10000·00		20000·00		50000·00		50000·00		50000·00	180000·00
	Quality Marking and other equipment		5000·00		6000·00		18000·00		2500·00		2500·00	34000·00
TOTAL											715,480·00	

ANNEXURE—X

Budget Provision for Scheme of Popularisation & Demonstration of Improved Agricultural Implements in the State

Sl. No.	Category of Post	Scale of Pay	First Year		Second Year		Third Year		Fourth Year		Fifth Year		Total Expenditure in Rs.
			No. of Post	Expenditure in Rs.	No. of Post	Expenditure in Rs.	No. of Post	Expenditure in Rs.	No. of Post	Expenditure in Rs.	No. of Post	Expenditure in Rs.	
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)
A. Recurring													
1. Cost of Establishment (STAFF)													
STATE LEVEL													
Chief Agricultural Engineer (Addl. Director of Agr.)* 2.													
Supdtg. Engs.													
1. Agri. Engs. M. A. S. Class I													
			1	4200-00	1	4,500	1	4,800	1	5,100	1	5,400	24,000
		145—185	1	1,740	1	1,600	1	1,980	1	2,100	1	2,220	9,900
			1	780	1	792	1	804	1	816	1	828	4,020
REGIONAL LEVEL													
			4	—	—	—	—	—	—	—	—	—	—
DISTRICT LEVEL													
			5	15,000	10	31,500	25	78,000	25	85,500	25	93,000	3,03,000

*In the scale of pay of Addl. Director of Agri.
 @In the scale of pay of Executive Engineer,
 †Scale of Pay should be revised.

Store-Keeper ..	145—205	5	8,700	10	18,000	25	44,700	25	47,700	25	50,700	1,69,800
Machinist ..	145—205	5	8,700	10	18,000	25	44,700	25	47,700	25	50,700	1,69,800
Clerk-cum-typist	100—170	5	6,000	10	12,600	25	31,800	25	34,800	25	37,800	1,23,000

BLOCK LEVEL

Extension Officer (Agr. Engineer) ..	150—375	45	81,000	90	167,400	229	423,000	229	450,480	229	4,77,960	15,99,840
Farm Mechanic ..	145—205	45	78,300	90	152,000	229	409,260	229	436,740	229	4,64,220	15,40,520
Technical Helper ..	100—170	45	54,000	90	113,400	229	385,600	229	313,080	229	3,40,560	11,06,640
T.A., D.A. & other allowances for Staff	—	—	4,000	—	4,000	—	4,000	—	4,000	—	4,000	20,000

NON-RECURRING

EQUIPMENT

Demonstration set per Panchayat ..	@ Rs. 200 per Set per Panchayat	No. of Sets. 3,720	7,44,000	7,440	744,000	11.160	22,32,000	—	—	—	—	37,20,000
Implements for Hir- ing ..	@ Rs. 5,000 per district	5	25,000	10	25,000	25	75,000	25	**1,250	25	**1,250	2,75,000
Furniture, and type- writer, etc. ..	—	—	1,000	—	10,000	—	15,000	—	15,000	—	15,000	65,000
Loans and Subsidy@@												

GRAND TOTAL .. 57,68,020
(Subject to revision)

‡Instead Farm Mechanic, Part-time demonstrator may also be employed on a fixed salary.
@ He will work under the Agriculture Officer, Zila Parishad.
**10 per cent of 1,25,000 for replacement of Hiring Implements.
@@ It has been sanctioned, under the implements propogation scheme of the State Government which may continue.

ANNEXURE—XI

Financial outlays for Servicing and Maintenance Facilities of Improved Agricultural Implements

Sl. No.	Category of Post	Scale of Pay	First Year		Second Year		Third Year		Fourth Year		Fifth Year		Total Expenditure in Rs.
			No. of Post	Expenditure in Rs.	No. of Post	Expenditure in Rs.	No. of Post	Expenditure in Rs.	No. of Post	Expenditure in Rs.	No. of Post	Expenditure in Rs.	
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)
A. Non-Recurring													
	Mobile Van ..	@Rs. 75,000	5	375,000	10	375,000	15	3,75,000	20	3,75,000	25	3,75,000	18,75,000
B. Staff Recurring													
	Demonstration ..	150—375	5	9,000	10	18,600	15	28,800	20	39,600	25	51,000	1,47,000
	Mechanist ..	145—205	5	8,700	10	18,000	15	27,900	20	38,400	25	49,500	1,42,500
	Technical Helper ..	100—170	5	6,000	10	12,600	15	19,800	20	27,600	25	36,000	1,02,000
	Driver ..	100—170	5	6,000	10	12,600	15	19,800	20	27,600	25	36,000	1,02,000
	T.A., D.A. and other allowances ..	—	—	2,000	—	4,000	—	6,000	—	8,000	—	10,000	30,000
	Contingencies including Petrol, Oil etc.	@Rs. 2,000 per vehicle per annum	5	10,000	10	20,000	15	30,000	20	40,000	25	50,000	1,50,000
GRAND TOTAL												25,48,500	

Note.—In first year the mobile van facility will be introduced in five districts and in subsequent years may be extended throughout the State.

@Services of the demonstrator is to be utilized for demonstration of Agricultural Implements wherever van goes with implements available with Panchayat.

ANNEXURE—XII

Sketch Drawing of some of the Important Implements.

1. Bukhar
2. Multipurpose Baknar
3. Two countered Drill
4. Dibble
5. Multipurpose Agricultural Implements
6. Poona Mechanical Seeder
7. Akola Hoe
8. Seed Drill and Yoke for Dry farming.
9. Groundnut digger
10. Threshing Roller
11. Detail of C. I. Bush and efficient fabricator and dust proving arrangement for Bullock cart.

PRINTED IN INDIA BY THE MANAGER, GOVERNMENT OF INDIA P
FARIDABAD, 1967.