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Evaluation of Management of Seed Supply in Oilseeds and Pulses in Madhya Pradesh

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INTRODUCTION

1.1 Oilseeds and Pulses

The Importance of oilseeds and pulses need not be emphasised. These are essential elements of human diet. Oilseeds stand next only to foodgrains. Vegetable oils are essential for human development. Oils serve as raw material for industries like soap, paints, lubricants, pharmaceuticals etc. Pulses are integral part of Indian diet. These are the major source of proteins especially for the vegetarian and the economically poor population of the country. Both oilseeds and pulses are important in the cropping systems. While the oilseeds are taken as cash crops, pulses help in improving the status of the soil by nitrogen fixation from the atmosphere. Thus, both these crop groups are very important for the Indian agricultural economy.

1.2 Importance of Seed

Seed is the key input in the production of oilseeds and pulses, like other crop groups. The use of high quality seed not only increase the productivity of crops but also helps to stabilise the productivity. Quality seeds increase the germination percentage and respond positively to the inputs like fertilisers and irrigation. The good quality seeds at times, give out plants which are resistant to drought conditions and many pests and diseases. According to an observation a good quality seed helps to increase the productivity by 20 per cent. Since seed is basic to any kind of crop development, the Govt. has been keen to supply good quality and high yielding seeds to farmers. Even after many years of efforts by the Govt. the seed replacement ratio has remained low across many regions of the country. The farmers tend to use previous year's crop produce as seeds although it lacks genetic vigour.

1.3 Qualities of Good Seed

A good quality seed should posses following characteristics:-

(a) It should be of adaptable crop variety or hybrid and the duration should suit the agro-climatic conditions and cropping systems of the region.
(b) It should be pure with high sowing quality and high germination rate, uniform growth pattern and maturity.
(c) It should be free from seed borne diseases and physiological disorder.
(d) It should be plump, uniform in size, shape, colour, texture development and of proper weight.
(e) It should be clean, free from dirt, sand, chaff, sticky substance, etc.
(f) It should be free from weed seeds.
(g) It should be free from insects and diseases.
(h) It should be whole, not broken or crushed or peeled or rotten and be free from dampness.
(i) It should be fresh and of proper age.
(j) It should contain enough moisture.

1.4 Types of Seeds and Suppliers

Among the guidelines circulated by the Technology Mission on Oilseeds and Pulses and Maize (TMOP & M) it has been mentioned that increasing productivity will be the major thrust in addition to area expansion through intercropping and mixed cropping. In the action plan suggested **Integrated Seed_Management** tops the list.

Management of the seed is the responsibility of the State Governments. in collaboration with state and central seed producing agencies. To ensure supply of quality seeds the State Governments. should prepare a five year seed plan indicating requirement of breeder, foundation and certified seeds for each coming year

(a) Breeder Seed

The varietywise requirement of breeder seed must be intimated tothe seed division of the Department of Agriculture, Government of India. The indents should be for the newer and the recommended seed. Timely lifting and distribution to multiplying agencies must be ensured.

Breeder or nucleus seed or vegetative propagative material is directly controlled by the plant breeders or institutions and provides for initial or recurring increase of the foundation seed. This is the seed that is produced directly under the supervision of the plant breeder.

(b) Foundation Seed

Conversion and multiplication of breeder seed into foundation seed should be done through the State Seed Corporations, Oil Federations and on the Departmental farms of Agriculture Department, under strict supervision and guidance of technical staff. Monitoring of the conversion/multiplication of Foundation Seed must be ensured and proper multiplication ratio must be achieved.

Foundation seed is the source of all other certified seed classes either directly or through registered seed. It is also known as mother seed.

© Certified Seed

Conversion/multiplication of foundation seed into certified seed must be done through the registered seed growers under strict supervision for quality control. The farmers selected for seed multiplication should be resourceful, having facility of irrigation and capacity to invest in fertilisers and plant protection measures. The seed multiplication should be closely monitored for maintaining desired seed multiplication ratio. The seed so produced must be purchased by the seed producing agencies at incentive prices from the farmers as per the guidelines under Seed Village Scheme (S.V.S.). With this view in mind the targets of seed production under S.V.S., should be fixed for each state.

Financial incentives for production of foundation and certified seeds should be provided as per OPP and NPDP programmes to ensure their interests and benefits.

1.5 Agencies Involved in Seed Supply

Various agencies and organisations are functioning with the objective of providing good quality seed to farmers. These are TMOP (Technology Mission on Oilseeds and Pulses), OPP (Oilseed Production Programme), NPDP (National Pulse Development Project), NSC (National Seed Corporation), SFCI (State Farms Corporation Of India), NSP (National Seeds Project), SSC (State Seed Corporation), SAU (State Agricultural Universities), ICAR (Indian Council of Agricultural Research), IARI (Indian Agricultural Reseach Institute), SSCA (State Seed Certification Agencies), SSTL(State Seed Testing Laboratories) and private sector companies engaged in seed production and distribution.

1.6 TMOP, OPP and NPDP

For the proper administration of the Oilseed Production Programme (OPP) and National Pulse Development Project (NPDP), a Techonology Mission on Oilseeds and Pulses (TMOP) was constituted under the Department of Agriculture, Govt. of India. For 1998-99 the TMOP approved a total outlay of Rs.134.60 crores for Oilseed Production Programme (OPP) out of which Rs.102.30 crores was to be borne by the Govt. of India. During the same year a total outlay of Rs.46.80 crores for National Pulse Development Project (NPDP) was approved. Out of this amount Rs.36.00 crores was to be borne by the Govt. of India. In both the programmes the pattern of assistance for the components was to be 75:25 basis to be shared between Govt. of India and State Govt (Table 1.1 & 1.2).

In 1998-99 out of the total allocation of Rs.134.60 crores for Oilseed Production Programme, the allocation for Madhya Pradesh was highest (Rs.18.40 crores or 13.67 per cent). In the case of NPDP also the share of Madhya Pradesh was highest. Out of the total outlay of Rs.46.80 crores the share of Madhya Pradesh was Rs.8.38 crores or 17.91 per cent.

1.7 Allocation of Funds for OPP, 1998-99

In the year 1998-99 a total amount of Rs.1346.00 lakhs was allocated to different states and organisations like ICAR, NSC, SFCI, etc. The amount allocated to different states came to Rs.12,920.00 lakhs. As mentioned earlier the share of Madhya Pradesh was highest among all states (Rs.1,840.00 lakhs or 13.67 per cent).

The componentwise allocation showed that the highest amount of Rs.4865.40 lakhs or 37.66 per cent was for distribution of sprinkler sets. As a group of different components the seed component shared second highest amount of Rs.4,144.21 lakhs or 32.08 per cent. Among other components distribution of gypsum/pyrite constituted 7.28 per cent and demonstrations organised by State Govt. 7.19 per cent. The componentwise allocation for the state of Madhya Pradesh was similar to that of whole country. Distribution of sprinkler sets constituted the largest percentage of 44.03 and seed component as a group, claimed 39.08 per cent. Distribution of rhizobium culture (4.08 per cent) and demonstrations by the State Government (2.17 per cent) were also important components (Table 1.3).

Table 1.1 Statewise financial allocation of Oilseeds Production Programme (OPP), 1998-99

(value in Rs. lakhs)

S. No.	State	Allocation			
		GOI share	State share	Total	
				Rs.	Percentage
1.	Andhra Pradesh	1100.00	366.70	1466.70	10.90
2.	Arunachal Pradesh	40.00	13.30	53.30	0.40
3.	Assam	200.00	66.70	266.70	1.98
4.	Bihar	100.00	33.30	133.30	0.99
5.	Gujarat	1130.00	376.70	1506.70	11.19
6.	Haryana	200.00	66.70	266.70	1.98
7.	Himachal Pradesh	40.00	13.30	53.30	0.40
8.	Jammu & Kashmir	80.00	26.70	106.70	0.79
9.	Karnataka	700.00	233.30	933.30	6.93
10.	Kerala	50.00	16.70	66.70	0.50
11.	Madhya Pradesh	1380.00	460.00	1840.00	13.67
12.	Maharashtra	1100.00	366.70	1466.70	10.90
13.	Manipur	100.00	33.30	133.30	0.99
14.	Meghalaya	25.00	8.30	33.30	0.25
15.	Nagaland	30.00	10.00	40.00	0.30
16.	Orissa	500.00	166.70	666.70	4.95
17.	Punjab	100.00	33.30	133.30	0.99
18.	Rajasthan	1230.00	410.00	1640.00	12.18
19.	Sikkim	60.00	20.00	80.00	0.59
20.	Tamilnadu	625.00	208.30	833.30	6.19
21.	Tripura	50.00	16.70	66.70	0.50
22.	Uttar Pradesh	600.00	200.00	800.00	5.94
23.	West Bengal	250.00	83.30	333.30	2.48
	Total	9690.00	3230.00	12920.00	95.99
	ICAR, NSC, SFCI, KRIBHCO etc.	500.00		500.00	3.71
	Evaluation of OPP	40.00		40.00	0.30
	Sub- Total	540.00		540.00	4.01
	Grand Total	10230.00	3230.00	13460.00	100.00

Table 1.2 Statewise financial allocation for National Pulses Development Project (NPDP), 1998-99

(Value in Rs. lakh)

S. No.	State	Allocation			
		GOI share	State share	Total	
				Rs.	Percentage
1.	Andhra Pradesh	125.00	41.00	166.00	3.55
2.	Arunachal Pradesh	5.00	1.70	6.70	0.14
3.	Assam	10.00	3.30	13.30	0.28
4.	Bihar	120.00	40.00	160.00	3.42
5.	Goa	1.00	0.30	1.30	0.03
6.	Gujarat	130.00	43.00	173.00	3.70
7.	Haryana	70.00	23.00	93.00	1.99
8.	Himachal Pradesh	15.00	5.00	20.00	0.43
9.	Jammu & Kashmir	30.00	10.00	40.00	0.85
10.	Karnataka	150.00	50.00	200.00	4.27
11.	Kerala	12.00	4.00	16.00	0.34
12.	Madhya Pradesh	630.00	208.00	838.00	17.91
13.	Maharashtra	430.00	142.00	572.00	12.22
14.	Manipur	25.00	8.00	33.00	0.71
15.	Meghalaya	5.00	1.70	6.70	0.14
16.	Nagaland	18.00	6.00	24.00	0.51
17.	Orissa	180.00	60.00	240.00	5.13
18.	Punjab	22.00	7.00	29.00	0.62
19.	Rajasthan	525.00	173.00	698.00	14.91
20.	Sikkim	15.00	5.00	20.00	0.43
21.	Tamilnadu	150.00	50.00	200.00	4.27
22.	Tripura	25.00	8.00	33.00	0.71
23.	Uttar Pradesh	550.00	182.00	732.00	15.64
24.	West Bengal	25.00	8.00	33.00	0.71
25.	Andaman & Nicobar Island	1.00		1.00	0.02
26.	Delhi	1.00		1.00	0.02
	Total	3270.00	1080.00	4350.00	92.95
	ICAR	100.00		100.00	2.14
	NSC, SFCI, KRIBHCO etc.	200.00		200.00	4.27
	Evaluation/AFC	30.00		30.00	0.64
	Grand Total	3600.00	1080.00	4680.00	100.00

Table 1.3 Componentwise allocation of funds for Oilseeds Production Programme (OPP) for the year 1998-99

(Gigures- Rs. lakhs)

S. No.	Particulars	Total of all States		Madhya Pradesh	
		Rs.lakh	Percentage to total	Rs.lakh	Percentage to total
1.	Purchase of Breeder Seed & Foundation Seed	364.50	2.82	100.00	5.44
2.	Distribution of Certified Seed	1376.00	10.65	239.00	12.99
3.	Seed Village Programme	832.00	6.44	150.00	8.15
4.	Distribution of Minikits	981.71	7.60	80.00	4.35
5.	Development of infra-structure for seed production	590.00	4.57	150.00	8.15
6.	Total Seed Component	4144.21	32.08	719.00	39.08
7.	Demonstrations organised by State	928.90	7.19	40.00	2.17
8.	Distribution of Improved implements	322.55	2.50	30.00	1.63
9.	Distribution of Sprinkler Sets	4865.40	37.66	811.00	44.08
10.	Seed treatment	164.49	1.27	30.00	1.63
11.	I.P.M. Demonstrations	277.00	2.14	30.00	1.63
12.	Control of root out through seed treatments	178.00	1.38	-	-
13.	Phermone traps	73.70	0.57	-	-
14.	Plant Protection Equipments	310.50	2.40	30.00	1.63
15.	Distribution of rhyzobium	196.70	1.52	75.00	4.08
16.	Distribution of Gupsym/ Pyrite	941.00	7.28	20.00	1.09
17.	Distribution of Micro-nutrients	95.20	0.74	-	-
18.	Training of Farmers	167.70	1.30	15.00	0.81
19.	Staff & contingencies	254.65	1.97	40.00	2.17
	Total Non-seed	8775.79	67.92	1121.00	60.92
	Total	12920.00	100.00	1840.00	100.00

It will thus be noted that besides the component of distribution of sprinkler sets seed component as a group was the most important item. Oilseeds production programme attached high priority to the seed component. It was true for the State of Madhya Pradesh.

1.8 Allocation of Funds for NPDP, 1998-99

It was observed that the allocation of funds for NPDP was one third that of the OPP. The total amount allocated was Rs.4,680.00 lakhs. Of this amount Rs.330.00 lakhs was for Central Institutions and Organisations. The amount allocated for the states was Rs.4,350.00 lakhs. Like OPP the largest allocation was for the State of Madhya Pradesh. It was Rs.838.00 lakhs or 17.91 per cent of the amount allocated for all the states. The componentwise distribution showed that seed component claimed highest amount of Rs.1,760.00 lakhs or 40.46 per cent. The sprinkler set distribution was second important component and claimed 31.26 per cent. The componentwise distribution for Madhya Pradesh was similar. The seed component claimed highest percentage of 41.17 followed by sprinkler set distribution (28.64 per cent) (Table 1.4).

Thus, the allocation of funds for NPDP assigned top priority to seed component followed by sprinkler set distribution.

1.9 This study

Inspite of the best efforts made under the two Centrally Sponsored Schemes of Oilseeds Production Programme (OPP) and National Pulse Development Project (NPDP) the availability of quality/certified seeds remains a problems. The problem of availability of seeds is particularly noticed in oilseeds like groundnut, soybean and sunflower. Among pulses the problem of seed supply is particularly important for gram, lentil, arhar, moong and urad.

The current study has an objective of finding out the problems of management of supply of seeds of oilseeds viz. groundnut, soybean and sunflower and pulses viz, gram, lentil, arhar, moong and urad. The specific objectives of the study are following.

1.10 Objectives of the Study

i) To find out the reasons for short supply of certified/quality seed in oilseeds & pulses.

Table 1.4 Componentwise allocation of funds for National Pulses Development Project (NPDP) for the year 1998-99

(Figures- Rs. lakh)

S. No.	Particulars	Total of all States		Madhya Pradesh	
		Rs. lakh	Percentage to total	Rs. lakh	Percentage to total
1.	Breeder Seed Procurement	72.30	1.66	15.00	1.79
2.	Foundation Seed Production	216.00	4.96	60.00	7.16
3.	Certified Seed Production/ Seed village	370.00	8.51	90.00	10.74
4.	Certified Seed Distribution	540.20	12.42	100.00	11.93
5.	Seed minikits distribution	561.50	12.91	80.00	9.55
6.	Total Seed Components	1760.00	40.46	345.00	41.17
7.	Field block demonstrations	613.00	14.09	140.00	16.71
8.	I.P.M. Demonstration	109.00	2.51	30.00	3.58
9.	Trainings	22.00	0.50	4.00	0.48
10.	Rhyzobium culture	70.00	1.61	6.00	0.71
11.	Micronutrients	22.30	0.51	5.00	0.60
12.	Storage bins	26.80	0.62	4.00	0.48
13.	Distribution of Farm Implements	223.00	5.13	40.00	4.77
14.	Plant Protection Equipments & Seed Treatment	86.90	2.00	18.00	2.15
15.	Sprinkler Set Distribution	1360.00	31.26	240.00	28.64
16.	Staff contingencies	57.00	1.31	6.00	0.71
	Total non-seed component	2590.00	59.54	493.00	58.83
	Grand Total	4350.00	100.00	838.00	100.00

ii) To find out the demand supply gap in the requirement and availability of seeds of oilseeds and pulses variety wise in the concerned state.
iii) To establish the proper linkages between the breeder's seed producing agencies/ICAR/SAUs and foundation seed producing agencies in the concerned state as also the central agencies like NSC and SFCI.
iv) To study whether proper monitoring and evaluation is done to strengthen the chain of breeder's seed to foundation seed and from foundation seed to certified seed.

The crops to be considered are groundnut, soybean and sunflower among oilseeds and gram, lentil, arhar, moong and urad among pulses.

1.11 Coverage of the States and Districts

This being an all India study sponsored by the TMOP the states and districts to be covered were suggested by the TMOP. These were following :

S.No.	State	Districts to be covered for study
1.	Andhra Pradesh	Anantpur Warangal
2.	Gujarat	Bhavnagar Panch Mahal
3.	Madhya Pradesh	Indore Narsinghpur
4.	Maharashtra	Amravati Sangli
5.	Rajasthan	Kota Bharatpur
6.	Uttar Pradesh	Jhansi Agra

Of the two districts selected for each state, one was for oilseeds and another for pulses. In the case of Andhra Pradesh while Anantpur was selected as suggested for

oilseeds Warangal was replaced by Kurnool for pulses, as the seed distribution programme was not implemented in Warangal for the last four years.

Agro-Economic Research Centre for M.P. Jabalpur is to coordinate the study and also to conduct the study in Madhya Pradesh. While Indore district was selected for oilseeds, particularly for soybean, Narsinghpur district was selected for pulses.

1.12 Sample Design

In each of the selected two districts two development blocks were selected. One of the two blocks (say block 'A') was such which had larger number of farmers having obtained certified seeds. The second block (say block 'B') was one which had no farmers or lesser number of farmers obtaining certified seed. From block 'A', three villages having larger number of farmers obtaining certified seed were selected. From block 'B'. two villages having no farmers or lesser number of farmers obtaining certified seed were selected. From three villages of block 'A' 10 farmers each having obtained certified seed of either oilseeds or pulses or both were selected. Thus, we had 30 farmers using certified seeds from block 'A'. From two villages of block 'B' 10 farmers each not obtaining certified seed either of oilseeds or pulses were selected. Thus, we had 20 farmers not using certified seed from block 'B'. Thirty farmers of block 'A' were termed as "participant" farmers and 20 farmers of block 'B' were termed as "non participant" farmers. Thus, in each district a sample of 30 participant and 20 non participant farmers was selected.

For the selection of 10 farmers from each village the farmers of the village were arranged in the ascending order of size of operational area These were to be stratified into five size group viz. i) marginal, ii) small, iii) semi medium iv) medium and v) large. However during the investigation it was noted that there were negligible number of large farmers and very small number of medium farmers. Therefore, the sample farmers which were drawn on the random basis belonged to marginal, small and semi medium size groups. Within these groups also the selection depended on the availability of farmers. Since the field work was done in the post harvest season many farmers were busy with harvesting of crops in the fields and were not available in the villages.

1.13 Reference Period of Data

The study covered kharif, rabi, and summer seasons for the evaluation and management of seed supply in oilseeds and pulses in two years viz. 1996-97 and 1997-98. The data from the selected farmers was collected for the year 1997-98.

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CHAPTER II

DISTRIBUTION OF SEED IN THE STATE AND SELECTED DISTRICTS

Before we take up the distribution of seed in the state it will be useful to describe agricultural characteristics of the state.

2.1 Location

Being centrally situated Madhya Pradesh is called "The Heart of India". It lies between 17°48'N and 26°52'N latitudes and 74°2'E and 84°24'E longitudes. Seven states of India share their boundaries with Madhya Pradesh. These are: Uttar Pradesh in the north, Bihar and Orissa in the east, Andhra Pradesh and Maharashtra in the south and south west, Gujarat in the west and Rajasthan in the north west.

2.2 Area and Population

The area of the state is 4,43,482 sq. kilometers. It forms 13.49 per cent of area of the country distinguishing the state as the largest among all the states and Union Territories.

The population of the state as per 1991 census was 6,61,81,170 or 7.82 per cent of the country's population. In this respect the state ranks sixth among the states of the country.

The rural population constitutes 76.82 per cent of the total population as against 74.29 per cent for the country.

With 149 persons per square kilometre (257 for the country as a whole) the state takes twenty second place in the ranking according to density of population. The state has a lower literacy percentage of 35.45, whereas, it is 42.90 for the country. Female literacy which has been recognised as crucial important factor influencing the literacy of the next generation, is only 23.07 per cent in the state as against 32.41 in the country.

Another important feature of the state's population is the high proportion of tribals. It was 23.68 per cent as compared to 8.01 per cent of the country. The scheduled castes also form a significant percentage of 14.54 of the state's population (16.48 per cent for the country).

The rainfall varies from less than 600 mm. to more than 1,600 mm. The rainfall is generally high in the south-eastern region and decreases in the north-west. About ninety per cent of the rainfall occurs between June to September.

2.3 Agriculture

Of the total geographical area 44.7 per cent was net sown area or 2.1 per cent lower than the country's average. However, in the matter of irrigation, with only 24.6 per cent of the gross cropped area under irrigation the state will have to increase its irrigated area considerably to be at par with the country's average of 37.5 per cent.

Foodgrains dominate the cropping pattern. About 49.16 per cent of the gross area is occupied by cereals and 20.66 per cent by pulses. Because of low percentage of area under irrigation the cropping intensity of the state is lower (126) as compared to the average for the country (131). Low percentage of irrigated area is also an important factor contributing to the low consumption of fertilisers in the state. It is 39.19 kg/ha. of cropped area as compared to 76.75 kg./ha for the country or 51.06 per cent. It ranks 14th among the states and Union Territories on this criterion.

2.4 Productivity of Crops

Low percentage of irrigation and low per hectare consumption of fertilisers have been the chief reasons of low productivity of crops. The other reasons being the use of local varieties and inadequate adoption of recommended practices. Paddy and wheat, the main important crops of the state, have far lower yields per hectare as compared to the average for the country. This needs critical examination and appropriate development strategy . Cash crops like groundnut, cotton and sugarcane have also yields lower than that of the country's average. (Table 2.1)

Table 2.1 Yield per hectare of important crops in Madhya Pradesh and All India, 1996-97

(Yield-kg./ha)

Crop	All India	Madhya Pradesh
Rice	1,879	1,172
Wheat	2,671	1,755
Jowar	958	854
Bajra	791	936
Maize	1,698	1,123
Gram	810	922
Arhar	747	832
Groundnut	1,155	983
Rapeseed & Mustard	1,013	908
Soybean	995	952
Cotton	266	141
Sugarcane	66,510	38,055
Potato	19,176	13,232
Onion	10,810	13,256

In the case of crops like bajra, gram, arhar and onion the yields were higher in the state than the all India yields.

2.4.1 Reasons for Low Productivity

Crop productivity in the case of most of the crops of the state was far lower as compared to that of country's average.

The reasons were following :

1. Low percentage of area under irrigation.
2. Low fertiliser off take, more so, in the rainfed areas.
3. Low percentage of area under high yielding varieties.
4. Inadequate adoption of recommended practices by farmers for both irrigated as well as dryland agriculture.

5. Large population of tribals who do not adopt any improved technology. For this class of farmers agriculture is only secondary occupation, collection and sale of forest produce being main occupation.

6. Inadequate research efforts to test/evolve suitable genotypes that can fit in the cropping pattern.

7. Inadequate number of crop demonstrations to educate the farmers about new crop technology.

2.5 Soils

The state has been divided into following soil groups-

1. Alluvial.
2. Deep Black.
3. Medium Black
4. Shallow and Light Black
5. Mixed Red and Black
6. Mixed Red and Yellow
7. Skeletal or Gravelly

The analytical results of large number of soil samples have shown that soils of Madhya Pradesh are low to medium in available nitrogen and phosphorus and medium to high in available potassium.

2.6 Irrigation

Among the different sources , wells and tubewells were most important commanding 55.02 per cent. The second important sources were canals which commanded 28.61 per cent. "Other sources" such as stop dams, pumps on rivers and rivulets etc. had 13.37 per cent under these. Tanks had only 3.00 per cent area under these.

It is thus evident that minor irrigation sources like wells and tubewells and stop dams and other micro minor irrigation sources were popular in the state.

2.7 Irrigated Crops

Rice and wheat were the most important crops of the state. Rightfully these claimed the largest proportion of irrigated area. While rice constituted 19.25 per cent of the irrigated area wheat constituted 46.52 per cent. Gram is the third important crop sharing 14.35 per cent.

The percentage of irrigated cropped area to cropped area was 25.62 in the state.

2.8 Cropping Pattern and Crop Productivity

The crop pattern was highly food crops oriented with as high as 71.4 per cent area allotted to them in 1996-97. Conversely only 28.6 per cent of the area was under non food crops or what could be termed as commercial crops.

It was noted that about 60 per cent of the cropped area was under kharif crops and 40 per cent under rabi crops.

Thus the cropping pattern of the state had following features.

(1) It was highly food crops oriented with as high as 71.4 per cent area under food crops.

(2) Kharif crops occupied 60 per cent and rabi crops, 40 per cent.

(3) Rice occupied 21.1 per cent and wheat 16.9 per cent. Jowar covered 3.6 per cent. Gram was the important pulse occupying 9.8 per cent. Oilseeds claimed 23.4 per cent.

2.9 Distribution of Breeder's Seed in 1996-97

As mentioned earlier the study is confined to three oilseed crops viz. sunflower, groundnut and soybean and five pulse crops viz. gram, urad, moong, lentil and arhar. In

1996-97 the total quantity of seed indented for these crops together was 499.49 quintals. Against this the quantity of seed allocated to the state was 391.55 quintals or a gap of 21.61 per cent between demand and supply. However, the quantity lifted was 2,697.72 quintals. Thus, the gap was (-) 440.09 between the quantity indented and quantity lifted. It was (-) 588.98 per cent of the quantity allocated. In the case of sunflower and gram the quantity lifted was less than the quantity indented. In the case of all other crops the quantity lifted was more than the quantity indented and quantity allocated. In the case of groundnut, soybean and lentil no quantity was indented or allocated. The M.P. State Seeds and Farms Development Corporation managed to lift the quantity from different sources (Table 2.2).

Table 2.2 Demand supply gap between quantity indented, allocated and lifted, breeder's seed, Madhya Pradesh, 1996-97

(Quantity-quintals)

S. No	Crop	Quantity indented	Quantity allocated	Percentage of demand supply gap between qty. indented & allocated	Quantity lifted	Percentage of demand supply gap between qty. indented & lifted	Percentage of demand supply gap between qty. allocated & lifted
1.	Sunflower	1.70	1.70	-	1.65	2.94	2.94
2.	Groundnut	-	-	-	24.00	-	-
3.	Soybean	-	-	-	2,204.18	-	-
4.	Gram	485.00	380.76	21.49	410.49	15.36	(-) 7.81
5.	Urad	3.10	2.25	27.42	7.75	(-) 50.00	(-) 244.44
6.	Moong	3.25	3.25	-	10.80	(-)232.31	(-) 232.31
7.	Lentil	-	-	-	18.20	-	-
8.	Arhar	6.44	3.59	44.25	20.65	(-)220.65	(-)475.20
	Total	499.49	391.55	21.61	2,697.72	(-)440.09	(-)588.98

2.9.1 Variety wise Demand Supply Gap

Demand supply gap is the difference between the quantity indented and quantity allocated. Besides these quantities the M.P. State Seeds and Farms Development Corporation managed to lift seed from different sources.

2.9.1.1 **Sunflower**

In sunflower four varieties viz. Morden, 234 A, 234 B and 6-D-1 were the varieties for which indents were placed. The total quantity indented for sunflower crop was 1.70 quintals. The quantity allocated was also 1.70 quintals, showing that there was no demand supply gap. Moreover, for three varieties viz. Morden, 234 A and 234 B there was no demand supply gap individually. As far as quantity lifted was concerned it matched the quantity indented and quantity allocated for above mentioned three varieties. In the case of variety 6-D-1 the M.P. Seeds and Farms Development Corporation did not lift any quantity (Table 2.3).

Table 2.3 Demand supply gap between quantity indented, allocated and lifted, breeder's seed of sunflower, Madhya Pradesh, 1996-97

(Quantity-quintals)

Variety	Quantity indented	Quantity allocated	Percentage of demand supply gap between qty. indented & allocated	Quantity lifted	Percentage of demand supply gap between qty. indented & lifted	Percentage of demand supply gap between qty. allocated & lifted
Morden	1.50	1.50	-	1.50	-	-
234-A	0.10	0.10	-	0.10	-	-
234-B	0.05	0.05	-	0.05	-	-
6-D-1	0.05	0.05	-	-	-	-
Total	1.70	1.70	-	1.65	-	-

2.9.1.2 **Soybean**

M.P. state being termed as soybean state no quantity of this crop was either indented or allocated. The entire quantity of 2,204.18 quintals was lifted by the Corporation from different sources. Thus there was no demand supply gap in the state (Table 2.4).

Table 2.4 Demand supply gap between quantity indented, allocated and lifted, breeder's seed of soybean, Madhya Pradesh

(Quantity-quintals)

Variety	Quantity indented	Quantity allocated	Percentage of demand supply gap between qty. indented & allocated	Quantity lifted	Percentage of demand supply gap between qty. indented & lifted	Percentage-of demand supply gap between qty. allocated & lifted
JS-72-44	-	-	-	23.60	-	-
JS-75	-	-	-	187.80	-	-
JS-80	-	-	-	59.20	-	-
JS-72	-	-	-	54.00	-	-
JS-335	-	-	-	1,399.58	-	-
PK-472	-	-	-	164.20	-	-
MACS-13	-	-	-	189.60	-	-
Pb-1	-	-	-	120.10	-	-
PK-414	-	-	-	6.10	-	-
Total	-	-	-	2,204.18	-	-

2.9.1.3 **Groundnut**

In the case of groundnut also there was no demand supply gap. The Seeds and Farms Development Corporation lifted 24.00 quintals from different sources (Table 2.5).

Table 2.5 Demand supply gap between quantity indented, allocated and lifted, breeder's seed of groundnut, Madhya Pradesh, 1996-97

(Quantity-Quintals)

Variety	Quantity indented	Quantity allocated	Percentage of demand supply gap between qty. indented & allocated	Quantity lifted	Percentage of demand supply gap between qty. indented & lifted	Percentage-of demand supply gap between qty. allocated & lifted
JL-24	-	-	-	24.00	-	-
Total	-	-	-	24.00	-	-

2.9.1.4 Gram

In the case of varieties PG-5, Radhey, JG-74 and P-256 the quantity indented and quantity allocated was equal indicating that there was no demand supply gap in these varieties. In the case of varieties Annagiri & P-240 although some quantity was indented, no quantity could be allocated as there was no production. In the case variety P-212 the quantity allocated was 43.00 per cent more than the quantity indented. In the case of variety C-235 there was a demand supply gap of 43 per cent. In the case of variety L-550 the gap was 71.43 per cent and in the case of variety JG-315 the gap was 12.50 per cent. In the case of varieties Vijay, J.G.218 and ICCV there was neither quantity indented nor allocated but the Seeds and Farms Development Corporation lifted the varieties from different sources (Table 2.6).

Table 2.6 Demand supply gap between quantity indented, allocated and lifted, breeder's seed of gram, Madhya Pradesh, 1996-97

(Quantity-quintals)

Variety	Quantity indented	Quantity allocated	Percentage of demand supply gap between qty. indented and allocated	Quantity lifted	Percentage of demand supply gap between qty indented and lifted	Percentage of demand supply gap between qty. allocated and lifted
C-235	28.00	16.00	42.86	-	-	-
PG-5	39.00	39.00	-	39.00	-	-
Radhey	28.00	28.00	-	28.00	-	-
Annagiri	30.00	No.Pro.	-	-	-	-
K-850	50.00	50.90	(-) 1.80	-	-	-
JG-74	60.00	60.00	-	91.85	(-) 53.08	(-) 53.08
P-212	2.00	2.86	(-) 43.00	2.55	-27.50	(-) 10.84
P-256	7.00	7.00	-	7.00	-	-
L-550	7.00	2.00	71.43	2.00	71.43	-
U-21	23.00	Pro-.awaited	-	70.00	(-) 204.35	-
U-24	9.00	Pro-.awaited	-	-	-	-
P-240	2.00	Pro-.awaited	-	-	-	-
Vijay	-	-	-	3.60	-	-
JG-218	-	-	-	0.89	-	-
ICCV			-	1.10	-	-
JG-315	200.00	175.00	12.50	164.50	17.75	6.00
Total	485.00	380.76	21.49	410.49	15.36	(-) 7.81

2.9.1.5 **Urad**

In T-9 variety the demand supply gap was very thin (2.27 per cent). In variety TPU-4 the demand supply gap was 77.78 per cent.

Besides these varieties in the case of variety JU-3 the Corporation lifted 2.50 quintals, although there was no indent or allocation for the variety (Table 2.7).

Table 2.7 Demand supply gap between quantity indented, allocated and lifted, breeder's seed of urad, Madhya Pradesh, 1996-97

(Quantity-Quintals)

Variety	Quantity indented	Quantity allocated	Percentage of demand supply gap between qty. indented & allocated	Quantity lifted	Percentage of demand supply gap between qty. indented & lifted	Percentage of demand supply gap between qty. allocated & lifted
T-9	2.20	2.15	2.27	2.15	2.27	-
TPU-4	0.45	0.10	77.78	0.10	77.78	-
Jawahar	0.45	Programme shifted to state prod.	-	3.00	-566.67	-
JU-3	-	-	-	2.50	-	-
Total	3.10	2.25	27.42	7.75	-150.00	-244.44

2.9.1.6 **Moong**

There was no demand supply gap in the case of variety K-851. Actually larger quantity than demanded and allocated was lifted by the Corporation. For variety JM-721 there was neither indent nor allocation. The Corporation, lifted 1.70 quintals from different sources (Table 2.8).

Table 2.8 Demand supply gap between quantity indented, allocated and lifted breeder's seed of moong, Madhya Pradesh, 1996-97

(Quantity- Quintals)

Variety	Quantity indented	Quantity allocated	Percentage of demand supply gap between qty. indented & allocated	Quantity lifted	Percentage of demand supply gap between qty. indented & lifted	Percentage of demand supply gap between qty. allocated & lifted
K-851	3.25	3.25	-	9.10	(-) 180.00	(-) 180.00
JM-721	-	-	-	1.70	-	-
Total	3.25	3.25	-	10.80	(-) 232.30	(-) 232.30

2.9.1.7 **Lentil**

For the two varieties K-75 and JL-1 there was neither indent nor allocation. However, the Corporation lifted 18.20 quintals of seed of the variety JL-1 (Table 2.9).

Table 2.9 Demand supply gap between quantity indented, allocated and lifted breeder's seed of lentil, Madhya Pradesh, 1996-97

(Quantity- Quintals)

Variety	Quantity indented	Quantity allocated	Percentage of demand supply gap between qty. indented & allocated	Quantity lifted	Percentage of demand supply gap between qty. indented & lifted	Percentage of demand supply gap between qty. allocated & lifted
K-75	-	-	-	-	-	-
JL-1	-	-	-	18.20	-	-
Total	-	-	-	18.20	-	-

2.9.1.8 **Arhar**

For variety No-148 and JKTM-7 there was neither indent nor allocation. However, the Corporation lifted 5.90 and 11.55 quintals of seed respectively. In the case of varieties ICPL 151 and No.108 the quantities indented and allocated were same (0.94

and 0.50 quintal respectively). In ICPL-8 the indent was for 2.00 quintals. Since, there was no production there was 100.00 per cent demand supply gap. However, no seed of this variety was lifted. In the case of variety ICPL-87 the demand supply gap between quantity indented and quantity allocated was 28.33 per cent. The demand supply gap between quantity indented and quantity lifted was 33.33 per cent and that between quantity allocated and quantity lifted 6.98 per cent (Table 2.10).

Table 2,10 Demand supply gap between quantity indented, allocated and lifted breeder's seed of arhar, Madhya Pradesh, 1996-97

(Quantity- Quintals)

Variety	Quantity indented	Quantity allocated	Percentage of demand supply gap between qty. indented & allocated	Quantity lifted	Percentage of demand supply gap between qty. indented & lifted	Percentage- of demand supply gap between qty. allocated & lifted
ICPL-87	3.00	2.15	28.33	2.00	33.33	6.98
ICPL-8	2.00	No prod.	-	-	-	-
ICPL-151	0.50	0.50	-	1.20	-	-
No.108	0.94	0.94	-	-	-	-
No.148	-	-	-	5.90	-	-
JKTM-7	-	-	-	11.55	-	-
Total	6.44	3.59	37.42	20.65	-220.65	-475.21

2.10 Distribution of Breeder's Seed in 1997-98

In 1997-98 the total quantity indented for all the selected crops was 5,380.00 quintals. Against this the quantity allocated was 3,407.05 quintals or a gap of 36.67 per cent. The quantity lifted was 3,218.63 quintals or a gap of 40.18 per cent between quantity indented and quantity lifted and 5.53 per cent between quantity allocated and lifted. There was significant variation between different crops. In the case of urad, moong and arhar no quantity was either indented or allocated. However, the M.P. State Seeds and Farms Development Corporation managed to lift the quantity needed from different sources. In the case of sunflower the quantity indented, the quantity allocated and quantity lifted was same (2.00 quintals) In the case of other crops the quantity

allocated was less than the quantity indented. Of these crops quantity lifted was higher than the quantity indented and allocated in the case of groundnut and lentil. In the case of soybean the quantity lifted was lower than the quantity indented and allocated. In the case of gram, although the quantity lifted was lower than the quantity indented, it was higher than the quantity allocated (Table 2.11).

Table 2.11 Demand supply gap between quantity indented, allocated and lifted, breeder's seed, Madhya Pradesh, 1997-98

(Quantity-quintals)

S. No	Crop	Quantity indented	Quantity allocated	Percentage of demand supply gap between qty. indented & allocated	Quantity lifted	Percentage of demand supply gap between qty. indented & lifted	Percentage of demand supply gap between qty. allocated & lifted
1.	Sunflower	2.00	2.00	-	2.00	-	-
2.	Groundnut	80.00	40.00	50.00	128.95	(-) 61.19	(-)222.38
3.	Soybean	4,560.00	2,839.85	37.72	2,348.59	48.50	17.30
4.	Gram	728.00	524.20	28.00	668.50	8.17	(-) 27.53
5.	Urad	-	-	-	13.65	-	-
6.	Moong	-	-	-	1.09	-	-
7.	Lentil	10.00	1.00	90.00	27.20	(-)172.00	(-)2,620.00
8.	Arhar	-	-	-	28.65	-	-
	Total	5,380.00	3,407.05	36.67	3,218.63	40.18	5.53

2.10.1 Variety wise Demand Supply Gap

2.10.1.1. Sunflower

In sunflower only one variety viz. Morden was one for which data was available. In this variety the quantity indented, quantity allocated and quantity lifted was same (2.00 quintals). Therefore, there was no gap in demand and supply at any stage (Table 2.12).

Table 2.12 Demand supply gap between quantity indented, allocated and lifted breeder's seed of sunflower, Madhya Pradesh, 1997-98

(Quantity- Quintals)

Variety	Quantity indented	Quantity allocated	Percentage of demand supply gap between qty. indented & allocated	Quantity lifted	Percentage of demand supply gap between qty. indented & lifted	Percentage- of demand supply gap between qty. allocated & lifted
Morden	2.00	2.00	-	2.00	-	-
Total	2.00	2.00	-	2.00	-	-

2.10.1.2 **Soybean**

In variety JS-76-205 there was no indent or allocation. The Corporation lifted 2.00 quintals of this variety. In the case of varieties MACS-13 and Durga (JS-70-280) the quantities indented and allocated were same. In MACS-13 the quantity lifted was 42.40 quintals. Thus, the gap between quantity indented and lifted and quantity allocated and lifted was 15.20 per cent each. In the case of variety Durga the quantity lifted was more than quantity indented and allocated. In the case of variety PS-564 the gap between demand and supply was as high as 78.33 per cent but the Corporation did not lift any quantity of this variety. In the case JS-71-05 although the quantity indented was 500.00 quintals no quantity was allocated as there was no production. The Corporation did not lift any quantity of this variety. In all the remaining varieties there was wide gap between the quantity indented and quantity allocated. The gap was widest (81.90 per cent) in the case of variety Punjab-1. A quantity of 18.25 quintals was lifted by the Corporation in the case of Punjab-1. However, this left a gap of 63.50 per cent between the demand and the quantity lifted. The narrowest gap (3.70 per cent) between quantity indented and allocated was noticed in variety JS-335. However, the Corporation lifted the maximum quantity (1,403.70 quintals) of this variety. Even then the gaps between the quantity indented and quantity lifted and quantity allocated and quantity lifted was 20.69 and 17.65 per cent respectively. It shows that the variety JS-335 was in maximum demand (Table 2.13).

Table 2.13 Demand supply gap between quantity indented, allocated and lifted breeder's seed of soybean, Madhya Pradesh, 1997-98

(Quantity- Quintals)

Variety	Quantity indented	Quantity allocated	Percentage of demand supply gap between qty. indented & allocated	Quantity lifted	Percentage of demand supply gap between qty. indented & lifted	Percentage- of demand supply gap between qty. allocated & lifted
Gaurav (JS-72-44)	15.00	8.00	46.67	7.20	52.00	10.00
MACS-58	300.00	136.50	54.50	7 6.00	74.67	44.32
PK-472	400.00	2 29.00	42.75	193.20	51.70	15.63
JS-335	1,770.00	1,704.50	3.70	1,403.70	20.69	17.65
PS-564	60.00	13.00	78.33	-	-	-
MACS-13	50.00	50.00	-	42.40	15.20	15.20
JS-75-46	700.00	378.80	45.89	311.18	55.55	17.85
JS-71-05	500.00	No prod.	-	-	-	-
JS-80-21	700.00	2 96.00	57.71	273.20	60.97	7.70
Durga (JS-72-280)	15.00	15.00	-	21.46	(-)43.07	(-) 43.07
Punjab-1	50.00	9.05	81.90	18.25	63.50	(-)101.65
JS-76-205	-	-	-	2.00	-	-
Total	4,560.00	2,839.85	37.72	2,348.59	48.50	17.30

2.10.1.3 **Groundnut**

In groundnut there was no indent and allocation in two varieties viz. JL-24 and AK-12-24. The Corporation lifted 86.00 quintals and 2.00 quintals, of these varieties respectively. In variety SB-XI the gap between the quantity indented and quantity allocated was 50.00 per cent. While the gap between quantity indented and the quantity lifted was 48.81 per cent that between quantity allocated and lifted was (-) 2.38 per cent (Table 2.14).

Table 2.14 Demand supply gap between quantity indented, allocated and lifted breeder's seed of groundnut, Madhya Pradesh, 1997-98

(Quantity- Quintals)

Variety	Quantity indented	Quantity allocated	Percentage of demand supply gap between qty. indented & allocated	Quantity lifted	Percentage of demand supply gap between qty. indented & lifted	Percentage- of demand supply gap between qty. allocated & lifted
SB-XI	80.00	40.00	50.00	40.95	48.81	(-) 2.38
JL-24	-	-	-	86.00	-	-
AK-12-24	-	-	-	2.00	-	-
Total	80.00	40.00	50.00	128.95	(-)61.19	(-)222.38

2.10.1.4 Gram

The varieties Pusa-372, ICCV-10, ICCV-2, ICCV-37 and JG-218 had neither any quantity indented nor allocated. However, less than 10.00 quintals each of these varieties were lifted by the Corporation. In the case of varieties Pusa-212, JG-74 and JG-315 the quantities indented were equal to quantity allocated. While in the case of Pusa-212 the quantity, lifted, quantity indented and allocated was equal (2.00 quintals) in the case of varieties JG-74 and JG-315 the quantities lifted were more than the quantities indented and allocated. In all other varieties the quantities allocated were less than the quantities indented giving rise to demand supply gap. The gap was widest (93.33 per cent) in the variety Radhey and narrowest (5.00 per cent) in the case of variety Phule-G-5. However, the Corporation lifted some quantity in each of these varieties. The quantities lifted were more than the quantities indented and allocated in the case of three varieties viz. P-256, JG-74 and JG-315 (Table 2.15).

Table 2.15 Demand supply gap between quantity indented, allocated and lifted breeder's seed of gram, Madhya Pradesh, 1997-98

(Quantity- Quintals)

Variety	Quantity indented	Quantity allocated	Percentage of demand supply gap between qty. indented & allocated	Quantity lifted	Percentage of demand supply gap between qty. indented & lifted	Percentage of demand supply gap between qty. allocated & lifted
C-235	30.00	20.00	33.33	6.00	80.00	70.00
Radhey	30.00	2.00	93.33	-	-	-
Pusa-212	2.00	2.00	-	2.00	-	-
K-850	50.00	12.00	76.00	4.20	91.60	65.00
P-256	8.00	1.00	87.50	19.90	- 148.75	-1890.00
JG-74	70.00	70.00	-	92.80	- 32.57	- 32.57
Phule-G-5	40.00	38.00	5.00	37.80	5.50	0.53
Ujjain-21	250.00	146.00	41.60	132.00	47.20	9.59
JG-315	200.00	200.00	-	336.00	- 68.00	- 68.00
P-240	3.00	2.20	26.67	2.20	26.67	-
Annagiri	45.00	31.00	31.11	18.40	59.11	40.65
Pusa-372	-	-	-	5.00	-	-
ICCV-10	-	-	-	1.00	-	-
IVVC-2	-	-	-	3.20	-	-
ICCV-37	-	-	-	2.00	-	-
JG-218	-	-	-	6.00	-	-
Total	728.00	524.20	27.99	668.50	8.17	- 27.53

2.10.1.5 Urad

In none of the four varieties of urad any quantity was either indented or allocated. However, in variety JU-2 the Corporation lifted 10.65 quintals. In type-9 the quantity lifted was 1.60 quintals. In TPU-4 the quantity lifted was 0.80 quintal and that in JU-3, 0.60 quintal (Table 2.16).

Table 2.16 Demand supply gap between quantity indented, allocated and lifted breeder's seed of urad, Madhya Pradesh, 1997-98

(Quantity- Quintals)

Variety	Quantity indented	Quantity allocated	Percentage of demand supply gap between qty. indented & allocated	Quantity lifted	Percentage of demand supply gap between qty. indented & lifted	Percentage of demand supply gap between qty. allocated & lifted
JU-2	-	-	-	10.65	-	-
JU-3	-	-	-	0.60	-	-
Type-9	-	-	-	1.60	-	-
TPU-4	-	-	-	0.80	-	-
Total	-	-	-	13.65	-	-

2.10.1.6 Moong

The Corporation lifted 1.09 quintals of variety K-851. None other variety was either indented, allocated or lifted (Table 2.17)

Table 2.17 Demand supply gap between quantity indented, allocated and lifted breeder's seed of moong, Madhya Pradesh, 1997-98

(Quantity- Quintals)

Variety	Quantity indented	Quantity allocated	Percentage of demand supply gap between qty. indented & allocated	Quantity lifted	Percentage of demand supply gap between qty. indented & lifted	Percentage of demand supply gap between qty. allocated & lifted
K-851	-	-	-	1.09	-	-
Total	-	-	-	1.09	-	-

2.10.1.7 **Lentil**

In variety K-75 the quantity indented was 10.00 quintals against which the quantity allocated was 1.00 quintal leaving a gap of 90.00 per cent between demand and supply. No quantity of this variety was lifted by the Corporation. On the other hand no quantity was indented or allocated for variety JL-1. However, 27.20 quintals were lifted by the Corporation of the variety (Table 2.18).

Table 2.18 Demand supply gap between quantity indented, allocated and lifted breeder's seed of lentil, Madhya Pradesh, 1997-98

(Quantity- Quintals)

Variety	Quantity indented	Quantity allocated	Percentage of demand supply gap between qty. indented & allocated	Quantity lifted	Percentage of demand supply gap between qty. indented & lifted	Percentage of demand supply gap between qty. allocated & lifted
K-75	10.00	1.00	90.00	-	-	-
Mallika						
JL-1	-	-	-	27.20	-	-
Total	10.00	1.00	90.00	27.20	(-) 1.72	(-) 2620.00

2.10.1.8 Arhar

There were six varieties of arhar for which no quantity was indented or allocated. However, the Corporation lifted some quantities of these varieties. The quantity lifted was highest (16.05 quintals) for JKH-7 followed by 10.40 quintals for variety N-148. In the case of variety ICPL-87 the quantity lifted was only 1.00 quintal. In the case of remaining three varieties the quantity lifted was less than 1.00 quintal each (Table 2.19).

Table 2.19 Demand supply gap between quantity indented, allocated and lifted breeder's seed of arhar, Madhya Pradesh, 1997-98

(Quantity- Quintals)

Variety	Quantity indented	Quantity allocated	Percentage of demand supply gap between qty. indented & allocated	Quantity lifted	Percentage of demand supply gap between qty. indented & lifted	Percentage of demand supply gap between qty. allocated & lifted
N-148	-	-	-	10.40	-	-
JKH-7	-	-	-	16.05	-	-
ICPL-87	-	-	-	1.00	-	-
ICPL-151	-	-	-	0.50	-	-
ICPL-8863	-	-	-	0.10	-	-
ICPL-87-119	-	-	-	0.60	-	-
Total	-	-	-	28.65	-	-

2.11 Distribution of Foundation Seed in 1996-97

The estimated requirement for foundation seed for 1996-97 was 30,455.01 quintals. Against this the quantity available was 23,853.00 quintals or a demand supply gap was 21.68 per cent. The demand supply gap existed in the case of groundnut (25.41 per cent), soybean (15.81 per cent), gram (61.14 per cent) and urad (2.79 per cent). For moong, lentil and arhar there was no demand supply gap. On the other hand the quantity available in these crops was more than estimated requirement. In the case of sunflower the estimated requirement and quantity available were equal (20.00 quintals) (Table 2.20).

Table 2.20 Demand supply gap between quantity required and quantity available, foundation seed, Madhya Pradesh, 1996-97

(Quantity- Quintals)

S. No.	Crop	Estimated requirement	Quantity available	percentage of demand supply gap between quantity available and quantity required
1.	Sunflower	20.00	20.00	-
2.	Groundnut	670.33	500.00	25.41
3.	Soybean	25,000.00	21,048.00	15.81
4.	Gram	4,300.00	1,671.00	61.14
5.	Urad	90.01	87.50	2.79
6.	Moong	91.67	107.00	(-) 16.72
7.	Lentil	155.00	210.00	(-) 35.48
8.	Arhar	128.00	209.50	(-) 63.67
	Total	30,455.01	23,853.00	21.68

2.11.1 Variety wise Demand Supply Gap

The demand supply gap is arrived at by calculating the percentage of quantity available to quantity required. As mentioned earlier the foundation seed is produced by M.P. State Seeds and Farms Development Corporation on its various farms.

2.11.1.1. Sunflower

Only one variety Morden was used. The quantity required and the quantity available was same and therefore there was no demand supply gap (Table 2.21).

Table 2.21 Demand supply gap between quantity of estimated requirement and quantity available, foundation seed of sunflower, Madhya Pradesh, 1996-97

(Quantity- Quintals)

Variety	Estimated requirement	Quantity available	Percentage of demand supply gap between quantity available and quantity required
Morden	20.00	20.00	-
Total	20.00	20.00	-

2.11.1.2 Soybean

The total requirement of seed for soybean was 25,000.00 quintals. Against this the quantity available was 21,048.00 quintals indicating a gap of 15.81 per cent between the demand and supply. The maximum gap of 89.68 per cent was observed in the case of variety JS-80-21. The minimum gap of 16.00 per cent was noticed in the case of variety JS-76-205. In the case of six varieties the quantity available was more than quantity estimated (Table 2.22).

Table 2.22 Demand supply gap between quantity of estimated requirement and quantity available, foundation seed of soybean, Madhya Pradesh, 1996-97

(Quantity- Quintals)

Variety	Estimated requirement	Quantity available	Percentage of demand supply gap between quantity available and quantity required
PB-1	250.00	613.00	(-) 145.20
JS-72-44	100.00	30.00	70.00
JS-72-280	125.00	434.00	(-) 247.20
MACS-13	275.00	350.00	(-) 27.27
PK-472	1,000.00	2,315.00	(-) 131.50
JS-75-46	7,500.00	5,847.00	22.04
MACS-58	500.00	164.00	67.20
JS-71-05	1,250.00	1,015.00	18.80
JS-80-21	5,000.00	516.00	89.68
JS-335	8,500.00	9,060.00	(-) 6.59
PK-564	400.00	620.00	(-) 55.00
JS-76-205	100.00	84.00	16.00
Total	25,000.00	21,048.00	15.81

2.11.1.3 Groundnut

In variety JL-24 the percentage of demand supply gap was 55.00. On the other hand in the case of variety J-11 the quantity available was more than the estimated requirement thereby indicating a surplus of 3.86 per cent. The overall gap for the crop came to 25.41 per cent (Table 2.23).

Table 2.23 Demand supply gap between quantity of estimated requirement and quantity available, foundation seed of groundnut, Madhya Pradesh, 1996-97

(Quantity- Quintals)

Variety	Estimated requirement	Quantity available	Percentage of demand supply gap between quantity available and quantity required
J-11	337.00	350.00	(-) 3.86
JL-24	333.33	150.00	55.00
Total	670.33	500.00	25.41

2.11.1.4 Gram

The total estimated requirement for gram was 4,300.00 quintals and the quantity available was 1,671.00 quintals indicating a gap of 61.14 per cent between demand and supply. The gap varied between 33.25 per cent in the case variety JG-74 to 70.00 per cent in the case of variety C-235. In the case of as many as five varieties there was no quantity of seed available but the requirement varied from 20.00 to 80.00 quintals (Table 2.24).

Table 2.24 Demand supply gap between quantity of estimated requirement and quantity available, foundation seed of gram, Madhya Pradesh, 1996-97

(Quantity- Quintals)

Variety	Estimated requirement	Quantity available	Percentage of demand supply gap between quantity available and quantity required
U-21	1,600.00	480.00	70.00
U-24	100.00	-	-
JG-74	400.00	267.00	33.25
JG-315	1,200.00	656.00	45.33
Annagiri	100.00	32.00	68.00
PG-5	350.00	120.00	65.71
C-235	200.00	60.00	70.00
Radhey	80.00	-	-
L-550	20.00	-	-
G-	50.00	-	-
P-218	50.00	-	-
P-256	-	12.00	-
L-850	100.00	44.00	56.00
ICVV-2	50.00	-	-
Total	4,300.00	1,671.00	61.14

2.11.1.5 Urad

For T-9 and TPU-4 varieties the quantity available was more than the estimated requirement . Thus the gap was negative. However, for variety JU-2 the estimated requirement was 11.67 quintals and the quantity available was nil, thus the total demand was without any supply quantity. The overall demand supply gap was 2.79 per cent (Table 2.25)

Table 2.25 Demand supply gap between quantity of estimated requirement and quantity available, foundation seed of urad, Madhya Pradesh, 1996-97

(Quantity- Quintals)

Variety	Estimated requirement	Quantity available	Percentage of demand supply gap between quantity available and quantity required
T-9	66.67	67.50	(-) 1.24
JU-2	11.67	-	-
TPU-4	11.67	20.00	(-) 71.38
Total	90.01	87.50	2.79

2.11.1.6 Moong

Only one variety K-851 was used as foundation seed. The quantity available was larger than the quantity estimated. Therefore, there was no demand supply gap for this crop (Table 2.26).

Table 2.26 Demand supply gap between quantity of estimated requirement and quantity available, foundation seed of moong, Madhya Pradesh, 1996-97

(Quantity- Quintals)

Variety	Estimated requirement	Quantity available	Percentage of demand supply gap between quantity available and quantity required
K-851	91.67	107.00	(-) 16.72
Total	91.67	107.00	(-) 16.72

2.11.1.7 Lentil

In the case of variety JLS-1 the quantity available was quite higher than the quantity required. In the case of variety K-75 however, the percentage of gap between demand and supply was extreemly high (90.53 per cent). The overall picture for the crop showed that the quantity available was 35.48 per cent more than the quantity required (Table 2.27).

Table 2.27 Demand supply gap between quantity of estimated requirement and quantity available, foundation seed of lentil, Madhya Pradesh, 1996-97

(Quantity- Quintals)

Variety	Estimated requirement	Quantity available	Percentage of demand supply gap between quantity available and quantity required
JLS-1	60.00	201.00	(-) 235.00
K-75	95.00	9.00	90.53
Total	155.00	210.00	(-) 35.48

2.11.1.8 Arhar

In four varieties out of five there was no gap between demand and supply as the quantity available was more than the quantity required. In only one variety JA-4 although the quantity required was 2.00 quintals there was no quantity available. For the crop as a whole the quantity available was 63.67 per cent more than the quantity required (Table 2.28).

Table 2.28 Demand supply gap between quantity of estimated requirement and quantity available, foundation seed of arhar, Madhya Pradesh, 1996-97

(Quantity- Quintals)

Variety	Estimated requirement	Quantity available	Percentage of demand supply gap between quantity available and quantity required
N-148	25.00	43.00	(-) 72.00
ICPL-87	83.00	109.00	(-) 31.33
ICPL-151	18.00	20.00	(-) 11.11
ICPH-8(11)	-	37.50(NSC)	-
JA-4	2.00	-	-
Total	128.00	209.50	(-) 63.67

2.11.2 Distribution of Foundation Seed in 1997-98

The total quantity of estimated requirement was 37,091,64 quintals. Against this the quantity available was 19,136.00 quintals or 48.41 per cent of the estimated requirement. Of the various crops sunflower had the narrowest gap (10.18 per cent) between demand and supply and gram had widest gap (60.74 per cent), Soybean had 47.26 per cent gap. In the remaining five crops the quantity available was more than the quantity required. The percentage of such surplus was lowest (21.49) in moong and highest 172.47 per cent in arhar. The percentage of surplus in lentil was 49.19 per cent, in groundnut 88.50 per cent and in urad 89.02 per cent (Table 2.29).

Table 2.29 Demand supply gap between quantity required and quantity available, foundation seed, Madhya Pradesh, 1997-98

(Quantity- Quintals)

S. No.	Crop	Estimated requirement	Quantity available	percentage of demand supply gap between quantity available and quantity required
1.	Sunflower	16.70	15.00	10.18
2.	Groundnut	62.60	118.00	(-) 88.50
3.	Soybean	29,625.00	15,625.00	47.26
4.	Gram	7,050.00	2,768.00	60.74
5.	Urad	66.66	126.00	(-) 89.02
6.	Moong	66.67	81.00	(-) 21.49
7.	Lentil	124.00	185.00	(-) 49.19
8.	Arhar	80.01	218.00	(-) 172.47
	Total	37,091.64	19,136.00	48.41

2.11.2.1 Sunflower

In variety morden the estimated requirement was 16.70 quintals and the quantity available was 15.00 quintals leaving a gap of 10.18 per cent between demand and supply (Table 2.30).

Table 2.30 Demand supply gap between quantity of estimated requirement and quantity available, foundation seed of sunflower, Madhya Pradesh, 1997-98

(Quantity- Quintals)

Variety	Estimated requirement	Quantity available	Percentage of demand supply gap between quantity available and quantity required
Morden	16.70	15.00	10.18
Total	16.70	15.00	10.18

2.11.2.2 Soybean

In seven out of sixteen varieties there was requirement ranging from 62.50 quintals to 875.00 quintals. However, no quantity of these seven varieties were available leaving the entire quantity of requirement uncovered. In five varieties the demand supply gap ranged from 45.10 per cent in the case of variety MACS-13 to 95.20 per cent in the case of variety PK-416. In the case of variety PK-472 the gap was 67.64 per cent in JS-75-46, 84.27 per cent and in the case of JS-80-21, 88.70 per cent.

In varieties PB-1, JS-72-44 and JS-335, the quantity available was more than the quantity required and therefore, the gap between demand and supply turned out to be negative. In the case of variety JS-72-280 although the requirement was nil the quantity available was 450.00 quintals.

The soybean crop as a whole had a gap of 47.26 per cent between the demand and supply (Table 2.31).

Table 2.31 Demand supply gap between quantity of estimated requirement and quantity available, foundation seed of soybean, Madhya Pradesh, 1997-98

(Quantity- Quintals)

Variety	Estimated requirement	Quantity available	Percentage of demand supply gap between quantity available and quantity required
JS-76-205	62.50	-	-
PB-1	250.00	612.00	(-) 144.80
JS-72-44	62.50	162.00	(-) 159.20
JS-72-280	-	450.00	-
MACS-13	1,000.00	549.00	45.10
PK-472	4,500.00	1,456.00	67.64
JS-75-46	8,625.00	1,357.00	84.27
MACS-58	250.00	-	-
JS-71-05	875.00	-	-
JS-80-21	3,062.50	346.00	88.70
JS-335	9,375.00	10,663.00	(-) 13.74
PK-564	625.00	-	-
NRC-2	125.00	-	-
NRC-12	125.00	-	-
P-16	62.50	-	-
PK-416	625.00	30.00	95.20
Total	29,625.00	15,625.00	47.26

2.11.2.3 Groundnut

The estimated requirement for variety J-11 was 18.80 quintals. There was no quantity available of this variety. Therefore, the entire quantity would be termed as deficit. In the case of variety JL-24 the quantity available was more (118.00 quintals) than the quantity required (43.80 quintals). For the crop as a whole the quantity available was 88.50 per cent more than the estimated requirement (Table 2.32).

Table 2.32 Demand supply gap between quantity of estimated requirement and quantity available, foundation seed of groundnut, Madhya Pradesh, 1997-98

(Quantity- Quintals)

Variety	Estimated requirement	Quantity available	Percentage of demand supply gap between quantity available and quantity required
J-11	18.80	-	-
JL-24	43.80	118.00	(-) 169.41
Total	62.60	118.00	(-) 88.50

2.11.2.4 **Gram**

Wide gap (60.74 per cent) existed between estimated requirement and quantity available. Among varieties the gap existed in eight out of fifteen varieties. The gap ranged between 10.60 per cent in the case of variety P-256 to 90.90 per cent in the case of variety L-550. In variety JG-315 it was 26.39 per cent, in JG-74, 43.92 per cent, in Radhey 51.64 per cent in Annagiri 54.54 per cent in PG-5 74.03 per cent and in U-21 81.60 per cent. For five varieties viz. U-24, C-235, P-240, P-212 and L-850 although the estimated requirement was quite significant no quantity was available. The total demand remained unattended. In the case of two varieties viz. ICCV-10 and Vijay there was no requirement but the quantity available came to be 7.00 quintals and 12.00 quintals respectively (Table 2.33).

Table 2.33 Demand supply gap between quantity of estimated requirement and quantity available, foundation seed of gram, Madhya Pradesh, 1997-98

(Quantity- Quintals)

Variety	Estimated requirement	Quantity available	Percentage of demand supply gap between quantity available and quantity required
U-21	2,310.00	425.00	81.60
U-24	86.00	-	-
JG-74	660.00	370.00	43.92
JG-315	2,012.00	1,481.00	26.39
Annagiri	385.00	175.00	54.54
PG-5	385.00	100.00	74.03
C-235	275.00	-	-
Radhey	275.00	133.00	51.64
L-550	66.00	6.00	90.90
P-240	15.00	-	-
P-212	15.00	-	-
ICCV-10	-	7.00	-
L-850	500.00	-	-
Vijay	-	12.00	-
P-250	66.00	59.00	10.60
Total	7,050.00	2,768.00	60.74

2.11.2.5 Urad

The quantity available (126.00 quintals) was more than the quantity required (66.66 quintals). Therefore, there was a surplus of 89.02 per cent of seed. The surplus existed in varieties T-9 (0.70 per cent), JU-2 (1041.14 per cent) and JU-3 (740.84 per cent). While there was no gap in variety TPU-4, in variety WB-4-108 the gap of 9.91 per cent existed (Table 2.34).

Table 2.34 Demand supply gap between quantity of estimated requirement and quantity available, foundation seed of urad, Madhya Pradesh, 1997-98

(Quantity- Quintals)

Variety	Estimated requirement	Quantity available	Percentage of demand supply gap between quantity available and quantity required
T-9	46.67	47.00	(-) 0.70
JU-2/RU-2	3.33	38.00	(-) 1,041.14
TPU-4	10.00	10.00	-
JU-3	3.33	28.00	(-) 740.84
WB-4-108	3.33	3.00	9.91
Total	66.66	126.00	(-) 89.02

2.11.2.6 Moong

In the case of moong the position was quite comfortable. Against the quantity of 81.00 quintals available the requirement was 66.67 quintals. Thus, the surplus of availability over the requirement was 21.49 per cent. This situation existed in variety K-851 (20.00 per cent surplus) and variety JMJ-721 (60.00 per cent surplus). In the case of other two varieties viz. BM-4 and M-45-2 the estimated requirement and quantity available were same (2.50 quintals each) and therefore there was no demand supply gap (Table 2.35).

Table 2.35 Demand supply gap between quantity of estimated requirement and quantity available, foundation seed of moong, Madhya Pradesh, 1997-98

(Quantity- Quintals)

Variety	Estimated requirement	Quantity available	Percentage of demand supply gap between quantity available and quantity required
K-851	56.67	68.00	(-) 20.00
JMJ-721	5.00	8.00	(-) 60.00
BM-4	2.50	2.50	-
M-45-2	2.50	2.50	-
Total	66.67	81.00	(-) 21.49

2.11..2.7 Lentil

In variety JL-1 the surplus quantity available was 320.45 per cent of the quantity required and there was no question of gap. In another variety Mallika-75 however, against the required quantity of 80.00 quintals there was no quantity available. For overall crop the quantity available was 49.19 per cent more than the quantity required (Table 2.36).

Table 2.36 Demand supply gap between quantity of estimated requirement and quantity available, foundation seed of lentil, Madhya Pradesh, 1997-98

(Quantity- Quintals)

Variety	Estimated requirement	Quantity available	Percentage of demand supply gap between quantity available and quantity required
JL-1	44.00	185.00	(-) 320.45
Mallika-75	80.00	-	-
Total	124.00	185.00	(-) 49.19

2.11.2.8 Arhar

The position as regards arhar was also comfortable as the quantity available was 172.47 per cent more than the estimated requirement. Among different varieties demand supply gap existed in only two varieties. While in variety ICPL-87 the gap was 55.00 per cent in variety ICPL-87-116 the entire quantity required remained uncovered. In the remaining four varieties the quantity available was more than the quantity required. The varieties were No.148, ICPL-151, Pusa-9 and JKMM-7 (Table 2.37).

Table 2.37 Demand supply gap between quantity of estimated requirement and quantity available, foundation seed of arhar, Madhya Pradesh, 1997-98

(Quantity- Quintals)

Variety	Estimated requirement	Quantity available	Percentage of demand supply gap between quantity available and quantity required
No.148	5.00	73.00	(-) 1,360.00
ICPL-87	66.67	30.00	55.00
ICPL-151	1.67	6.00	(-) 259.28
Pusa-9	1.67	2.00	(-) 19.76
JKMM-7	1.67	107.00	(-) 6,307.19
ICPL-87-116	3.33	-	-
Total	80.01	218.00	(-) 172.47

2.12 Distribution of Certified Seed

Certified seed is one which is produced on the selected farmers' fields and is certified by Seed Certification Agency (SCA).

2.12.1 Distribution of Certified Seed in 1996-97

The quantity of certified seed required was 2,07,154 quintals. Against this, the quantity available was 1,38,451 quintals. Thus, the demand supply gap was 33.17 per cent. The actual quantity distributed was 1,29,030 quintals. Thus percentage of demand supply gap between quantity required and quantity distributed came to 37.71 per cent. However, there was very small gap between the quantity available and quantity distributed (6.80 per cent).

The percentage of demand supply gap between the quantity available and quantity required was narrowest (0.52) in the case of gram and widest (85.30) in the case of moong. For sunflower the gap was 81.72, for lentil 66.72, for urad 41.15 and for soybean 38.39. The percentage of demand supply gap between quantity required and quantity distributed was narrowest (16.74) in the case of gram and widest in the case of moong (88.74). In sunflower the gap was 87.00 per cent, in lentil 67.95 per cent, in urad 42.23 per cent and in soybean 40.79 per cent. The percentage of demand supply gap between quantity available and quantity distributed was narrowest (1.82) in the case of urad and widest 28.92 in the case of sunflower. It will thus be observed, that the demand supply gap between the quantity required and quantity available and also in quantity required and quantity distributed was narrowest in gram. It was widest in both these cases in moong. As far as the distribution of seed, against the quantity available was concerned the situation was worst in sunflower (Table 2.38).

Table 2.38 Demand supply gap between quantity required, quantity available and quantity distributed of certified seed, Madhya Pradesh, 1996-97

(Quantity-quintals)

S. No	Crop	Quantity required	Quantity available	Percentage of demand supply gap between qty. required & quantity available	Quantity distributed	Percentage of demand supply gap between qty. required and quantity distributed	Percentage of demand supply gap between qty. available & quantity distributed
1.	Sunflower	454	83	81.72	59	87.00	28.92
2.	Groundnut	636	447	29.72	400	37.11	10.52
3.	Soybean	1,68,697	1,03,932	38.39	99,889	40.79	3.89
4.	Gram	31,232	31,069	0.52	26,005	16.74	16.39
5.	Urad	1,492	878	41.15	862	42.23	1.82
6.	Moong	1,163	171	85.30	131	88.74	23.39
7.	Lentil	1,788	595	66.72	573	67.95	3.70
8.	Arhar	1,692	1,276	24.59	1,111	34.34	12.93
	Total	2,07,154	1,38,451	33.17	1,29,030	37.71	6.80

2.12.2 Variety wise Demand Supply Gap

2.12.2.1 Sunflower

The percentage of gap between demand and supply was quite wide (81.72 per cent) between quantity required and quantity available. The gap widened further to 87.00 per cent between quantity required and quantity distributed and was lower in the case of the quantity available (Table 2.39).

Table 2.39 Demand supply gap between quantity required, quantity available and quantity distributed, certified seed of sunflower, Madhya Pradesh, 1996-97

(Quantity-quintals)

Variety	Quantity required	Quantity available	Percentage of demand supply gap between qty. required and quantity available	Quantity distributed	Percentage of demand supply gap between qty. required and quantity distributed	Percentage of demand supply gap between qty. available & quantity distributed
Morden	454.00	83.00	81.72	59.00	87.00	28.92
Total	454.00	83.00	81.72	59.00	87.00	28.92

2.12.2.2 Soybean

The demand supply gap between the quantity required and the quantity available was narrowest (2.35 per cent) for variety MAC-58, it was widest (98.83 per cent) in the case of variety JS-71-05. Other varieties with larger gap were, Monetta (93.45 per cent), JS-72-44 (85.81 per cent), JS-335 (74.49 per cent) and JS-76-205 (64.90 per cent). For variety PK-564 the requirement was 105 quintals but there was no quantity available. Thus, the entire requirement remained unfulfilled. On the other hand in the case of varieties JS-80-21 and JS-75-46 the quantity available was more than the quantity required and therefore the gap was negative. As regards the percentage of demand supply gap between the quantity distributed and quantity required the picture was similar to the gap between the quantity required and available. As far as the percentage of quantity distributed to quantity available it was observed that there was no

gap in the case of varieties JS-71-05, JS-76-205 and Monetta. It was observed that entire quantity available was distributed (Table 2.40).

Table 2.40 Demand supply gap between quantity required, quantity available and quantity distributed, certified seed of soybean, Madhya Pradesh, 1996-97

(Quantity-quintals)

Variety	Quantity required	Quantity available	Percentage of demand supply gap between qty. required and quantity available	Quantity distributed	Percentage of demand supply gap between qty. required and quantity distributed	Percentage of demand supply gap between qty. available & quantity distributed
JS-75-46	35,761.00	38,553.00	(-) 7.81	38,019.00	(-) 6.31	1.39
JS-71-05	21,386.00	251.00	98.83	251.00	98.83	-
JS-72-44	8,995.00	1,276.00	85.81	1,211.00	86.54	5.09
JS-72-280	3,260.00	1,962.00	39.82	1,939.00	40.52	1.17
JS-80-21	8,555.00	18,947.00	(-) 121.47	18,612.00	(-) 117.56	1.77
PK-472	23,910.00	19,734.00	17.47	18,952.00	20.74	3.96
PK-564	105.00	-	-	-	-	-
JS-76-205	2,000.00	702.00	64.90	702.00	64.90	-
Punjab-1	5,952.00	4,257.00	28.48	3,988.00	33.00	6.32
MACS-13	4,184.00	2,968.00	29.06	2,774.00	33.70	6.54
MACS-58	2,260.00	2,207.00	2.35	1,974.00	12.65	10.56
JS-335	50,894.00	12,981.00	74.49	11,374.00	77.65	12.38
Monetta	1,435.00	94.00	93.45	94.00	93.45	-
Total	1,68,697.00	1,03,932.00	38.39	99,889.00	40.79	3.89

2.12.2.3 **Groundnut**

In the case of variety JL-24 the demand supply gap was 44.05 per cent. The gap further increased to 52.79 per cent because the quantity distributed was lower than the quantity available. In the case of variety SB-11 there was no demand supply gap as the quantity available was higher than the quantity required. Again, the quantity distributed was equal to quantity abailable and therefore there was no gap subsequently (Table 2.41)

Table 2.43 Demand supply gap between quantity required, quantity available and quantity distributed, certified seed of urad, Madhya Pradesh, 1996-97

(Quantity-quintals)

Variety	Quantity required	Quantity available	Percentage of demand supply gap between qty. required & quantity available	Quantity distributed	Percentage of demand supply gap between qty. required & quantity distributed	Percentage of demand supply gap between qty. available & quantity distributed
T-9	1,440	847	41.18	831	42.29	1.89
PU-30	52	13	75.00	13	75.00	-
TPU-4	-	18	-	18	-	-
Total	1,492	878	41.15	862	42.23	1.82

2.12.2.6 Moong

In variety K-851 against a huge quantity of 1,123 quintals required the quantity available was only 170 quintals. Thus, a gap of 84.86 per cent existed. In the case of variety Pusa Baisakhi although the quantity required was only 40 quintals, in terms of percentage the demand supply gap was as high as 97.50 per cent. Of the total quantity available of variety K-851, 23.53 per cent remained to be distributed. In the case of variety Pusa Baisakhi the entire quantity was distributed although the quantity was only 1 quintal (Table 2.44).

Table 2.44 Demand supply gap between quantity required, quantity available and quantity distributed, certified seed of moong, Madhya Pradesh, 1996-97

(Quantity-quintals)

Variety	Quantity required	Quantity available	Percentage of demand supply gap between qty. required & quantity available	Quantity distributed	Percentage of demand supply gap between qty. required and quantity distributed	Percentage of demand supply gap between qty. available & quantity distributed
K-851	1,123	170	84.86	130	88.42	23.53
Pusa Baisakhi	40	1	97.50	1	97.50	-
TOTAL	1,163	171	85.30	131	88.74	23.39

2.12.2.7 **Lentil**

In the case of variety K-75 the demand supply gap was as high as 75.43 per cent. In the case of variety JLS-1 the gap was 61.83 per cent. Since not all the quantities available of these varieties could be distributed the percentage gap between the quantity required and quantity distributed further increased to 62.71 and 77.29 for varieties JLS-1 and K-75 respectively. However, nearly the entire quantity available was distributed to the farmers (Table 2.45).

Table 2.45 Demand supply gap between quantity required, quantity available and quantity distributed, certified seed of lentil, Madhya Pradesh, 1996-97

(Quantity-quintals)

Variety	Quantity required	Quantity available	Percentage of demand supply gap between qty. required and quantity available	Quantity distributed	Percentage of demand supply gap between qty. required and quantity distributed	Percentage of demand supply gap between qty. available & quantity distributed
JLS-1	1,145	437	61.83	427	62.71	2.29
K-75	643	158	75.43	146	77.29	7.59
Total	1,788	595	66.72	573	67.95	3.70

2.12.2.8 **Arhar**

The smallest gap between demand and supply (12.78 per cent) existed in variety ICPL-87. The gap was more than 70.00 per cent in the remaining two varieties ICPL-87-119 (74.42 per cent) and N-148 (72.28 per cent). Of the total quantity available of ICPL-87 86.10 per cent was distributed. In the case of other two varieties the entire quantities of available seed were distributed (Table 2.46).

Table 2.46 Demand supply gap between quantity required, quantity available and quantity distributed, certified seed of arhar, Madhya Pradesh, 1996-97

(Quantity-quintals)

Variety	Quantity required	Quantity available	Percentage of demand supply gap between qty. required and quantity available	Quantity distributed	Percentage of demand supply gap between qty. required and quantity distributed	Percentage of demand supply gap between qty. available & quantity distributed
ICPL-87	1,361	1,187	12.78	1,022	24.91	13.90
ICPL-87-119	129	33	74.42	33	74.42	-
N-148	202	56	72.28	56	72.28	-
Total	1,692	1,276	24.59	1,111	34.34	12.93

2.12.3 **Distribution of Certified Seed in 1997-98**

The total quantity of certified seed required was 2,05,159 quintals. Of this quantity the quantity available was 1,25,725 quintals or there was a gap of 38.72 per cent between the demand and supply. The quantity distributed was 1,10,701 quintals resulting in the percentage gap of 46.04 between quantity required and quantity distributed and 11.95 between quantity available and quantity distributed.

Among different crops the percentage of gap between quantity required and available was narrowest (11.65) in arhar. The gap was widest (76.90) in sunflower. In moong the gap was 66.29 per cent, in urad 58.52 per cent, in soybean 40.72 per cent and in lentil 29.40 per cent. Since the quantity distributed was lower than the quantity required and quantity available, the demand supply gap widened between the quantity required and quantity distributed. However, since the quantity distributed formed significant percentage of quantity available the percentage gap between the quantity available and quantity distributed narrowed down. The gap was narrowest 0.67 per cent in the case of moong and widest (38.36 per cent) in the case of sunflower (Table 2.47).

Table 2.47 Demand supply gap between quantity required, quantity available and quantity distributed of certified seed, Madhya Pradesh, 1997-98

(Quantity-quintals)

Crop	Quantity required	Quantity available	Percentage of demand supply gap between qty. required and quantity available	Quantity distribu-ted	Percentage of demand supply gap between qty. required and quantity distributed	Percentage of demand supply gap between qty. available & quantity distributed
1. Sunflower	316	73	76.90	45	85.76	38.36
2. Groundnut	474	339	28.48	285	39.87	15.93
3. Soybean	1,69,150	1,00,267	40.72	89,107	47.32	11.13
4. Gram	29, 992	21,740	27.51	18,805	37.30	13.50
5. Urad	1,092	453	58.52	378	65.38	16.56
6. Moong	890	300	66.29	298	66.52	0.67
7. Lentil	1,769	1,249	29.40	871	50.76	30.26
8. Arhar	1,476	1,304	11.65	912	38.21	30.06
Total	2,05,159	1,25,725	38.72	1,10,701	46.04	11.95

2.12.4 Variety wise Demand Supply Gap

2.12.4.1 Sunflower

For variety morden the quantity required was 316 quintals but the quantity available was 73 quintals or in other words there was wide gap of 76.90 per cent. The quantity distributed was 45 quintals resulting in the gap of 85.76 per cent between quantity required and quantity distributed and gap of 38.36 per cent between quantity available and quantity distributed (Table 2.48).

Table 2.48 Demand supply gap between quantity required, quantity available and quantity distributed, certified seed of sunflower, Madhya Pradesh, 1997-98

(Quantity-quintals)

Variety	Quantity required	Quantity available	Percentage of demand supply gap between qty. required and quantity available	Quantity distributed	Percentage of demand supply gap between qty. required and quantity distributed	Percentage of demand supply gap between qty. available & quantity distributed
Morden	316	73	76.90	45	85.76	38.36
Total	316	73	76.90	45	85.76	38.36

2.12.4.2 **Soybean**

The gap between the quantity available and quantity required was narrowest (7.66 per cent) in the case of variety JS-335. The gap was widest (98.93 per cent) in the case of variety JS-72-44. The varieties with considerable gap were MACS-58 (94.87 per cent) JS-72-280 (94.70 per cent), Punjab-1 (92.27 per cent), Monetta (89.30 per cent), MACS-13 (80.73 per cent) and PK-564 (80.00 per cent). As regards quantity distributed it was noted that the quantity distributed was equal to quantity available in JS-72-44. The gap was narrowest (1.12 per cent) in the case of variety JS-71-05. The gap was narrow in varieties JS-335 and MACS-58. The gap was highest 54.87 per cent for variety JS-76-205 which showed that very little of the quantity available was distributed. The gap was also considerable in varieties Punjab-1 and MACS-13 (Table 2.49).

Table 2.49 Demand supply gap between quantity required, quantity available and quantity distributed, certified seed of soybean, Madhya Pradesh, 1997-98

(Quantity-quintals)

Variety	Quantity required	Quantity available	Percentage of demand supply gap between qty. required and quantity available	Quantity distributed	Percentage of demand supply gap between qty. required and quantity distributed	Percentage of demand supply gap between qty. available & quantity distributed
JS-75-46	33,853	20,558	39.27	17,032	49.69	17.15
JS-71-05	3,600	2,326	35.39	2,300	36.11	1.12
JS-72-44	4,745	51	98.93	51	98.93	-
JS-72-280	6,250	331	94.70	270	95.68	18.43
JS-80-21	19,218	7,673	60.07	5,661	70.54	26.22
PK-472	23,354	7,839	66.43	6,300	73.02	19.63
PK-564	1,635	327	80.00	254	84.46	22.32
JS-76-205	600	226	62.33	102	83.00	54.87
Punjab-1	2,420	187	92.27	116	95.21	37.97
MACS-13	4,680	902	80.73	621	86.73	31.15
MACS-58	3,140	161	94.87	146	95.35	9.32
JS-335	64,505	59,563	7.66	56,167	12.93	5.70
Monetta	1,150	123	89.30	87	92.43	29.27
Total	1,69,150	1,00,267	40.72	89,107	47.32	11.13

2.12.4.3 **Groundnut**

In variety JL-24 there was a very narrow gap of 0.29 per cent between the quantity required and quantity available. The quantity distributed was 285 quintals. A gap between quantity required and quantity distributed was 16.18 per cent and that between quantity available and quantity distributed was 15.93 per cent. In the case of variety SB-11 although the quantity required was 134 quintals no quantity was either available or distributed (Table 2.50).

Table 2.50 Demand supply gap between quantity required, quantity available and quantity distributed, certified seed of groundnut, Madhya Pradesh, 1997-98

(Quantity-quintals)

Variety	Quantity required	Quantity available	Percentage of demand supply gap between qty. required and quantity available	Quantity distributed	Percentage of demand supply gap between qty. required and quantity distributed	Percentage of demand supply gap between qty. available & quantity distributed
JL-24	340	339	0.29	285	16.18	15.93
SB-11	134	-	-	-	-	-
Total	474	339	0.29	285	16.18	15.93

2.12.4.4 **Gram**

In variety P-212 there was no quantity mentioned as required but the quantity available for the distribution was 349 quintals. Against this, the quantity distributed was 305 quintals leaving a gap of only 12.61 per cent between the quantity available and quantity distributed. In the case of two varieties Radhey and C-235 although the quantity required were mentioned neither there were quantities available nor quantities distributed The gap between quantity required and available was narrowest (23.66 per cent) in the case of variety JG-315 and widest (91.49 per cent) in the case of variety PG-5. The gap was considerable in varieties Ujjain-24 (89.36 per cent) and Annagiri (71.76 per cent). On the other hand in the case of variety JG-74, ICCV-2, P-267 and Gaurav, the quantities available were more than the quantities required resulting in negative gap. In regard to distribution of seed it was observed that the entire seed available was distributed in the case of varieties Ujjain-24 and Gaurav. Further, nearly entire quantity available was distributed in varieties Annagiri, JG-74 and Ujjain-21. In the case of varieties P-267 and ICCV-2 the distribution was quite poor in comparison to the quantity available (Table 2.51).

Table 2.51 Demand supply gap between quantity required, quantity available and quantity distributed, certified seed of gram, Madhya Pradesh, 1997-98

(Quantity-quintals)

Variety	Quantity required	Quantity available	Percentage of demand supply gap between qty. required and quantity available	Quantity distributed	Percentage of demand supply gap between qty. required and quantity distributed	Percentage of demand supply gap between qty. available & quantity distributed
JG-315	13,066	9,974	23.66	8,844	32.31	11.33
Ujjain-21	9,340	6,698	28.29	6,084	34.86	9.17
Ujjain-24	188	20	89.36	20	89.36	-
Radhey	1,060	-	-	-	-	-
K-850	525	432	17.71	79	84.95	81.71
C-235	150	-	-	-	-	-
Annagiri	1,965	555	71.76	550	72.01	0.90
JG-74	2,192	2,368	(-) 8.03	2,308	(-) 5.29	2.53
PG-5	1,246	106	91.49	87	93.02	17.92
ICCV-2	60	108	(-) 80.00	54	10.00	50.00
P-212	-	349	-	305	-	12.61
P-267	185	1,062	(-)474.05	406	(-)119.46	61.77
Gaurav	15	68	(-)353.33	68	(-)353.33	-
Total	29,992	21,740	27.51	18,805	37.30	13.50

2.12.4.5 **Urad**

In variety PU-30 the gap between quantity required and quantity available was 90.77 per cent. In variety T-9 the gap was 63.44 per cent. On the other hand in variety TPU-4 the quantity available was more than four times the quantity required. As regards distribution the percentage gap between quantity available and quantity distributed was 15.68 in variety T-9 19.48, in variety TPU-4 and 33.33 in PU-30 (Table 2.52).

Table 2.52 Demand supply gap between quantity required, quantity available and quantity distributed, certified seed of urad, Madhya Pradesh, 1997-98

(Quantity-quintals)

Variety	Quantity required	Quantity available	Percentage of demand supply gap between qty. required & quantity available	Quantity distributed	Percentage of demand supply gap between qty. required & quantity distributed	Percentage of demand supply gap between qty. available & quantity distributed
T-9	1,012	370	63.44	312	69.17	15.68
PU-30	65	6	90.77	4	93.85	33.33
TPU-4	15	77	(-)413.33	62	313.33	19.48
Total	1,092	453	58.52	378	65.38	16.56

2.12.4.6 Moong

The quantity required for variety K-851 was 875 quintals and the quantity available was 300 quintals. Thus, there was a gap of 65.71 per cent. The quantity distributed was 298 quintals or the gap between quantity required and quantity distributed came to 65.94 per cent and that between quantity available and distributed, only 0.66 per cent. In Pusa Baisakhi the quantity required was 15.00 quintals. However, no quantity of this variety was either available or distributed (Table 2.53).

Table 2.53 Demand supply gap between quantity required, quantity available and quantity distributed, certified seed of moong, Madhya Pradesh, 1997-98

(Quantity-quintals)

Variety	Quantity required	Quantity available	Percentage of demand supply gap between qty. required & quantity available	Quantity distributed	Percentage of demand supply gap between qty. required & quantity distributed	Percentage of demand supply gap between qty. available & quantity distributed
K-851	875	300	65.71	298	65.94	0.66
Pusa Baisakhi	15	-	-	-	-	-
Total	890	300	66.29	298	66.52	0.66

2.12.4.7 **Lentil**

In variety K-75 the quantity required was 571 quintals. The quantity available was only 20 quintals, leaving a huge gap of 96.50 per cent between quantity required and quantity available. The quantity distributed was 10 quintals or half of the quantity available. In variety JLS-1 the gap between the quantity required and quantity available was in the negative i.e. the quantity available was more than the quantity required. However, the entire quantity available was not distributed and a gap of about 30.00 per cent existed between the quantity required and distributed and the quantity available and distributed (Table 2.54).

Table 2.54 Demand supply gap between quantity required, quantity available and quantity distributed, certified seed of lentil, Madhya Pradesh, 1997-98

(Quantity-quintals)

Variety	Quantity required	Quantity available	Percentage of demand supply gap between qty. required and quantity available	Quantity distributed	Percentage of demand supply gap between qty. required and quantity distributed	Percentage of demand supply gap between qty. available & quantity distributed
JLS-1	1,198	1,229	(-) 2.58	861	28.13	29.94
K-75	571	20	96.50	10	98.25	50.00
Total	1,769	1,249	29.40	871	50.76	30.26

2.12.4.8 **Arhar**

In the case of variety ICPL-87 the gap between the quantity required and quantity available was 25.45 per cent. The quantity distributed was 557 quintals or there existed a gap of 50.09 per cent between the quantity required and the quantity distributed. The gap between the quantity available and quantity distributed was 33.05 per cent. In the case of variety JKM-7 there was no quantity required but the quantity

available of this variety was 16 quintals. However, of this quantity only 2 quintals were distributed leaving a gap of 87.50 per cent. In variety ICPL-87-119 the quantity required was 19 quintals, no quantity of this variety was either available or distributed. In variety N-148 the quantity available was more than the quantity required resulting in a negative gap of 33.72 per cent. While the quantity distributed was more than the quantity required it left a gap of 22.59 per cent in relation with the quantity available. In other words 22.59 per cent of the quantity available remained to be distributed (Table 2.55).

Table 2.55 Demand supply gap between quantity required, quantity available and quantity distributed, certified seed of arhar, Madhya Pradesh, 1997-98

(Quantity-quintals)

Variety	Quantity required	Quantity available	Percentage of demand supply gap between qty. required and quantity available	Quantity distributed	Percentage of demand supply gap between qty. required and quantity distributed	Percentage of demand supply gap between qty. available & quantity distributed
ICPL-87	1,116	832	25.45	557	50.09	33.05
KIM-7	-	16	-	2	-	87.50
ICPL-87-119	19	-	-	-	-	-
N-148	341	456	(-) 33.72	353	(-) 3.52	22.59
Total	1,476	1,304	11.65	912	38.21	30.06

2.13 **Indore district**

Indore district of Indore division is located in western part of Madhya Pradesh. It is southern district of Malwa Plateau. The extremeties of this comparatively small district measure between 22°22' and 23°05' north latitudes and between 75°25' and 75°15' east longitudes. It is bound on the north by Ujjain district, in the east by Dewas district, in the south by Khargon district and in the west by Dhar district.

Geographical area of Indore district was 3,83,100 hectares. Population of Indore district as per 1991 census was 18,35,915. It comprised 52.47 per cent males and 47.53 per cent females. The district is very much urban in character as Indore is one of the most important industrial and financial centres of the state.

Of the total population only 30.58 per cent was rural and the majority (69.42 per cent), urban. The literacy percentage of the district was 54.96. Indore was one of the districts having high literacy percentage. However, the percentage was higher (64.85) for males than females (44.03). Of the total population 33.09 per cent were workers, 1.26 per cent marginal workers and 65.65 per cent non workers. Of the total workers the largest percentage (19.94) were engaged in "other" services. Cultivators constituted 18.51 per cent. Manufacturing industries absorbed 17.54 per cent and trade and commerce, 16.58 per cent. Thus the district was urban in character. However, cultivators (18.51 per cent) and agricultural labourers (14.79 per cent) together as a rural group constituted 1/3 (33.30 per cent) of the total number of workers.

The peculiarities of land use of district were two : very low percentage of area under forest (13.63) and very high percentage of net sown area (67.35). Other uncultivated area excluding fallow constituted 9.24 per cent and land not available for cultivation, 8.17 per cent.

Gross irrigated area in the district was 128.07 thousand hectares. With gross cropped area equalling 420.99 thousand hectares the percentage of irrigated area came to 30.42. This was quite high as compared to state average of 18.50 per cent.

As in other districts of Malwa Plateau irrigation was mainly commanded by groundwater sources. Tubewells commanded as high as 68.15 per cent of irrigated area and open wells, 25.70 per cent. Other sources were not important.

With good quality soil and assured and perennial sources of irrigation Indore district produced wide variety of crops like jowar, maize, wheat, gram, potato, soybean and fodder. Of these crops soybean occupied highest percentage (45.25) of the gross cropped area. Indore had highest percentage of area under soybean and also had largest number of soybean processing units. Indore had been a traditionally wheat growing district and continued to be so with 23.41 per cent of the gross cropped area under it. Gram, another rabi crop occupied 12.88 per cent of the cropped area. With dairy industry thriving well fodder crops occupied 6.72 per cent of the cropped area. Potatoes were grown on 2.09 per cent area, the largest in the state.

Pulses dominated the cropping pattern occupying 44.94 per cent of the gross cropped area.

Oilseeds and cereals occupied second and third positions with 29.90 per cent and 21.48 per cent of the gross cropped area respectively. Among cereals wheat occupied 16.46 per cent. Among pulses, gram was the major crop and occupied 30.30 per cent area. Other important pulses were lentil (3.60 per cent), pea (5.05 per cent) and arhar (4.28 per cent). Soybean was most important oilseed crop occupying 28.16 per cent. Sugarcane was another important crop and occupied 2.06 per cent area.

2.13.1 Distribution of Certified Seed in 1996-97

The total quantity required stood at 4,401.40 quintals. Against this the quantity available was 1,533.00 quintals resulting in the demand supply gap of 65.17 per cent. The quantity distributed being less than the quantity available the demand supply gap slightly increased to 67.06 per cent. However, nearly 95.00 per cent of the quantity available was distributed to the farmers.

In sunflower and groundnut no demand was made nor there was any quantity available. In the case of gram, urad and moong the quantity available was more than the required quantity resulting in negative demand supply gap. The demand supply gap was highest in soybean (70.16 per cent) followed by lentil (66.67 per cent). As regards distribution it was observed that entire quantity of available seed of urad, moong, lentil and arhar was distributed. In soybean and gram also nearly entire quantity of available seed was distributed (Table 2.56).

Table 2.56 Demand supply gap between quantity required, quantity available and quantity distributed, certified seed, Indore district, Madhya Pradesh,1996-97

(Quantity-quintals)

Crop	Quantity required	Quantity available	Percentage of demand supply gap between qty. required and quantity available	Quantity distributed	Percentage of demand supply gap between qty. required and quantity distributed	Percentage of demand supply gap between qty. available & quantity distributed
1. Sunflower	--	--	--	--	--	--
2. Groundnut	--	--	--	--	--	--
3. Soybean	4,150.00	1,238.40	70.16	1,209.20	70.86	2.36
4. Gram	240.00	284.00	(-) 18.33	270.00	(-) 12.50	4.93
5. Urad	1.20	2.00	(-) 66.67	2.00	(-) 66.67	--
6. Moong	1.20	2.00	(-) 66.67	2.00	(-) 66.67	--
7. Lentil	3.00	1.00	66.67	1.00	66.67	--
8. Arhar	6.00	5.60	6.67	5.60	6.67	--
Total	4,401.40	1,533.00	65.17	1,449.80	67.06	5.43

2.13.2 Varietywise Demand Supply Gap

2.13.2.1 Soybean

In varieties PK-472, P-1 and JS-75-46 the quantity available was more than the quantity required and therefore the gap was in the negative. In variety JS-80-21 and MACS-13 there was no demand. In variety MACS-58 there was no demand supply gap as the quantity required equalled the quantity available. In JS-71-05 although quantity demanded was 1,600.00 quintals no quantity was available nor any quantity distributed (Table 2.57).

Table 2.57 Demand supply gap between quantity required, quantity available and quantity distributed, certified seed of soybean, Indore district, Madhya Pradesh, 1996-97

(Quantity-quintals)

Variety	Quantity required	Quantity available	Percentage of demand supply gap between qty. required and quantity available	Quantity distributed	Percentage of demand supply gap between qty. required and quantity distributed	Percentage of demand supply gap between qty. available & quantity distributed
PK-472	100.00	221.20	(-) 121.20	221.20	121.20	--
P-1	50.00	106.80	(-) 113.60	77.60	(-) 55.20	27.34
JS-75-46	50.00	79.20	(-) 58.40	79.20	(-) 58.00	--
JS-80-21	--	194.80	--	194.80	--	--
MACS-58	50.00	50.00	--	50.00	--	--
MACS-13	--	32.40	--	32.40	--	--
JS-335	2,300.00	554.00	75.91	554.00	75.91	--
JS-71-05	1,600.00	--	--	--	--	--
Total	4,150.00	1,238.40	70.16	1,209.20	70.86	2.35

2.13.2.2 Gram

In variety U-21 the quantity available was more than the quantity required and therefore, the gap was in the negative. In variety JG-315 the demand supply gap was quite high (70.00 per cent). In other three varieties viz. U-24, PG-5 and Annagiri the quantity required was equal (40.00 quintals each). However, no quantity of these varieties was available nor any quantity distributed (Table 2.58).

Table 2.58 Demand supply gap between quantity required, quantity available and quantity distributed, certified seed of gram, Indore district, Madhya Pradesh, 1996-97

(Quantity-quintals)

Variety	Quantity required	Quantity available	Percentage of demand supply gap between qty. required and quantity available	Quantity distributed	Percentage of demand supply gap between qty. required and quantity distributed	Percentage of demand supply gap between qty. available & quantity distributed
U-21	60.00	266.00	(-)343.33	254.00	(-)323.33	4.51
U-24	40.00	--	--	--	--	--
JG-315	60.00	18.00	70.00	16.00	73.33	11.11
PG-5	40.00	--	--	--	--	--
Annagiri	40.00	--	--	--	--	--
Total	240.00	284.00	(-) 18.33	240.00	(-) 12.50	4.93

2.13.2.3 Urad

The quantity available for variety T-9 was more than the quantity required and therefore the demand supply gap was negative and there was no problem in distribution (Table 2.59).

Table 2.59 Demand supply gap between quantity required, quantity available and quantity distributed, certified seed of urad, Indore district, Madhya Pradesh, 1996-97

(Quantity-quintals)

Variety	Quantity required	Quantity available	Percentage of demand supply gap between qty. required and quantity available	Quantity distributed	Percentage of demand supply gap between qty. required and quantity distributed	Percentage of demand supply gap between qty. available & quantity distributed
T-9	1.20	2.00	(-)66.67	2.00	(-) 66.67	--
Total	1.20	2.00	(-)66.67	2.00	(-)66.67	--

2.13.2.4 Moong

In variety K-851 the quantity available was more than the quantity required. This resulted in the negative demand supply gap of 66.67 per cent. The entire quantity of available seed was distributed (Table 2.60).

Table 2.60 Demand supply gap between quantity required, quantity available and quantity distributed, certified seed of moong, Indore district, Madhya Pradesh, 1996-97

(Quantity-quintals)

Variety	Quantity required	Quantity available	Percentage of demand supply gap between qty. required and quantity available	Quantity distributed	Percentage of demand supply gap between qty. required and quantity distributed	Percentage of demand supply gap between qty. available & quantity distributed
K-851	1.20	2.00	(-) 66.67	2.00	(-) 66.67	--
Total	1.20	2.00	(-) 66.67	2.00	(-) 66.67	--

2.13.2.5 Lentil

In variety JLS-1 the demand supply gap was 66.67 per cent. However, the entire available seed was distributed (Table 2.61).

Table 2.61 Demand supply gap between quantity required, quantity available and quantity distributed, certified seed of lentil, Indore district, Madhya Pradesh, 1996-97

(Quantity-quintals)

Variety	Quantity required	Quantity available	Percentage of demand supply gap between qty. required and quantity available	Quantity distributed	Percentage of demand supply gap between qty. required and quantity distributed	Percentage of demand supply gap between qty. available & quantity distributed
JLS-1	3.00	1.00	66.67	1.00	66.67	--
Total	3.00	1.00	66.67	1.00	66.67	--

Table 2.64 Demand supply gap between quantity required, quantity available and quantity distributed, certified seed of soybean, Indore district, Madhya Pradesh, 1997-98

(Quantity-quintals)

Variety	Quantity required	Quantity available	Percentage of demand supply gap between qty. required and quantity available	Quantity distributed	Percentage of demand supply gap between qty. required and quantity distributed	Percentage of demand supply gap between qty. available & quantity distributed
PK-472	100.00	--	--	--	--	--
P1	50.00	--	--	--	--	--
JS-75-46	50.00	16.00	68.00	16.00	68.00	--
JS-80-21	50.00	--	--	--	--	--
MACS-58	50.00	--	--	--	--	--
JS-335	2,000.00	1,108.80	44.56	1,080.00	46.00	2.60
JS-71-05	1,600.00	1.60	99.90	1.60	99.90	--
Total	3,900.00	1,126.40	71.12	1,097.60	71.86	2.56

2.13.4.2 Gram

In three varieties viz., JG-315, PG-5 and U-24 only the quantity required was mentioned. No quantity of these varieties was available for distribution nor any quantity was distributed. Therefore, there was no gap between demand and supply. In the case of varieties Vijay, JG-74, P-267 the quantity required was not mentioned. However, quantities of these varieties were available. In variety Vijay the gap between quantity available and quantity distributed was 76.47 per cent. In variety JG-74 the gap was 50.00 per cent. In variety P-267 the entire quantity of available seed was distributed. In variety Annagiri the percentage of demand supply gap between quantity required and quantity available was 50.00. In variety U-21 it was 44.29. As regards distribution the entire quantity of available seed of variety Annagiri was distributed. In variety U-21 the gap was 30.77 per cent (Table 2.65).

Table 2.65 Demand supply gap between quantity required, quantity available and quantity distributed, certified seed of gram, Indore district, Madhya Pradesh, 1997-98

(Quantity-quintals)

Variety	Quantity required	Quantity available	Percentage of demand supply gap between qty. required and quantity available	Quantity distributed	Percentage of demand supply gap between qty. required and quantity distributed	Percentage of demand supply gap between qty. available & quantity distributed
JG-315	70.00	--	--	--	--	--
JG-5	20.00	--	--	--	--	--
Annagiri	20.00	10.00	50.00	10.00	50.00	--
Vijay	--	17.00	--	4.00	--	76.47
JG-74	--	8.00	--	4.00	--	50.00
U-24	15.00	--	--	--	--	--
U-21	70.00	39.00	44.29	27.00	28.57	30.77
P-267	--	90.00	--	90.00	--	--
Total	195.00	164.00	15.90	135.00	30.77	17.68

2.13.4.3 Urad

In variety T-9 the quantity required was 5.00 quintals. The quantity available, on the other hand, was 0.95 quintal indicating a gap of 81.00 per cent. The entire quantity available was distributed (Table 2.66).

Table 2.66 Demand supply gap between quantity required, quantity available and quantity distributed, certified seed of urad, Indore district, Madhya Pradesh, 1997-98

(Quantity-quintals)

Variety	Quantity required	Quantity available	Percentage of demand supply gap between qty. required and quantity available	Quantity distributed	Percentage of demand supply gap between qty. required and quantity distributed	Percentage of demand supply gap between qty. available & quantity distributed
T-9	5.00	0.95	81.00	0.95	81.00	--
Total	5.00	0.95	81.00	0.95	81.00	--

2.13.4.4 Moong

In variety K-851 the quantity required, the quantity available and the quantity distributed was 2.00 quintals each. Therefore, there was no demand supply gap at any stage (Table 2.67).

Table 2.67 Demand supply gap between quantity required, quantity available and quantity distributed, certified seed of moong, Indore district, Madhya Pradesh, 1997-98

(Quantity-quintals)

Variety	Quantity required	Quantity available	Percentage of demand supply gap between qty. required and quantity available	Quantity distributed	Percentage of demand supply gap between qty. required and quantity distributed	Percentage of demand supply gap between qty. available & quantity distributed
K-851	2.00	2.00	--	2.00	--	--
Total	2.00	2.00	--	2.00	--	--

2.13.4.5 Lentil

In variety JLS-1 only the quantity required (1.00 quintal) was mentioned. There was no mention of quantity available and quantity distributed. Therefore, the demand supply gap could not be assessed at any stage (Table 2.68).

Table 2.68 Demand supply gap between quantity required, quantity available and quantity distributed, certified seed of lentil, Indore district, Madhya Pradesh, 1997-98

(Quantity-quintals)

Variety	Quantity required	Quantity available	Percentage of demand supply gap between qty. required and quantity available	Quantity distributed	Percentage of demand supply gap between qty. required and quantity distributed	Percentage of demand supply gap between qty. available & quantity distributed
JLS-1	1.00	--	--	--	--	--
Total	1.00	--	--	--	--	--

2.13.4.6 Arhar

In variety ICPL-87 the quantity required was 10.00 quintals. But the quantity available was 3.00 quintals indicating a demand supply gap of 70.00 per cent. The quantity distributed was 2.60 quintals. Therefore, the percentage of demand supply gap between quantity required and quantity distributed was 74.00 per cent and that between quantity available and quantity distributed was 13.33 per cent (Table 2.69).

Table 2.69 Demand supply gap between quantity required, quantity available and quantity distributed, certified seed of arhar, Indore district, Madhya Pradesh, 1997-98

(Quantity-quintals)

Variety	Quantity required	Quantity available	Percentage of demand supply gap between qty. required and quantity available	Quantity distributed	Percentage of demand supply gap between qty. required and quantity distributed	Percentage of demand supply gap between qty. available & quantity distributed
ICPL-87	10.00	3.00	70.00	2.60	74.00	13.33
Total	10.00	3.00	70.00	2.60	74.00	13.33

2.14 Narsinghpur district

Narsinghpur district lies almost in the central part of the state and is situated between 22°45'N and 23°15'N latitudes and 78°38' and 79°38'E longitudes. It is surrounded by seven districts including Sagar in the north, Raisen in the north-west, Damoh in the north-east, Seoni in the south-east, Jabalpur in the east and Chhindwara in the south and south-west.

Narsinghpur district has an area of 5,136 sq.km. and forest area of 26.53 per cent of the total geographical area. The density of pulation per sq.km. is 153. Of the total population, rural population is 85.13 per cent and urban population is 14.87 per cent. The population belonging to scheduled castes and scheduled tribes is 16.59 and 12.90 per cent respectively. The proportion of main workers in this district is 36.08. The workers are mainly engaged in agricultural activities and returned as cultivators and agricultural labourers. These two categories accounted for nearly 80 per cent of the main workers.

The literacy percentage of the district is 45.33. Among rural population it is lower than the urban population. The literacy percentage among females is lower (41.59) than the males (68.44).

The average rainfall in the district is 1,300.8 mm. The consumption of fertilisers in the district is 33.73 kg/ha.

Nearly 58 per cent of the district area is under cultivation. The cropping intensity is 135.44 per cent. The intensity of irrigation in the district is 102.15 per cent. Of the gross cropped area 36.09 per cent is irrigated.

Pulses dominated the cropping pattern occupying 44.94 per cent of the gross cropped area.

Oilseeds and cereals occupied second and third positions with 29.90 per cent and 21.48 per cent of the gross cropped area respectively. Among cereals wheat occupied 16.46 per cent. Among pulses, gram was the major crop and occupied 30.30 per cent area. Other important pulses were lentil (3.60 per cent), pea (5.05 per cent) and arhar (4.28 per cent). Soybean was most important oilseed crop occupying 28.16 per cent. Sugarcane was another important crop and occupied 2.06 per cent area.

2.14.1 Distribution of Certified Seed in 1996-97

The total quantity of seed required was 6,240.00 quintals. The quantity available was more than the quantity required (6,658.13 quintals). Therefore, the demand supply gap was (-) 6.70 per cent. However, the quantity distributed was 5,705.96 quintals resulting in the gap of 8.56 per cent between the quantity required and quantity distributed. The gap between the quantity available and quantity distributed was 14.30 per cent.

In the case of urad only the quantity required was mentioned. The quantity available and quantity distributed was not mentioned and therefore the demand supply gap could not be calculated. In the case of soybean, lentil and arhar the quantity available was more than the quantity required and therefore the resultant negative gap between demand and supply. The percentage of demand supply gap was highest (60.00) in the case of sunflower. In the case of gram the gap was 15.79 per cent and in moong it was 2.60 per cent. Nearly entire quantity of seed available was distributed in the case of soybean and arhar. However, a large gap existed (88.91 per cent) between quantity available and quantity distributed in the case of moong and 38.71 per cent in the case of gram (Table 2.70).

Table 2.70 Demand supply gap between quantity required, quantity available and quantity distributed, certified seed, Narsinghpur district, Madhya Pradesh,1996-97

(Quantity-quintals)

Crop	Quantity required	Quantity available	Percentage of demand supply gap between qty. required and quantity available	Quantity distributed	Percentage of demand supply gap between qty. required and quantity distributed	Percentage of demand supply gap between qty. available & quantity distributed
1. Sunflower	5.00	2.00	60.00	2.00	60.00	--
2. Groundnut	--	---	--	--	--	--
3. Soybean	3,350.00	4,126.00	(-) 23.16	4,089.60	(-) 22.08	0.88
4. Gram	2,735.00	2,303.10	15.79	1,411.50	48.39	38.71
5. Urad	25.00	--	--	--	--	--
6. Moong	25.00	24.35	2.60	2.70	89.20	88.91
7. Lentil	20.00	108.36	(-)441.80	108.36	(-)441.80	--
8. Arhar	80.00	94.32	(-) 17.90	91.80	(-) 14.75	2.67
Total	6,240.00	6,658.13	(-) 6.70	5,705.96	8.56	14.30

2.14.2 Varietywise Demand Supply Gap

2.14.2.1 Sunflower

The quantity required for variety Morden was 5.00 quintals. The quantity available was 2.00 quintals resulting in the gap of 60.00 per cent between the quantity required and quantity available. The entire quantity available was distributed (Table 2.71).

Table 2.71 Demand supply gap between quantity required, quantity available and quantity distributed, certified seed of sunflower, Narsinghpur district, Madhya Pradesh, 1996-97

(Quantity-quintals)

Variety	Quantity required	Quantity available	Percentage of demand supply gap between qty. required and quantity available	Quantity distributed	Percentage of demand supply gap between qty. required and quantity distributed	Percentage of demand supply gap between qty. available & quantity distributed
Morden	5.00	2.00	60.00	2.00	60.00	--
Total	5.00	2.00	60.00	2.00	60.00	--

2.14.2.2 Soybean

In varieties JS-72-44 and JS-71-05 only quantities required were mentioned. There was no mention of quantities available or quantities distributed. Therefore, the demand supply gap could not be worked out. In varieties Punjab-1, MACS-13, and MACS-58 there was no mention of quantity required. There was, however, mention of quantity available and nearly the entire quantity was distributed. In varieties JS-75-46, JS-80-21 and PK-472 the quantities available were more than the quantities required. Therefore, the demand supply gap was in the negative. The position regarding the distribution of available seed was quite satisfactory (Table 2.72).

Table 2.72 Demand supply gap between quantity required, quantity available and quantity distributed, certified seed of soybean, Narsinghpur district, Madhya Pradesh, 1996-97

(Quantity-quintals)

Variety	Quantity required	Quantity available	Percentage of demand supply gap between qty. required and quantity available	Quantity distributed	Percentage of demand supply gap between qty. required and quantity distributed	Percentage of demand supply gap between qty. available & quantity distributed
JS-75-46	900.00	1917.20	(-)113.02	1902.00	(-)111.33	0.79
JS-72-44	50.00	--	--	--	--	--
JS-80-21	250.00	778.00	(-)212.20	767.20	(-)206.88	1.39
JS-71-05	625.00	--	--	--	--	--
JS-335	1,325.00	816.00	38.42	816.00	38.42	--
PK-472	200.00	430.00	(-)115.00	425.00	(-)112.60	1.12
Punjab-1	--	50.00	--	50.00	--	--
MACS-13	--	46.80	--	43.20	--	7.69
MACS-58	--	88.00	--	86.00	--	2.27
Total	3350.00	4126.00	(-) 23.16	4089.60	(-) 22.08	0.88

2.14.2.3 Gram

In four out of five varieties there was no mention of quantity required. However, there was some quantity available for these varieties. The quantities distributed of these varieties were such that between 10.00 to 16.00 per cent of the quantities available remained to the distributed. In the case of variety JG-315 there was a demand supply gap of 16.67 per cent. The distribution of this variety was not satisfactory as nearly 40.00 per cent of the available seed remained to be distributed (Table 2.73).

Table 2.73 Demand supply gap between quantity required, quantity available and quantity distributed, certified seed of gram, Narsinghpur district, Madhya Pradesh, 1996-97

(Quantity-quintals)

Variety	Quantity required	Quantity available	Percentage of demand supply gap between qty. required and quantity available	Quantity distributed	Percentage of demand supply gap between qty. required and quantity distributed	Percentage of demand supply gap between qty. available & quantity distributed
JG-315	2735.00	2279.10	16.67	1,390.80	49.15	38.98
U-21	--	7.50	--	6.30	--	16.00
Annagiri	--	6.00	--	5.40	--	10.00
PG-5	--	0.60	--	0.60	--	--
JG-74	--	9.90	--	8.40	--	15.15
Total	2735.00	2303.10	15.79	1,411.50	48.39	38.71

2.14.2.4 Urad

In variety T-9 there was only mention of quantity required. There was no mention of either quantity available or distributed. Therefore, the demand supply gap could not be calculated (Table 2.74).

Table 2.74 Demand supply gap between quantity required, quantity available and quantity distributed, certified seed of urad, Narsinghpur district, Madhya Pradesh, 1996-97

(Quantity-quintals)

Variety	Quantity required	Quantity available	Percentage of demand supply gap between qty. required and quantity available	Quantity distributed	Percentage of demand supply gap between qty. required and quantity distributed	Percentage of demand supply gap between qty. available & quantity distributed
T-9	25.00	--	--	--	--	--
Total	25.00	--	--	--	--	--

2.14.2.5 Moong

For variety K-851 the quantity required was 25.00 quintals and the quantity available was 2.60 per cent less than the quantity required. The quantity distributed was only 2.70 quintals. Thus, as high as 88.91 per cent of the quantity available remained to be distributed. It shows that not only the quantity available was less than the required quantity but also the quantity distributed was very little as compared to quantity available (Table 2.75).

Table 2.75 **Demand supply gap between quantity required, quantity available and quantity distributed, certified seed of moong, Narsinghpur district, Madhya Pradesh, 1996-97**

(Quantity-quintals)

Variety	Quantity required	Quantity available	Percentage of demand supply gap between qty. required and quantity available	Quantity distributed	Percentage of demand supply gap between qty. required and quantity distributed	Percentage of demand supply gap between qty. available & quantity distributed
K-851	25.00	24.35	2.60	2.70	89.20	88.91
Total	25.00	24.35	2.60	2.70	89.20	88.91

2.14.2.6 Lentil

The variety JLS-1 was not in short supply. On the contrary the quantity available was 288.00 per cent more than the quantity required. The entire quantity available was distributed. For variety Malika although there was no mention of quantity required the quantity available was 30.60 quintals and the entire available quantity was distributed (Table 2.76).

Table 2.76 **Demand supply gap between quantity required, quantity available and quantity distributed, certified seed of urad, Narsinghpur district, Madhya Pradesh, 1996-97**

(Quantity-quintals)

Variety	Quantity required	Quantity available	Percentage of demand supply gap between qty. required and quantity available	Quantity distributed	Percentage of demand supply gap between qty. required and quantity distributed	Percentage of demand supply gap between qty. available & quantity distributed
JLS-1	20.00	77.76	(-) 288.80	77.76	(-) 288.80	--
Mallika	--	30.60	--	30.60	--	--
Total	20.00	108.36	(-) 441.80	108.36	(-)441.80	--

2.14.2.7 Arhar

In varieties ICPL-87 and N-148 the quantity required was 40.00 quintals each. While, the quantity available for former was 92.00 per cent more than the quantity required, the quantity available for latter was less than required so that there was a gap of 56.20 per cent between demand and supply. Nearly, entire quantities of available seed were distributed (Table 2.77).

Table 2.77 Demand supply gap between quantity required, quantity available and quantity distributed, certified seed of arhar, Narsinghpur district, Madhya Pradesh, 1996-97

(Quantity-quintals)

Variety	Quantity required	Quantity available	Percentage of demand supply gap between qty. required and quantity available	Quantity distributed	Percentage of demand supply gap between qty. required and quantity distributed	Percentage of demand supply gap between qty. available & quantity distributed
ICPL-87	40.00	76.80	(-) 92.00	74.28	(-) 85.7	3.28
N-148	40.00	17.52	56.20	17.52	56.20	--
Total	80.00	94.32	(-) 17.90	91.80	(-) 14.75	2.67

2.14.3 Distribution of Certified Seed in 1997-98

In the year 1997-98 the demand supply gap between quantity required and quantity available was 9.66 per cent. The gap was in the negative in the case of sunflower, gram and lentil. The demand supply gap was highest (96.00 per cent) in urad followed by arhar (28.58 per cent) and soybean (15.45 per cent), While, the entire quantity of urad was distributed, nearly 90.00 per cent of soybean seed was distributed. On the other hand very large quantities of groundnut, sunflower and moong remained to be distributed (Table 2.78).

Table 2.78 Demand supply gap between quantity required, quantity available and quantity distributed, certified seed, Narsinghpur district, Madhya Pradesh,1997-98

(Quantity-quintals)

Crop	Quantity required	Quantity available	Percentage of demand supply gap between qty. required and quantity available	Quantity distributed	Percentage of demand supply gap between qty. required and quantity distributed	Percentage of demand supply gap between qty. available & quantity distributed
Sunflower	3.00	7.11	(-) 137.00	1.83	39.00	74.26
Groundnut	--	6.60	--	1.50	--	77.27
Soybean	4,925.00	4,164.00	15.45	3,744.00	23.98	10.09
Gram	1,260.00	1,376.70	(-) 9.26	1,058.20	16.02	23.14
Urad	10.00	0.40	96.00	0.40	96.00	--
Moong	10.00	9.53	4.70	3.28	67.20	65.58
Lentil	52.00	114.60	(-) 120.38	84.70	(-) 62.88	26.09
Arhar	125.00	89.28	28.58	41.55	66.76	53.46
Total	6,385.00	5,768.22	9.66	4,935.46	22.70	14.43

2.14.4 Variety wise Demand Supply Gap

2.14. 4.1 Sunflower

In variety Morden the quantity available was 137.00 per cent more than the quantity required. However, the quantity distributed was so small that nearly 75.00 per cent of the seed remained to be distributed (Table 2.79).

Table 2.79 Demand supply gap between quantity required, quantity available and quantity distributed, certified seed of sunflower Narsinghpur district, Madhya Pradesh, 1997-98

(Quantity-quintals)

Variety	Quantity required	Quantity available	Percentage of demand supply gap between qty. required and quantity available	Quantity distributed	Percentage of demand supply gap between qty. required and quantity distributed	Percentage of demand supply gap between qty. available & quantity distributed
Morden	3.00	7.11	(-)137.00	1.83	(+) 39.00	74.26
Total	3.00	7.11	(-)137.00	1.83	(+) 39.00	74.26

2.14.4.2 Groundnut

In variety JL-24 there was no mention of quantity required but 6.60 quintals of seed was available. However, the distribution was not satisfactory and 77.27 per cent of the available seed remained to be distributed (Table 2.80).

Table 2.80 Demand supply gap between quantity required quantity available and quantity distributed, certified seed of groundnut, Narsinghpur district Madhya Pradesh, 1997-98

(Quantity - quintals)

Variety	Quantity required	Quantity available	Percentage of demand supply gap between qty. required and quantity available	Quantity distributed	Percentage of demand supply gap between qty. required and quantity distributed	Percentage of demand supply gap between qty. available and quantity distributed
JL-24	--	6.60	--	1.50	--	77.27
Total	--	6.60	--	1.50	--	77.27

2.14.4.3 Soybean

In varieties Punjab-1 and MACS-13 although there was demand for seed, there was no quantity available. On the other hand in variety JS-72-280 although there was no demand the quantity available was 8.00 quintals. In the case of variety JS-335 the demand supply gap was in the negative. In other three varieties the demand supply gap was between 52.00 to 76.00 per cent (Table 2.81).

Table 2.81 Demand supply gap between quantity required, quantity available and quantity distributed, certified seed of soybean Narsinghpur district. Madhya Pradesh 1997-98

(Quantity-quintals)

Variety	Quantity required	Quantity available	Percentage of demand supply gap between qty. required & quantity available	Quantity distributed	Percentage of demand supply gap between qty. required & quantity distributed	Percentage of demand supply gap between qty. available and quantity distributed
Js-75-46	2,400.00	1,130.80	52.88	863.20	64.03	23.66
JS-80-21	900.00	212.80	76.36	170.40	81.07	19.92
JS-335	1,000.00	2,689.20	(-) 168.92	2,610.80	(-) 161.08	2.92
PK-472	500.00	123.20	75.36	98.40	80.32	20.13
Punjab-1	75.00	--	--	--	--	--
MACS-13	50.00	--	--	--	--	--
JS-72-280	--	8.00	--	1.20	--	85.00
Total	4,925.00	4,164.00	15.45	3,744.00	23.98	10.09

2.14.4.4. Gram

In varieties JG-315 and P-267 the demand supply gap was in the negative. The gap was maximum (88.50 per cent) in Annagiri followed by ICCV-2 (60.50 per cent). The distribution of seed was very unsatisfactory for varieties ICCV-2 and Annagiri. In other varieties also distribution was such that about 20.00 to 25.00 per cent seed remained undistributed (Table 2.82).

Table 2.82 Demand supply gap between quantity required , quantity available and quantity distributed, certified seed of gram, Narsinghpur district, Madhya Pradesh, 1997-98

(Quantity-quintals)

Variety	Quantity required	Quantity available	Percentage of demand supply gap between qty. required & quantity available	Quantity distributed	Percentage of demand supply gap between qty. required and quantity distributed	Percentage of demand supply gap between qty. available & quantity distributed
JG-315	900.00	1,136.10	(-) 26.23	888.90	1.23	21.75
V-21	200.00	130.80	34.60	99.30	50.35	24.08
ICCV-2	60.00	23.70	60.50	4.00	93.33	83.12
Annagiri	60.00	6.90	88.50	4.80	92.00	30.43
P-267	40.00	79.20	(-) 98.00	61.20	(-) 53.00	22.73
Total	1,260.00	1,376.70	(-) 9.26	1,058.20	16.02	23.14

2.14.4.5 Urad

For variety T-9 there was mention of quantity required but there was no mention of either quantity available or distributed. For variety TPU-4 there was no mention of quantity required but 0.40 quintal of seed was available and entire quantity was distributed (Table 2.83).

Table 2.83 Demand supply gap between quantity required , quantity available and quantity distributed, certified seed of urad, Narsinghpur district, Madhya Pradesh, 1997-98

(Quantity-quintals)

Variety	Quantity required	Quantity available	Percentage of demand supply gap between qty. required and quantity available	Quantity distributed	Percentage of demand supply gap between qty. required and quantity distributed	Percentage of demand supply gap between qty. available & quantity distributed
T-9	10.00	--	--	--	--	--
TPU-4	--	0.40	--	0.40	--	--
Total	10.00	0.40	96.00	0.40	96.00	--

2.14.4.6 Moong

For variety K-851 the demand supply gap was 4.70 per cent but the quantity distributed was so little that more than 65.00 per cent of the quantity available remained to be distributed (Table 2.84).

Table 2.84 Demand supply gap between quantity required, quantity available and quantity distributed, certified seed of moong, Narsinghpur district, Madhya Pradesh, 1997-98

(Quantity-quintals)

Variety	Quantity required	Quantity available	Percentage of demand supply gap between qty. required and quantity available	Quantity distributed	Percentage of demand supply gap between qty. required and quantity distributed	Percentage of demand supply gap between qty. available & quantity distributed
K-851	10.00	9.53	4.70	3.28	67.20	65.58
Total	10.00	9.53	4.70	3.28	67.20	65.58

2.14.4.7 Lentil

For variety JLS-1 the demand supply gap was in the negative but 26.09 per cent of the quantity remained undistributed (Table 2.85).

Table 2.85 Demand supply gap between quantity required, quantity available and quantity distributed, certified seed of lentil, Narsinghpur district, Madhya Pradesh, 1997-98

(Quantity-quintals)

Variety	Quantity required	Quantity available	Percentage of demand supply gap between qty. required and quantity available	Quantity distributed	Percentage of demand supply gap between qty. required and quantity distributed	Percentage of demand supply gap between qty. available & quantity distributed
JLS-1	42.00	114.60	(-) 172.86	84.70	(-) 101.67	26.09
Mallika	10.00	--	--	--	--	--
Total	52.00	114.60	(-) 120.38	84.70	(-) 62.88	26.09

2.14.4.8 Arhar

In variety ICPL-87 the demand supply gap was 47.44 per cent. In variety N-148, on the other hand, the demand supply gap was in the negative. While, in ICPL-87 61.95 per cent of seed remained to the distributed, the percentage for variety N-148 was 41.29 (Table 2.86).

Table 2.86 Demand supply gap between quantity required, quantity available and quantity distributed, certified seed of arhar, Narsinghpur district, Madhya Pradesh, 1997-98

(Quantity-quintals)

Variety	Quantity required	Quantity available	Percentage of demand supply gap between qty. required and quantity available	Quantity distributed	Percentage of demand supply gap between qty. required and quantity distributed	Percentage of demand supply gap between qty. available & quantity distributed
ICPL-87	100.00	52.56	47.44	19.99	80.01	61.95
N-148	25.00	36.72	(-) 46.88	21.56	13.76	41.29
Total	125.00	89.28	28.58	41.55	66.76	53.46

2.15 Reasons for Demand Supply gap in Breeders' Seed, Foundation Seed and Certified Seed

1. It is very difficult to correctly assess the demand of seed for the next agricultural season (leave apart the next few years) because the demand of seed depends on the soil (moisture) and climatic conditions such as rainfall, humidity, etc.

2. Demand for early/late maturing varieties goes with early/late sowing, which in turn, depends on soil moisture and climate.

3. Although seed rolling plan is for 5 to 10 years, the farmers or the department specify/ change their choice and demand (quantity) just prior to sowing or at the time of sowing. This results in increased demand of non specified varieties and decreased demand of certified varieties.

4. The govt. of India has fixed norms for Seed Multiplication Ratio (SMR). The seed production planning is based on these SMRs. However, the productivity and therefore, the SMRs in M.P. for pulses and oilseeds are lower due to soil and low percentage of irrigation as compared to SMRs fixed by GOI. This results in lower production of seed and therefore widening of demand supply gap.

5. Abnormal climatic conditions at the time of sowing and at maturity stage affect productivity and therefore widen the demand supply gap.

6. Many areas in the state are not suitable for groundnut production resulting in lower productivity and widening of the gap between demand and supply.

7. In the case of soybean the productivity and production are decreasing from year to year since last 3-4 years due to adverse climatic conditions, rust, and non podding. This results in lower production of seed at all the three stages of breeders', foundation and certified seed.

Reasons specific to Demand Supply Gap in Breeders' Seed

1. Improper assessment of seed demand

2. Fluctuating seed demand before the on set of sowing season.

3. Non lifting of indented breeders' seed.

4. Short falls in breeders seed production of soybean and groundnut.

5. Adverse climatic conditions/ diseases/pests.

Reasons specific to Demand Supply Gap in Foundation Seed

1. The productivity of crops is lower on Government and M.P. State Seeds and Farms Development Corporation farms as compared to farmers' fields. In the case of soybean while the yield on farmers' fields is 16-17 quintals per hectare that on govt. and corporation farms is 8 to 9 quintals per hectare. This was due to management problems.

2. Seed Multiplication Ratio (SMR) on Govt. farms and Corporation Farms is low.

3. Foundation seed producing farms prefer to take crops which have higher profitability.

4. Because of management problems the produce on the Govt. and Seed Corporation's Farms is not physically pure but has an admixture of dirt, inert material, weed seed and other varieties.

Reasons Specific to Demand Supply Gap in certified seed

1. The seed production programme is prepared 4 years in advance keeping in view the demand that would emerge for a particular reference year. On the basis of such an anticipated demand, programme for the production of breeders seed to foundation seed and foundation seed to certified seed is undertaken. However, during the reference year the demand for already produced seed might not be put up by farmers but demand for new varieties might crop up. It is not possible to meet such a newly cropped up demand. The seed production and seed distribution programme is organised by Seeds and Farms Development Corporation on the basis of demand put up by the state Department of Agriculture. However, the demand for varieties change from what was produced to what is now demanded.

2. The Seeds and Farms Development Corporation supplies seed of only notified varieties. In the villages private companies supply seed under the name of "Research Varieties" which are uncertified. For reasons noted above it is not possible for the Corporation to supply these varieties to farmers.

3. Production of certified seed even at the incentive price offered is not economical. At times it is very difficult to find out farmers willing to participate in the programme having necessary infrastructure.

4. Farmers do not strictly follow the recommended practices. They are supplied with literature on recommend practices alongwith seed. With limited staff it is not possible to monitor the production process. Due to these reasons the target of certified seed production is not achieved many a times. There is a system of blacklisting of such farmers but at times it is very difficult to find out farmers with necessary infrastructure.

5. The certified seed grower farmers do not part with the entire produce. Part of it is retained by farmers and another part is sold to other farmers/agencies.

6. The produce of certified seed growers is subjected to various tests before being certified. The process involves strict standards and therefore a large part of produce/ sample stands rejected. For example between 30 to 40 per cent of the produce is rejected because of the smaller size of grains. Another 20 per cent produce is rejected in germination test. Some percentage of produce is rejected as the seed gets damaged due to rain and insect infestation. It may be said that about 50 per cent of the produce

is rejected and the remaining half is found fit to be certified. This resulted in low percentage of achievement of quantity found suitable for certification against target and therefore, the demand supply gap.

7. For sunflower and groundnut production there is neither demand put up for supply of seed by government nor demand put up by farmers for seed. This is due to the fact that in selected districts soybean has replaced kharif pulses and other kharif oilseeds. Therefore, there is very little demand for sunflower and groundnut varieties seed. In the absence of demand put up by Agriculture Department and farmers it is not possible to fulfil the demand.

8. Input of groundnut seed is a costly affair. Farmers are not, therefore, interested in taking up certified seed production programme of groundnut. Moreover, SMR of groundnut in the state is generally lower.

Suggestions

It is suggested that the Department of Agriculture, JNKVV Jabalpur, IGKVV Raipur and Seeds and Farms Development Corporation etc., should keep in mind the region specific demand of seed and go in for the production of breeders' seed, foundation seed for varieties for which there is demand. The Field Officers of the Department of Agriculture should canvass for the popularity of those seeds which are recommended for the region. Farmers should be convinced to row only those varieties of seed. If the farmers put up demand for other varieties they should be told about the reasons why those varieties seed are not available for distribution and why should farmers grow only recommended and tested seeds. This will ensure distribution of available recommended varieties of seed and reduce the demand supply gap between available quantity and distributed quantity.

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CHAPTER III

ANALYSIS OF DATA OF SELECTED FARMERS

As mentioned earlier, for collecting field level data 50 farmers each were selected in two districts of Indore and Narsinghpur. Further, out of 50 farmers 30 were participants and 20, non participants. The description of selected farmers of Indore district follows.

3.1 Indore District

3.1.1 Operated Area

The total operated area of 50 farmers was 167.989 hectares. Thus, the average area of the farm was 3.36 hectares. The average size of participant farms was 3.528 hectares and the average size of non participants, was 3.107 hectares (Table 3.1).

Table 3.1 Operated area, selected participant and non participant farms, Indore district,M.P.

(Area- Hectares)

Size group	Participant			Non participant			Total		
	Operated area	No.of Holdings	Percen-tage to total	Operated area	No.of Holdings	Percen-tage to total	Operated area	No.of Holdings	Percen-tage to total
Marginal	--	--	--	0.978 (1.57)	1	5.00	0.978 (0.58)	1	2.00
Small	13.784 (13.02)	9	30.00	14.951 (24.06)	9	45.00	28.735 (17.11)	18	36.00
Semi-Medium	28.190 (26.63)	11	36.67	14.445 (23.24)	5	25.00	42.635 (25.38)	16	32.00
Medium	63.868 (60.34)	10	33.33	31.773 (51.13)	5	25.00	95.641 (56.93)	15	30.00
Large	--	--	--	--	--	--	--	--	--
Total	105.842 (100.00)	30.00	100.00	62.147	20	100.00	167.989 (100.00)	50	100.00
Average per holdings	3.528	--	--	3.107	--	--	3.359	--	--

3.1.2 Irrigated Area

The total irrigated area on the selected farms was 152.632 hectares. This formed 90.86 per cent of the operated area. On the participant farms the irrigated area formed 88.35 per cent and on the non-participant farms 95.13 per cent. On the participant farms 88.24 per cent of the irrigated area was commanded by wells and the remaining 11.76 per cent by other sources like, rivers, nalahs, etc. On the non participant farms the entire irrigated area was under the command of wells only (Table 3.2).

Table 3.2 Sources of irrigation, selected farms, Indore district, M.P.

(Area-Hectares)

Size group	Participants					Non- participants			Total		
	Irrigated area under			Operated area	Percentage of irrigated area to operated area	Irrigated area under			Irrigated area	Operated area	Percentage of irrigated area to operated area
	Wells	Other sources	Total irrigated area			Wells	Operated area	Percentage of irrigated area to operated area			
Marginal	--	--	--	--	--	0.978	0.978	100.00	0.978	0.978	100.00
Small	13.784	--	13.784	13.784	100.00	13.951	14.951	93.31	27.735	28.735	96.52
Semi-medium	23.131	2.250	25.381	28.190	90.04	14.445	14.445	100.00	39.826	42.635	93.41
Medium	45.594	8.750	54.344	63.868	85.09	29.749	31.773	93.63	84.093	95.641	87.93
Large	--	--	--	--	--	--	--	--	--	--	--
Total	82.509 (88.24)	11.000 (11.76)	93.509 (100.00)	105.842	88.35	59.123 (100.00)	62.147	95.13	152.632	167.989	90.86

3.1.3 Cropping Pattern

The gross cropped area of the selected farms was 320.406 hectares. Soybean was the most important crop contributing 48.31 per cent to the gross cropped area. The next important crop was wheat which contributed 23.14 per cent. The third important crop group was vegetables which contributed 18.72 per cent to the gross cropped area. Gram contributed 7.49 per cent.

On both participant and non participant farms the percentage of area under soybean was around 48.00 per cent. On participant farms wheat contributed higher percentage (30.43) than that on non participant farms (11.38). On the other hand vegetables had higher proportion on non participant farms (36.91) than participant farms (7.45 per cent).

It is observed that participant farms had a diversified cropping pattern with larger number of crops grown than non-participant farms. Non participant farms did not grow crops like maize, pea, lentil, marigold, jowar and garlic (Table 3.3).

Table 3.3 Cropping pattern, Indore district, M.P.

(Area- Hectares)

Crops	Participant				Non participant					Total
	Small	Semi-medium	Medium	Total	Marginal	Small	Semi-medium	Medium	Total	
Jowar	--	--	--	--	--	--	--	0.750 (1.19)	0.750 (0.61)	0.750 (0.23)
Maize	0.202 (0.76)	--	1.000 (0.85)	1.202 (0.61)	--	--	--	--	--	1.202 (0.38)
Wheat	9.546 (35.95)	14.166 (26.57)	36.488 (30.92)	60.200 (30.43)	--	2.375 (8.08)	4.528 (16.13)	7.047 (11.17)	13.950 (11.38)	74.150 (23.14)
Gram	1.000 (3.77)	6.106 (11.45)	13.869 (11.75)	20.975 (10.60)	--	--	--	3.024 (4.79)	3.024 (2.47	23.999 (7.49)
Pea	0.404 (1.52)	--	0.202 (0.17)	0.606 (0.31)	--	--	--	--	--	0.606 (0.19)
Lentil	--	0.809 (1.52)	--	0.809 (0.41)	--	--	--	--	--	0.809 (0.25)
Soybean	12.366 (46.58)	26.771 (50.21)	56.559 (47.93)	95.696 (48.36)	0.978 (50.00)	14.749 (50.16)	13.838 (49.28)	29.523 (46.78)	59.088 (48.22)	154.784 (48.31)
Vegetables	2.023 (7.62)	4.452 (8.35)	8.274 (7.01)	14.749 (7.45)	0.978 (50,00)	12.278 (41.76)	9.713 (34.59)	22.261 (35.28)	45.230 (36.91)	59.979 (18.72)
Marigoldl	0.606 (2.28)	1.011 (1.90)	1.000 (0.85)	2.617 (1.32)	--	--	--	--	--	2.617 (0.82)
Jowar (Fodder)	0.202 (0.76)	--	0.404 (0.34)	0.606 (0.31)	--	--	--	--	--	0.606 (0.19)
Berseem	0.202	--	--	0.202 (0.10)	--	--	--	0.500 (0.79)	0.500 (0.41)	0.702 (0.22)
Garlic	--	--	0.202 (0.17)	0.202 (0.10)	--	--	--	--	--	0.202 (0.06)
Gross cropped area	26.551 (100.00)	53.315 (100.00)	117.998 (100.00)	197.864 (100.00)	1.956 (100.00)	29.402 (100.00)	28.079 (100.00)	63.105 (100.00)	122.542 (100.00)	320.406 (100.00)

** Figures in parentheses indicate percentage to gross cropped area*

3.1.4 Sources of Seed

3.1.4.1 Indore District Participant farms

Since the study aimed at evaluation of seed supply it will be useful to know the sources of seed supply on the selected farms and to know the extent to which certified seed was used. It was noted that the total quantity of seed used on the participant farms was 47,621.850 kilograms. The quantity of seed used for soybean, gram and lentil taken together was 10,832.00 kilograms. These were the three crops of the eight selected crops for the study and, therefore, we have considered the use of certified seed mainly for these crops. While, the percentage of quantity of certified seed for all the crops was 8.94 that for above mentioned three crops were 36.85. Since Indore district was selected for soybean the participants were those who used certified seed of soybean of one variety or the other. However, the selected farmers did not use the certified seed on entire area under soybean. Of the total seed used for soybean 43.33 per cent was of certified variety. The owned seed of soybean formed 51.78 per cent. For gram and lentil

The owned seed of soybean formed 51.78 per cent. For gram and lentil no certified seed was used. Of the gram seed used 82.39 per cent was owned seed and 17.61 per cent of seed was purchased from other sources. In lentil the entire seed used was owned seed.

For wheat as much as 96.47 per cent of the quantity of seed used was owned and only 1.92 per cent was certified seed. In the case of pea, of the total quantity of seed used 50.00 per cent was certified seed and the remaining 50.00 per cent was purchased from other sources (Table 3.4).

Table 3.4 Sources of seed supply, Indore district, M.P., 1997-98

(Quantity - Kg.)

Crop/Variety	Owned	Exchanged	Borrowed	Purchased		Total
				Certified	From others	
Soybean JS-335	3,590.00 (50.69)	--	--	3,492.00 (49.31)	--	7,082.00 (100.00)
Samrat	675.00 (69.23)	100.00 (10.26)	--	--	200.00 (20.51)	975.00 (100.00)
JS-71-05	500.00 (58.82)	150.00 (17.65)	--	200.00 (23.53)	--	850.00 (100.00)
PK-472	--	--	--	300.00 (100.00)	--	300.00 (100.00)
Kali Tuar	5,00	--	--	--	--	5.00 (100.00)
Total Soybean	4,770.00 (51.78)	250.00 (2.71)	--	3,992.00 (43.33)	200.00 (2.17)	9,212.00 (100.00)
Gram - JG 218	80.00	--	--	--	--	80.00
Ujjain-24	780.00	--	--	--	280.00	1060.00
Annagiri	150.00	--	--	--	--	150.00
Kabuli	300.00	--	--	--	--	300.00
Total gram	1.310.00 (82.39)	--	--	--	280.00 (17.61)	1,590.00 (100.00)
Lentil	30.00 (100.00)	--	--	----	--	30.00 (100.00)
Total selected crops	6,110.00 (56.41)	250.00 (2.31)	--	3,992.00 (36.85)	480.00 (4.43)	10,832.00 (100.00)
Jowar (Fodder)	10.00	--	--	--	--	10.00
Maize	44.00	--	--	--	--	44.00
Marigold	0.850	--	--	--	--	0.850
Wheat- Lok-1	5.790.00	10.00	--	40.00	--	5.930.00
W.H.-147	100.00	--	--	80.00	--	180.00
Sujata	120.00	--	--	--	--	120.00
Total Wheat	6,010 (96.47)	100.00 (1.61)	--	120.00 (1.92)	--	6,230.00 (100.00)
Pea Arkil	--	--	--	25.00 (50.00)	25.00 (50.00)	50.00 (100.00)
Potato - Jyoti	20,620.00	--	--	--	3500.00	24,120.00
Garlic	100.00	--	--	--	--	100.00
Berseem	--	--	--	--	5.00	5.00
Total other crops	32,794.850 (89.04)	200.00 (0.54)	--	265.00 (0.72)	3,530.00 (19.60)	36,789.850 (100.00)
Grand total	38.904.850 (81.70)	450.00 (0.94)	--	4,257 (8.94)	4,010 (8.42)	47,621.850 (100.00)

3.1.4.2 Indore District Non participant Farms

The total seed used on non participant farms was 89,803.00 kilograms. Of this 26.51 per cent was owned seed and the remaining 73.49 per cent was seed purchased from other sources. For the two selected crops of soybean and gram the percentage of owned seed was 77.20 and that of purchased seed from other sources was 22.80. For the crops other than the selected two crops the percentage of owned seed was 22.37 and that for seed purchased from other sources 77.63. This increased pecentage was mainly due to potato and garlic. In the case of potato 78.95 per cent of the total seed used was purchased. In the case of garlic the percentage of seed purchased from other sources
was 78.45. Other vegetables and berseem seed was purchased from other sources (Table 3.5).

Table 3.5 Sources of seed supply, Indore district, M.P.

(Quantity- Kg.)

Crop/Variety	Owned	Exchanged	Borrowed	Purchased		Total
				Certi-fied	From other sources	
Soybean JS-335	540.00 (57.45)	--	--	--	400.00 (42.55)	940.00 (100.00)
Samrat	1,840.00 (93.64)	--	--	--	125.00 (6.36)	1,965.00 (100.00)
JS-71-05	2,625.00 (72.02)	--	--	--	1,020.00 (27.98)	3,645.00 (100.00)
Total soybean	5,005.00 (76.41)	--	--	--	1,545.00 (23.59)	6,550.00 (100.00)
Gram	225.00 (100.00)	--	--	--	--	225.00 (100.00)
Total selected crops	5,230.00 (77.20)	--	--	--	1,545.00 (22.80)	6,775.00 (100.00)
Jowar	10.00 (100.00)	--	--	--	--	10.00 (100.00)
Wheat - Lok-1	1,255.00	--	--	--	150.00	1,405.00
Sujata	130.00	--	--	--	--	130.00
W.H.-147	180.00	--	--	--	150.00	330.00
Total wheat	1,565.00	--	--	--	300.00 (16.09)	1,865.00 (100.00)
Potato	16,500.00 (21.05)	--	--	--	61,900.00 (78.95)	78,400.00 (100.00)
Garlic	500.00 (21.55)	--	--	--	1,820.00 (78.45)	2,320.00 (100.00)
Other vegetables	--	--	--	--	428.00 (100.00)	428.00 (100.00)
Berseem	--	--	--	--	5.00 (100.00)	5.00 (100.00)
Total other crops	18,575.00 (22.37)	--	--	--	64,453.00 (77.63)	83,028 (100.00)
Grand Total	23,805.00 (26.51)	--	--	--	65,998.00 (73.49)	89,803.00 (100.00)

3.1.5 Experiences of Selected Farmers

3.1.5.1. Participants of Indore District

All the selected 30 participants sown JS-335 variety of soybean six of them sown variety JS-71-05 also. One farmer sown variety PK-472.

For gram varieties Ujjain-24, Annagiri and Kabuli were used. However, these were not certified varieties. About seed rate all the selected 30 farmers used recommended seeed rate of 80 kg, per hectare for certified seed. For other varieties higher seed rate was used. The reason given is : Home produced seed had lower germination percentage as seed available was not of good quality. When asked which of the soybean varieties was best suited, most of the farmers opined that JS-335 was the best variety at the time. Few farmers opined that variety JS-71-05 was equally good and another few said that variety Samrat was so. All the farmers desired certified seed variety of JS-335 for the entire soybean crop area. However, the govt. had decided to supply only 80 kg. of certified seed irrespective of the demand of farmers. Therefore, the farmers having large holdings had to be content with certified seed for only in one hectare. The balance quantity of seed was arranged from either owned seed or exchanged seed.

About half of the participants opined that certified seed of variety JS-335 was good and should be supplied in future also.

However, the remaining half of the total number were against the use of certified seed variety. The reason put forward were;

i) Seed had very low germination rate
ii) There was no flowering or pod-formation.
iii) The flowers and pods shedded.
iv) In low lying areas due to flooding the germination was very poor.

Regarding suggestions for the betterment of seed supply scheme following suggestions were given ;

i) The seed given should be of good quality and should be pre tested one.
ii) Technical personnel of Seed Corporation and Agriculture Department should visit the farmers and offer suggestions for the betterment of crop.
iii) Apart from JS-335 other varieties' seed should also be given.
iv) Some farmers complained that pests and diseases attacked the certified seed varieties.
v) Farmers should be adequately compensated if the certified seed did not germinate or flower or failed in pod formation.
vi) The certified seed should be given in larger quantity.

Nearly half of the participants said they changed the certified seed after one year. About one fifth of the farmers changed in two years and another one fifth changed after three years (Table 3.6).

Table 3.6 Knowledge and opinion of the farmers, regarding certified seed, Indore district, M.P. (Participants)

S.No.	Particulars	Marginal (Number)	Small (Number)	Semi-medium (Number)	Medium (Number)	Large (Number)	Total (Number)
1.	**Which variety did you use ?**						
	1. Soybean						
	i) JS-335	--	9	11	10	--	30
	ii) Samrat	--	4	--	1	--	5
	iii) JS.71-05	--	2	3	1	--	6
	iv) PK-472	--	-	--	1	--	1
	2. Gram						
	i) JG-218	--	1	--	--	--	1
	ii) Ujjain	--	-	3	3	--	6
	iii) Annagiri	--	-	1	--	--	1
	iv) Kabuli	--	--	--	1	--	1
2.	**What is the recommended seed rate**						
	i) 80 Kg./hectare	--	9	11	10	--	30
3.	**What seed rate did you use ?**						
	i) Recommended seed rate 80 kg./ha.	--	2	1	5	--	8
	ii) More than the recommended seed rate.	--	7	10	5	--	22
4.	**Reasons for using higher seed rate**						
	i) Home produced seed	--	2	3	1	--	6
	ii) Seed had low gemination rate	--	-	2	--	--	2
	iii) Seed given was of poor quality	--	-	1	--	--	1
5.	**Which is the best variety in your opinion**						
	i) JS-335	--	4	6	8	--	18
	ii) JS.71-05 & Samrat	--	3	2	1	--	6
	iii) Samrat	--	2	--	--	--	3
	iv) NHR-12 & Ahilya-3	--					
6.	**Which variety of certified seed is supplied**						
	i) JS-335	--	9	11	10	11	30
	ii) JS-71-05	--	-	1	--	--	1
	iii) Samrat & NHR-12	--	-	1	--	--	1
7.	**What is your requirement of certified seed**						
	i) As supplied by NSC-1	--	7	10	6	--	23
	ii) More than the supplied quantity by NSC	--	2	1	4	--	7

S.No.	Particulars	Marginal (Number)	Small (Number)	Semi-medium (Number)	Medium (Number)	Large (Number)	Total (Number)
8.	**How much qty. of seed did you receive?**						
	i) As required	--	6	11	7	--	24
	ii) Less quantity	--	3	--	3	--	6
9.	**From where did you receive the remaining quantity of seed ?**						
	i) Used home produced seed	--	5	7	9	--	22
	ii) The seed taken in exchange	--	2	--	--	--	2
	iii) Purchased from Oilfed	--	-	1	1	--	2
10.	**Why did you not receive the required quantity of certified seed ?**						
	i) Only 80 kg. Seed was supplied	--	2	1	3	--	6
	ii) Certified seed was in limited quantity	--	1	--	--	--	1
	iii) Seed was supplied by Oilfed	--	--	1	--	--	1
11.	**What is your opinion regarding the certified seed supplied ?**						
	i) Good quality seed should be given	--	3	3	2	--	8
	ii) The seed did not germinate	--	4	4	3	--	11
	iii) The seed was of good quality	--	1	2	2	--	5
	iv) The technical personnel of National Seed Corporation did not visit the field but the technical personnel of SOPA inspected the field.	--	1	--	--	--	1
	v) We have been purchasing soybean seed for the last five years from SOPA & selling them at remunerative price on certification they get bonus @ Rs.400 per quintal more than the prevailing market rate.	--	1	--	--	--	1
	vi) There was flower shedding or less flower ing and pod formation in few plants of JS-335.	--	--	1	--	--	1
	vii) There was flower shedding or less flower ing in JS-335	--	--	1	--	--	1
	viii) The soybean field was inundated due to flooding of river.	--	--	2	--	--	2

S.No.	Particulars	Marginal (Number)	Small (Number)	Semi-medium (Number)	Medium (Number)	Large (Number)	Total (Number)
12.	**Suggestions of the farmers**						
	i) The certified seed should have good germination percentage	--	1	4	4	--	9
	ii) The seed should be of good quality	--	1	4	4	--	9
	iii) The tehnical personnel of Seed Corporation should inspect the field after sowing.	--	1	--	1	--	2
	iv) The certified seed of other varieties of soybean should also be given alongwith JS-335.	--	1	--	--	--	1
	v) The seed certification on team should administratively be checked by Govt. and pure seed should be given.	--	--	1	1	--	2
	vi) There was severe infestation of pests and diseases in 1998-99.	--	--	1	--	--	1
	vii) The seed given to the farmers should be certified pure quality and proper germination percentage.	--	--	1	1	--	2
	viii) The compensation should be given to the farmers by Seed Corporation if seed did not germinate. In the case crop fails farmers interest should be protected through Crop Insurance Scheme.	--	--	1	--	--	1
	ix) The certified seed should be given through the State Agriculture Department.	--	--	--	1	--	1
13.	**When do you change the certified seed ?**						
	i) In one year	--	2	6	5	--	13
	ii) In two years	--	3	1	2	--	6
	iii) In three years	--	2	2	1	--	5
	iv) In four years	--	--	1	--	--	1
	v) More than 4 years	--	--	1	--	--	1
	vi) Do not change the seed	--	--	1	--	--	1
	vii) The seed is changed only in emergency, now want to change every year.	--	--	--	1	--	1

3.1.5.2 Non participants of Indore District

Of the twenty non participants 65 per cent sowed JS-71-05 variety. The remaining 35 per cent used variety Samrat. All the non- participants used the seed rate of one quintal per hectare twenty kg. per hectare more than the recommended. Two thirds of the non participants opined that variety JS-335 was most suitable. The remaining farmers opined that variety Samrat was most suitable. Eighty per cent of the farmers did not desire to get certified seed. They had adverse opinion about it such as ; the certified seed is not pure and it is neither guaranteed. Two thirds of the non participants changed the seed after two years (Table 3.7)

3.2 Narsinghpur District

3.2.1 Operated Area

The total operated area of fifty selected famers was 111.642 hectares. Thus, the average operated holding was 2.233 hectares. While the average area of participant farmers was 1,676 hectares that of non-participant farmers was 3.069 hectares (Table 3.8).

Table 3.8 Operated area, selected farms Narsinghpur district, M.P.

Size group	Participant			Non participant			Total		
	Operated area	No.of Holdings	Percen-tage to total	Operated area	No.of Holdings	Percen-tage to total	Operated area	No.of Holdings	Percen-tage to total
Marginal	4.630 (9.21)	6	20.00	3.093 (5.04)	4	20.00	7.723 (6.92)	10	20.00
Small	22.821 (45.40)	16	53.34	7.487 (12.20)	5	25.00	30.308 (27.15)	21	42.00
Semi-Medium	17.964 (35.73)	7	23.33	13.356 (21.76)	5	25.00	31.320 (28.05)	12	24.00
Medium	4.856 (9.66)	1	3.33	27.317 (44.51)	5	25.00	32.173 (28.82)	6	12.00
Large	--	--	--	10.118 (16.49)	1	5.00	10.118 (9.06)	1	2.00
Total	50.271 (100.00)	30	100.00	61.371 (100.00)	20	100.00	111.642 (100.00)	50	100.00
Average per holdings	1.676	--	--	3.069	--	--	2.233	--	--

Table 3.7 Knowledge and opinion of the farmers, regarding certified seed, Indore district, M.P. (Non-participants)

S.No.	Particulars	Marginal (Number)	Small (Number)	Semi-medium (Number)	Medium (Number)	Large (Number)	Total (Number)
1.	Which variety did you use ?						
	i) JS-71-05	--	8	3	2	--	13
	ii) Samrat	1	1	2	3	--	7
2.	What is the recommended seed rate used ?						
	i) 80 kg./hectare		--	--	--	--	--
3.	What seed rate did you use ?						
	i) 1 quintal/hectare	1	9	9	9	--	20
4.	Reasons for using higher seed rate ?						
	i) Home produced seed	1	9	5	5	--	20
5.	Which is the best variety in your opinion ?						
	i) Samrat	1	-	2	3	--	6
	ii) JS-335	-	9	3	2	--	14
6.	Which variety of certified seed is supplied ?						
	i) JS-335	1	9	5	5	--	20
7.	Did you want certified seed ?						
	i) Yes	-	1	1	2	--	4
8.	Why did you not receive the required quantity of certified seed ?						
	i) The certified seed was costly.	5	4	3	2	--	14
9.	What are your views regarding the supply of certified seed ?						
	i) The corporation seed was not good.		1	1	2	--	5
	ii) There was mixture of other varieties in certified seed.		1	2	1	--	4
	iii) The certified seed is not guaranteed		7	2	2	--	11
10.	Suggestions of the farmers.						
	i) The Certified seed should be of good quality.	1	3	3	4	--	11
	ii) The price of certified seed should be low.	-	3	1	1	--	5
	iii) The certified seed should be guaranteed.	-	3	1	-	--	4

3.2.2 Irrigated Area

The total irrigated area of the selected farms was 79.715 hectares. This formed 71.40 per cent of the operated area. On the participant farmers irrigated area formed 50.96 per cent and on non-participant farms, 88.15 per cent. On the participant farms 92.89 per cent was commanded by wells and 7.11 per cent by other sources. On the non participant farms wells commanded 82.04 per cent and canals, 10.48 per cent. Other sources had 7.48 per cent of the irrigated area (Table 3.9).

3.2.3 Cropping Pattern

The gross cropped area of the selected farms was 190.147 hectares. Soybean occupied the highest percentage (42.24) of the gross cropped area. Gram occupied 25.46 per cent and wheat, 22.77 per cent.

On participant farms the area under soybean 31.70 per cent. This was lower than the percentage on non-participant farms (48.33 per cent). On the other hand gram occupied higher percentage (35.54) than non-participant farms (19.64). Wheat had lower percentage (17.59) on participant farms than the non participant farms (25.76). Thus, participant farms had higher percentage of area under gram than non-participant farms. On the other hand non-participant farms had larger percentage of area under wheat and soybean.

The cropping pattern was more diversified on participant farms than the non-participant farms. It was observed that jowar, moong and batri were grown by participant farms only. Further, arhar was grown on much larger area on participant farms. Urad was grown by only marginal farmers on non-participant farms. It may also he mentioned that participant farmers did not grow paddy (Table 3.10).

3.2.4 Sources of Seed

3.2.4.1 Narsingpur District Participant farms

The total quantity of seed used on the participant farms was 7516.300 kilograms. Of this quantity half of the quantity was owned. Another 28.05 per cent was exchanged seed. The quantity of certified seed formed 20.62 per cent.

For the selected crops of soybean, gram, urad, moong, lentil and arhar the total quantity of seed used was 5,757 kilograms. Of this quantity owned seed formed 46.05 per cent, exchanged seed 28.76 per cent and certified seed 23.45 per cent. For the

Table 3.9 Sources of irrigation, selected farms, Narsinghpur district, M.P.

Size group	Participants					Non-partiipants						Total		
	Irrigated area under					Irrigated area under								
	Wells	Other sources	Total irrigated area	Operated area	Percentage of irrigated area to operated area	Wells	Canals	Other sources	Total irrigated area	Operated area	Percentage of irrigated area to operated area	Irrigated area	Operated area	Percentage of irrigated area to operated area
Marginal	2.821	--	2.821	4.630	60.93	2.093	--	--	2..093	3.093	67.67	4.914	7.723	63.63
Small	6.249	1.821	8.070	22.821	35.36	3.238	1.619	--	4.857	7.487	64.87	12.927	30.308	42.65
Semi-medium	9.869	--	9.869	17.964	54.94	8.904	4.048	--	12.952	13.356	96.98	22.821	31.320	72.86
Medium	4.856	--	4.856	4.856	100.00	20.032	--	4.047	24.079	27.317	88.15	28.935	32.173	89.94
Large	--	--	--	--	--	10.118	--	--	10.118	10.118	100.00	10.118	10.118	100.00
Total	23.795 (92.89)	1.821 (7.11)	25.616 (100.00)	50.271	50.96	44.385 (82.04)	5.667 (10.48)	4.047 (7.48)	54.099 (100.00)	61.371	88.15	79.715	111.642	71.40

Table 3.10 Cropping pattern, Narsinghpur District, M.P.

(Area- Hectares)

Crops	Participants					Non-participants						Total
	Marginal	Small	Semi-medium	Medium	Total	Marginal	small	Semi-medium	Medium	Large	Total	
Paddy	--	--	--	--	--	0.183 (4.37)	1.416 (9.46)	--	0.607	--	2.206 (1.83)	2.206 (1.16)
Jowar	0.555 (8.10)	0.816 (2.96)	0.540 (2.12)	--	1.911 (2.75)	--	--	--	--	--	--	1.911 (1.01)
Wheat	0.609 (8.88)	3.743 (13.57)	3.644 (14.32)	4.249 (17.59)	12.245 (17.59)	1.093 (26.11	5.868 (39.19)	8.903 (33.33)	9.922 (18.23)	5.262 (26.00)	31.048 (25.76)	43.293 (22.77)
Gram	3.016 (44.00)	11.042 (40.05)	10.070 (39.56)	0.607 (6.24)	24.735 (35.54)	--	1.214 (8.11)	1.619 (6.06)	15.985 (29.36)	4.856 (24.00)	23.674 (19.64)	48.409 (25.46)
Urad	0.075 (1.09)	0.202 (0.73	--	--	0.277 (0.40)	0.404 (9.65	--	--	--	--	0.404 (0.34)	0.681 (0.36)
Moong	0.075 (1.09)	0.202 (0.73)	0.283 (1.11)	--	0.560 (0.80)	--	--	--	--	--	--	0.560 (0.29)
Lentil	--	--	0.404 (1.59)	--	0.404 (0.58)	--	0.405 (2.70)	0.810 (3.03)	1.214 (2.23)	--	2.429 (2.01)	2.833 (1.45)
Arhar	0.300 (4.38)	3.577 (12.97)	2.213 (8.69)	--	6.090 (8.75)	0.500 (11.95)	--	--	--	--	0.500 (0.41)	6.590 (3.47)
Batri	--	--	0.810 (3.18)	--	0.810 (1.16)	--	--	--	--	--	--	0.810 (0.48)
Sunflower	--	--	--	--	--	--	--	2.024 (7.58)	--	--	2.024 (1.68)	2.024 (1.06)
Soybean	2.225 (32.46)	7.485 (27.15)	7.488 (29.42)	4.865 (50.05)	22.053 (31.70)	2.006 (47.92)	6.071 (40.54)	13.356 (50.00)	26.710 (49.05)	10.118 (50.00)	58.261 (48.33)	80.324 (42.24)
Vegetables	--	0.506 (1.84)	--	--	0.506 (0.73)	--	--	--	--	--	--	0.506 (0.27)
Gross cropped area	6.855 (100.00)	27.573 (100.00)	25.452 (100.00)	9.721 (100.00)	69.601 (100.00)	4.186 (100.00)	14.974 (100.00)	26.712 (100.00)	54.438 (100.00)	20.236 (100.00)	120.546 (100.00)	190.147 (100.00)

(Figures in parentheses indicate percentage to gross cropped area)

crops other than the selected crops the quantity of seed used was 1759.00 kilograms. Of this 62.92 per cent was owned seed, 25.69 per cent exchanged seed and 11.37 per cent certified seed (Table 3.11).

Participants

Table 3.11 Sources of seed supply Narsinghpur District, M.P.

(Quantity - Kg.)

Crop/Variety	Owned	Exchanged	Borrowed	Purchased		Total
				Certified	From Others	
Soybean						
JS-335	1,295.00	1,070.00	--	--	--	2,365.00
Patel-85	--	--	100.00	--	--	100.00
JS-71-44	450.00	--	--	--	--	450.00
Total Soybean	1,745.00 (59.86)	1,070.00 (36.71)	100.00 (3.43)	--	--	2,915.00 (100.00)
Gram						
JG-315	815.00 (33.47)	270.00 (11.09)	--	1,350.00 (55.44)	--	2,435.00 (100.00)
Gram (Focal)	--	310.00	--	--	--	310.00
Total Gram	815.00 (29.69)	580.00 (21.13)	--	1,350.00 (49.18)	--	2,745.00 (100.00)
Urad	10.00 (90.91)	1.00 (9.09)	--	--	--	11.00 (100.00)
Moong	15.00 (93.75)	1.00 (6.25)	--	--	--	16.00 (100.00)
Lentil	15.00 (100.00)	--	--	--	--	15.00 (100.00)
Arhar	51.00 (92.73)	4.00 (7.27)	--	--	--	55.00 (100.00)
Total Selected crops	2,651.00 (46.05)	1,656.00 (28.76)	100.00 (1.74)	1,350.00 (23.45)	--	5,757.00 (100.00)
Jowar	12.00	2.00	--	--	--	14.00
Wheat						
Lok-1	55.00	200.00	--	--	--	255.00
W.H.147	260.00 (56.52)	--	--	200.00 (43.48)	--	460.00 (100.00)
Wheat Local	700.00	250.00	--	--	--	950.00
Total Wheat	1,015 (60.96)	450.00 (27.03)	--	200.00 (12.01)	--	1,665.00 (100.00)
Batri	80.00	--	--	--	--	80.00
Tomato	--	--	--	--	0.300	0.300
Other Crops	1,107.00 (62.92)	452.00 (25.69)	--	200.00 (11.37)	0.300 (0.02)	1,759.300 (100.00)
Grand Total	3,758.00 (50.00)	2,108 (28.05)	100.00 (1.33)	1,550.00 (20.62)	0.300 0.003	7,516.300 (100.00)

3.2.4.2 Narsinghpur District, Non-participant Farms

On the non participant farms the total quantity of seed used was 126.90 kilograms. Of this owned seed formed 92.83 per cent, exchanged seed 5.59 per cent and seed from other sources 1.58 per cent (Table 3.12).

Non-participants

Table 3.12 Sources of seed supply Narsinghpur district, M.P. 1997-98

(Figures- Kilogram)

Crop/variety	Owned	Exchanged	Borrowed	Purchased		
				Certified	From Others	Total
Soybean	10.20	2.80	--	--	--	13.00
90-41	(78.46)	(21.54)				(100.00)
Patel-85	2.85	--	--	--	--	2.85
	(100.00)					(100.00)
72-44	1.60	1.20	--	--	--	2.80
	(57.14)	(42.86)				(100.00)
JS-335	38.30	--	--	--	2.00	40.30
	(95.04)				(4.96)	(100.00)
Total soybean	52.95	4.00	--	--	2.00	58.95
	(89.82)	(6.79)			(3.39)	(100.00)
Gram	2.00	--	--	--	--	2.00
Ujjain	(100.00)					(100.00)
Desi	4.00	--	--	--	--	4.00
	(100.00)					(100.00)
JG-315	20.90	--	--	--	--	20.90
	(100.00)					(100.00)
Total Gram	26.90	--	--	--	--	26.90
	(100.00)					(100.00)
Urad	0.05	--	--	--	--	0.05
	(100.00)					(100.00)
Lentil	0.61	0.20	--	--	--	0.81
	(75.31)	(24.69)				(100.00)
Tur	0.04	--	--	--	--	0.04
	(100.00)					(100.00)
Sunflower	0.40	--	--	--	--	0.40
	(100.00)					(100.00)
Wheat	3.30	0.60	--	--	--	3.90
Desi	(84.62)	(15.38)				(100.00)
Loke-1	30.50	1.90	--	--	--	32.00
	(95.31)	(4.69)				(100.00)
Sujata	1.40	--	--	--	--	1.40
	(100.00)					(100.00)
W.H.147	0.40	--	--	--	--	0.40
	(100.00)					(100.00)
Total Wheat	35.20	2.50	--	--	--	37.70
	(93.37)	(6.63)				(100.00)
Paddy	1.65	0.40	--	--	--	2.05
	(80.49)	(19.51)				(100.00)
Grand Total	117.80	7.10	--	--	2.00	126.90
	(92.83)	(5.59)			(1.58)	(100.00)

3.2.5 Experiences of Selected Farmers

3.2.5.1 Participants of Narsinghpur District

All the participant farmers used JG-315 variety of gram. This was the variety which was supplied in the district. All the farmers knew that the recommended seed rate of the variety was 80 kilograms per hectare. However, only 16 per cent of them used the recommended seed rate. The remaining 84 per cent farmers used more than the recommended seed rate. The reasons for the use of higher dose than recommended were;

(i) Weevilled grains
(ii) Admixture of other varieties
(iii) Late sowing and
(iv) Sowing in dry conditions

In the opinion of all the selected farmers variety JG-315 was the most suitable variety. As per decision of the supplying agency a farmer was to be supplied 40 kilograms of certified seed which was good enough for half hectare. Naturally, farmers having larger holdings desired to get more than 40 kilograms but they could not get the desired quantity. Therefore, they used home produced seed or seed obtained in exchange or sown crop other than gram. About the opinion on the certified seed the views were divergent. While one third of the farmers opined that the seed was good and should be supplied in larger quantity. About 10.00 per cent farmers expressed that the seed was infested and rotten, another 10.00 per cent farmers experienced that although the seed was good the climatic conditions in the post sowing period were such that the germination was very little. Yet another 10 per cent expressed that the seed was weevilled and was a mixture with other varieties.

When asked about the suggestions about the improvement following were recounted;

(i) the seed should be uninformly of desired variety without admixture

(ii) seed should be supplied well before the sowing period

(iii) the seed should be low priced

(iv) larger quantity of seed should be supplied.

(v) seed should be pre tested for germination on percentage and free from broken and weevilled seed.

To the question as to when is the seed replaced, majority of formers replied that they changed the seed after two years or whenever they found the seed to be weevilled or diseased (Table 3.13).

3.2.5.2 Non participants of Narsinghpur District

In the opinion of non participants JG-315 variety of gram was most suitable and all of them said that they desired to get the certified seed but could not get. About the ideal certified seed following parametres were mentioned by them.

(i) it should be pure and guaranteed
(ii) it should be available well before sowing
(iii) it should be available at proper price.

Most of them said that by are habitual to charge seed after 3 years (Table 3.14)

3.3 Seed Replacement Ratio (S.R.R.)

The seed replacement ratio is calculated by following formula

$$SRR = \frac{\text{Certified seed used}}{\text{Total seed used}} \times 100$$

On the selected farms of Indore district the SRR for soybean was 43.33 per cent. In Narsinghpur district SRR for gram was 49.18 per cent. However the SRR for the total sample was less. The SRR for Indore district for soybean was 25.33 per cent. The SRR for Narsinghpur district was 48.70 per cent.

.....

Participants

Table 3.13 Knowledge and opinion of the farmers regarding certified seed, Narsinghpur district, M.P., 1997-98

S.No.	Particulars	Marginal (Number)	Small (Number)	Semi-medium (Number)	Medium (Number)	Large (Number)	Total (Number)
1.	Which variety did you use ?						
	1. Gram						
	i) J.G.-315	6	16	7	1	--	30
2.	What is the recommended seed rate ?						
	i) 80 Kg./hectare	6	16	7	1	--	30
3.	What seed rate did you use ?						
	i) Recommended seed rate 80 kg/hectare	--	3	2	--	--	5
	ii) More than the recommended seed rate	6	13	5	1	--	25
4.	Reasons for using higher seed rate						
	i) Weevilled grain	1	1	5	1	--	8
	ii) Mixed seed	2	4	1	--	--	7
	iii) Late sowing	1	4	1	--	--	6
	iv) No irrigation facility	2	2	--	--	--	4
5.	Which is the best variety in your opinion ?						
	i) J.G.-315	6	16	7	1	--	30
6.	Which variety of certified seed is supplied ?						
	i) J.G.-315	6	16	7	1	--	30
7.	What is your requirement of certified seed ?						
	i) As supplied by N.S.C.	3	9	--	1	--	13
	ii) More than the Supplied quantity by NSC	3	7	7	--	--	17
8.	How much quantity of seed did you receive?						
	i) As required	3	9	--	1	--	13
	ii) Less quantity	3	7	7	--	--	17
9.	From where did you receive the remaining quantity of seed ?						
	i) Used Home produced seed	2	2	5	--	--	9
	ii) The seed taken in exchange	1	5	1	--	--	7
	iii) Sown other crops seed : jowar & arhar	--	1	--	--	--	1

10.	Why did you not receive the required quantity of certified seed ?						
	i) The certified seed was in limited quantity.	3	6	5	--	--	14
11.	What is you opinion regarding the certified seed supplied ?						
	i) JG-315 Seed gives higher yield	2	4	1	--	--	7
	ii) Seed was rotten	1	--	--	--	--	1
	iii) Seed germination was good	1	2	--	--	--	2
	iv) The price of certified seed is higher	1	--	1	--	--	2
	v) Farmers purchase in emergency	1	--	1	--	--	2
	vi) Seed certification should be checked and corrected	1	1	1	--	--	3
	vii) Seed was good and it should be easily available.	1	7	1	1	--	10
	viii)The harvesting of gram could not be done as it rained with hail-storm in the months December & January the gram seed rotted in the field the remaining crop was infected by gram caterpillar severely.	--	3	--	--	--	3
	ix) The crop was destroyed.	--	1	--	--	--	1
	x) The larger quantity of seed was required it could not be made available.	--	1	--	--	--	1
	xi) J.G.-315 seed is good, high yielding but due to hail-storm seed was rotten and and the entire crop was destroyed..	--	1	--	--	--	1
	xii) The seed should be given at proper time of sowing.	--	1	--	--	--	1
	xiii) There should not be any mixture in the seed.	--	1	--	--	--	1
	xiv)The seed given was weevilled costly and grains were smaller.	--	--	2	--	--	2

	xv) Poor germination and lesser branching was observed in the plants.	--	--	1	--	--	1
12.	Suggestions of the farmers :						
	i) The seed given should be of good quality	1	--	--	--	--	1
	ii) The seed certification should be checked	1	1	2	1	--	5
	iii) The seed should be supplied at proper time of sowing.	1	1	2	--	--	4
	iv) The seed should be given at proper price.	1	1	1	--	--	3
	v) The seed was good and larger quantity should be given.	1	5	2	--	--	8
	vi) The germination percentage was good.	--	1	--	--	--	1
	vii) The certified seed of other pulses varieties should also be given in larger quantities.	--	1	--	--	--	1
	viii) The certified seed should be given as per timely requirement and soil type.	--	1	--	--	--	1
	ix) The certified seed is good in germination and gives higher yield.	--	--	1	--	--	1
	x) The certified seed should be pure, sieved and of proper size.	--	--	1	--	--	1
	xi) There should not be weevilled grains and certification should be proper.	--	--	1	--	--	1
13.	When do you replace the certified seed ?						
	i) In one year	--	3	--	--	--	3
	ii) In two years	--	3	1	1	--	5
	iii) More than two years	1	4	2	--	--	7
	iv) When crop is infected with diseases the farmers replace the seed.	1	3	3	--	--	7
	v) Never change the seed.	4	2	--	--	--	6

Non-participants

Table 3.14 Knowledge and opinion of the farmers regarding certified seed, Narsinghpur district, M.P., 1997-98

S.No.	Particulars	Marginal (Number)	Small (Number)	Semi-medium (Number)	Medium (Number)	Large (Number)	Total (Number)
1.	Which variety did you use ?						
	i) Local gram	–	1	1	5	1	8
2.	Which is the best variety in your opinion.						
	Gram i) J.G.-315	–	2	3	5	1	11
3.	Did you want certified seed ?						
	i) Yes	–	3	2	5	1	11
	ii) No	4	2	3	–	–	9
4.	What are your views regarding the supply of certified seed ?						
	i) The corporation seed was not good.	3	5	5	5	1	19
	ii) There was mixture of other varieties in certified seed.	1	–	–	–	–	1
	iii) The certified seed is not given at proper time of sowing.	1	–	–	–	–	1
5.	Suggestions of the farmers.						
	i) The certified seed should be of good quality.	4	1	–	–	–	5
	ii) The certified seed should be given at low price.	–	3	5	5	1	14
	iii) The certified seed should be guaranteed.	–	1	–	–	–	1

CHAPTER IV

LINKAGES BETWEEN DIFFERENT SEED PRODUCING AGENCIES, MONITORING AND SUGGESTIONS

The State Agriculture Department and M.P. State Seeds and Farms Development Corporation are mainly concerned with production and distribution of quality seeds. In this chapter linkages between the production of breeders' seed, foundation seed and certified seed are studied.

4.1 Breeders' Seed

Breeders' seed is the first stage of production of seed. High genetic purity in breeders seed is essential as even small amount of mistaken genetic identity will be greatly magnified to certified seed. The State Agricultural Universities located at Jabalpur and Raipur produce breeders' seed besides other institutions. The breeders' seed plot is monitored by a team of specialists consisting of Senior Scientist, Breeder, representative of State Seed and Farms D.C., State Seed Certification Agency and Department of Agriculture. However, the State Government can not procure the breeders' seed from the Universities. The State Government assesses the requirement of certified seed. From the requirement of certified seed the requirement of foundation seed is assessed. Lastly on the basis of requirement of foundation seed the demand for breeders seed is assessed cropwise and variety wise and submitted to the Ministry of Agriculture, Govt. of India, New Delhi in January and August.

To assess the demand for different types (certified, foundation and breeders' seed) of seed a meeting is convened by the State Government every year. In this meeting officials of concerned departments and institutions like State Agricultural Universities, State Agricultural Marketing Federation, National Seed Corporation, Farmers' Association, M.P. State Seeds and Farms Development Corporation etc. participate.

While putting up the demand for cropwise and varietywise certified seed factors like capacity of the state farms and farms of the M.P. State Seeds & F.D.C. for producing foundation seed, demand for foundation seed, and seed replacement ratio etc. are considered. Breeders' seed to the state is also allotted from other states.

While putting up the demand for cropwise and varietywise certified seed factors like capacity of the state farms and farms of the M.P. State Seeds & F.D.C. for producing foundation seed, demand for foundation seed, and seed replacement ratio etc. are considered. Breeders' seed to the state is also allotted from other states.

After the allotment the breeders' seed is lifted by state department of agriculture. Many a times the entire breeders seed is not lifted.

The figures for lifting of breeders seed against allotment have been given in the earlier chapters. The reasons for not lifting of entire quantity of allotted seed have also been narrated in earlier chapters.

These problems can be solved by proper planning and more importantly by better coordination between breeder's seed producing agencies and foundation seed producing agencies and the state department of agriculture.

4.2 Foundation Seed

This is the second stage in the linkage. The foundation seed is produced by state department farms and the farms of M.P. State Seeds & F.D.C., etc. Frequent visits to the farms by concerned authorities are needed specially at the time of sowing, harvesting and processing.

The demand and supply gap in foundation seed has already been described. The reasons for demand supply gap are : natural calamities like rainfall (shortage and excess), lower seed multiplication ratio (SMR), pests and diseases, shortage in availability of breeders' seed and above all farm management efficiency.

4.3 Certified Seed

This is the third and final stage in linkage. The M.P. State Seed Certification Agency and seed testing laboratories are mainly concerned with certified seed production besides the certified seed growers. Certified seed production must not exceed two generations beyond foundation seed so as to maintain genetic purity and identity.

At the certified seed farmer's level factors like availability of infrastructure facilities like irrigation, equipments, fertilisers pesticides seed storage facilities, seed multiplication ratio (SMR) etc. contribute to the success or failure besides factors

1) grown in a field which satisfied the prescribed land requirement as to previous crops to prevent contamination by volunteer plants and disease spread by pathogens.

2) raised from seed whose source is approved

3) provided with the prescribed isolation

4) properly rogued

5) harvested properly to avoid mechanical admixure

The demand and supply gaps in certified seed have been described earlier, so also the reasons for the gaps. We have also observed that private agencies have entered the market of certified seed in a big way.

4.4 Monitoring of Seed Supply

Monitoring of certified seed supply is done by the State Department of Agriculture in close coordination with M.P. State Seeds and F.D.C. and M.P. State Seed Certification Agency alongwith seed testing laboratories. The extent of achievement of SRR prescribed by Ministry of Agriculture can be termed as one of the indications of extent of monitoring. It was observed that SRR in most of the crops was lower in the state. However, in some crops the progress has been considerable indicating satisfactory monitoring. The reasons for non achieving of SRR were weather and soil conditions. The officials of the state department of agriculture go to the extent of asking the farmers to use their own seed or shift to other crops/ varieties in the event of non availability of seed of the desired variety.

However, defective management of seed multiplication at different stages is not completely ruled out.

In the chain of supply of seed time factor is very important. Time gap between placement of indent and supply of seed, or late lifting of seed, and late supply of foundation seed to growers affect production.

The selling points of certified seed should be near to the villages. Farmers hesitated to go to far away selling points to avoid transportation cost. The subsidy offered by government should be increased.

Due to lack of proper communication and coordination between producing and supplying agencies many varieties do not get popularity. Two fulfledged meetings are convened at the state headquarters to review the production and distribution of various kinds of seeds and plan for next year. All the concerned departments divisions/institutes/universities are invited to attend these meetings.

We suggest that the meetings be more frequently held so that all the participants in the meeting would know the stage and condition of the selected crops in between sowing and harvesting.

In addition to above mentioned state level meetings workshops and seminars be arranged of 2 to 3 days duration at different seed production units so that all concerned get the first hand knowledge of crop conditions in particular division of the state.

Two meetings are held at all India level at New Delhi. These meetings serve as tool to monitoring the programme in different states. We suggest that additional meetings, seminars and workshops be held so that scientists of a state know more about the programme implemented in other states and also get the knowledge, seed production techniques used by their counterparts in other states.

4.5 Suggestions

In the process of seed production attention must be paid to maintenance of genetic purity and other qualities of the varieties. The crop varieties are being grown under different environmental influences with regard to ecological conditions. It is essential to go for rogueing operations. It is essential to maintain the genetic purity of seed stock in large scale multiplications and ensuring conformity to the original types. One has to retain the relationships of small amount of nucleus seed with that originally selected by plant breeders and the certified seed marketed to the farmers. The entire seed production programme should be in the hands of qualified plant breeders and highly skilled technical personnel. Genotype x environment interaction may also affect the maintenance of genetic purity of a variety. If the crop varieties are grown in environment other than that where varieties have been selected will affect the genetic purity of variety. Environment also has major effect on population behaviour and varietal maintenance. The factors influencing fast progress of seed sector are following.

1. Administrative Coordination

The Director of Agriculture should act as a nodal officer for the state. He should have a control of public and private agencies involved in seed industry. Fortnightly meetings should be arranged with all the agencies to discuss production, marketing, availability and distribution of seeds of all crops. The indented quantities of breeder/foundation seed should be available to private sector with the condition that the seed would be multiplied and sold in the state itself. Changes in governments and personnel resulted in new policies and strategies which weakned the seed sector.

There is a need for closer coordination between plant breeders, scientists of crop research, extention officials, leaders of farmers' organisations, Managers of Seed Corporations, Oil Federation, Certification Officers, Seed Growers, Seed retailars and farmers.

2. Varietal Replacement

Varietal replacement component is very weak in crops like wheat, paddy, maize, etc. There is need to bring awareness among farmers with respect to recently released varieties. There is need for the production of identified varieties before their release and notification. In the normal course, after identification, varieties are released and notified. The seed production chain starts from the purification of improved varieties to meet the seed certification standards of genetic purity. Later on nucleus, breeder, foundation and certified seeds are produced. The variety development programme itself requires minimum 10 to 13 years. The breeder pays more attention to the development of variety and its released but not to the genetic purity of the variety that is being given for the production of breeder seed. Permature release of varieties creates problem in seed production chain.

3. Personnel Development and Training Alternatives

Human resource development is the most important factor in strengthening the seed sector. Attention must be paid to the selection of people for their training.

The seed sector needs physical, financial and human resources to grow and develop.

Steps to be taken by Madhya Pradesh Government

A strong support is needed from the State Govt. to develop a dynamic seed sector. Crop research can strengthen or weaken a seed sector.

Following steps be taken -

(1) Develop a quick system for release and introduction of new varieties

(2) Detailed description be given of varieties under seed production chain

(3) Early exchange of germ plasm with other states, countries, etc.

(4) Import of best planting material for testing and multiplication

(5) Increased cooperation with private seed sector in crop research to deal with specific problems

(6) Seed Replacement Rates :

The seed replacement rates fixed by the experts group is up to 15% and for hybrids, 100%, National Commission on Agriculture fixed the target of seed replacement rate of 33% and for hybrids 100%. However, the seed replacement rate for M.P. is miserably low in all the crops. Efforts should be made to increase the seed replacement rates in all the major crops. This will increase production and productivity.

(7) The Conversion factor :

The conversion factor of breeder seed to certified seed is extremely low for majority of crops for Madhya Pradesh. There is need to increase the conversion factor so that the valuable breeder seed is properly utilised and reaches the farmers in adequate quantities. The low seed multiplication rates at the level of foundation/certified seed will create recurring short falls in in the seed distribution.

(8) Make available breeder seed to seed multipliers

(9) Good technical (extension) support to all concerned by imparting training

(10) Favourable credit for infrastructure and working capital

(11) Leasing of equipments and storage facilities

(12) Increasing the use of good seed of improved varieties requires coordination among research, extension and seed sector.

(13) The pricing of seed is critical for the better use of seed. The most successful method of pricing of seed includes all costs of production and allow for profits so that industry can invest for its growth.

(14) Inadequate financial support to seed sector results in weak programme and low staff moral. There is need to establish review teams representing all facets of seed sector. These review teams should develop long term plans for seed sector so that goals can be set and measures to achieve the goals can be planned. The measures become the policy quidelines. Review teams should assess the seed programme from time to time and make recommendations.

(15) Seed programme often suffers from lack of continuity in goals policies and strategies. This weakness results from changes in the government or changes in personnel. There is no basic/fundamental structure to assure needed continuity such as State Seed Board. This should be established.

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CHAPTER V

SUMMARY AND CONCLUSIONS

5.1.1 Seed is the most important input in the production of crops. A good quality seed helps to increase the productivity by 20 per cent. Even after many efforts of the Government, the seed replacement ratio remained low in many crops in most of the regions of the country. A good seed should be pure with highest sowing quality and high germination rate, uniform growth and maturity. According to one classification the seed is of three types :

(i) Breeder's seed
(ii) Foundation seed, and,
(iii) Certified seed

While the breeder's seed is produced by the farm scientists from nucleus seed, the foundation seed is produced by multiplication of breeder's seed. Certified seed is produced by multiplication of foundation seed by seed grower farmers.

5.1.2 For 1998-99 the Technology Mission on Oilseeds and Pulses (TMOP) approved a total outlay of Rs.134.60 crores for Oilseeds Production Programme (OPP). During the same year an outlay of Rs.46.80 crores for National Pulses Development Project (NPDP) was approved. In allocation of both the programmes Madhya Pradesh State had highest share. For Oilseeds Production Programme, the componentwise allocation showed that largest share was for distribution of sprinklers sets. As a group of different components, seed component group shared second highest amount. The picture was similar for the state of Madhya Pradesh.

For NPDP the componentwise distribution showed that seed component claimed highest amount of 40.46 per cent. The distribution of sprinklers sets was the second important component.

5.1.3 Inspite of many efforts made under Centrally Sponsored Scheme the availability of quality seeds remained a problem. The crops for which the problem was particularly noticed were groundnut, soybean and sunflower among oilseeds and gram, lentil, arhar, moong and urad in pulses. The objectives of the study were the following.

i) To find out the reasons for short supply of certified / quality seeds in oilseeds and pulses.

ii) To find out the demand supply gap in the requirement and availability of seeds of oilseeds and pulses variety wise in the concerned state.

iii) To establish the proper linkages between the breeder's seed producing agencies/ ICAR/SAUs and foundation seed producing agencies in the concerned state as also the central agencies like NSC and SFCI.

iv) To study whether proper monitoring and evaluation is done to strengthen the chain of breeder's seed to foundation seed and from foundation seed to certified seed.

The crops to be considered were 3 oilseeds and 5 pulses.

For the field work the districts were suggested by TMOP who sponsored the study. In Madhya Pradesh Indore district was selected for oilseeds, mainly for soybean and Narsinghpur district for pulses mainly for gram.

In each selected district two development blocks were selected. One of the two blocks was such which had larger number of farmers having obtained certified seed. The second block was one which had no farmer or lesser number of farmers obtaining certified seed. From the former block 3 villages were selected and from the latter 2 villages were selected. From each village 10 farmers were selected by stratified random sample.

Thus, we had 30 farmers using certified seed and 20 farmers not using certified seed. Thus, in each district a sample of 50 farmers (30 participants and 20 non-participants)were selected.

The reference year for the field data was the year 1997-98.

5.2.1 Madhya Pradesh is the largest state of India with an area of 4,43,482 square kilometres. The population of the state as per 1991 census was 6,61.81.170 or 7.82 per cent of the country's population. It has rural population of 76.82 per cent against the country's percentage of 74.29. The

density of population is 149 persons per square kilometre. It has a lower literacy percentage of 35.45 against the country's average of 42.90. The percentage of tribal population in the state is 23.68, much higher than the country's average of 8.01 per cent. Of the total geographical area 44.7 per cent was net area sown, 2.1 per cent lower than the country's average. Of the gross cropped area 24.6 per cent was irrigated, much lower than the country's average of 37.5 per cent. The cropping intensity of the state was126 per cent, lower than the country's average of 131 per cent. The consumption of fertiliser was quite low (39.19 kg./hectare of cropped area) as compared to76.75 kg./hectare for the country.

Paddy and wheat, the main crops of the state have far lower yields per hectare as compared to the average for the country. Cash crops like groundnut, soybean, cotton and sugarcane have also lower yields in the state as compared to the country.

The reasons for low productivity of crops are following :

1. Low percentage of area under irrigation.

2 Low fertiliser offtake, more so, in the rainfed areas.

3. Low percentage of area under high yielding varieties.

4. Inadequate adoption of recommended practices by farmers for both irrigated as well as dryland agriculture.

5. Large population of tribals who do not adopt any improved technology. For this class of farmers agriculture is only secondary occupation, collection and sale of forest produce being main occupation.

The soils of the state are low to medium in available nitrogen and phosphorus and medium to high in available potassium. Among the sources of irrigation minor irrigation sources like wells and tubewells and stop dams were more important. Paddy and wheat were the most important irrigated crops of the state.

The cropping pattern of the state had following features.

(1) It was highly food crops oriented with as high as 71.4 per cent area under food crops.

(2) Kharif crops occupied 60 per cent and rabi crops, 40 per cent.

(3) Rice occupied 21.1 per cent and wheat 16.9 per cent. Jowar covered 3.6 per cent. Gram was the important pulse occupying 9.8 per cent. Oilseeds claimed 23.4 per cent.

5.2.2 In 1996-97 the total quantity of breeder's seed indented was 499.49 quintals. Against this the quantity allocated was 391.55 quintals or a demand supply gap of 21.61 per cent. The quantity lifted was 2,697.72 quintals. Thus, the gap was negative between quantity indented and quantity lifted. The demand between the quantity lifted and, quantity allocated was negative. The position with respect to different crops was that no quantity was indented or allocated for groundnut, soybean and lentil. In the case of sunflower and gram the quantity lifted was less than the quantity indented. In the case moong there was no demand supply gap between the quantity indented or allocated.

In the case of sunflower indents were placed for four varieties. There was no demand supply gap as the quantities indented and allocated were same. The entire quantity indented was lifted. In the case of soybean no quantity was indented or allocated. A total quantity of 2,204.18 quintals was lifted from different sources. In the case of groundnut there was no demand supply gap as no quantity was indented or allocated. In the case of gram in five varieties the quantity indented and allocated was equal and there was no demand supply gap. In another three varieties there was neither quantity indented or allocated and therefore there was no gap. In the case of urad wide gap existed between demand and supply in variety TPU-4. In variety T-9 the demand supply gap was only 2.27 per cent. In moong there was no demand supply gap in variety K-851. In variety JM-721 there was no quantity indented or allocated. In lentil no quantity was indented or allocated for two varieties. In arhar there was neither indent nor allocation for two varieties. In another two varieties the quantities indented or allocated were same and there was no gap.

To sum up the demand supply gap between the quantity indented and quantity allocated was 21.61 percent. The quantity lifted was more than quantity indented and allocated. In sunflower however the quantity lifted was less than quantity indented and allocated. In the case of groundnut, soybean and lentil no quantity was indented or allocated.

5.2.3 In 1997-98 the demand supply gap between quantity indented and allocated was 37.67 per cent. The gap between quantity indented and lifted was 40.18 per cent and that between quantity allocated and lifted was 5.53 per cent. In the case of urad moong and arhar no quantity was either indented or allocated. In sunflower the quantity indented, quantity allocated and quantity lifted was same (2.00 quintals). In all other crops quantity allocated was less than the quantity indented.

In soybean for variety JS-76-205 there was no indent or allocation. In the case of varieties MACS-13 and Durga the quantities indented and allocated were same. In all the remaining varieties there was wide gap between quantity indented and allocated. In groundnut there was no indent or allocation in two of the three varieties. In variety SB-11 the gap between quantity indented and allocated was 50 per cent. In gram for five varieties there was no quantity either indented or allocated. In another three varieties the quantities indented was equal to quantities allocated. The demand supply gap was widest in variety Radhey and narrowest in variety Phule-G-5. In none of the varieties in urad any quantity was either indented or allocated. However, some quantities of these varieties were lifted. In moong for variety K-851 no quantity was either indented or allocated. In lentil the demand supply gap for variety K-75 was 90.00 per cent. For variety JL-1 and Mallika no quantity was indented or allocated. In arhar no quantity was indented or allocated for any of the six varieties. However, some quantity was lifted for each of these varieties.

5.2.4 The demand supply gap for foundation seed in 1996-97 was 21.68 per cent. For moong, lentil and arhar the demand supply gap was in the negative i.e. the quantity available was more than the required. In sunflower the estimated requirement and quantity available was same (20.00 quintals). In soybean the demand supply gap was 15.81 per cent. In the case of six varieties the quantity available was more than the quantity estimated. In groundnut the demand supply gap for variety JL-24 was 55.00 per cent. In variety J-11 the quantity available was more than the required. In gram the demand supply gap was 61.14 per cent. The gap varied between 33.25 per cent to 70.00 per cent. In the case of five varieties no quantity was available although there was estimated requirement. In lentil for variety JLS-1 the quantity available was higher than the quantity required. However, in the case of variety K-75 the demand supply gap was as high as 90.53 per cent. In the case of arhar in four out of five varieties quantity available was more

than the quantity required. In one variety no quantity was available against the required quantity of 2.00 quintals.

5.2.5 In 1997-98 in the case of foundation seed the demand supply gap was48.41 per cent. Sunflower had the narrowest gap and gram had widest gap. Soybean had 47.26 per cent gap. In the remaining five crops quantity available was more than the quantity required.

In soybean in seven out of 16 varieties although there was requirement of seed no quantity was available for distribution. In five varieties the demand supply gap ranged from 45.10 per cent to 95.20 per cent. In three varieties the quantity available was more than the quantity required. In groundnut for variety J-11 the requirement was 18.80 quintals but there was no quantity available. For variety JL-24 the quantity available was more than the quantity required. In the case of gram the demand supply gap was 60.74 per cent. Among varieties the gap existed in eight of the fifteen varieties. In five varieties although there was requirement no quantity was available. In the case of urad the quantity available was more than the quantity required. The surplus existed in varieties T-9, JU-2, and JU-3. In variety WB-4-108 the demand supply gap existed to 9.91 per cent. In the case of moong the quantity available was more than the quantity required for two varieties. In the remaining two varieties the quantity available and quantity required was equal. In lentil while the quantity available was more than the requirement in variety JL-1, in the case of variety Mallika no quantity was available against the requirement of 80.00 quintals. In the case of arhar the quantity available was more than the estimated requirement. Thus, the position was quite comfortable. Of six varieties the demand supply gap existed only in two varieties.

5.2.6 In 1996-97 the demand supply gap for certified seed for the state was 33.17 per cent. The percentage of demand supply gap between quantity required and quantity distributed was 37.71 per cent. Nearly the entire quantity available was distributed. The percentage of demand supply gap was narrowest (0.52) in the case of gram and widest (85.30) in the case of moong. The gap was 81.72 per cent for sunflower, 62.72 per cent for lentil, 41.15 per cent for urad and 38.39 per cent for soybean. It will thus be observed that demand supply gap existed in all the crops except gram. Similarly, the demand supply gap between quantity required and quantity distributed existed in all the crops. In sunflower the demand was for variety Morden, in soybean the demand supply gap was narrowest in variety MACS-58 and widest in variety JS-71-05. In two varieties quantity available was

more than the required. In groundnut for variety JL-24 the demand supply gap was 44.05 per cent. In another variety SB-11 there was no demand supply gap. In gram the demand supply gap was highest (99.00 per cent) for variety ICCV-2. It was observed that the varieties for which significant quantities were distributed were JG-315, Ujjain-21 and JG-74. In urad demand supply gap existed in varieties T-9 and PU-30. In moong demand supply gap existed for both the varieties K-851 and Pusa Baisakhi. In lentil demand supply gap existed for both the varieties K-75 and JLS-1. However,most of the quantity available was distributed. In arhar the demand supply gap was quite high in two varieties viz. ICPL-87-119 and N-148.

5.2.7 In 1997-98 the demand supply gap for different crops was 38.72 per cent for the state as a whole. The distribution was also not satisfactory as the gap between quantity required and quantity distributed was 46.04 per cent. However, nearly all the available quantity was distributed. The demand supply gap was narrowest (11.65 per cent) in arhar. The gap was widest (76.90 per cent) in sunflower. In soybean the most popular variety was JS-335. For this variety the demand and quantity available were highest. Another variety JS-75-46 was also popular as adequate quantity of this variety was distributed. For groundnut matching quantity was available for distribution in the case of variety JL-24.

In gram maximum seed was distributed for variety JG-315 followed by Ujjain-21 and JG-74. In urad the demand supply gap was quite high in varieties T-9 and PU-30. Matching quantities were distributed for both the varieties. In moong the demand supply gap for variety K-851 was 65.71 per cent. Nearly entire quantity was distributed. In lentil large gap existed in variety K-75. In arhar the demand supply gap was 25.45 per cent in variety ICPL-87. In variety N-148 there was a negative demand supply gap.

5.2.8 In Indore district in 1996-97 there was no demand for sunflower and groundnut seed. The demand was also very little for urad, moong, lentil and arhar. Thus, the demand was for soybean and gram. While the percentage of demand supply gap for soybean was 70.16 that for gram was (-) 18.33. The distribution of seed was also considerable for these two crops. In soybean quantity available for distribution was more than the quantity required in the case of 3 varieties, namely; PK-472, P-1 and JS-75-46. The demand supply gap was 75.91 per cent in the case of variety JS-335. In gram for variety U-21 the demand supply gap was in the negative. In variety JG-315 the gap was 70.00 per cent. In other 3 varieties viz., U-24, PG-5, and Annagiri the

quantity required was 40.00 quintals each. However, no quantity of these varieties was available nor any quantity distributed.

5.2.9 The demand supply gap for 1997-98 in Indore district was 68.50 per cent. For sunflower, groundnut, urad and moong there was no demand nor any quantity available. Similarly the demand for lentil was very little (1.00 quintal) and there was no quantity available for these varieties. For soybean the demand supply gap was 71.12 per cent and that for arhar 70.00 per cent. The demand supply gap for gram was 15.90 per cent. In soybean for four varieties viz ; PK-472, P-1, JS-80-21 and MACS-58 only quantity required was mentioned, No quantity was either available or distributed. In variety JS-75-46 the demand supply gap was 68.00 per cent for JS-335, 44.56 per cent and for JS-71-05, 99.90 per cent. However, nearly entire quantities of these varieties were distributed. In gram for 3 varieties viz ; JG-315, PG-5 and U-24 only the quantity required was mentioned. No quantity was either available or distributed. The demand supply gap was 50.00 per cent in case of Annagiri and 44.29 per cent in the case of U-21.

5.2.10 In Narsinghpur district in 1996-97 the demand supply gap for all the crops taken together was (-) 6.70 per cent. In the case of groundnut there was no quantity required nor available. In urad only quantity required was mentioned. The quantity available and quantity distributed was not mentioned. In the case of soybean, lentil and arhar the demand supply gap was in the negative. The demand supply gap for sunflower was 60.00 per cent. In the case of gram it was 15.79 per cent. In varieties JS-72-44 and JS-71-05, only quantities required were mentioned. Quantities available and quantities distributed were not mentioned. In varieties Punjab-1, MACS-13, and MACS-58 there was no mention of quantities required. In varieties JS-75-46, JS-80-21 and PK-472 the demand supply gap was in the negative. The distribution of available seed was satisfactorily distributed. In gram in four out of five varieties there was no mention of quantity required. In variety JG-315 there was a demand supply gap of 16.67 per cent.

5.2.11 In Narsinghpur district in 1997-98 the demand supply gap was 9.66 per cent. The gap was in the negative in the case of sunflower, gram and lentil. The demand supply gap was highest (96.00 per cent) in urad followed by arhar (28.58 per cent) and soybean (15.45 per cent). In soybean there was demand for varieties Punjab-1 and MACS-13 but there was no quantity available. In the case of variety JS-335 the demand supply gap was in the negative. In other three varieties the gap ranged between 52.00 to 76.00 per cent. In gram maximum demand and quantity available was for JG-315. The

demand supply gap for this variety was in the negative. Another important variety was U-21 for which the demand supply gap was 34.60 per cent. For other two varieties the gap ranged between 66.00 to 88.00 per cent.

5.2.12 Among the reasons of demand supply gap in breeder's seed the important were: Non lifting of indented seed, adverse climatic conditions and lower breeder's seed production of soybean and groundnut. Among the reasons of demand supply gap in foundation seed the most important was low productivity on Govt. Farms and Farms of M.P. State Seeds and Farms Development Corporation. The another reason was that the farms preferred to produce those crops which have higher profitability. Among the reasons of demand supply gap in certified seed the most important was that the farmers change their demand just prior to sowing from the notified varieties to non-notified varieties. The supply of certified seed gets reduced as the production of certified seed is not economical. Moreover, due to low productivity the production gets reduced. The certified seed grower farmers partly sell their produce to other agencies. Due to strict certification process nearly half of the produce of the certified growers is rejected.

5.3.1 In Indore district the average size of participant farm was 3.528 hectares and of non-participant farms 3.107 hectares. The irrigated area formed 90.86 per cent of the operated area. On the participant farms the irrigated area was 88.35 per cent and on non-participant farms 95.13 per cent. Most of the irrigated area was commanded by wells. Soybean was the most important crop contributing 48.31 per cent. The next important crop was wheat which contributed 23.14 per cent. On both participant and non-participant farms soybean and wheat were the most important crops. On participant farms the quantity of certified seed formed 8.94 per cent. And for 3 selected crops of soybean, gram and lentil it was 36.85 per cent. The participant farmers did not use certified seed for entire area of soybean. Of the total seed used for soybean 43.33 per cent was of certified varieties. On non-participant farms 26.51 per cent seed used was owned and the remaining, purchased. For the selected crops of soybean and gram 77.00 per cent was owned seed. Seed of potato and garlic was mainly purchased. All the 30 participants of Indore district used JS-335 variety of soybean. For gram varieties Ujjain-24 and Annagiri were used. Fifty per cent of the farmers opined favourably about variety JS-335. The remaining half of the farmers opined that the variety had lower germination rate, lower flowering and lower pod formation. Among the suggestions were :

Certification Agency and Seed Testing Laboratories. The certified seed farmers should have infrastructure facilities like, irrigation equipments, fertilizers, pesticides and seed storage facilities. Inspection of certified seed is made both in field of standing crops as well as laboratories. Monitoring of certified seed suppliers is done by State Department of Agriculture in close coordination with M.P. State Seeds & FDC and M.P. State Seed Certification Agencies. It was observed that Seed Replacement Ratio (SRR) in most crops was lower in the state. The reasons for low SRR were, weather and soil conditions besides defective management of seed multiplication at different stages. Two fulfledged meetings are convened at the state level to review the production and distribution of various kinds of seeds. We suggest that the meetings should be more frequently held. In addition, workshops and seminars should be arranged at different seed production units of state. Two meetings are held at All India level at New Delhi. We suggest that additional meetings, seminars and workshops be held at all India level. Among the suggestions the first one is regarding maintenance of genetic purity and other qualities of the varieties. It is essential to go for rogueing operations. The seed production programme should be in the hands of qualified plant breeders and highly skilled technical personnel. For the successful seed production programme, the factors responsible are :

i) The administrative coordination,
ii) Varietal replacement and,
iii) Personnel development and training alternatives.

The important steps that might be taken by the Govt. are :

i) Develop a quick system for release and introduction of new varieties
ii) Early exchange of germ plasm with other states, countries, etc.
iii) Import of best planting material for testing and multiplication
iv) Efforts to increase the Seed Replacement Rate
v) To increase the conversion factor of breeder's seed to foundation seed to certified seed.
vi) Technical (Extension) support to all concerned.
vii) Favourable credit for infrastructure, leasing of equipments and storage facilities to certified seed growers.
viii) The better pricing system for certified seed.
ix) Establishment of review teams to assess the seed production programme.