OILSEED PRODUCTION PROGRAMME (OPP) IN KARNATAKA

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CONTENTS

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CHAPTER I

INTRODUCTION

1.1 Introduction

The technological change introduced during mid-sixties ensured significant step up in foodgrain production. Among many features of this phase of growth three prominent aspects are worth noting here. First, unlike the earlier phases of growth, the contribution of growth in productivity was higher than the area expansion in aggregate growth. Second, the change in productivity was confined mainly to paddy and wheat and quite a few important crops were bypassed. Lastly, the change was confined to a few regions and groups of cultivators. These features were noted quite sharply during mid seventies. Serious attention was invited for quick policy intervention to bring the bypassed regions and crop groups in the mainstream growth initiative. Pulses, coarse cereals and oilseeds were the crop groups that caused concern. The problems of these slow growth crops were discussed at various forums and quite a few initiatives were suggested. Following this the Cereal Development Programme, National Pulses Development Programme and National Oilseed Development Programmes were designed and suggested as main policy thrust. An intensive Technology Mission followed this to promote growth of oilseeds and pulses.

1.2 The Initiatives

Technological Mission of oilseed called Oilseeds Production Programme (OPP) was initiated by the Govt of India in May 1986, during 8th five-year plan. The programme was designed to supplement the efforts of the state governments' for increasing the production and productivity of various oilseed crops such as groundnut, rapeseed/mustard, soybean, sunflower, sesamum, castor, safflower, linseed and Niger seeds. The Mission intended to harness the best of technology in production, pricing and management technologies to accelerate self-reliance in oilseeds and vegetable oils by effectively implementing the carefully drawn strategies.

The Technology Mission achieved significant strides at the country level. Area under nine major oilseeds increased from 18.6 million hectares (1986-87) to 26.34 million hectares by 1996-97. Production of oilseeds increased from 11.27 million tonnes (1986-87) to 24.38 million tonnes (1996-97) heralding self-sufficiency in oilseeds. This was also experienced across states in the country and Karnataka was no exception. But probably

this spurt was short-lived and following 1996-97, deceleration was set in the oilseed sectors, growth rates in area, production, and productivity dropped down. The Planning Commission with the aim of doubling the food production assigned a production target of 30 million tonnes of oilseeds by the end of 9th Plan (2001-2002). By proper adoption of strategies, a significant change in oilseed crop sector was observed. The oilseed production increased from 108 lakh tonnes in 1985-86 to 247.3 lakh tonnes in 1998-93.

During the Ninth plan, greater emphasis was laid on the production and distribution of certified/quality seeds of oilseeds in order to enhance the seed replacement rate. Among the few components of crash programme included the supply of quality seeds of groundnut and soybean, augmenting the availability of quality seeds of these crops, the supply of minikits of new varieties, improved production technology, and integrated pest and nutrient management supported with micro-irrigation through sprinkler sets. It was expected that these will help in increasing the production of oilseeds in the country. Oilseed Production Programme was an outcome of this strategy.

The major objectives of the Oilseed Production Programme (termed as Project in the official literature) were: (i) To achieve the targeted increase in the production by expansion of area under oilseeds in different states. This was envisaged to be achieved by introducing oilseeds in intercropping, replacement of low yielding/economy crops with oilseeds, as substitute crop in problematic areas/situation; (ii) To increase the productivity by adoption of improved crop production technologies, particularly through improved quality and variety seed, pre-sowing treatment, usage of bio-fertilizers, pest and weed control; (iii) To identify key areas to provide input supply and support services to motivate farmers by availability of quality seed, educating farmers about pest control methods, on field demonstration of production technologies and giving training to farmers, availability of improved implements and popularize the use of sprinkler irrigation; and (iv) To maintain the existing production trend and to attain self-sufficiency in vegetable oils, production of oilseeds.

1.2.1 Salient features of the project

Integrated Management for production and distribution of seed is in the hands of the State Government in collaboration with the State and Central seed producing Agencies. To ensure supply of quality seed, the State Governments has prepared a Plan indicating requirement of breeder, foundation, and certified seeds for the coming years and ensure their proper multiplication and distribution. Minikits were introduced to take the seeds to the farmers and popularize latest released/pre-released varieties, ensure their propagation. Appropriate infrastructure development facility was undertaken for this purpose. Implementation of crash programme for quality seed production of groundnut and soybean has been provided.

1.3 The Components under OPP

The Oilseed Production Programme has 19 components as listed below:

COMPONENTS
1. Certified seed distribution
2. Seed Village Scheme
3. Distribution of Seed Treatment
4. Organizing Large Scale Demonstration
5. Control of Root grub
6. Supply of Plant Protection Equipment's
7. Supply of Sprinkler Sets
8. Distribution of Gypsum
9. Distribution of Rhizobium Culture
10. Development of Infrastructure
11. Micro Nutrients
12. Input Kits
13. Farmers Training
14. Distribution of Weedicides
15. Demonstration of Pheromone trap
16. Staff and Contingency
17. Distribution of Minikits
18. IPM Demonstration
19. Supply of improved implements

The choice of the component seem to be guided by emphasis on technical parameters more than economic, extension or developmental parameter. If we classify these components by broad philosophy behind these, for building a positive intervention in the crop economy, we get four broad groups. First, there are four components which focus on production and supply of quality seeds viz., Certified Seed Distribution, Seed Village Scheme, Distribution of Seed Treatment Chemicals and Distribution of Rhizobium Culture. Among these Rhizobium culture seem to have better achievements compared

with the other three. It is surprising that the certified seed distribution has only about 44.72 per cent achievement whereas, seed village scheme scores only 19.74 per cent on this count (For details see Table 2.1 and Appendix Tables 3.1 to 3.3). Second, are technological inputs including supply of improved implements, supply of sprinkler sets and other inputs like gypsum, micro-nutrients, input kits and minikits. These components support the production system reducing the cost of cultivation of oilseeds. It is expected that these components also contribute to increment in yield per hectare and at the same time will bring cost of cultivation under control. Third, oilseed crops are infested with pests and diseases. Root grub is one of the largest infestation found among oilseeds. Therefore, Root Grub Control is a specific component under OPP. There are other three components dealing with the control of pests and diseases viz., Control of root grub, provision of plant protection equipments, distribution of weedicides and demonstration of pheromones. The demonstrations of various technologies make a significant difference in their adoption by the farmers. Therefore, the third group includes three components viz., organisation of demonstrations, which include various technologies, IPM and demonstration of Pheromones. Lastly, the infrastructure and additional staff required is dealt under two separate components as logistic support.

1.4 Methodology and selection of the Beneficiaries

The impact of OPP needed to be reviewed at micro level separately for district as well as state level schemes. In order to get the micro level picture we needed specific beneficiary level responses of the state intervention through OPP. The sample survey was planned with a three stage purposive sampling method. The first stage of selection involved the districts to be concentrated upon based on the density of investment across various components. In order to achieve this we obtained the data at secondary level from the state headquarters on various components of OPP. After taking three years averages to iron out the yearly fluctuations we arrived at a list of 14 districts in order to review the components of the OPP project. The first stage of field work was concentrated on seven out of these fourteen districts based on the intensity of the components taking due care that all the components of the scheme are represented. The districts chosen for field work during the first round were Chitradurga, Bellary, Belgaum, Gulbarga, Koppal, Bijapur, Dharwad, and Shimoga. Remaining seven districts viz. Raichur, Hassan, Kolar, Tumkur, Belgaum, Davangere and Bidar were covered during second round. Out of these districts one taluka each was selected again based on the density of investment under

OPP (including state and district sector schemes). After discussing with the officials at the district level, villages having beneficiaries of different schemes were selected in order to ascertain impact of OPP on various components of oilseed economy. List of the selected districts and talukas is given below:

Table 1.1: Spread of the Sample Beneficiaries and Non beneficiaries

Sl. No.	Districts	Talukas	Villages	No. of Beneficiaries Selected	No. of Non-beneficiaries selected
1.	Bijapur	Bijapur	Babaleshwar Sarwad	4 6	5
2.	Bellary	Kudaligi	Hosahalli	10	5
3.	Chitradurga	Chitradurga Challakere	Kunabehu Belgatta Doddahullarthi	1 2 7	5
4.	Dharwad	Dharwad	Garag	10	5
5.	Gulbarga	Gulbarga	Hagaraga K Nandur	9 1	5
6.	Koppal	Koppal	Irakalagad Muthagal Dadgal Hanumanahatti Gunnahalli Kolur	3 1 2 1 1 2	5
7.	Shimoga	Soraba	Haleshoraba Mallapur	6 4	5
8.	Raichur	Maneri	Neeramani Madagiri	8 2	5
9.	Hassan	Arsikere	Haranahalli	10	5
10.	Kolar	Bagepally	Kangamanakalpalli	10	5
11.	Tumkur	Pavagada	Gujjanur C.H. Pallya A.H. Pallya K.H.Pallya	5 2 2 1	2 3
12.	Belgaum	Bilahongala	Vannur	10	5
13.	Davangere	Jagalur	Siddihalli Diddihalli	9 1	5
14	Bidar	Balki	Gorachincholli Kottigera	8 2	5
15.	Total			140	70

Structured questionnaire was prepared and canvassed among the beneficiaries in order to obtain the information (See Appendix-I). Separate questionnaires were canvassed for the beneficiaries and non-beneficiaries.

The next chapter deals with the features of OPP and the oilseed crop economy in the State of Karnataka. In the third chapter, an analysis of the districtwise trends in the components is attempted in order to locate OPP concentrated regions so as to bring out impact of OPP across districts in Karnataka. It is true that any change in the oilseed economy cannot be entirely attributed to OPP even then a large portion of these changes may be due to the direct and spiral effects of OPP. This chapter is followed by an analysis at beneficiary level based on the data collected from primary sources. Finally, we tried to highlight the achievements and constraints of the programme.

CHAPTER II
OILSEED CROPS IN KARNATAKA AND OPP

2.1 Introduction

Oilseeds occupy an important position in the Indian agricultural economy on five important counts. First, this crop group covers second largest share of area under the cropping pattern of the country next only to foodgrains. Second, it is one of the important commercial crops in the rainfed and irrigated regions of central India for which local processing option is available. Third, even though the oilseed sector did not receive the required attention during the phase of technological change, it was taken up specifically in the Technology Mission that began in May 1986. Following this it became a prominent crop group with good processing linkages but depicted fluctuating features. Fourth, the import of oilseeds/edible oils was increasing at a faster rate and the import bill of edible oils which was about Rs. 1,000 crores in 1982-83 increased to Rs. 2,926 crores by 1996-97. In the recent past the import of edible oil caused a panic among oilseed producers and processors. The quantum of imported edible oils increased from 1.9 lakh mts to 49.0 lakh mts during 1990-91 to 1999-2000. In response to this the Central Government increased the import duty to 67 per cent. Therefore, it is a trade sensitive crop. Lastly, it is a crop grown mainly by the marginal and small farmers. The household economy of this group of farmers hinges upon the performance of oilseeds as a major commercial crop. All these factors underscore the importance of the crop group in the agricultural economy.

2.2 Technology Mission and Oilseed Production Programme

After achieving sufficient progress in food self sufficiency the problem of slow growth crops surfaced in the debate covering impact of technological change. Pulses and oilseeds were identified as major slow growth crops. The proceedings of the symposia on these two crops by Hindustan Lever Ltd. and Indian Society of Agricultural Economics during early eighties caused initiation of two massive programmes namely: National Pulses Development Programme and National Oilseeds Development Programmes (NODP). The NODP also formed a major component of Technology Mission. Following this, development of oilseeds was taken up under Mission Mode. The Mission Mode concentrated on following strategies:

i. to improve oilseed crop production technology;
ii. to improve processing and post harvest technology;
iii. to strengthen input services to farmers; and
iv. to improve institutions connected with the industry and marketing;

These points helped to formulate the oilseed policy of the country. Similarly, the strategy that emerged out of the Technology Mission was crystalised and a policy statement on oilseed was declared. The policy statement broadly covered four points:

i. Support to farmers with technological inputs to increase production.
ii. Periodic review of the price policy. Regulation of market prices and providing incentive prices.
iii. Domestic procurement of oilseeds.
iv. Implementation of an integrated policy for oilseeds grown.

(Shenoi, 1989)

Similarly, Since then, the Govt of India adopted Mission-Mode approach under the broad policies indicated above and launched a massive **Oil Seeds Production Programme (OPP)** with Rs, 590.23 crores during the eighth plan. (1992-93 to 1996-97). Impact evaluation of OPP during the eighth plan was carried out by Agricultural Finance Corporation in nine major oilseed producing states. The evaluation highlighted the positive impact of the programme and suggested need for bold steps with a larger outlay. This approach has resulted in positive gains in terms of oilseeds production and productivity. The production of oilseeds increased from 108 lakh tonnes during 1985-86 to 240.75 lakh tonnes during 1988-89, and the area under oilseeds' increased by one million hectare between 1992-93 and 1996-97. The productivity step up was about 17 per cent and reached above 900 kgs/ha. In Karnataka, during this period area under the crop group did not increase much but there was a significant change in productivity. Following this success the programme was extended during Ninth Plan.

However, one cannot be complacent about this with the ever-increasing population and increasing demand for vegetable oils in the country. Therefore, in order to maintain the existing production trends and to attain self-sufficiency in vegetable oils, production of oilseeds has to be stepped up further. The Planning Commission in the wake of doubling the food production has fixed the target for oilseeds at 30 million tonnes by the

end of ninth plan i.e 2000-2002 and financial allocation for OPP has been enhanced towards input and service support to farmers.

During 1994-95, OPP was implemented in 331 districts of 22 States and from 1999-2000 it was extended to 397 districts covering 25 States. During the Ninth plan total allocation on OPP was of the tune of Rs. 500 crores and out of which Karnataka was to get Rs. 36 crores from the Central pool as the State target was Rs. 12 crores (Govt. of Karnataka, 9th Plan, p. 78).

2.3 Broad Strategies

To achieve targeted production of oilseeds under OPP two broad strategies were identified in terms of **area expansion** and **productivity increase.**

I. Area Expansion:

With the bleak prospects of increasing net sown area, the expansion of area under oil seeds can only be achieved through increase in cropping intensity and by suitable changes in cropping pattern. Under OPP various area specific situations have been identified for expansion of area in different regions, such as:

(a) Sequential cropping
(b) Oilseeds in inter-cropping systems
(c) Replacement of low economy crops
(d) As substitute crop in problematic areas/situations

Under all these situations, different oilseed crops as well as other crops and season in which a particular oilseed crop has to be taken up, are clearly identified for different regions depending on their suitability. Farmers are encouraged to take up area expansion through these methods. This is achieved through provision of incentives as well as extension methods.

II. Productivity increase

Efforts to reach the potential yield of the crop are taken as a goal for reaching the targeted output of oil seed crops. Results of various frontline demonstrations have shown that oilseeds production could be increased between 40 per cent to 100 per cent above the existing level. This can be done by adopting improved crop production

techniques and crop management. Under OPP some of the technologies identified are as follows:

i. Use of improved varieties;
ii. Use of quality seed, optimum seed rate and timely sowing;
iii. Pre-sowing treatment of seed against seed and soil borne diseases;
iv. Use of fertilizers in recommended dosages, including bio-fertilisers like Rhizobium Culture for groundnut and soybean, use of phosphate soluble bacteria, application of Gypsum/Pyrites as Sulphur Source, soil PH correction and application of micro-nutrients in case of deficiency;
v. Control of weeds through mechanical and chemical methods;
vi. Timely plant protection measures against pests and diseases, using bio-pesticides like neem oil, neem seed extract, other neem based preparations, integrating non-chemical methods and devices like biological control, mechanical control etc., and need based chemical control;
vii. Use of improved farm implements and life saving irrigation in kharif and rabi season at critical stages of crop growth wherever required.
viii. Use of power implement for timely operation.

It is envisaged under OPP to motivate farmers to adopt new technologies by means of incentives, timely supply of inputs, education training and demonstrations. These factors help in enhancing productivity provided the farmers adopt the technology properly.

It was also suggested under the review of OPP that increase in productivity can be achieved through input support on a package basis (AFC, 1998). This should be provided to a large number of beneficiary farmers on cluster basis in a district in such a manner that the entire area with good potential for achieving desired increase in area/productivity of the district. This helps to bring the district under intensive package programme over a period of 4-5 years. Extension support and plant protection umbrella with IPM was made available to all the districts covered under OPP.

III. Input supply and support services:

Broad guidelines for providing input supply and support services to farmers by covering entire gambit of timely supply of quality inputs till harvest are given under OPP. Input supply and support services identified are as follows:

(a) Integrated management for production and distribution of seeds

Timely availability of quality seeds at reasonable prices continues to be one of the major constraints in spread of new improved varieties/hybrids for realising their yield advantage. Process of seed production being time consuming and cost intensive with high degree of risk, it was felt necessary to put thrust on quality seed production. Under OPP all the stages starting from breeder seed to supply of certified seeds to farmers were identified and guidelines were provided at all stages and targets were envisaged for production and distribution.

Some of the salient features under operation are as follows,

(i) For production of foundation seeds an assistance of Rs. 500/- per quintal is being provided.

(ii) For production of certified seeds, of **seed village programme** (SVP) has been envisaged in OPP. Under SVP an assistance Rs. 500/- per quintal was given, out of Rs. 500, Rs. 375 was given to the farmer to meet the cost of certification, loss due to roughing and under sized seed. Remaining amount of Rs. 125/- was given to procurement agencies to improve handling and infrastructure facilities. Further, for the distribution of certified seeds the assistance to the extent of 30 per cent of the cost of seed limited to Rs. 800/- per quintal was made available only for groundnut and soyabean.

(iii) For the soyabean and groundnut seeds produced under crash programme through Nodal agencies assistance of 25 per cent of the seed cost or Rs. 600/- per quintal whichever in less was given.

(iv) Supply of mini kits was aimed at popularisation of latest/pre-released varieties. These mini kits contain besides seeds, seed treatment chemicals, Rhizobium culture and package of practice printed in regional language.

(v) To increase production of quality seeds and their storage requires creation of infrastructure facilities. Assistance was provided for irrigation facilities in government farms, construction of godowns with dehumidification facility and construction of Pucca threshing floor.

(vi) National Seeds Corporation (NSC) and State Farms Corporation of India (SFCI) were entrusted with the programme for quality seed production of groundnut and soyabean during ninth plan. The programme of 1st year i.e., 2000-2001 was taken on a pilot basis and offer reviewing the progress it is expected to continue further. Guidelines have been given to implement the programme. It is expected that seed production will be taken up with only known source of seed which bears truthful label. The production is being monitored by representatives of producing agencies, scientists of the state agricultural university, ICAR Institution and representatives of state department of agriculture. An incentive of Rs. 375/- per quintals has been provided to farmers towards roughing compensation and expenditure on processing and packing.

(vii) Assistance is provide to supplement the efforts of States, augment supplies of certified seed to farmers at reasonable prices, and enhancing the production, distribution network and technical expertise. Financial assistance is also made available to NSC and SFCI as per approved pattern of financial assistance under OPP for the following:

i. Production of foundation seed and purchase of Breeder Seed
ii. Organising Seed Village Programme for production of Certified Seed.
iii. Distribution of Certified Seed at subsidised price to farmers in OPP districts.
iv. Distribution of seed input kits/minikits in special thrust areas identified by TMOP.
v. Assistance to NSC and NFCI for infrastructure development at their seed farms for production of breeder and foundation seed of oilseeds crops.
vi. Cost of breeder seed and foundation seed will be reimbursed by TMOP.

vii. For improved varieties of groundnut and soyabean seeds an assistance of Rs. 8/- per kg will be given to farmers.

(b) Plant Protection

Many oil seed crops are prone to attacks of pests and diseases resulting in huge loss of crop yield. Under OPP, series of strategies have been recommended for plant protection measures, such as:

(i) Seed treatment – an assistance of 50% of the cost of chemical limited to Rs. 100/- per hectare is made available.

(ii) Demonstration on Integrated Pest Management (IPM)

In prevention and control of pests and diseases, the emphasis and thrust hitherto was on use of PP chemicals. It is widely accepted that injudicious application of plant protection chemicals has resulted in various problems in terms of, increased residues of pesticides in soil, water, food and fodder have resulted in environmental pollution, health hazards, ecological imbalances and resistance in pests to pesticides as also resulted in destruction of natural enemies of the pests causing resurgence of minor pests.

OPP emphasised the need for IPM and following strategies have been undertaken:

i. Use of disease/pest resistant varieties.
ii. Improved cultural practices
iii. Regular monitoring of pest situation vis-à-vis their natural enemies
iv. Mechanical control
v. Biological control
vi. Need based use of pesticides on the basis of ETL (Economic Threshold Level)
vii. Use of Relatively Environmental Friendly (REF) insecticides/pesticides.

To motivate and to train the farmers in IPM an assistance of Rs. 1500/- per hectare has been provided which is expected to be used for purchase of various inputs includes pheromone traps, rodent control and publicity materials. Liaison persons

were identified among the farming community and involve voluntary organisation wherever possible.

(c) Plant protection measures

Root grub/white grub is a pest of groundnut attacking large areas in Karnataka. For its control an integrated approach consisting of **soil treatment, seed treatment and cultural practices have been advised**.

(i) Assistance for P.P. chemicals/ weedicides/ herbicides to the extent of 50 per cent of the cost of chemical with the maximum limit of Rs. 100 per hectare is being provided.

(ii) Assistance on P.P. equipments to the extent of 50% of the cost with limit of Rs. 800/- for manually operated and Rs. 2000/- for power operated equipment was provided.

IV. Demonstrations

Effective transfer of improved production technologies being evolved by research system for increasing oilseeds production is one of the thrust areas. Adequate assistance has, therefore, been provided under the project for conduct of demonstrations on farmers' fields. A two-tier approach has been adopted for technology transfer to farmers through demonstrations.

(a) Frontline Demonstration: ICAR is the nodal agency for implementation which consists of 4 sub components

i. Frontline demonstrations on production potential
ii. First line block demonstrations
iii. Frontline demonstrations on improved agricultural machinery
iv. Frontline demonstration on discipline oriented programmes

(b) Demonstration by State Level Agencies:

For all the demonstration detailed procedures regarding selection of farmers, plot size and technology to be adopted based on local condition have been provided.

V. Improved Farm Implements

Improved farm implements play a crucial role in taking up timely cultural operation and to improve labour efficiency. To popularise these implements states have been provided assistance for distribution of manual/bullock drawn and power driven implements. Pattern of assistance in this programme is as follows:

(i) 50 per cent of the cost or Rs.2000/- per implement for manual or bullock drawn

(ii) 30 per cent of the cost or Rs. 10000/- per power driven implement

VI. Use of Micro-irrigation system

Oilseed crops being grown predominantly under rainfed conditions are prone to vagaries of weather. Hence, it is imperative to use available water judiciously to cover maximum areas. Sprinkler mode of micro irrigation has been identified as an ideal type for oil seed crops. To popularise its use, under OPP, 50 per cent of the cost or Rs. 15000/- is being provided to small and marginal farmers, SC/ST and to woman farmers. For other category of farmers, it has been fixed at 33 per cent of the cost or Rs. 10000/- whichever is less.

VII. Rhizobium Culture and Phosphate Solublising Bacteria (PSB)

Rhizobium Culture is one of the cheapest input in increasing production of leguminous crops like groundnut and soyabean. Treatment of seed with culture helps in fixation of atmospheric Nitrogen through its symbiotic activity. The treatment is particularly, beneficial in areas where groundnut and soyabean are new introduction and grown after paddy. PSB has a capacity to release Phospherous from unavailable form. It helps to reduce nearly 25 per cent of phosphetic fertilizer input to crops. Combination of Rhizobium and PSB enhance nodule formation and Nitrogen fixation in leguminous crops.

To popularise use of Rhizobium and PSB and assistance of Rs. 50/- per hectare has been provided and necessary precautions during seed treatment were listed out in detail.

VIII. Integrated Nutrient Management

It is widely observed that farmers are using major nutrients like NPK without proper use of other micronutrients. For yield maximisation, it is necessary to apply

balanced dose of fertilizers including organic manure and micronutrients. Under OPP certain steps were taken for integrated nutrient management and provisions were made for incentives.

2.4 Component wise Investment under OPP

The physical achievement and financial progress achieved in Karnataka under each of the component of OPP is shown in Table 2.1. Highest expenditure was incurred on supply of sprinkler sets. A good number of these components have high unit value. Among the components distribution of pheromones, farmers' training programmes and distribution of micro-nutrients have lower relative expenditures but the per cent achievement of these programmes has not been on lower side. On the per cent achievement scale we find that supply of input kits, distribution of plant protection equipments, pheromones, sprinkler sets and demonstrations score very well. Whereas, seed village scheme, distribution of weedicides and gypsum do not claim equally impressive achievement. Similarly, though the per cent expenditure on staff and contingency is quite low, it is an indicative of increased efficiency of the existing staff, who could manage the scheme without recruiting additional personnel.

Table 2.1 : Componentwise Physical Achievement and Financial Investment in OPP: Total for 1997-2002

Sl. No	Components	Target	Achieve-ment	Allocation (Lakhs)	Expenditure (Lakhs)	Per cent Achieve-ment	Per cent Expenditure
1.	Certified Seed Distribution (Qtls)	113318	48363.1	495.00	221.38	42.68	44.72
2.	Seed Village Scheme (Qtls)	115800	17606.22	279	55.07	15.20	19.74
3.	Distribution of Seed Treatment Chemicals (ha)	34200	40617	60.5	56.10	118.76	92.74
4.	Organizing of Large Scale Demonstration (ha)	19072	17542	304.27	275.26	91.98	90.47
5.	Control of Root Grub (ha)	70104	63239	154	125.03	90.21	81.19
6.	Distribution of Plant Protection Equipment (ha)	9148	64575	64.86	376.07	705.89	579.83
7.	Supply of Improved Implements (No's)	12622	99075	223.42	239.24	789.94	107.08
8.	Supply of Sprinkler Sets (No's)	5469	7325	783.29	1134.54	133.94	144.84
9.	Distribution of Gypsum (ha)	125595	72948	287.29	159.40	58.08	55.49
10.	Distribution of Rhizobium Culture (ha)	123364	119848	40.55	32.64	97.15	80.48
11.	Development of Infrastructure	-	-	187.32	83.49	-	44.57
12.	Distribution of Micro-nutrients (ha)	24210	21456.1	30.6	29.56	88.63	96.62
13.	Input Kits (No's)	37934	41773	50.0	44.59	110.12	89.18
14.	Farmers Training Programe (No's)	275	267	31.05	26.97	97.09	86.88
15.	IPM demonstration organized (ha)	8274	8409	124.1	121.78	101.63	98.13
16.	Distribution of Weedicides (ha)	41100	13127	123.00	40.71	31.94	33.10
17.	Demonstration on Pheromone trap (ha)	6060	6127	30.00	26.87	101.11	89.59
18.	Staff & Contingency	-	-	144.71	49.41		34.15
19.	Distribution of Minikits (No's)	53497	44379	65.79	61.96	82.96	94.19

Source: Office of the Commissioner of Agriculture, Government of Karnataka, Bangalore.

Table 2.2: Changes in Cropping Pattern in Karnataka: 1980-98

(Area in '000 hectares)

Crops	Three years averages centred at		
	1980-81	1990-91	1997-98
Cereals	5799.00 (52.75)	5618.33 (46.47)	5513.67 (45.85)
Pulses	1544.00 (14.05)	1685.00 (13.94)	1756.33 (14.61)
Foodgrains	7342.67 (66.79)	7303.33 (60.41)	7270.00 (60.46)
Sugarcane	148.00 (1.35)	274.00 (2.27)	314.00 (2.61)
Cotton	1056.67 (9.61)	626.33 (5.18)	599.00 (4.98)
Oilseeds	1311.67 (11.93)	2612.67 (21.61)	2468.33 (20.53)
Gross cropped area	10993.00 (100.00)	12089.00 (100.00)	12024.33 (100.00)

Source: Office of the Commissioner of Agriculture, Government of Karnataka, Bangalore.

Note: Figures in the parantheses indicates % to total

Table 2.3: Average productivity of major oil seeds in Karnataka

Kgs/hectare

Crops	Three years averages centred at		
	1980-81	1990-91	1997-98
Groundnut	718.00	794.67 (10.68)	905.00 (13.88)
Rapseed/Mustred	280.00	254.33 (-9.17)	277.67 (9.17)
Soyabean	NA	492.33 NA	913.00 (85.44)
Sesamum	312.00	331.00 (6.09)	396.33 (19.74)
Sunflower	575.33	441.33 (-23.29)	359.33 (-18.58)
safflower	528.00	499.33 (-5.43)	611.00 (22.36)
Niger	177.33	181.33 (2.26)	191.00 (5.33)
Linseed	240.00	263.67 (9.86)	268.33 (1.77)
Castor	627.67	898.67 (43.18)	1172.33 (30.45)
Total oilseeds	601.00	609.00 (1.33)	657.33 (7.94)

Source: Office of the Commissioner of Agriculture, Government of Karnataka, Bangalore.

Note: Figures in the parentheses indicates per cent increase over earlier period

Importance of oilseed crops in the country, as reflected from its area share, increased substantially during eighties. During early nineties the oilseed crops had more than 12 per cent of area share. It looks as if this share got stagnated at that level itself (GoI, 2001). Karnataka is one of the major oilseed growing states and the area share of oilseeds in the State was also about 12 per cent during early eighties. This went above 21 per cent during early nineties and stayed about that level during the decade (See table 2.2). Productivity of oilseeds in the State of Karnataka have shown similar trends as those at the country level. Significant improvement in productivity was noted in soyabean, safflower, castor, groundnut and rape and mustard. Sunflower showed decline in productivity during the recent past (see Table 2.3). The overall increase in productivity was about 8 per cent during late nineties. It is clear that sunflower, minor oilseeds and groundnut need further attention to boost up the productivity.

CHAPTER III

EVALUATION AT MESO LEVEL

3.1 Introduction

OPP Scheme has two components namely the State Sector and District Sector schemes. These are retained for the purpose of ease of funding but from the point of view of impact evaluation these components are mutually supportive and have an aggregate cumulative impact. Keeping this in view, we analyzed the two sector schemes together. We also realised the difficulty to decompose the impact into two components and therefore it was prudent to review the impact as a joint effect. The state sector involves purchase of breeder seeds, seed village schemes, staff and contingency and development of infrastructure as major components, whereas, the rest of the components are taken under district sector scheme.

Evaluation of any crop promotion scheme broadly encompasses four aspects. First, in any process evaluation a close look needs to be taken at the various components of the process involved, wherein the choice of components, inter-linkage of the components and the probable impact of the components is assessed from the view point of the basic focus of the scheme. As a second step in the process of evaluation the financial and physical achievements are analyzed. This gives a clear picture of intentions as well as the achievements under the scheme. The scenario that we get out of the macro parameters is sufficiently indicative of the programme. Third step in an evaluation study involves a critical look at the implementation process at the ground level. The expected outcome of this analysis is a list of steps to be taken to improve upon the existing methods. Lastly, the success of any programme has to be viewed from what appears on ground and competently supported by the analysis of secondary data. Therefore, the impact on the actual beneficiaries of the scheme becomes quite crucial. In this chapter, we take a close look at the parameters of the scheme at state level and in the selected districts.

3.2 State Level Impact Analysis

The scheme is operated in order to enhance area and productivity of oilseeds in the State. The focus is on groundnut, sunflower, sesamum, safflower, niger, castor and linseed (OPP Guidelines, p.33). In order to look at the trends in these oilseeds we have presented trends in area and productivity of these crops for 1986-87 to 2001-02. It can be seen that the growth in productivity of these oilseeds is higher during the operation of OPP especially for soyabean and minor oilseeds. The productivity has been fluctuating during the last five years (see tables 3.1 and 3.2).

Table 3.1 : Growth Rates of Major Oilseeds in Karnataka During the Period 1986-87 to 1996-97 and 1990-91 to 2000-2001

(Per cent per annum)

Oilseeds	1986-87 to 1996-97			1990-91 to 2000-01		
	Area	Production	Productivity	Area	Production	Productivity
Groundnut	1.38	3.66	2.25	-1.65	-0.68	0.99
Sunflower	5.04	2.07	0.15	-7.25	-7.64	-0.42
Rape & Mustard	5.04	6.50	0.17	2.58	6.00	1.32
Castor	-2.84	-3.20	-0.21	1.80	4.27	2.85
Soyabean	18.47	24.86	6.18	9.63	17.55	7.37
Sesamum	-4.33	-2.41	1.99	-3.48	-0.23	3.35
Safflower	-3.89	-1.47	2.57	-5.56	-0.92	4.89
Linseed	-6.43	-4.33	2.28	-4.10	-0.49	3.57
Nigerseed	-2.62	-2.17	0.25	-2.66	-1.50	0.96

Source: Based on data collected from Directorate of Statistics, Govt. of Karnataka

Table 3.2 : Percentage Changes in Area and Productivity of Oilseeds in Karnataka

(in per cent)

Oilseeds	Area			Productivity		
	1998-99	1999-00	2000-01	1998-99	1999-00	2000-01
Groundnut	18.27	-8.91	-5.03	45.50	-31.37	45.01
Sunflower	-10.33	-40.68	-2.58	8.39	27.38	18.22
Rape & Mustard	40.00	-8.44	2.75	3.91	-5.14	2.89
Castor	28.57	-5.39	17.89	-40.78	-7.41	14.16
Soyabean	-4.41	0.06	-3.94	53.44	-16.98	10.49
Sesamum	0.88	-8.09	-8.66	25.51	18.94	-13.01
Safflower	-26.72	4.70	-100.00	33.26	24.02	-100.00
Linseed	-9.09	5.00	-19.05	41.31	17.94	8.17
Nigerseed	2.70	15.79	-15.91	0.00	-3.65	6.49

Source: Same as in Table 3.1

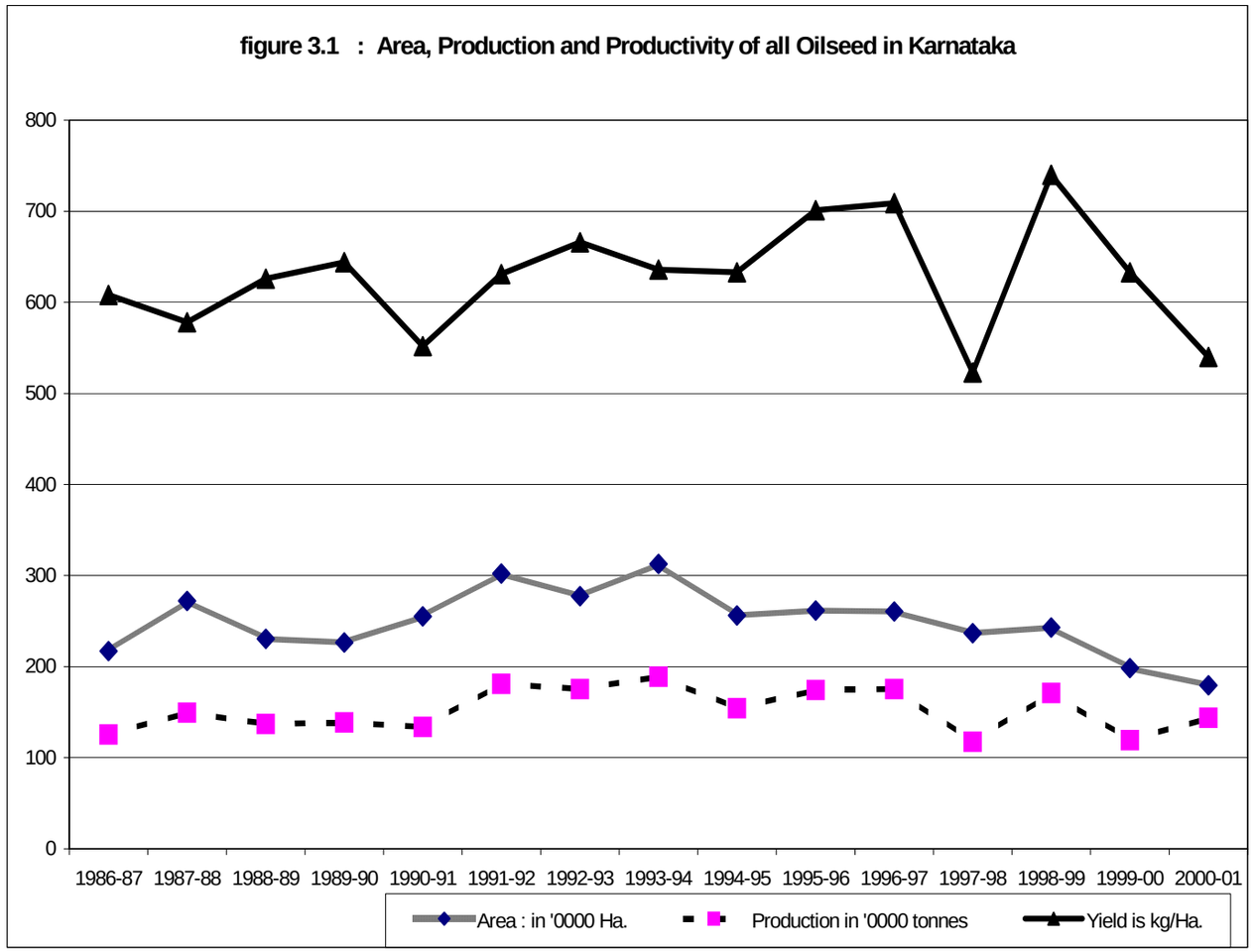
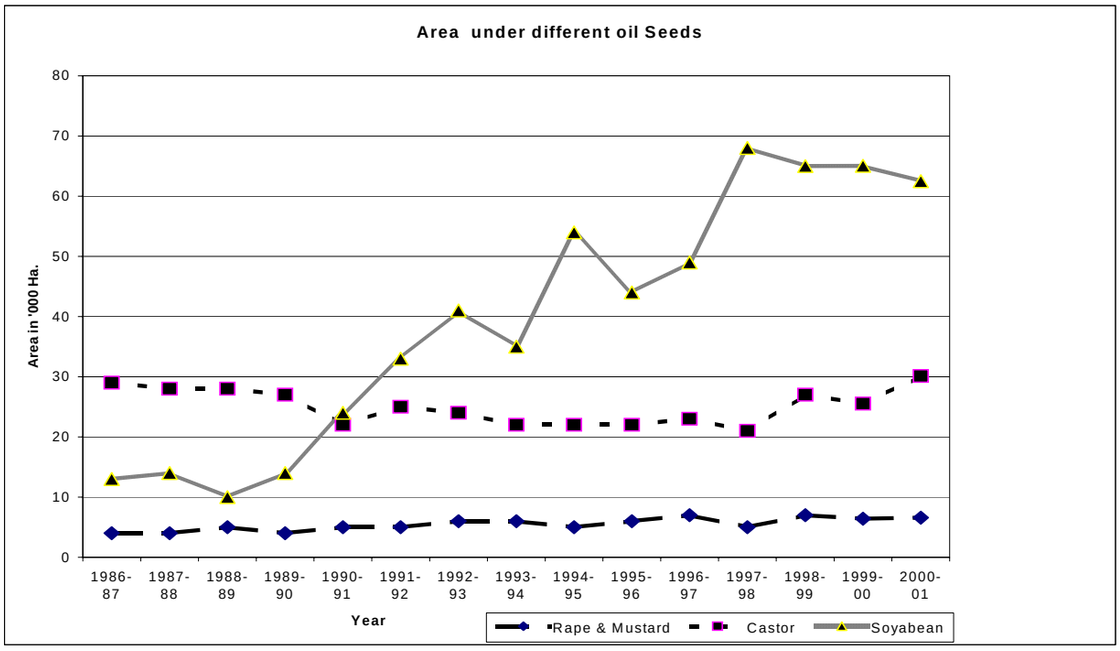
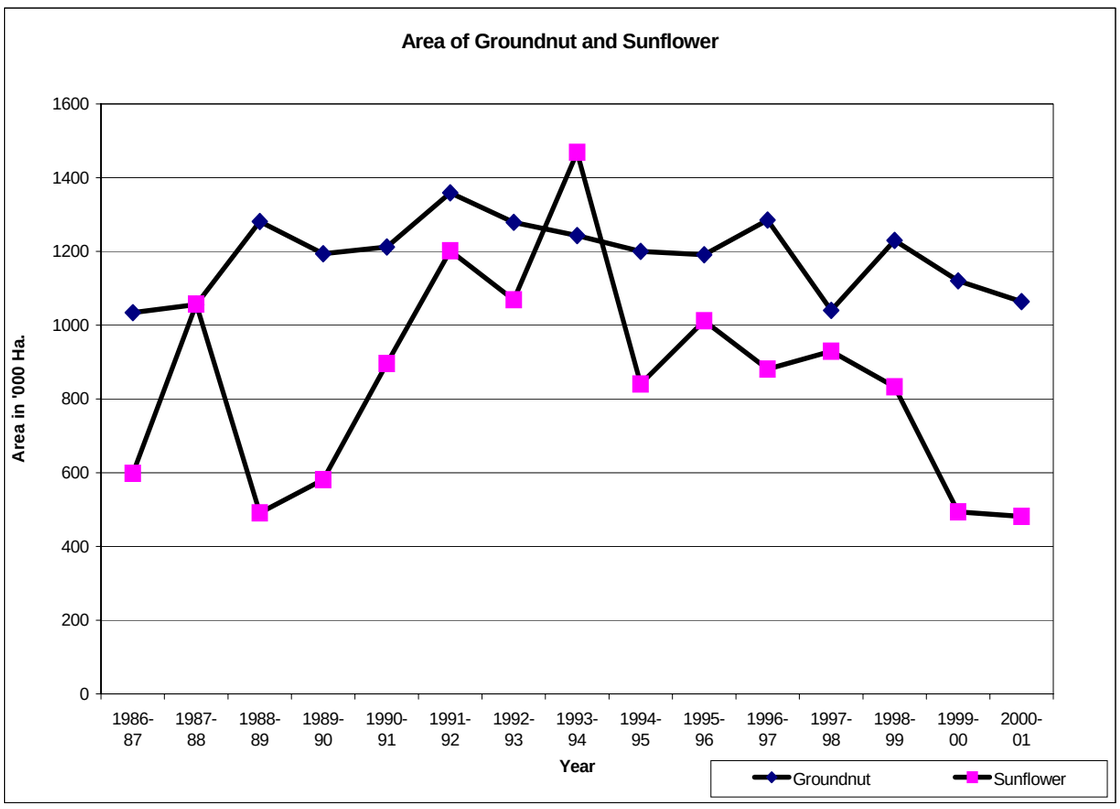
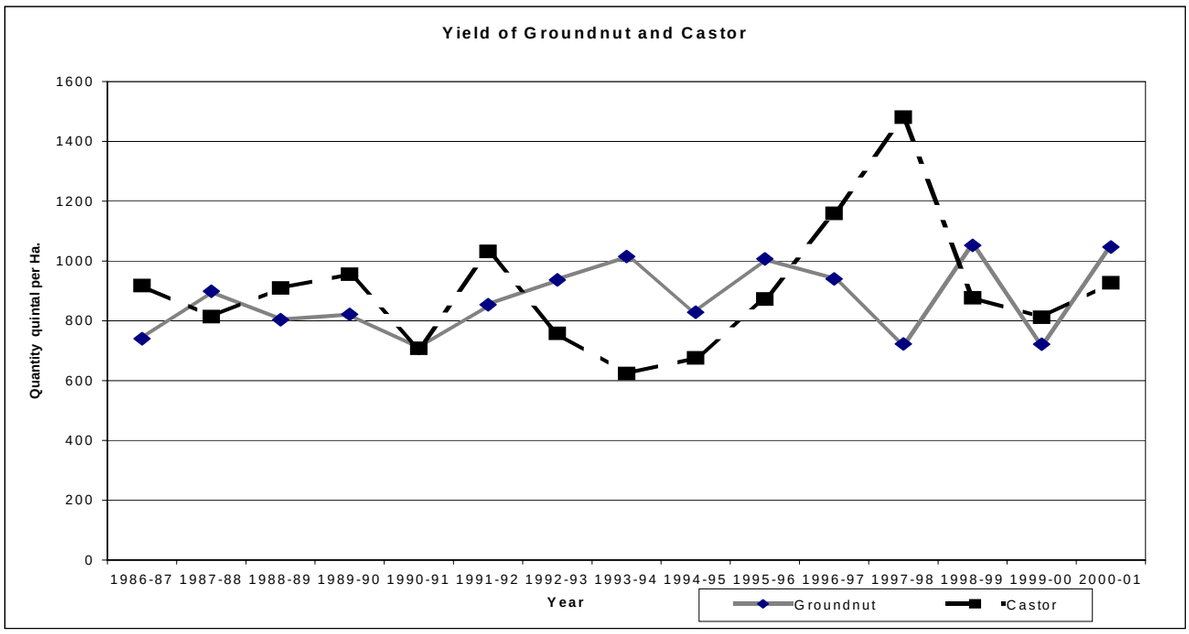


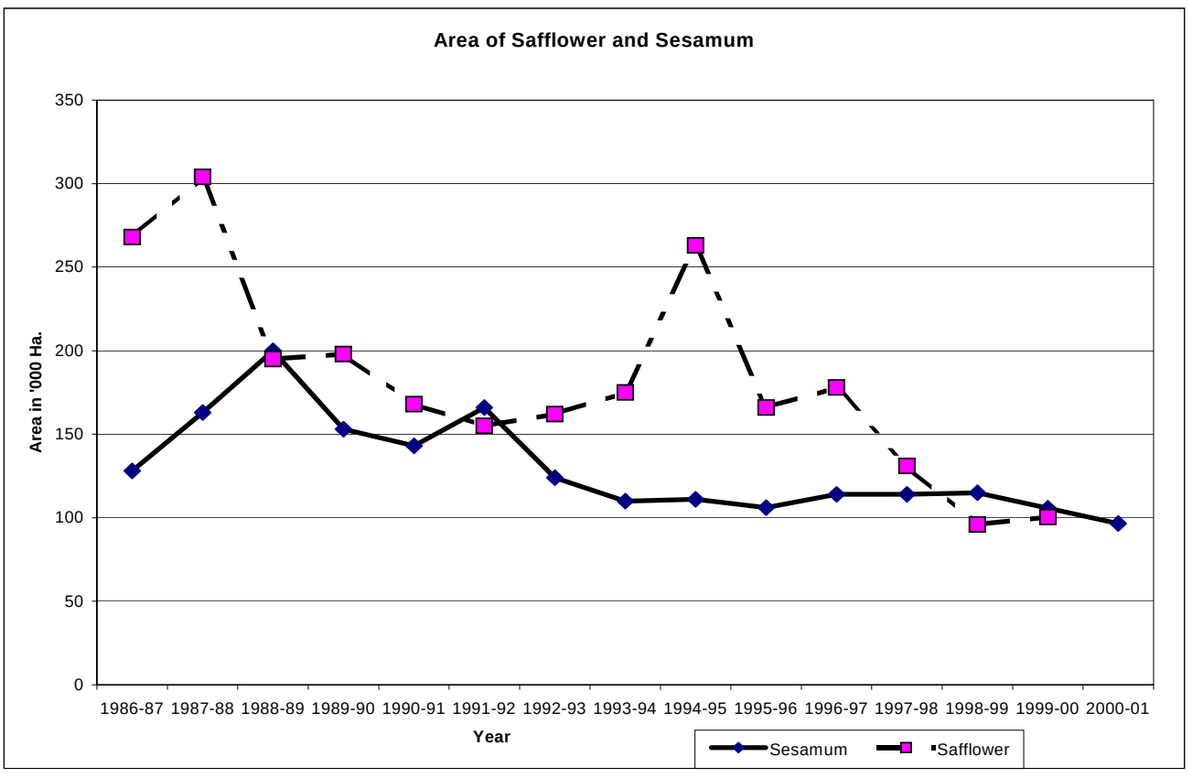
figure 3.1 : Area, Production and Productivity of all Oilseed in Karnataka
800
700
600
500
400
300
200
100
0
1986-87
1987-88
1988-89
1989-90
1990-91
1991-92
1992-93
1993-94
1994-95
1995-96
1996-97
1997-98
1998-99
1999-00
2000-01
Area : in '0000 Ha.
Production in '0000 tonnes
Yield is kg/Ha.

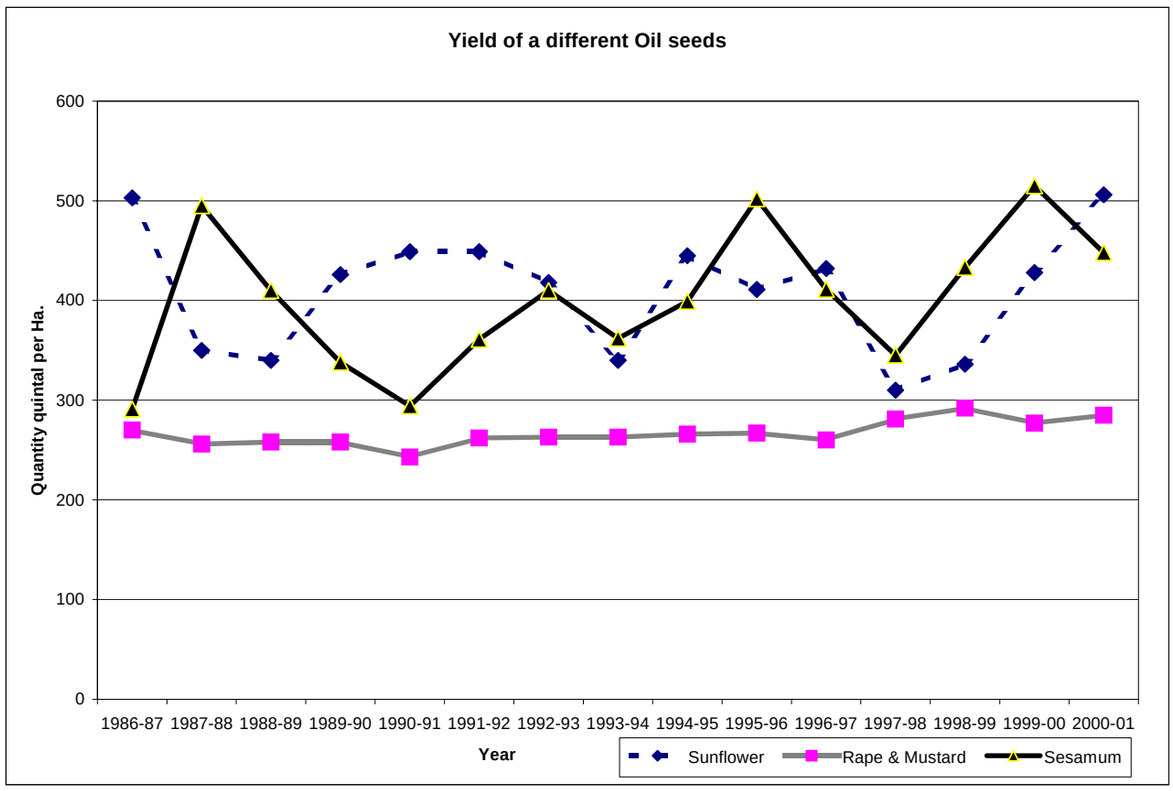
Figure 3.2: Area and Productivity of Individual Oilseeds in Karnataka

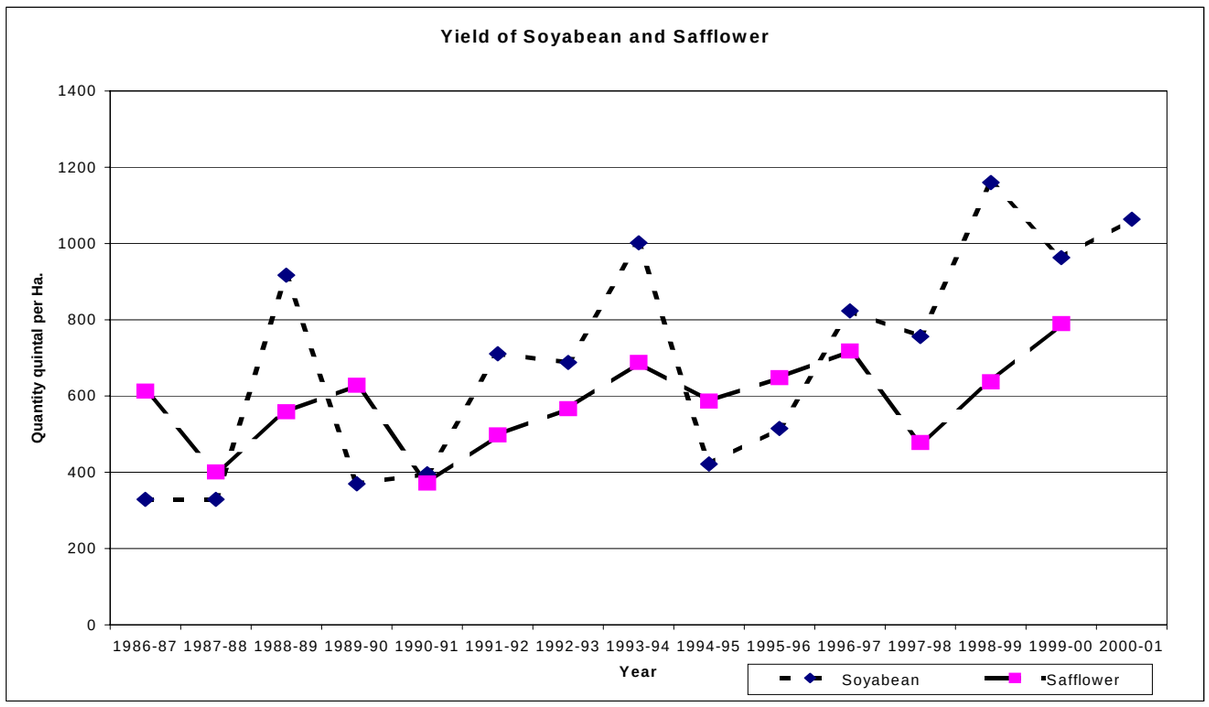





Yield of Groundnut and Castor
Quantity quintal per Ha.
1600
1400
1200
1000
800
600
400
200
0
1986-87 1987-88 1988-89 1989-90 1990-91 1991-92 1992-93 1993-94 1994-95 1995-96 1996-97 1997-98 1998-99 1999-00 2000-01
Year
Groundnut
Castor


Area of Safflower and Sesamum
Area in '000 Ha.
350
300
250
200
150
100
50
0
1986-87 1987-88 1988-89 1989-90 1990-91 1991-92 1992-93 1993-94 1994-95 1995-96 1996-97 1997-98 1998-99 1999-00 2000-01
Year
Sesamum
Safflower


Yield of a different Oil seeds
600
500
400
300
200
100
0
Quantity quintal per Ha.
1986-87 1987-88 1988-89 1989-90 1990-91 1991-92 1992-93 1993-94 1994-95 1995-96 1996-97 1997-98 1998-99 1999-00 2000-01
Year
Sunflower
Rape & Mustard
Sesamum


Yield of Soyabean and Safflower
1400
1200
1000
800
600
400
200
0
Quantity quintal per Ha.
1986-87 1987-88 1988-89 1989-90 1990-91 1991-92 1992-93 1993-94 1994-95 1995-96 1996-97 1997-98 1998-99 1999-00 2000-01
Year
Soyabean
Safflower

The tables above indicate clearly that the oilseed crops as a group showed good growth during nineties and especially in late nineties. The productivity of oilseeds was around 600 kgs per hectare during 1985-86 and by 1987-88 it has gone well above 700 kgs per hectare. This further increased by about 50 kgs in aggregate. The picture is not the same for individual oilseeds but the trend growth is very clear (GoK, Karnataka Agriculture: A Brief Profile, 2000, p.71). Productivity of total oilseeds has improved during eighties but the production growth came mainly through area improvement rather than productivity. It is only during nineties that productivity trends seem to have picked up with higher growth rates compared to earlier period (see tables 3.1 and 3.2). All oilseeds together cover about 25 lakh hectares. The area under oilseeds achieved a peak during 1993-94 but could not sustain it (Figure 3.1). Productivity of groundnut has been fluctuating in the neighbourhood of 1000 kgs per hectare. It is commendable that the production of groundnut had never reached beyond 10 lakh tonnes earlier but during nineties it was always above that with an exception of 1997-98. When we look at the trend behaviour of individual oilseeds, the growth pattern differs widely (see figure 3.2). The growth pattern of Sesamum during nineties is not comparable with that of groundnut. The productivity of sesamum has wider fluctuations and the area is more or less hovering in the neighbourhood of 1.2 lakh hectares. Sunflower as a crop had picked up in the early nineties with a coverage of more than 10 lakh hectares and production ranging between 3 to 4 lakh tonnes. Suddenly, during 1997-98 and 1998-99 the oilseed sector received a setback in its trends. The productivity dropped down significantly. Safflower became a cause of concern in the State and needs immediate attention. The area under this crop was between 2 to 3 lakh hectares and it has been showing steep declining trends. Fortunately, productivity has not followed the similar decline with an exception of 1997-98.

Among the minor oilseeds which include linseed, soyabean, castor, rape and mustard and nigerseeds; soyabean covers sizeable area. Soyabean has also significantly positive trends in terms of area and productivity. All these put together have on an average about 1.5 lakh hectares, whereas soyabean alone covers about 50 to 60 thousand hectares of cultivated area. On the productivity count, also soyabean has shown good growth rate in yield and higher productivity levels, though not comparable to the traditional soyabean growing regions in the country. The performance of all oilseeds as a group may not be exemplary but it is also not of the kind that will cause a deep concern. However, policy focus has to be different for the minor oilseeds.

3.3 Supply Response Analysis

Supply response analysis is attempted in order to analyse the area allocation decisions at macro level. We have a good number of models attempting supply response in agricultural economics literature. Right from Raj Krishna's (1963) pioneering work supply response studies have proliferated in the literature. Supply response functions help to analyse the impact of expected price, expected yield and habit forming variable on area allocation decisions. Most of the studies utilise the basic Nerlovian framework (Nerlove, 1958) for estimating the elasticities for price and non-price factors. The basic supply function

$$A_t = F\ (\ A^*_{t-1},\ P^*_t,\ PR^*_t,\ Z_t\ )$$

Where A_t = Area under the crop in year t

A^*_{t-1} = Expected area under the crop, usually preceding year's area or average of three previous years

P^*_t, = Price of the crop (AT times P^*_{t-1} is also used for expected price

PR^*_t = Relative price of the competing crop

Z_t = Other supply shifters (Rainfall, tech, etc.)

We have used the following specification for estimation

$$A_t = \alpha + \beta_1 A_{t-1}, + \beta_2 P_{t-1} + \beta_3 Std_p + \beta_4 GRPH_{t-1} + \beta_5 P^* + \beta_6 SDYLD + \beta_7 RF + e$$

Where, A_{t-1} = Area during the period t-1

P_{t-1} = Price during the period t-1

Std_p = Standard Deviation of prices of previous three years

$GRPH_{t-1}$ = Gross Revenue during the period t-1

P^* = Expected price (Average of previous three years)

SDYLD = Standard Deviation of yield

RF = Rainfall (Supply Shifters)

e = Stochastic error term

After looking into various forms of Supply Response equation (Deshpande, 1996), we arrived at the equations given above. These are OLS estimates. Our choice of these equations was guided by the fact that their Adjusted R Square was high and the co-efficients were statistically significant. We are concerned here only about the signs and the statistical significance of the coefficients and not about the magnitude of their elasticities. The results indicate that prices, variations in the prices and trend variable emerge with statistically significant coefficients for groundnut. In the case of sunflower and other oilseed crops, we get quite astonishing results. None of the chosen variables have emerged with a statistically significant coefficient. But price variables and supply shifters seem to dominate the response equation for sunflower. Overall, it is quite clear that price factors dominate the supply conditions of oilseeds.

Table 3.3: Results of Supply Response Regressions

Function: At = F (A_{t-1}, P_{t-1}, SDP, GR_{t-1}, $GRPH_{t-1}$, P^*, Rainfall and Trend)

	Intercept	A^{t-1}	P_{t-1}	SDP	GR_{t-1}	$GRPH_{t-1}$	P^*	Rainfall	SDYLD	Trend	Adjusted R Square
Groundnut											
1	1054.18 (2.32)	0.01 (0.33)	0.12 (0.28)	1.88 (2.17)		0.00 (0.03)		9.29 (0.92)		-102.13* (3.19)	0.45
2	2698.30* (4.36)	-0.15 (0.65)	-1.35* (2.44)	3.57* (4.20)		-0.01 (0.32		0.36 (1.14)			0.69
Sun flower											
1	-684.87 (0.44)	0.43 (1.24)		1.95 (0.91)	-0.84 (0.61)		4.09 (1.98)	-1.73* (2.48)	1.94 (0.53)	-151.29 (1.67)	0.49
2	1471.29 (1.55)	0.55 (1.43)		2.63 (1.09)	-0.77 (0.49)		0.83 (1.12)	-1.84 (2.32)	-2.36 (0.79)		0.33

Note: 1) * - Indicate statistical significance of the coefficient at 10 per cent level

2) A_{t-1} - Area during the period t-1, P_{t-1} - Price during the period t-1, SDP - Standard Deviation of prices of previous three years, GR_{t-1} - Gross revenue during t-1, $GRPH_{t-1}$ - Gross Revenue during the period t-1, P^* - Expected price (Average of previous three years) SDYLD - Standard Deviation of yield

3.4 Financial and Physical Achievements

We have seen under componentwise, physical and financial achievements in the earlier chapter at a glance. It is quite heartening that most of the components are performing extremely well except the Seed Village Scheme, distribution of weedicides and distribution of Gypsum. The performance of these three components over the five years period from 1997-2002 has not been keeping pace with the other components (see table 3.4 and figure 3.3). Even then, if we classify the components into two broad groups viz. Well Performing Components and Average Performers, we get a clear picture at state level.

Table 3.4: Componentwise Performance under OPP

Sl. no	Physical Achievement		Financial Achievement	
	Well Performing Components	Average Performing Components	Well Performing Components	Average Performing Components
1		Certified Seed Distribution		Certified Seed Distribution
2		Seed Village Scheme		Seed Village Scheme
3	Seed Treatment Chemicals		Seed Treatment Chemicals	
4	Large Scale Development		Large Scale Development	
5	Control of Root Grub		Control of Root Grub	
6	Plant Protection Equipment		Plant Protection Equipment	
7	Supply of Improved Agricultural Implements		Supply of Improved Agricultural Implements	
8	Supply of Sprinkler Sets		Supply of Sprinkler Sets	
9		Supply of Gypsum		Supply of Gypsum
10	Supply of Rhizobium culture		Supply of Rhizobium culture	
11				Development of Infrastructure
12	Distribution of Micronutrient		Distribution of Micronutrient	
13	Supply of Input Kits		Supply of Input Kits	
14	Farmers Training programme		Farmers Training Programe	
15	IPM Demonstration		IPM Demonstration	
16		Distribution of Weedicides		Distribution of Weedicides
17	Pheromone traps		Pheromone traps	
18				Staff and Contingency
19	Distribution of Minikits		Distribution of Minikits	

Source: Based on the percentage Achievement to Target and Percentage Expenditure to Allocation on the basis of five years total – 1997-2002

Any crop development therefore should cover basically five important phases. These should include: Seed Treatment and Availability of Seeds as the first step. The availability of appropriate seeds and technology certainly ensures high productivity. Second, this needs to be supported by technology about the application of inputs viz., fertilizers, pesticides and other components. These components also include proper implements and irrigation facilities such as sprinkler irrigation sets and other resource saving devices. Third, pest infestation not only causes dis-incentives to farmer but at the same time increases the cost of production substantially. Heavy cost on pests and diseases not only reduces the yield but also nullifies the investment made on the crop from sowing phase onwards. Therefore, this aspect needs to be dealt carefully. The fourth important aspect is the adoption of technology and participation of the farmer in the crop expansion

Figure 3.3 (a): Componentwise Percent of Achievement to the Physical Targets (Based on cumulative total for 1995-96 to 2001-02)

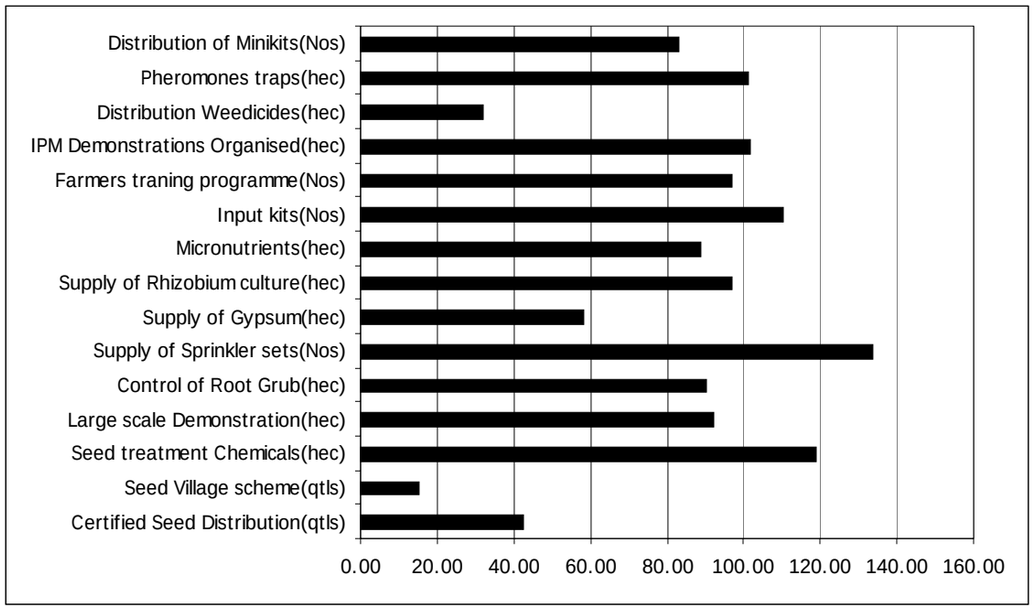
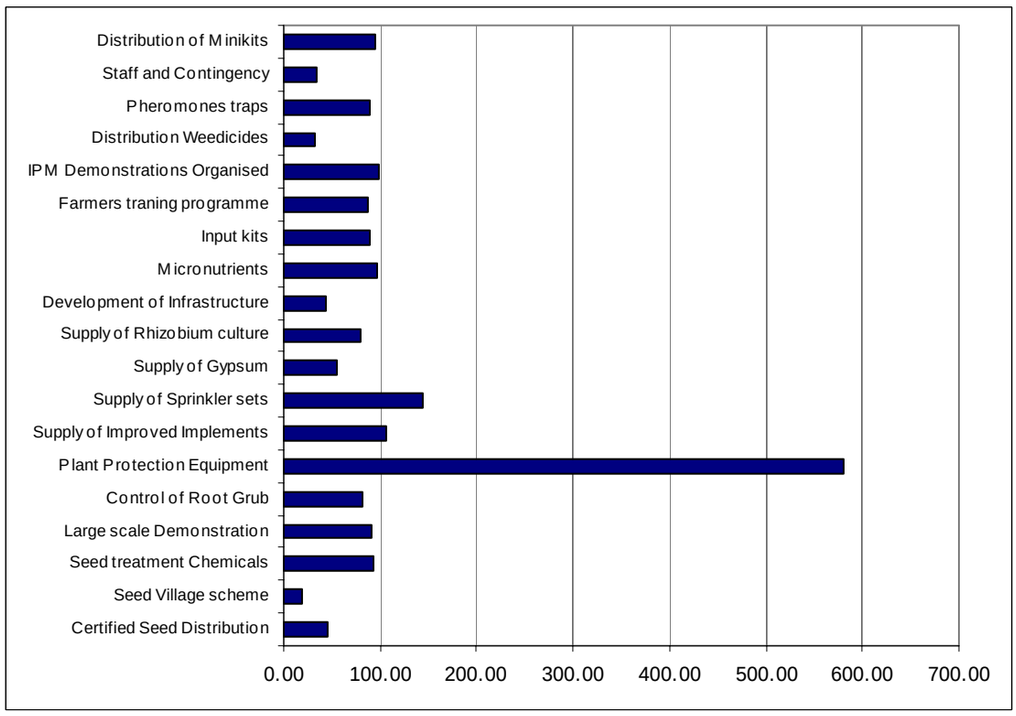
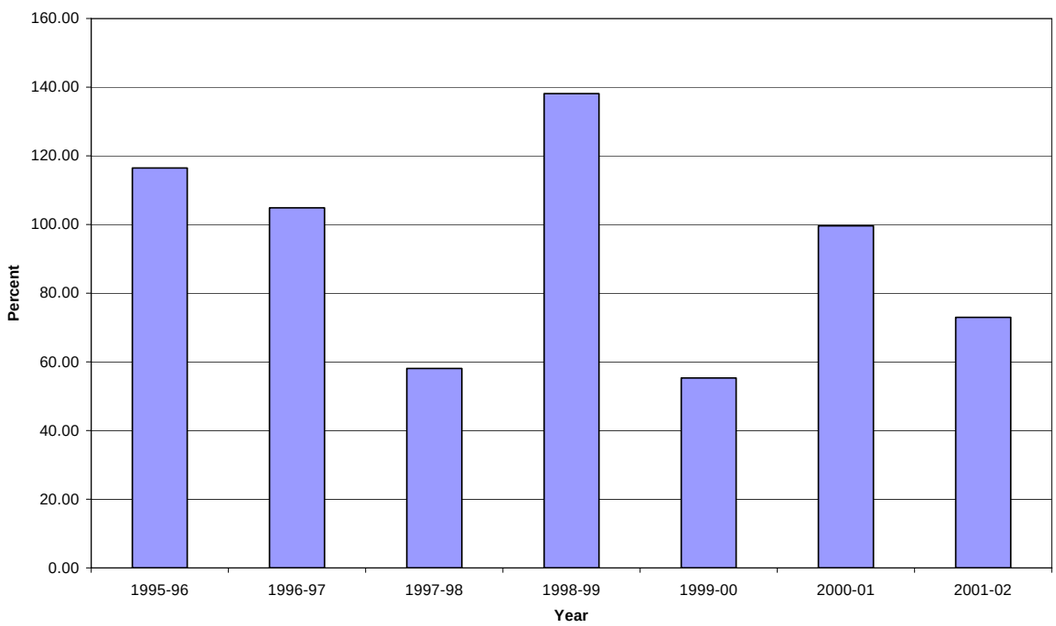
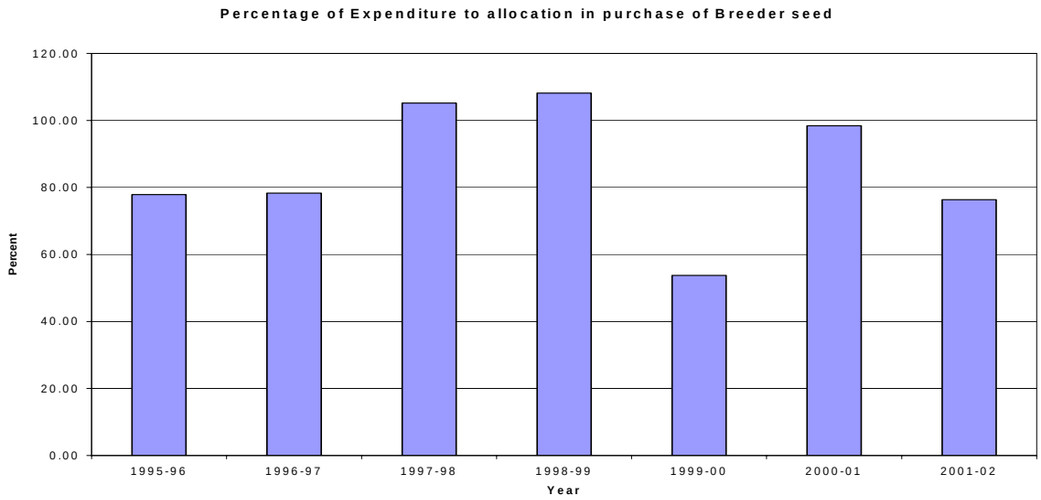


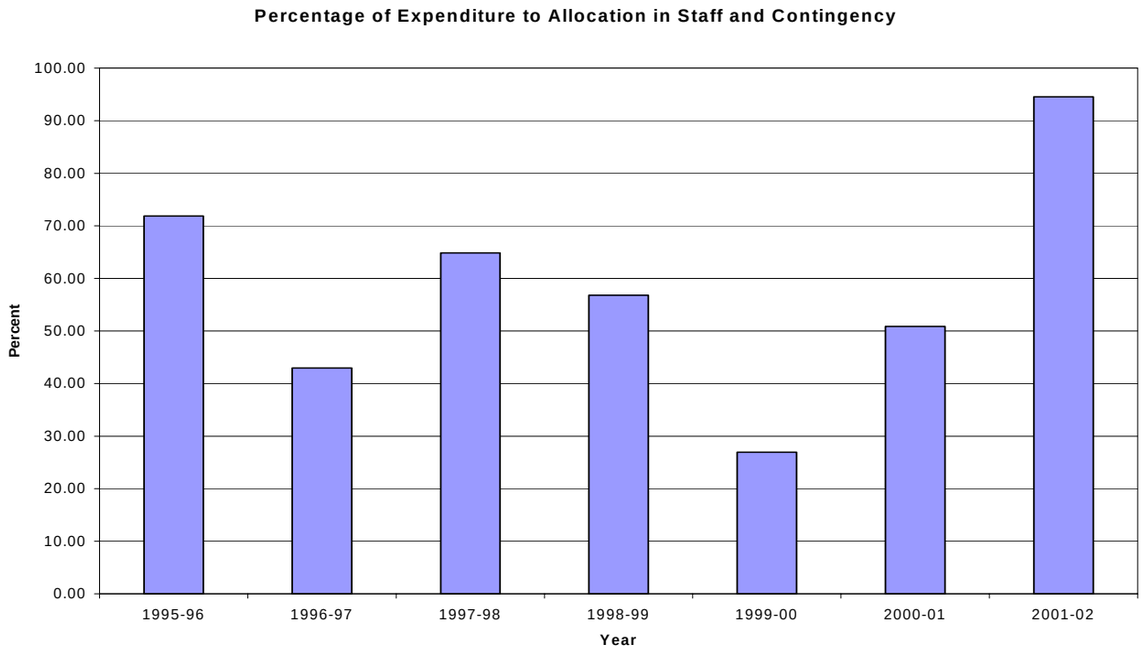
Figure 3.3(b): Componentwise Percent of Expenditure to Allocation (Based on cumulative total for 1995-96 to 2001-02)



Percentage of Physical Achievement in purchase of Breeder seed




Percentage of Expenditure to allocation in purchase of Breeder seed
120.00
100.00
80.00
60.00
40.00
20.00
0.00
Percent
1995-96
1996-97
1997-98
1998-99
1999-00
2000-01
2001-02
Year


Percentage of Expenditure to Allocation in Staff and Contingency
100.00
90.00
80.00
70.00
60.00
50.00
40.00
30.00
20.00
10.00
0.00
Percent
1995-96
1996-97
1997-98
1998-99
1999-00
2000-01
2001-02
Year

Fiture 3.4(d) Percentage of Expenditure to allocation in Development of Infrastructure

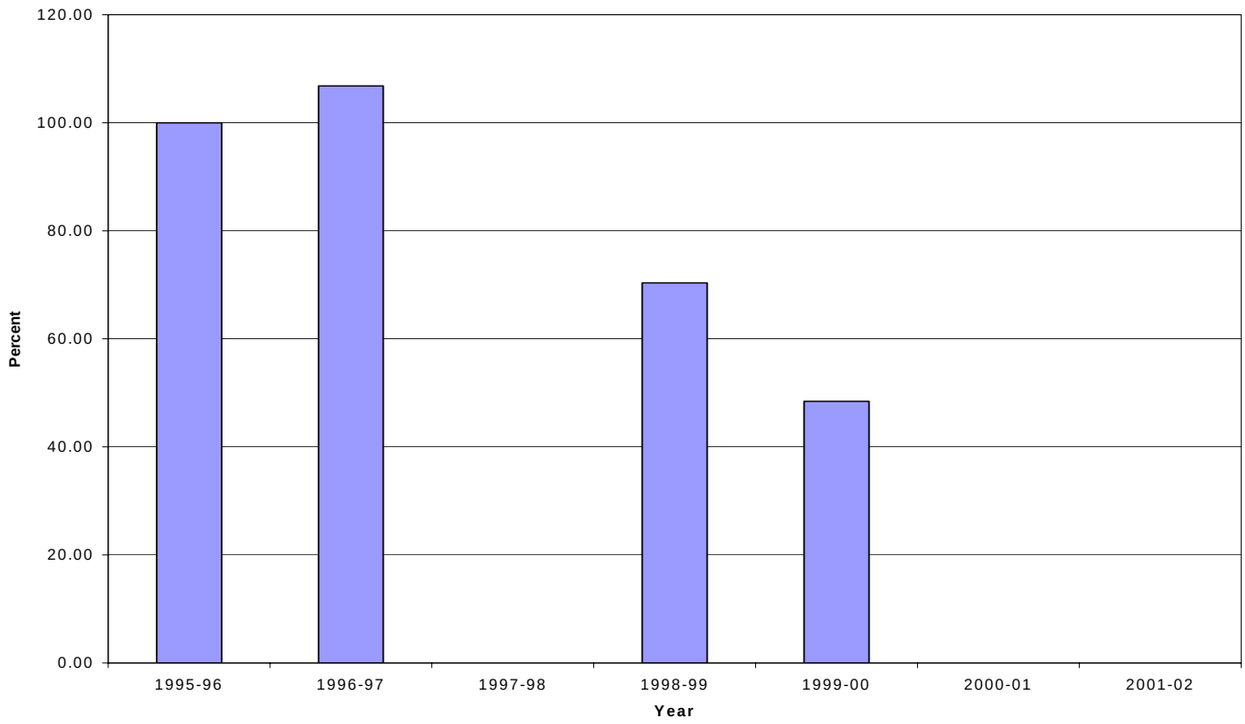


Figure 3.4(e) Percentage of Expenditure to allocation in foundation seeds

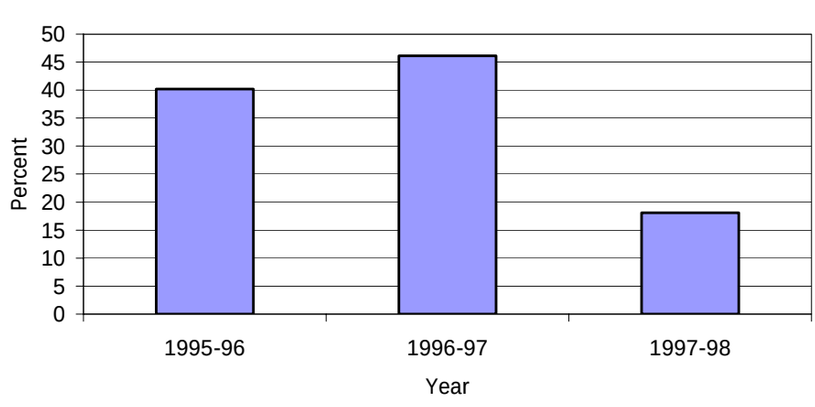


Table 3.5(a)- Componentwise Districts by Level of Physical Achievement Index

Components	High Achievers (Above 75%)	Moderate Achievers(45-75%)	Slow Achievers (below 45%)
Certified Seed Distribution	Tumkur (1)	Kolar, Hassan, Chikmagalur, Gadag, Bagalkote, Koppal, Gulbarga, Belgaum (8)	Bangalore (R), Chitradurga, Davangare, Mysore, Chamarajnagar, Dharwad, Haveri, Bellary, Bijapur, Raichur, Bidar (11)
Seed Village scheme		Dharwad (1)	Bangalore (R), Kolar, Chitradurga, Davanagere, Hassan, Shimoga, Haveri, Gadag, Bellary, Bijapur, Bagalkote, Belgaum, Raichur, Gulbarga, Bidar, Tumkur, (16)
Distribution of Seed Treatment chemicals	Bangalore (U), Bidar, Bangalore (R), Haveri, Bagalkote, Koppal, Belagaum, Tumkur, Davangere, Gadag, Mandya, Hassan, Chamarajnagar,Bellary, Kolar, Gulburga, Dharwad, Chitradurga, Bijapur, U.Kannada, Mysore (21)	Shimoga,Raichur (2)	-
Large Scale Demonstration	Bangalore(U), Mandya, Kolar, Gadag, Tumkur, Chitradurga, Bidar, Chamarajnagar, Udupi Davangere, Hassan, Haveri, Chickmagalur, Bagalkote, Belgaum, D. Kannada, Bellary, U.Kannada, Raichur, Bijapur, Gulburga, Koppal, Shimoga (23)	Bangalore (R), Mysore, Dharwad (3)	-
Control of Root Grub	Kolar, Tumkur,Chitrdurga, Davangere, Mysore, Chamarajnagar, Haveri, Gadag, Bellary, Bijapur, Bagalkote, Raichur, Koppal (13)	Shimoga, Gulburga (2)	Chickmagalur, Mandya, Dharwad, Bidar (4)
Distribution of Plant Protection Equipment's	Raichur, Gulbarga, Koppal, Mandya, Davangere, Bellary, Chickmagalur, Mysore,Bijapur, Kolar, Udupi, Bangalore(U),	-	Gadag (1)

	Tumkur, D. Kannada, Bidar, Bangalore(R), Dharwad, Belgaum, Chamarajnagar, Hassan, Bagalkote, U.Kannada, Shimoga, Chitradurga, Haveri, (25)		
Supply of Improved Implements	Bangalore(R), Kolar, Tumkur, Chitradurga, Davangere, Hassan, Chickmagalur, Udupi, D.Kannada, Mysore, Mandya, Chamarajnagar, Shimoga, Gadag, Haveri, U.Kannada, Dharwad, Bellary, Bijapur, Raichur, Bagalkote, Belgaum, Koppal (23)	Bidar (1)	Gulbarga (1)
Supply of Sprinklers Sets	Bangalore(U), Udupi, Bangalore (R), Tumkur, Chitradurga, Davangere, Chickmagalur, Hassan, D.Kannada, Mysore, Chamarajnagar, Shimoga, U.Kannada, Dharwad, Haveri, Gadag, Bijapur, Bagalkote, Belgaum, Raichur, Koppal, Bidar, Gulbarga, Bellary (24)	Kolar, Mandya (2)	-
Distribution of Gypsum	Tumkur, Mysore, Shimoga, Belgaum, Chamarajnagar, Bellary, Kolar (7)	Davangere, Mandya, Haveri, Koppal, Chitradurga, Bangalore (R) (6)	Bangalore (U), Udupi, Chickmagalur, Raichur, D.Kannada, U.Kannada, Dharwad, Gadag, Bijapur, Bagalkote, Bidar, Gulbarga,Hassan (13)
Distribution of Rhizobium Culture	Bangalore (R), Kolar, Chitradurga, Davangere, Udupi, Hassan, Chamarajnagar, Mysore, Mandya, Haveri, Gadag, Bellary, Shimoga, Bijapur, Bagalkote, Belgaum, Koppal, Gulbarga, Bidar (19)	Bangalore (U), Chikmanglur, D.Kannada, Dharwad, (4)	Tumkur, Raichur (2)
Distribution of Micronutrients	Bangalore (U), Kolar, Udupi, Bangalore(R), Hassan, Davangere, Gadag, Mysore, Chitradurga, Chickmagalur, Mandya, Haveri, Bellary, Belgaum, Bagalkote, Koppal (16)	D. Kannada, Bijapur, Chamarajnagar, Shimoga,Gulburga, Raichur (6)	Dharwad, Bidar, Tumkur (3)

Distribution of Input Kits	Bagalore (U), Bagalore(R) Tumkur, Chitradurga, Hassan, Chickmagalur, D. Kannada, Mysore, Mandya, Shimoga, Dharwad, Bellary, Bijapur, Raichur, ulbuaga, Bidar (16)	Kolar, Belgaum (2)	-
Farmers Training Programme	Bangalore(U), Bangalore(R) Kolar, Tumkur, Davangere Chitradurga, Hassan, Bagalkote, Chikmagalur, D. Kannada, Udupi, Gadag, Mysore, Mandya, Haveri, Chamarajnagar, Dharwad, Bellary, Bijapur, Belgaum, Raichur, Koppal, Gulburga, Bidar, U. Kannada (25)	Shimoga (1)	-
IPM Demonstrations	Bangalore(R), Kolar, Udupi, Chitradurga, Davangere, Hassan, Chickmagalur, Mysore, Chamarajnagar, Mandya, Shimoga, Bellary Dharwad, Haveri, Gadag, Bijapur, Bagalkote, Bidar Belgaum, Raichur, Koppal Gulburga. (22)	Tumkur (1)	U. Kannada (1)
Distribution of Weedicides	Davangere, Koppal (2)	Chitradurga, Bagalkote (2)	Bellary, Bidar, Raichur, Gulburga, Chickmagalur, Mysore, Chamarajnagar, Mandya, Shimoga, Dharwad, Haveri, Bijapur, Belgaum (13)
Demonstration of Pheromones traps	Bangalore(U), Kolar, Bidar Chitradurga, Davagere, Chickmagalur, D.Kannada, Udupi, Mysore, Shimoga, Chamarajnagar, Haveri, U.Kannada, Dharwad, Gadag, Bellary, Bijapur, Bagalkote, Belgaum, Raichur, Koppal, Gulburga (22)	Tumkur, Mandya, Hassan (3)	Bangalore (R) (1)
Distribution of Minikits	Bangalore (U), Tumkur, Davangere, Mysore, Bidar Shimoga, Mandya, Bijapur Chamarajnagar, Hassan, U.Kannada, Dharwad, Bagalkote, Belgaum, Raichur, Gulburga (16)	Chitradurga, Udupi, Chickmagalur, Haveri, Bellary, Koppal, Kolar, Bangalore (R) (8)	Gadag (1)

IPM Demonstrations Organised	Bangalore(U) Bangalore (R), Chitradurga, Davangere, Hassan, Chikmanglur, Udupi, Mysore, Chamarajanagara, Mandya,Shimoga, Dharwad, Haveri, Gadag, Bellary, Bijapur, Bagalkote, Belgaum Raichur, Koppal,Gulbarga, Bidar	Tumkur	U Kannada
Distribution of Weedicides	Davangere, Bellary, Bagalkot,Koppal, Gulbarga, Bidar (6)	Chitradurga, Raichur (2)	Hassan, Chikmanglur, Mysore, Chamarajanaraga, Mandya, Shimoga, Dharwad, Haveri, Bijapur, Belgaum (10)
Demonstration of Pheromones	Bangalore(U), Kolar, Chitradurga, Davangere, Chikmanglur, D Kannada, Udupi, Mysore, Chamarajanagar, Shimoga, U. Kannada, Dharwad, Haveri, Gadag, Bellary, Bijapur, Bagalkote, Belgaum, Raichur, Koppal, Bidar, Gulbarga (22)	Tumkur, Mandya, Hassan (3)	Bangalore (R) (1)
Distribution of Minikits	Bangalore(U), Bangalore (R), Kolar, Tumkur, Davangere, Mysore, Chamarajanagara, Mandya, Shimoga, U.Kannada, Dharwad, Bijapur, Bagalkote, Belgaum, Raichur, Gulbarga,	Chitradurga, Chikmanglur, Udupi, Haveri, Bellary, Koppal ,Bidar (7)	Gadag (1)

programme. Demonstration is a sure method of explaining the finer points of technology and making the farmer adopt these. The provision of minikits, other input and demonstrations together achieve such a goal. Lastly, after the production is accrued to the farmer it is the economic incentives that drives the farmer to accept the technology and extend the area under the crop. This crucial aspect received a backstage in the whole process. Economic incentives include providing proper access to market, prices which initiate the growth of the crop and removal of inefficiencies in marketing and processing, if any. It is suggested that the revised OPP can have an added emphasis on these aspects which we bring and sustained growth in the oilseed sector.

3.5 Componentwise-Districtwise Evaluation of the Scheme

We have presented in Tables 3.5(a) and 3.5(b) the componentwise achievements for the districts in Karnataka on the count of target fulfillment as well as expenditure incurred. We have classified the districts into three groups – high achiever districts, moderate achiever districts and slow achiever districts based on the index of achievements. This is based on physical or financial achievements (achievement/target in the case of physical achievement and expenditure/allocation in the case of financial achievement). The index of achievement is defined as:

$$I_{ap} = P_a / P_t \times 100$$

Where, I_{ap} = Index of Physical Achievement

P_a = Achievement in Physical unity of the component

P_t = Target set for the component in Physical units

And,

$$I_{ae} = F_a / F_t \times 100$$

Where, I_{af} = Index of Financial Achievement

F_a = Financial Allocation on the component

P_e = Expenditure Incurred on the component

It is quite clear that certified seed distribution, seed village scheme, distribution of gypsum and distribution of rhizobium culture have good number of districts categorised as slow achievers. The high achiever districts are the districts where the achievement as per cent of the target set exceeds 75 per cent, the moderate achiever districts were the districts where this proportion is between 45 to 75 per cent and those districts having the achievement ratio of lower than 45 per cent are termed as slow achiever districts. Looking into the frequency distribution of the districts we find that most of the components of the scheme have achieved the targets. Samething is true about the financial achievement which is presented in Table 3.5(b). The tables suggests that it is necessary to concentrate on some of the regions of the State where we find certain components are lagging. Table 3.6 presents the components involved in

the selected districts and classification of these into intensive and not so intensive components. Organised large scale demonstration and supply of improved implements, supply of sprinkler sets, certified seed distribution seem to be more intensively utilised in these districts. The other components of OPP are not so intensively utilised. It is very clear from the table that emphasis is needed on the components, which have not performed well among these district. We have given a matrix, which gives a clear emphasis of the components by districts. Table 3.7 presents a list of the districts, which require more attention across schemes. Dharwad, Raichur, Bijapur and Bidar show requirement of attention on both financial allocation and physical achievement.

Table 3.5(b)- Componentwise Districts by Level of Financial Achievement Index

Components	High Achievers (Above 75%)	Moderate Achievers (45-75%)	Slow Achievers (below 45%)
Certified Seed Distribution	Tumkur (1)	Kolar, Hassan, Gadag, Bagalkote, Koppal, Gulburga (6)	Bangalore(U), Bijapur, Bangalore(R), Chitradurga, Davangere, Chikmagalur, Mysore, Chamarajnagar, Shimoga, Dharwad, Haveri, Bellary, Belgaum, Bidar, Raichur (15)
Seed Village Scheme	-	Belgaum, Dharwad, Kolar (3)	Bangalore(R), Tumkur, Chitradurga, Davangere, Hassan, Shimoga, Haveri, Gadag, Bellary, Bijapur, Bagalkote, Raichur, Bidar, Gulbarga (14)
Distribution of Seed Treatment Chemicals	Bangalore(R), Kolar, Tumkur, Chitradurga,, Davangere, Udupi, Mysore, Chamarajnagar, Mandya, Dharwad, Haveri, Gadag, Bellary, Belgaum, Bagalkote, Koppal, Bidar, Hassan (18)	Bangalore(U), D.Kannada, Shimoga, Gulbarga, Raichur, U.Kannada (6)	Chickmagalur, Bijapur, (2)

Large Scale Demonstration	Bangalore(U), Koppal, Bangalore(R), Kolar, Tumkur, Chitradurga, Davangere, Hassan, Chickmagalur, Udupi, Mysore, Shimoga, Haveri, Bellary, Raichur, Belgaum, Gulburga, Bidar, Chamarajnagar, Mandya, Gadag, Bagalkote, Bijapur (23)	Dharwad, U. Kannada, D. Kannada (3)	-
Control of Root Grub	Kolar, Tumkur, Gadag, Chitradurga, Davangere, Mysore, Chamarajnagar, Haveri, Bellary, Bijapur, Bagalkote, Raichur, Koppal (13)	-	Bidar, Chickmagalur, Mandya, Dharwad, Gulburga, Shimoga (6)
Distribution of Plant Protection Equipment's	Raichur, Gulbarga, Koppal, Mandya, Gadag Davangere, Bellary, Chickmagalur, Mysore, Bijapur, Kolar, Udupi, Bangalore(U), Tumkur, D. Kannada, Bidar, Bangalore(R), Dharwad, Belgaum, Chamrajnagar, Hassan, Bagalkote, U.Kannada, Shimoga, Chitradurga, Haveri, (26)	-	-
Supply of Improved Implements	Tumkur, Davangere, Hassan, Chickmagalur, Chamarajnagar, Mandya, Shimoga, Dharwad, Haveri, Bijapur, Gadag Bagalkote, Belgaum, Koppal (14)	Bangalore(R), Kolar, Chitradurga, Mysore, Bellary, Raichur (6)	D.Kannada, Udupi, Bidar U.Kannada, Gulburga (5)

Supply of Sprinklers Sets	Raichur, Gulbarga, Koppal, Gadag Davangere, Bellary, Chickmagalur, Mysore, Bijapur, Kolar, Udupi, Bangalore(U), Tumkur, D. Kannada, Bidar, Bangalore(R), Dharwad,Belgaum, Chamarajnagar, Hassan, Bagalkote, U.Kannada, Shimoga, Chitradurga, Haveri, (25)	Mandya (1)	
Distribution of Gypsum	Tumkur, Shimoga, Kolar, Belgaum, Bellary, Chamarajnagar (6)	Davangere, Haveri, Koppal Mysore, Mandya, Udupi, Chitradurga, Bangalore(R) (8)	Bangalore(U), Hassan Chickmagalur, D.Kannada, U.Kannada, Dharwad, Gadag, Bijapur, Bagalkote, Raichur, Bidar, Gulburga (12)
Distribution of Rhizobium Culture	Bangalore(R), Kolar, Davangere, Hassan, Udupi, Mysore, Mandya, Koppal, Bellary, Shimoga, Bidar Haveri, , Bijapur, Belgaum, Chitradurga, Bagalkote, Gulburga,(17)	Bangalore(U), Gadag, Chamarajnagar, Raichur (4)	Tumkur, Dharwad, Chickmagalur, D.Kannada (4)
Distribution of Micronutrients	Bangalore(U), Koppal, Bangalore(R), Kolar, , Chitradurga, Hassan, Chickmagalur, Udupi, Davangere, Mysore, Mandya, Haveri, Gadag, Bellary, Bagalkote, Belgaum, Shimoga, (17)	D. Kannada, Chamarajnagar, Bijapur, Gulburga, Bidar, Raichur, (6)	Tumkur, Dharwad (2)
Distribution of Input Kits	Bangalore(U), Tumkur, Bangalore(R), Kolar, , Chitradurga, Hassan, Chickmagalur, Bidar, Mysore, Mandya, Bellary, D.Kannada, Bijapur, Raichur, Gulburga, Shimoga, (16)	Dharwad, Belgaum (2)	-

Farmers Training Programme	Tumkur, Bangalore(R), Chitradurga, Hassan, Chickmagalur, Davangere, Mysore, Mandya, Gadag, Bellary, Udupi, D.Kannada, Bijapur, Raichur, Gulburga, Shimoga, Haveri, Koppal , Bidar Chamajnagar, Dharwad, Belgaum, (22)	Bagalkote, Kolar, Bangalore(U) (3)	U.Kannada (1)
IPM Demonstrations	Bangalore (R), Kolar, Chitradurga, Davangere, Hassan, Udupi, Mandya, Koppal, Chamarajnagar, Shimoga, Dharwad, Haveri, Bidar, Gadag, Bijapur, Raichur, Bagalkote, Belgaum, Gulbarga, Bellary, Mysore, Chickmagalur (22)	Tumkur (1)	U.Kannada (1)
Distribution of Weedicides	Davangere (1)	Chickmagalur, Mandya, Bellary (3)	Chitradurga, Hassan, Koppal, Mysore, Haveri Chamarajnagar, Shimoga, Dharwad, Belgaum, Bijapur, Raichur, Gulburga, Bidar, Bagalkote (14)
Demonstration of Pheromones traps	Raichur, Gulbarga, Koppal, Gadag, Davangere, Bellary, Chickmagalur, Mysore, Bijapur, Kolar, Udupi D.Kannada, Bidar, Dharwad, Belgaum, Chamrajnagar,Hassan, Bagalkote, U.Kannada, Shimoga, Chitradurga, Haveri, (22)	Bangalore (U), Tumkur, Mandya (3)	Bangalore(R) (1)

Distribution of Minikits	Raichur, Gulbarga, Koppal, Mandya, Davangere, Chickmagalur, Mysore, Bijapur, Kolar, Udupi, Bangalore(U), Tumkur, D. Kannada, Bidar, Bangalore(R), Dharwad, Belgaum, Chamarajnagar, Hassan, Bagalkote, U.Kannada, Shimoga, Chitradurga, Haveri, (24)	Bellary, Gadag (2)	-
Staff and Contingency	Chitradurga (1)	-	Tumkur, Bellary, Bijapur, Belgaum, Raichur, Gulburga, Bidar (7)
Development of Infrastructure	Dharwad, Bellary, Bidar (3)	Shimoga, Davangere, Hassan, Gadag, Bijapur, Belgaum, Tumkur (7)	Bangalore(R), Bangalore(U), Kolar, Chitrdurga, Udupi, Mysore, U.Kannada, Bagalkote, Raichur, Koppal, Gulburga (11)

Table 3.6 : Selected Districts and Components involved

Sl. No.	Districts	Intensive Components	Not Intensive Components
1	Bellary	CSD(1.58), LSD(3.96), CRG(3.69), PPE(6.49), SII(1.01), SSS(10.38), SG(3.42), DI(1.8),IPM(1.48)	SVS(0.33), STC(0.75), RC(0.37), M(0.32), IK(0.77), FT(0.23), DW(0.63), PT(0.32), SC(0.05), DM(0.24)
2	Belagum	CSD(1.39), SVS(1.56), LSD(3.78), PPE(2.25), SII(4.49), SSS(10.55), SG(2.76), DI(1.37), IPM(1.35), SC(2.20), DM(1.02)	STC(0.79), RC(0.48), M(0.28), IK(0.43), FT(0.26), DW(0.21), PT(0.28), CRG(0.00)
3	Bijapur	LSD(5.36), CRG(1.07), PPE(3.01), SII(2.07), SSS(9.28), DI(1.03)	CSD(0.30), SPS(0.06), STC(0.21), SG(0.27), RC(0.37), M(O.20), IK(0.80), FT(0.25), IPM(0.62), DW(0.11), PT(0.31), SC(0.02), DM(0.87)
4	Bidar	LSD(2.55), PPE(2.10), SSS(14.28), DI(1.84), IPM(1.41)	CSD(0.19),SVS(0.07), STC(0.59), CRG(0.09), SII(0.19), SG(0.77), RC(0.32), M(0.24), IK(0.52), FT(0.18), DW(0.32), PT(0.30), SC(0.59), DM(0.65)
5	Chitradurga	CSD(4.47), STC(1.22), SVS(2.27), LSD(4.34), CRG(4.79), PPE(2.52), SII(2.61), SSS(19.94), SG(3.63), DI(1.44), IPM(2.14), SC(5.96)	RC(0.82), M(0.76), IK(0.74), FT(0.48), DW(0.94), PT(0.59), DM(0.67)
6	Davangere	STC(1.01), LSD(1.41), CRG(1.89), PPE(4.21), SII(4.29), SSS(12.02), SG(1.99), IPM(3.23), DW(2.91)	CSD(0.35), SVS(0.15), RC(0.21), DI(0.40), M(0.83), IK(0.00), FT(0.24), PT(0.26), SC(0.00), DM(0.48)
7	Dharwad	CSD(1.17), SVS(2.43), LSD(2.90), PPE(1.29), SII(2.64), SSS(13.96), DI(1.09)	STC(0.38), CRG(0.28), SG(0.88), RC(0.15), M(0.09), IK(0.71), FT(0.22), IPM(0.79), DW(0.04), PT(0.35), SC(0.00), DM(0.73)
8	Gulbarga	CSD(3.17), LSD(5.06), PPE(11.07), IPM(1.68), DM(1.09), SSS(11.21)	SVS(0.50), STC(0.46), CRG(0.38), SII(0.16), SG(0.76), RC(0.33), DI(0.40), M(0.21), IK(0.76), FT(0.29), DW(0.20), PT(0.29), SC(0.59)
9	Hassan	CSD(1.11), LSD(1.30), PPE(1.71), SII(3.17), SSS(9.12), SG(1.12), IPM(1.01)	SVS(0.11), STC(0.45), CRG(0.00), RC(0.25), DI(0.60), M(0.19), IK(0.36), FT(0.27), DW(0.01), PT(0.24), SC(0.00), DM(0.46)
10	Koppal	CSD(3.18), CRG(1.39), LSD(1.32), PPE(3.76), SII(2.15), SSS(8.28), IPM(1.58)	SVS(0.01), STC(0.49), SG(0.97), RC(0.27), DI(0.10), M(0.16), IK(0.00), FT(0.19), DW(0.55), PT(0.15), SC(0.00), DM(0.33)
11	Kolar	CSD(3.32), LSD(1.42), CRG(1.66), PPE(5.99), SII(1.26), SSS(10.02), SG(2.30)	SVS(0.76), STC(0.35), RC(0.29), DI(0.48), M(0.40), IK(0.37), FT(0.22), IPM(0.98), DW(0.00), PT(0.22), SC(0.00), DM(0.48)
12	Raichur	CSD(3.32), LSD(4.05), CRG(2.40), PPE(10.81), SII(1.85), SSS(11.49), SG(1.40), IPM(1.40)	SVS(0.10), STC(0.37), RC(0.23), DI(0.31), M(0.22), IK(0.61), FT(0.33), DW(0.37), PT(0.43), SC(019), DM(0.65)
13	Shimoga	LSD(3.21), PPE(3.76), SII(1.39), SSS(7.35), SG(1.26), DI(1.41)	CSD(0.02), SVS(0.03), STC(0.34), CRG(0.10), RC(0.29), M(0.33), IK(0.63), FT(0.18) IPM(0.35), DW(0.31), PT(0.14), SC(0.00), DM(0.68)
14	Tumkur	CSD(16.07), STC(1.16), LSD(2.40), CRG(5.08), PPE(4.68), SII(3.66), SSS(21.49), SG(4.63), DI(1.44)	SVS(0.83), RC(0.25), M(0.18), IK(0.64), FT(0.36), IPM(0.88), DW(0.00), PT(0.18), SC(0.24), DM(0.73)

Note:

1 .CSD -Certified Seed Distribution, SVS -Seed Village Program, STC-Distribution of Seed treatment Chemicals, OLD-Organised Large Scale Demonstrations, CRG-Control of Root Grub, PPE-Distribution of Plant Protection Equipment's, SII-Supply of Improved Implements, SSS-Supply of Sprinkler Sets, DG-Distribution of Gypsum, DRC-Distribution of Rhizobium Culture,DI-Development of Infrastructure, DM-Distribution of Micronutrients, DIK-Distribution of Input Kits, IPM-IPM Demonstrations Organised, FTP-Farmers Training Program, DW- Distribution of Weedicides, DP-Demonstration of Pheromones, SC-Staff and Contingency, DMK-Distribution of Minikits

2. Componentwise average expenditure per year for the period 1997-2002 is shown in the classification of intensive and non-intensive components is arrived on the basis of the average expenditure.(0-1 lakh) - Not intensive Components (1-20 lakh) - Intensive Components

Table 3.7: Component wise Districts needing further attention under OPP

Components	Slow Achievers on both Physical and Financial terms	Slow Achievers on Physical terms	Slow Achievers on Financial terms
Certified Seed Distribution	Chitradurga, Davangere, Haveri, Bellary, Belgaum, Raichur, Dharwad, Bidar	**Bijapur**	**Bagalkote**
Seed Village Scheme	Chitradurga, Davangere,Haveri, Gadag, Bellary, Bijapur, Bagalkote, Raichur, Koppal, Gulbarga, Bidar	**Belgaum, Dharwad**	**Tumkur**
Distribution of Seed Treatment Chemicals		Raichur, Dharwad	
Organizing of Large Scale Demonstration		Bagalkote, Koppal	
Control of Root Grub	Gulbarga, Dharwad		
Distribution of Plant Protection Equipment		Gadag	
Supply of Improved Implements	Gulbarga		Kolar, Bidar
Supply of Sprinkler Sets		Bellary	
Distribution of Gypsum	Gadag, Bijapur, Raichur, Bagalkote, Raichur, Gulburga, Bidar, Dharwad		
Distribution of Rhizobium Culture	Tumkur, Raichur		Dharwad
Development of Infrastructure			Tumkur, Chitradurga, Bagalkote, Raichur, Koppal, Gulburga
Distribution of Micro-nutrients	Dharwad	Bidar	Tumkur
Input Kits			
Farmers Training Programe			
IPM demonstration organized			
Distribution of Weedicides	Haveri, Bijapur. Dharwad,	Belgaum	Raichur, Gulburga, Bellary, Bidar
Demonstration on Pheromone trap			Gadag, Bagalkote
Staff & Contingency			Tumkur, Bellary, Bijapur, Belgaum, Raichur, Gulburga, Chitradurga, Bidar
Distribution of Minikits		Gadag	Tumkur, Dharwad

Note: 1. Based on table 3.4(a) and 3.4 (b)
2. Here we have not considered the districts having less than 50 thousand hectares under oilseeds.

3.6 Conclusions

The Oilseed production incentive programme is being implemented in Karnataka through its various phases. Karnataka being one of the important oilseed growing state, these programmes brought significant changes in the oilseed economy. The initial thrust through Technology Mission brought about a shift in crop pattern in favour of this

crop group. The growth in production and area under the crop group was quite remarkable. Groundnut, soyabean and sunflower were the vanguards of this change. During the decade of nineties the oilseed incentive programme continued but under different names. However, the area trends in the crop group beyond 1993-94 are not quite encouraging and these have a tale-tale effect on the production growth. This experience is however, not the same across all oilseeds and soyabean showed better prospects.

The Oilseed Production Programme continued during ninth plan period. The thrust of the initial Technology Mission was not seen during nineties and especially after 1993-94. But possibly the thrust was to sustain the momentum achieved during the earlier phases. If we take this as the focus of OPP then the programme has achieved its goal of sustaining the momentum. During the implementation of the programme the area under the crops nor the yield rates improved significantly except for soyabean and groundnut. Almost all the crops showed fluctuations during this phase. Our supply response exercise showed clear importance on price and related factors. In that case, we need to consider the possible scenario in the absence of the support programmes through various components.

Almost all the components of OPP show a good achievement on the scale of achievement index. Seed Village Scheme, Distribution of Gypsum and Distribution of Weedicides are the among the average performing components. The lower expenditure on `Staff and Contingency' shows better economy and stringent financial control in the programme implementation. Our analysis indicates necessity of further attention on seed related technological inputs. Further, the post-harvest stages of the crop remain totally neglected in the programme. Economic incentives play much greater role than technological support. These should include providing proper access to market, processing facilities, prices and post-harvest storage in the market. Providing these incentives will surely make an impact on the crop economy.

Across the districts we find that the OPP programme should be strengthened in Chitradurga, Bijapur, Bellary, Belgaum and Koppal districts. Additional emphasis is needed in Davangere, Gulbarga, Raichur and Gadag districts. We have provided a matrix elaborating the emphasis across components in table 3.7. Slight modifications in allocations for these regions and inclusion of a few components will make the programme more emphatic and successful

CHAPTER IV

MICRO LEVEL EVALUATION OF OPP

4.1 Introduction

In order to understand the process of implementation of OPP and its reach at micro-level we selected beneficiaries from the areas where the programme is being implemented intensively. The selection was based on three three-stage sampling procedure. Density of the programme implementation was our guiding variable. As a first stage we selected fourteen districts purposively having higher level of achievements under different components and falling in different agro-climatic regions. One taluka each was purposively selected from the districts for the purpose of intensive field work in consultation with the officials of Directorate of Agriculture at the district and taluka levels. This served as a second stage of sampling process. Further, we selected one village from each of the taluka and with the help of Simple Random Sampling Procedure 10 households having benefited under the Oilseed Production Programme from the list of beneficiaries. In this chapter, we have attempted to evaluate the performance of OPP at micro level specifically focussed on the impact of the programme on area and productivity. Another seven districts were selected during the second stage.

4.2 General Characteristics

Out of the selected 14 districts, 140 beneficiary households and 70 non-beneficiaries were selected. The beneficiaries have availed different facilities under different components of OPP and utilised these for the purpose of oilseed crops grown. There were 19 Scheduled Caste and Scheduled Tribe beneficiaries. Twelve beneficiaries were women farmers. The average size of holdings of the beneficiaries was 10.16 acres (and 8.53 acres for non-beneficiaries) which was lowest in Shimoga and highest in Gulbarga districts. Most of the beneficiaries have oilseeds as major crops grown and there were beneficiaries who have about 70 per cent of the operated area under oilseeds. The per cent of irrigation among beneficiaries ranges from 9 per cent to 60 per cent as against 4.4 per cent to 52 per cent in control cases (table 4.18). It was clearly observed that larger area is being devoted to oilseeds and oilseeds also

got benefit of irrigation. These are also the major cash crops of the beneficiaries. Table 4.1a presents the basic characteristics of the respondents covered in the sample survey. Similar characteristics for non-beneficiaries was furnished in Table-4.1b.

Table 4.1a: Respondents covered and their holding size (Beneficiaries)

District	No. of respondents					Average holding size (acres)	% Area under irrigation	% Area under oilseeds
	No. of house holds covered	State sector	District sector	No. of Households				
				SC/ST	Women			
Chitradurga	10	3	7	2	3	11.75	31.70	64.68
Bellary	10	_	10	1	2	6.30	15.87	69.84
Gulburga	10	_	10	2	1	17.65	13.03	37.39
Koppal	10	5	5	_	_	7.75	59.35	38.06
Bijapur	10	2	8	2	_	10.52	13.78	49.90
Dharwad	10	_	10	2	_	9.90	12.00	42.92
Shimoga	10	_	10		_	4.80	49.00	20.39
Hassan	10	1	9	0	1	10.38	59.28	42.89
Bidar	10	3	7	3	1	7.43	43.09	39.72
Belgaum	10	-	10	3	1	14.03	12.12	43.69
Raichur	10	2	8	2	0	10.85	84.33	58.06
Kolar	10	0	10	2	0	7.40	9.46	60.81
Davangere	10	0	10	0	1	9.93	23.17	69.77
Tumkur	10	0	10	0	2	13.61	21.68	70.56
Total	140	16	124	19	12	10.16	30.08	50.87

Table 4.1b: Respondents covered and their holding size (Non-Beneficiaries)

District	No. of respondents		Average holding size (acres)	% Area under irrigation	% Area under oilseeds
	No. of house holds covered	No. of SC/ST House-holds			
Chitradurga	5	1	12.4	6.45	74.19
Bellary	5	1	5.4	11.11	62.96
Koppal	5		12.5	41.6	30.4
Gulburga	5	1	9.1	4.4	37.36
Bijapur	5	-	7.4	16.22	31.08
Dharwad	5	-	7	11.43	31.43
Shimoga	5	-	5.7	22.81	14.04
Hassan	5	1	9.70	27.84	39.18
Bidar	5	0	8.90	44.94	17.98
Belgaum	5	0	14.60	13.70	31.51
Raichur	5	2	5.90	52.54	50.85
Kolar	5	2	2.50	0.00	60.00
Davangere	5	0	10.60	28.30	66.04
Tumkur	5	0	7.70	28.57	53.25
Total	70	8	8.53	22.87	42.46

Componentwise spread of beneficiaries is shown in Table 4.2. It was noted that largest number of beneficiaries take advantage of seed treatment or Rhizobium culture followed by those who are benefited in terms of supply of gypsum and certified seed distribution. Only 1.43 per cent of the beneficiaries have received weedicides whereas, less than 1 per cent have reported to have received input kits. The average size of holdings across components is also presented in the table and we find that Integrated Pest Management, Plant Protection Equipments, Micro Nutrients and demonstrations are usually favoured by farmers having larger size of holdings, whereas the small farmers preferred input kits, sprinkler sets and farmers' training. Among the components, seed treatment seem to have received larger attention, however seed distribution seem to have got relegated back in the process.

Table 4.2: Benefits availed under different components (Beneficiaries)

Sl.No.	Component	% Households	Average Holding Size (acres)	% of irrigated area	% of area under oil seeds
1	Certified seed	61.43	9.80	22.80	27.41
2	Seed Village Scheme	-	-	-	-
3	Seed Treatment	47.86	10.08	9.53	48.55
4	Large Scale Demonstration	22.86	11.42	28.27	55.56
5	Root Grub Control	29.29	11.45	0.00	47.67
6	Improved Implements	37.86	10.24	24.68	42.19
7	Sprinkler Set	15.72	7.29	24.29	47.16
8	Supply of Gypsum	65.71	9.37	24.55	40.47
9	Supply of Rhizobium Culture	65.00	10.22	19.19	49.99
10	Supply of Micro Nutrients	23.57	10.08	15.89	44.20
11	Input Kit	0.72	7.50	0.00	66.67
12	Farmers Training	10.72	8.56	22.84	44.68
13	Supply of Weedicides	1.43	11.75	0.00	44.68
14	Supply of Pheromone Trap	14.28	16.17	13.03	44.01
15	Minikit	32.86	11.50	12.23	46.75
16	IPM	28.57	12.65	22.20	46.64
17	PP Equipment's	32.14	11.74	31.69	43.51
18	Integrated Nutrient Management	5.71	9.24	0.00	9.24
19	Phosphate Soluble Bacteria	5.00	17.33	65.12	61.00

The cropping pattern of the beneficiaries is presented in table 4.3a and we can see oilseed as the dominating crop among the beneficiaries. This finding is quite natural as we reached mainly to the oilseed growers in search of those who have derived benefits out of OPP programme. Large number of beneficiaries are inclined more to the

low density rainfed crops. It was very clear that oilseeds serve as major cash crop for the farmers under rainfed conditions. Even among non-beneficiaries area under oilseeds dominate their cropping pattern (Table 4.3b). However they have comparatively lower proportion of their area under oilseeds.

Table 4.3a: Landuse pattern of the respondent farmers (Beneficiaries)

Size Class	Average holding Size	% Irrigated Area	% Area Under Oilseeds	Jowar	Maize	Cotton	Paddy	Tur	Bajra	Sugar-cane	Ragi	Others
<2.5 acres	1.75	32.73	65.07	16.21	1.66	0.00	4.77	4.96	1.66	0.00	0.00	5.67
2.51 to 6.25 acres	4.82	22.21	62.73	11.30	4.36	3.03	1.55	3.11	3.95	0.83	4.78	4.36
6.251 to 12.5 acres	9.13	39.88	45.31	14.65	1.28	0.78	5.47	2.66	1.47	1.96	9.39	17.05
12.51 to 25 acres	17.76	35.14	47.63	8.56	7.27	1.64	12.91	8.21	2.35	2.35	1.88	7.20
>25.00 acres	32.71	23.80	49.45	22.29	2.18	4.28	4.04	4.44	4.89	0.76	4.37	3.30
Total	10.16	30.08	50.87	14.76	3.90	2.52	6.56	5.04	3.26	1.44	4.46	7.19

Note: Holding size in acres and all others are percentages

Table 4.3b: Landuse pattern of the respondent farmers (Non-Beneficiaries)

Size Class	Average holding Size	% Irrigated Area	% Area Under Oilseeds	Jowar	Maize	Cotton	Paddy	Tur	Bajra	Sugar-cane	Ragi	Others
<2.5 acres	1.89	23.53	55.88	2.94	0.00	2.94	5.88	2.94	11.76	0.00	14.71	2.94
2.51 to 6.25 acres	4.47	17.76	49.81	10.81	4.25	3.09	9.27	8.11	5.41	0.00	5.02	4.25
6.251 to 12.5 acres	8.79	21.07	45.15	8.19	8.70	0.67	5.35	9.70	7.36	0.00	9.70	5.18
12.51 to 25 acres	17.77	31.17	35.93	19.26	3.46	2.60	1.30	11.04	6.49	0.87	5.19	13.85
>25.00 acres	35.00	8.57	41.43	17.14	13.57	0.00	7.14	13.57	2.86	1.43	0.00	2.86
Total	8.53	22.86	42.46	13.94	6.03	1.93	4.86	10.13	6.20	0.50	5.95	8.00

Technology adoption has been one of the important objectives of OPP. The programme focus on providing the new technological inputs and incentives to adopt such technology. It can be observed from the table 4.5a that a large number of farmers have changed from the traditional oilseed varieties to modern oilseed varieties. This change needs to be attributed to the oilseed production programme. The number of varieties that are popular in the field are reported in Table 4.5a and we can see that for groundnut TMV-2 and JL-24 are the most common varieties whereas for sunflower MAHYCO and MORDAN are the popular varieties. Soyabean has 90 per cent area under JS-335. This change is quite commendable, however this has not been accompanied by an associated increase in the productivity.

4.3 Yield Response Functions

In order to locate the determinants of productivity we have attempted fitting of the yield response functions of the following types:

1 $Y_t = \alpha + \beta_1 HS + \beta_2 sh.OA + \beta_3 Perirr + \beta_4 VOF$

2 $Y_t = \alpha + \beta_1 HS + \beta_2 sh.OA + \beta_3 VOF + \beta_4 IRRD$

3 $Y_t = \alpha + \beta_1 HS + \beta_2 sh.OA + \beta_3 Perirr + \beta_4 VOF + \beta_5 P + \beta_6 VD$

4 $Y_t = \alpha + \beta_1 HS + \beta_2 sh.OA + \beta_3 Perirr + \beta_4 VOF + \beta_5 P + \beta_6 ST$

5 $Y_t = \alpha + \beta_1 HS + \beta_2 sh.OA + \beta_3 Perirr + \beta_4 VOF + \beta_5 P + \beta_6 DD$

6 $Y_t = \alpha + \beta_1 HS + \beta_2 sh.OA + \beta_3 Perirr + \beta_4 VOF + \beta_5 P + \beta_6 TD$

Where, Y_t - Yield per acre in kgs
HS - Total holding size in acres
Sh.oA - Percentage share of area under that crop
Perirr - Percentage share of irrigated area
VOF - Value of fertilizers in rupees
P - Price per quintal in Rupees
ST - Seed treatment dummy (0 and 1)
IRRD - Irrigation dummy (0 and 1)
VD - Crop variety dummy (0 and 1)
DD - Demonstration dummy (0 and 1)
TD - Training dummy (0 and 1)

These functions were estimated for the group of beneficiaries and non-beneficiaries separately, and for groundnut and sunflower. The purpose of the yield response functions here is to locate the traditional determinants of yield vis-à-vis the project determinants of yield among beneficiaries and non-beneficiaries. Results of the estimation are presented in tables 4.4a, 4.4b, 4.4c and 4.4d. It can be seen from table 4.4a and 4.4b that, among beneficiaries the per cent of irrigated area emerges as strong determinants in groundnut whereas the fertilizer use clearly shows its influence on yield among the non-beneficiaries. Among the non-beneficiaries group groundnut yield response function has a specific division between rainfed vis-à-vis irrigated areas with irrigation dummy emerging with statistically significant coefficients. It is interesting that

the project variables viz., the varieties supplied under OPP and the demonstrations have a clear and statistically significant impact on the yield of groundnut whereas the price of groundnut also indicates positive influence on yield but has not clearly emerged with statistically significant co-efficients. As regard sunflower, again irrigation makes a significant difference in the yield of sunflower but here the influence is similar among beneficiaries as well as non-beneficiaries. Probably, OPP could not influence yield of beneficiaries. Unlike groundnut, in sunflower the technology variables have negligible influence on the yield parameters, as reflected from the statistically insignificant coefficients for these variables. Surprisingly, majority of the components of OPP also emerge with insignificant influence on the yield rates. It is only the dummy variable for crop varieties which has the negative, and statistically significant influence on yield rates, the result which is difficult to accept due to its negative sign.

Table 4.4a: Yield Response Functions : Groundnut (Beneficiary)

Intercept	Holding Size	Share of oilseeds area	% irrigated area	Value of fertilizers	Variety dummy	Price	Seed treatmen t dummy	Demon-stration dummy	Training dummy	Multiple R	Adjusted R Square
263.54	1.87	0.20	3.91	0.14						0.51	0.23
(3.16)	(0.72)	(0.27)	(5.62)	(1.23)							
-80.04	2.09	0.14	3.83	0.11	109.00	0.21				0.54	0.25
(0.46)	(0.81)	(0.19)	(5.41)	(0.95)	(1.29)	(1.86)					
-55.04	1.42	0.11	3.88	0.10		0.20	106.04			0.54	0.25
(0.33)	(0.55)	(0.15)	(5.43)	(0.91)		(1.78)	(1.35)				
53.35	1.74	0.28	3.66	0.08	0.22			-112.06		0.56	0.27
(0.34)	(0.69)	(0.39)	(5.32)	(0.68)	(1.97)			(2.10)			
29.85	1.69	0.17	3.75	0.12		0.21			-36.01	0.53	0.24
(0.18)	(0.65)	(0.24)	(5.23)	(1.10)		(1.79)			(0.56)		

Table 4.4b: Yield Response Functions : Groundnut (Non-Beneficiary)

Intercept	Holding Size	Share oilseeds area	% irrigated area	Value of fertilizers	Irrigation dummy	Variety dummy	Price	Seed treatment dummy	Multiple R	Adjusted R Square
116.73	0.49	-0.32	1.57	0.63					0.53	0.22
(1.34)	(0.12)	(0.27)	(1.26)	(2.26)						
149.71	-1.60	0.42		0.49	596.93				0.74	0.52
2.17	0.51	0.48		(2.70)	(5.61)					
120.99	0.15	-0.43	1.65	0.67		85.76	-0.08		0.54	0.20
(0.65)	(0.04)	(0.36)	(1.28)	(2.32)		(0.67)	(0.57)			
174.17	0.28	-0.59	1.46	0.61			-0.06	52.68	0.55	0.21
(1.07)	(0.07)	(0.48)	(1.12)	(2.14)			(0.46)	(0.95)		
180.39	0.71	-0.29	1.68	0.64			-0.07		0.54	0.21
(1.11)	(0.17)	(0.24)	(1.31)	(2.27)			(0.47)			
180.39	0.71	-0.29	1.68	0.64			-0.07		0.54	0.21
(1.11)	(0.17)	(0.24)	(1.31)	(2.27)			(0.47)			

Table 4.4c: Yield Response Functions : Sunflower (Beneficiary)

Intercept	Holding Size	Share oilseeds area	% irrigated area	Value of fertilizers	Irrigation dummy	Variety dummy	Price	Seed treatment dummy	Demon-stration dummy	Training dummy	Multiple R	Adjusted R Square
319.51	2.93	0.58	2.30	0.09							0.40	0.10
(3.97)	(1.10)	(0.74)	(3.06)	(0.99)								
394.29	2.03	0.80	0.04		262.44						0.45	0.15
(5.50)	(0.80)	(1.06)	(0.42)		(3.62)							
528.50	2.24	0.61	2.51	0.00		-259.63	0.06				0.46	0.13
(2.85)	(0.84)	(0.80)	(3.30)	(0.02)		(1.92)	(0.68)					
287.50	2.65	0.62	2.29	0.08			0.04	-32.59			0.40	0.08
(2.09)	(0.97)	(0.79)	(2.91)	(0.83)			(0.45)	(0.58)				
136.46	2.70	0.78	0.77	0.10			0.10		60.75		0.41	0.09
(2.08)	(1.07)	(0.78)	(3.07)	(0.64)			(0.49)		(1.06)			
281.51	2.83	0.58	2.36	0.08			0.03			12.82	0.40	0.07
(2.04)	(1.04)	(0.74)	(3.03)	(0.77)			(0.32)			(0.20)		

Table 4.4d: Yield Response Functions : Sunflower (Non-Beneficiary)

Intercept	Holding Size	Share oilseeds area	% irrigated area	Value of fertilizers	Variety dummy	Price	Seed treatment Dummy	Multiple R	Adjusted R Square
274.78	6.08	0.84	3.57	-0.10				0.59	0.20
(1.67)	(0.88)	(0.31)	(2.54)	(0.41)					
198.53	8.16	1.73	3.28	-0.16	-167.60	0.17		0.62	0.15
(0.59)	(1.09)	(0.57)	(2.06)	(0.61)	(0.84)	(0.72)			
94.25	5.65	2.05	3.33	-0.04		0.03	100.75	0.62	0.15
(0.29)	(0.78)	(0.66)	(2.08)	(0.13)		(0.14)	(0.78)		
131.30	6.43	1.32	3.24	-0.14		0.12		0.60	0.17
(0.41)	(0.90)	(0.45)	(2.05)	(0.54)		(0.52)			
131.30	6.43	1.32	3.24	-0.14		0.12		0.60	0.17
(0.41)	(0.90)	(0.45)	(2.05)	(0.54)		(0.52)			

Table 4.5a: Varieties of seeds used-before and after the OPP - Beneficiaries

		Groundnut		Sunflower		Safflower		Soyabean		Castor	Sesamum	Linseed	
Crop	Variety	Now	Before	Now	Before	Now	Before	Now	Before	Now	Now	Now	Before
	Local	14.21	52.26										
	JL-24	16.44	2.43										
	Improved	4.68	0.00	-	-	-	-	-	-	-	-	-	-
	TMV-2	57.42	36.04										
Groundnut	S 206	7.25	6.00										
	Local			11.86	35.53								
	KBSH-1			26.67	6.94								
	Sandoz			3.22	0.00								
	Jwalamuki			3.45	5.88								
	Mahyco	-	-	22.29	7.88	-	-	-	-	-	-	-	-
	IH2			5.17	-								
	Mordan			10.12	12.00								
	Pioneer			1.73	11.77								
	Ganga Cauvery			13.00	16.00								
	Kargil			2.00	4.00								
	Local					14.56	70.84						
	A1	-	-	-	-	58.18	20.83	-	-	-	-	-	-
Safflower	A2					27.26	8.33						
	Local	-	-	-	-	-	-	10.00	87.5	-	-	-	-
Soyabean	JS-335							90.00	12.5				
Castor	Local	-	-	-	-	-	-	-	-	100.00	-	-	-
Sesamum	Local	-	-	-	-	-	-	-	-	-	100.00	-	-
Linseed	Local	-	-	-	-	-	-	-	-	-	-	100.00	100.00

Note: Figures are in percentages

Table 4.5b: Varieties of seeds used-before and after the OPP (Non-Beneficiaries)

		Groundnut		Sunflower		Safflower		Soyabean		Gingely	
Crop	Variety	Now	Before	Now	Before	Now	Before	Now	Before	Now	Before
	Local	6.30	44.67								
	JL-24	26.71	13.00								
	Improved	28.57	5.00	-	-	-	-	-	-	-	-
	TMV-2	36.91	36.33								
Groundnut	S 206	1.50	1.00								
	Local			0.00	6.00						
	KBSH-1			0.00	6.00						
	Sandoz			11.54	0.00						
	Jwalamuki			19.23	5.50						
	Mahyco	-	-	12.19	36.11	-	-	-	-	-	-
	Aruna			27.00	0.00						
	Mordan			4.90	6.00						
	Improved			11.5	33.34						
	Ganga Cauvery			9.00	0.00						
Sunflower	Kargil			4.50	7.00						
	Local					0.00	25.00				
	A1	-	-	-	-	100.00	75.00	-	-	-	-
Safflower	A2										
	Local	-	-	-	-	-	-	0.00	50.00	-	-
Soyabean	JS-335							100.00	50.00		
Gingely	Local	-	-	-	-	-	-	-	-	100.00	100.00

Note: Figures are in percentages

Table 4.6a shows the percentage change in the area under oilseed crops and table 4.7a gives changes in yield rates of major oilseeds. The results presented in these tables reveal that, with the exception of Sunflower, Safflower and Sesamum, the area under oilseed at micro level has been declining. Though this decline is not of large magnitude it causes concern as OPP focuses on inducement in area. Of course, there are cases where there is an impressive increase in the oilseed area. It is quite interesting to observe that farmers with larger size of holdings have increased their area under oilseeds. As regards the incremental yield achieved out of oilseed production programme, the results are not very encouraging. It seems that the farmers might have under-estimated the yield increase as these do not match even with the crop cutting experiments of the district. The productivity levels prior to OPP and current yield levels are compared and we find that overall, there has been a slight decline of about 6.85 per cent in the productivity. Positive changes in the yield levels were observed in the case of Sunflower, and Linseed. The reported decline in the yield level of groundnut was 12 per cent whereas, sunflower reported to have at 3 per cent higher yield than the previous yield levels before the OPP. These observations are based on the data of one

single year and needs to be cross-checked during the second phase of the evaluation. Even among the non-beneficiaries same trend is disearnable (Table 4.6b +4.7b).

4.6a: Percentage change in area under different oil seed crops- before and after OPP (Beneficiaries)

Size class	Groundnut	Sunflower	Safflower	Soyabean	Linseed	Sesamum	All
< 2.5 acres	-36.03	10.75	-83.33	0.00	-	-	-14.27
2.51 to 6.25 acres	-5.05	35.42	15.38	0.00	-33.33	0.00	2.87
6.251 to 12.5 acres	-28.38	-17.79	16.67	0.00	-	33.33	-22.27
12.51 to 25 acres	-4.18	-15.08	8.33	-20.00	-50.00	0.00	-7.43
> 25 acres	-9.68	56.52	100.00	0.00	-50.00	-12.50	11.78
Total	-13.94	14.25	26.14	-4.35	-44.44	5.88	-4.49

4.6a: Percentage change in area under different oil seed crops- before and after OPP (Non-Beneficiaries)

Size class	Groundnut	Sunflower	Safflower	*Gingely*	Sesamum	All
< 2.5 acres	-5.88	-70.00	-	-	-	-29.63
2.51 to 6.25 acres	-24.03	47.37	-11.11	0.00	0.00	-14.29
6.251 to 12.5 acres	-25.20	50.00	-	0.00	-	-7.64
12.51 to 25 acres	-6.41	80.00	0.00	0.00	-25.00	12.98
> 25 acres	-14.71	-	-	-	-	-14.71
Total	-18.80	46.07	-5.00	0.00	-20.00	-6.62

4.7a: Percentage change in yield levels of different oil seed crops- before and after OPP (Beneficiaries)

Size class	Groundnut	Sunflower	Safflower	Soyabean	Sesamum	Linseed	All crops
< 2.5 acres	7.63	-10.28	12.50	52.73	-	-	13.47
2.51 to 6.25 acres	-3.62	1.34	29.81	20.00	-50.00	50.00	-0.34
6.251 to 12.5 acres	-20.45	14.95	71.43	11.76	-50.00	-	-10.53
12.51 to 25 acres	-20.45	13.32	69.93	34.62	25.00	100.00	-7.71
> 25 acres	16.41	1.96	62.50	-71.43	-8.16	-33.33	7.99
All	-6.27	9.54	56.31	-5.84	-27.11	11.43	-1.43

4.7b: Percentage change in yield levels of different oil seed crops- before and after OPP (Non-Beneficiaries)

Size class	Groundnut	Sunflower	Safflower	Sesamum	Gingely	All crops
< 2.5 acres	-2.08	-14.29	-	-	-	-23.66
2.51 to 6.25 acres	-24.59	14.74	-15.63	0.00	0.00	-21.04
6.251 to 12.5 acres	-12.48	7.96	-	-	0.00	-3.14
12.51 to 25 acres	-0.41	9.39	-5.88	-20.00	-25.00	3.11
> 25 acres	3.45	-	-	-	-	3.45
All	-11.68	2.69	-12.71	-20.45	-13.33	-6.85

The adoption of technology by the beneficiaries clearly indicates success for Oilseed Production Programme. This is presented in Tables 4.8a and 4.9. Seed Treatment and use of new seeds and fertilizers are the most popular components of the new technology. Among crops it is soyabean which attracts larger technological investment from the beneficiary farmer followed by groundnut and sunflower. The use of improved implements has also been popular among oilseed growers. It is surprising that about 44 per cent the beneficiaries of farmers used tractors and 45 per cent of them used improved seed drills as against 29 and 30 per cent among non-beneficiaries. These are positive signs of acceptance of technology and naturally the incentive is provided through the OPP.

Table 4.8a: Specific technologies used (Beneficiaries)

		Fertilizer application		
Oilseed crop	Seed treatment	Seed cum fertilizer seed	Broadcasting	Use of pesticides
Groundnut	80.72	67.94	32.06	89.12
Sunflower	72.49	55.53	44.47	73.84
Safflower	44.23	62.14	37.86	57.93
Soyabean	83.00	95.00	5.00	100.00
Linseed	25.00	100.00	0.00	25.00
Castor	0.00	0.00	100.00	25.00
Sesamum	0.00	100.00	0.00	50.00
All	68.84	65.40	34.6	79.51

Note: Percentages of farmers who have adopted these practices

Table 4.8b: Specific technologies used (Non-Beneficiaries)

		Fertilizer application		
Oilseed crop	Seed treatment	Seed cum fertilizer seed	Broadcasting	Use of pesticides
Groundnut	54.62	67.95	32.05	37.83
Sunflower	96.43	82.14	17.86	53.57
Safflower	50.00	73.33	26.67	30.00
Soyabean	100.00	100.00	0.00	100.00
Linseed	0.00	100.00	0.00	0.00
Gingely		66.66	33.33	0.00
All	82.17	71.67	28.33	56.34

Note: Figures are in percentages of farmers who have adopted these practices

Table 4.9: Use of improved implements

Implement	% to total No. of farmers	
	Beneficiaries	Non-Beneficiaries
Tractor	44.29	28.57
Seed drillers	45.00	30.29
Stripers	13.58	15.79
Decorticators	8.57	18.57
Sprinkler sets	17.16	0.00

Finally, the success of any programme can be judged from the satisfaction indicated by the beneficiaries. We have presented in table 4.10, the percent of farmers having different levels of satisfaction. About 67 per cent of the farmers have indicated minimum to high level of satisfaction about various components of the programme. The satisfaction level differs across the components of the programme but in aggregate it is two-third majority which has indicated satisfactory implementation of the programme. However, there are a good number of suggestions made by the farmers in terms of the problem that they have confronted. We have gisted out the problems confronted by the farmers in table 4.11. The density of the farmers indicating the problems with the quality of improved seeds is highest followed by the plant protection equipments and quality of plant protection chemicals. It has been reported that the IPM has not been very effective mainly because of its cost intensity and lack of training. There are a few complaints about the field demonstrations but overall the satisfaction level is quite commendable.

Table 4.10: Level of satisfaction of the respondents

Component	Satisfaction level (%)		
	High	Medium	Low
Foundation seeds	66.67	16.67	16.67
Certified seeds	55.60	22.22	22.22
Minikits	10.71	39.29	50.00
Infrastructure development		100.00	
Crash programme	0.00	0.00	0.00
Total	38.03	29.58	32.39

Note: Per cent of respondents by the level of satisfaction

Table 4.11: Problems Confronted by Oilseed Growers

Inputs	Major Problems	% of Respondents	
		Beneficiaries	Non-Beneficiaries
Seeds	a. Poor quality/Spurious seeds	32.15	32.93
	b. Timely availability	30.57	44.25
	c. High price	12.86	5.72
	d. Poor yield	4.27	18.54
Fertilizers	a. Locally not available	4.29	8.54
	b. Ever increasing prices	32.11	28.54
	c. Poor quality	4.97	7.12
Plant Protection Chemicals	a. Spurious quality/Poor quality	15.70	31.40
	b. Timely availability	2.13	14.26
	c. Scarcity	5.72	0.00
	d. Not effective	5.68	2.86
Plant Protection Equipment	a. High cost	19.27	11.41
	b. Non-availability when required	7.82	0.00
Field Demonstrations	a. Do not know anything about demonstrations	9.25	19.97
	b. Heard about demonstrations, but proper demonstration was not conducted	16.43	9.97
Place of Purchase	a. Lack of transportation facility	8.55	4.25
	b. Place is too far	12.13	4.25
IPM	a. Lack of knowledge/not exposed	36.00	38.22
	b. Not effective	5.00	0.00
	c. Cost intensive	3.50	0.00
	d. Non-availability of required inputs	4.40	7.10

Note: Per cent of beneficiaries indicating the problems

4.12: Effectiveness of the Components as Perceived by the Respondents

(Figures are in percentage)

Components	Very Effective	Effective	No Impact	Not Useful
Quality of Seeds	39	57	4	0
Rhizobium Culture	33	56	6	6
Seed Treatment	55	36	2	7
Micronutrient	10	85	5	0
IPM	55	28	6	11
Gypsum	45	45	2	18
Micro-Irrigation	32	68	0	0

Note: Per cent of beneficiaries by levels of effectiveness

4.4 Conclusions

The micro level evaluation of Oilseed Production Programme indicated that among the various components dealing with pests, diseases, and providing implements and demonstrations have been very successful. Farmers indicated attention towards the distribution of seeds and plant protection chemicals. Therefore, additional attention is needed for these two components. It was suggested that the seed material as well as the distribution has not been timely and in sufficient quantity. Mostly, old stock of seeds is provided and germination percentage is quite low. The implements provided include Balram plough and the farmers reported that the gauge of these ploughs is quite high and therefore there are a lot of maintenance problems with it. The nozzles of the sprinkler sets give significant maintenance problem and therefore the farmers suggested to change this particular component for a better substitute. It was also felt that suitable drip sets be provided. Overall the OPP seem to have made an impact in sustaining growth in area of oilseeds as well as enhancing the productivity. It will be possible to comment more about the programme only after completion of the second phase of fieldwork of the project.

APPENDIX 4.1

FARMERS' OPINION ABOUT VARIOUS COMPONENTS IMPLEMENTED

1. Certified Seed Distribution:

Majority of the farmers (the beneficiaries) reported that the quality of the supplied certified seed was poor and thus the germination rate was low. In turn the crop growth was quite poor, thus resulting in lower crop yields. There was a delay in the distribution of the certified seeds which led to delay in sowing. As a result the cultivators under the rainfed region faced crop failure. A few beneficiaries were unhappy about high price of the sunflower seeds. It was also found that the seeds obtained from private firms were good in germination rate and gave comparatively higher yield than the one supplied under the programme, but these were costlier. Doubts were expressed about the process of certification itself.

2. Seed Village Scheme:

The main objective of this component is to produce Certified Seeds. Beneficiaries reported that this Programme was not implemented effectively. They also suggested that the above mentioned scheme would be of great advantage as the produce will ensure timely availability of seeds.

3. Distribution of Seed Treatment Chemicals :

Seed treatment with Chloropyriphos was effective in controlling the Root grub which is a serious pest of Groundnut. Farmers said that the cost involved on the Seed treatment was much cheaper than the Soil treatment. Thus the programme seem to be successful in controlling root grub through seed treatment with Chloropyriphos. Farmers suggested for the distribution of better and varied quality seed treatment chemicals.

4. Control of Root Grub:

Farmers incurred nearly 20-30% of crop loss when the groundnut growing areas was severely attacked by root grub. Root grub is a serious pest of groundnut. It was told that Root grub can be more effectively controlled through the seed treatment chemical (Chloropyriphos) than the soil treatment with Phorate. Farmers suggested for the supply of good and varied quality of chemicals for seed treatment for effective control of root grub.

5. Organizing Large Scale Demonstration:

These large-scale demonstrations play significant role in transfer of improved production technologies being evolved by research. Farmers opined that this was not effectively implemented and required further attention. Farmers also suggested conduct demonstrations about latest improved technologies.

6. Supply of Improved Agricultural Implements:

Department of Agriculture has supplied Balram plough and other improved implements to the farmers for tillage operations. Farmers were not very happy with the quality of the implement supplied to them. It was suggested that the supply of improved implements with proper measurements and at more subsidy rates.

7. Supply of Sprinkler Sets :

Department of Agriculture had supplied sprinkler set to the beneficiaries under Micro-irrigation system with a view to use the water efficiently. But many farmers reported that the sprinkler system was not ideal for groundnut crop due to uneven distribution of water, which resulted in low yield of groundnut.

8. Distribution of Gypsum:

Department of Agriculture had distributed gypsum to the beneficiaries as a source of secondary nutrients like Calcium and Sulphur. Farmers opined that there was not much yield difference between gypsum applied and non-gypsum groundnut plots. The quality of gypsum supplied needs to be closely monitored.

9. Distribution of Rhizobium Culture:

Department of Agriculture had distributed Rhizobium culture for seed treatment to increase production of groundnut and soyabean. Phosphate solubalizing bacteria (PSB) was also distributed under this component. A few well informed farmers reported that the culture was powdery and didn't contain any inoculum (microbial population). It was also mentioned that there was a little difference between the treated and untreated plots. Therefore, it is required that random quality checks are made.

10. Development of Infrastructure:

The objective of this component is to provide irrigation facilities to the farms and other amenities. The component was not intensively implemented. Farmers suggested to provide proper infrastructure facilities under this component.

11. Micronutrients:

Department of Agriculture had supplied Zinc sulphate under this component, to correct the deficiencies of micronutrients in soil under certain areas. Farmers suggested to supply other micronutrients along with Zinc. They urged to take up 'soil testing' as a necessary tool while recommending micronutrients application.

12. Distribution of Minikits / Inputkits:

Some of the beneficiaries reported that performance of varieties supplied to them was not good and also the yield was very low when compared with the currently popular varieties like TMV-2 in groundnut and KBSH-1 in sunflower. They suggested to supply the replacement /alternative varieties for the existing ones if the seeds are in short supply. Varieties like Kranti and Jyothi in castor were supplied through minikits but the performance was poor. Farmers suggested for the increase in the quantity of inputs supplied through the input kits.

13. Farmers Training Programme:

Farmer training is conducted to transfer improved crop production technologies to the farmers. It was suggested to conduct more number of training programmes about innovations and other technologies participated by the specialised subject matter specialists.

14. Demonstration of Pheromone Trap:

Many farmers were not aware of Pheromone trap which is mainly used in monitoring the pest population. Farmers suggested to conduct demonstrations about the method of using such traps, in the field. Thus the density of such demonstrations and media coverage needs to be increased.

ANNEXURE

Institute for Social and Economic Change
Agricultural Development & Rural Transformation
Nagarabhavi PO, Bangalore-560072

Schedule- Oilseed Production Programme

Date of Survey: Name of the Investigator :

1. Name of the Respondent:
2. District
3. Taluk
4. Village

5. Land Details:

Land Particulars	Now	Before Participating in OPP
Total owned Land operated		
Waste Land		
Net Cropped area		
Net Irrigated area		
Unirrigated		
Area Cropped more than one season		
Area Irrigated more than one season		

6) Crop Details:

Crops	Area under the crop		Productivity per acre /hect	
Oilseed	Now	Before OPP	Now	Before OPP
Ground Nut				
Sunflower				
Soybean				
Safflower				
Seasmum				
Other Crops				

6(a) Crop Varieties and Technology

Oilseed Crop	Varieties used		Varieties used		Yield increase noted
	Now	Seed rate	Earlier	Seed rate	

6) b Specific Technologies used (OPP)

Crop	**Seed treatment**	**Technology Fertilizer used**	**Pesticides used**	**Other practices Specify**

7) Do you use any of the following in oilseed production and year of introduction

Sl	Components	Yes	No	Year	Source	Price	Subsidy Component
1	Micro-irrigation system						
2	Rhizobium culture						
3	Soluble Phosphate						
4	Integrated Nutrient Management						
5	Distribution of Pyrite/Gypsum/ Liming agent						
6	Micro-nutrients						
7	IPM						
8	Minikits						
9	Any other						

8) Are there any Institutions or offices connected with industry and marketing, which you are aware of.

1. Government
2. Private
3. Friends
4. NGO's
5. Own

8 (a) Marketing details of oilseeds

Crops	Place of Market	Price per/-	Highest price received		Lowest price received	
			price	year	price	year

9) Has the government made available various inputs like:-

Inputs	Yes	No	Your participation	State support	Level of satisfaction
Breeder seed					
Foundation seed					
Certified seed					
Minikits					
Infrastructure Development					
Implementation of crash Programme					
Any other					

9 (a) What are your suggestions to improve the input services to farmers.

10) Has there been any increase in the production of oilseeds by increasing the area? Y/N

10 (a) Did you replace the variety of the seed? Y/N

10 (b) Have you expanded area under hybrid seeds? Y/N

If yes,

Before		**After**	
Seed	Area	Seed	Area

10 (c) Do you use pest and resistant/ tolerant varieties? Y/N

If yes,

Variety used	Price/ Kg

11) Has there been any change you have brought about in cropping system? Y/N

12) Which is the cropping system used by you.

		Y/N
a)	Sequential cropping	☐
b)	Multiple cropping	☐
c)	Inter cropping	☐
d)	Any other	☐

d) What was being used earlier?

13) What are the inter crops used in the inter cropping pattern under oilseed production

Main crop	Inter crop	Density Lanes: Lanes

14) Is there any change in crop sequencing relating to Oilseed? Y/N

14 (a) What is the sequence cropping used for oilseed presently?

Oilseed crop	Crop taken before oilseed	Crop taken after oilseed	Recent change

15) Do you have any substitute crop for oilseeds, if yes, which are they?

First substitute	Shift in area	Second substitute	Shift in area	Reason

16) Is there an increase in the productivity? Y/N

Oilseed	Increase/Decrease in Productivity	Reason

17) Details of expenditure of production of oilseeds.

	Oilseed Crops			
	Crop I		Crop II	
	Name	Expenditure	Name	Expenditure
Seed treatment				
Type of seeds				
Seed diseases confronted				
Fertilizers used				
Plant protection chemicals				
Weed control				
Plant protection equipment				
Any other tech-innovative				
IPM				

18) Do you process oilseed for getting oil? Y/N
If yes,

Process	Investment		Subsidy	Value added	Problems
	Amount	Source			

19) Problems Confronted by the oilseed growers in factor market inputs

Inputs	Problems
Seeds	
Fertilizer	
Plant protection chemicals	
Plant Protection equipment	
Field demonstrations	
Place of purchase input	
IPM	
Any other	

20) Do you use any of these improved farm implements?

Implements	Yes / No	Rented	Owned	Rent	Own	
					Year of purchase	Component purchase
Tractor						
Seed drillers						
Stripers						
Decorticator						
Digger						
Sprinkler sets						

20a) Who suggested you to adopt these new farm implements?

20(b) Are these implements helping you to get more yield/ production?

20(c) Have you been given any of the improved implements by Dept. of Agriculture, Govt. of Karnataka, if yes, which are they?

Implements	Terms on which it was given	Subsidy component	Total price

20(d) Was there any field demonstration of these improved implements? If yes give details:

20) Have you adopted any of the frontline demonstrations provided by ICAR?

Demonstrations type	No. of days attended	Details	Expenditure, if any
1. Frontline demonstration on production potential			
2. First line block demonstration			
3. Frontline demonstration on improved agricultural machinery			
4. Frontline demonstration discipline oriented programme			

21(a) Have you adopted any of the new technology suggested by the agriculture department under the demonstration schemes, if yes which technology.

Scheme	**Demonstration**		Details	Expenditure, if any
	Type	No. of days attended		

21(b) Which were the sectors under which the demonstration programme was held.

21(c) were you benefited by these demonstration classes?

22. Did you confront Root grub disease? Y/N

If yes,

22(a) How did you deal with this?

22(b) Expenditure incurred

22(c) Problems confronted

23. Are you using IPM? If yes,

Source	Details	Expenditure incurred	Expenditure saved

23(a) Problems confronted.

24. Do you monitor pest situation? Y/N

If yes,

24(a) Whom do you report first?

i. Government ☐

ii. Pesticide dealers ☐

iii. Friends ☐

iv. NGO's ☐

24(b) What steps do you take?

24(c) Do you use Biological, Mechanical and Chemical modes of control? Give examples.

25. What is your opinion about OPP?

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Response to comments and suggestions by Agricultural Department on draft report on Oilseed Production Programme (OPP) in Karnataka and during the presentation on 16th September 2002 at MS building in the presence of World Bank team.

Sl. No.	Comments	Response
1.	Para 1.8, Page 7: Suggestions about the techniques and productivity increase given by the institute at the micro level is quite agreeable. It is opined that these suggestions can be once verified in detail during 2nd stage of evaluation.	Agreed, verified and incorporated
2.	Seed production and seed certifying agencies will be informed to decrease the production cost as mentioned in seed village scheme	Agreed
3.	Suggestions regarding the sprinkler sets being not useful – cannot be agreed. This suggestion should be reconsidered, verified and requires modification.	**Rectified** **Sprinkler and drip irrigation methods are always preferred over, flood irrigation. Therefore, providing subsidies for the sprinkler and drip irrigation sets is fully justified as these require higher capital investment. It was observed that the sprinkler sets are purchased under the OPP are being used for other crops and these have good number of maintenance problems. Therefore, it is suggested that the beneficiaries taking sprinkler sets may be asked to give an undertaking that they will use it for oilseed crops only.**
4.	IPM demonstration is being improvised by giving training to farmers through Farmers Field Schools (FFS) and by extension staff of the department.	Agreed
5.	Para 1, page 15: Suggestions about the Oil seed growers are Genuine.	Agreed
6.	Para 1,Page 21: Assistance Provided to seed production under seed Village Scheme is mentioned as Rs. 500/hectare which is incorrect, to be amended as Rs 500/qunital.	Incorporated
7.	Para 1, Page 22: Need to amend the information about Seed treatment as mentioned below: Seed treatment – an assistance of 50% of the cost of chemical limited to Rs. 100/ -per hectare is made available.	Corrected

	Change heading “Root grub control “ as plant protection measures.	

8.	Page 24-5(1) Assistance provided is amended as mentioned below. 50% of the cost or RS 2000/ - per implement for manual /bullock drawn.	Corrected
9.	Para 2.4, page 25: The opinion regarding higher expenditure incurred under components Certified seed distribution and Supply of gypsum is incorrect. It is been suggested to modify the statement as per the Table 2.1, page 26.	Modified accordingly
10.	Page 27, The opinion given about the productivity of different oilseeds is generally agreeable. But preference will be given to increase the productivity of sunflower, groundnut and other oilseed crops.	-
11.	Page 39, Though the production of foundation seeds was not taken up during 1999-2000, 2000-2001 and 2001-2002, but it has been shown in the bar graph. It has been suggested to incorporate the necessary changes.	Incorporated
12.	Para 3, Page 51, Findings and suggestions under post harvest technology are quite agreeable, they shell be brought to notice of the state and the central Government.	-
13.	For the evaluation 14 districts have been selected. During the first phase, only 7 districts have been evaluated and report has been submitted. It is suggested to evaluate the programme in another seven districts and representation may be given all the agroclimatic zones.	Additional seven districts are covered and the present report is based on 14 districts
14.	Page 103, The problems mentioned which were encountered by the oil seed growers like, supply of poor quality seeds, high cost of plant protection equipments and lack of awareness about IPM are agreeable. To improve upon these, necessary action will be taken.	-
15.	Para 44.3, Page 104: Opinion about the sprinkler sets being non- beneficial in oilseed production is incorrect. While the sprinkler irrigation sets helps in saving water, uniform distribution of water and to provide protective irrigation during critical stages of crops growth, thus facilitating increased yield levels. Therefore modification in the suggestion is needed. In order to solve the problems concerning the nozzles in the sprinkler sets, manufacturers/suppliers shall be advised to rectify the problem.	As in Sl. No. 3

Comments during Presentation in the presence of World Bank Team		
16.	When all the agro-climatic zones are represented, why purposive sampling (Directorate of Agriculture).	It is only at the second stage that taluks and villages were selected purposively (with the help of Joint Directors of Agriculture of the selected districts) depending on the density of investment in order to give representation to different agro-climatic zones. After selecting the village/villages, respondents were selected through Simple Random Sampling technique after obtaining a list from the department.
17.	Varietal performance should have been considered. (Directorate of Agriculture).	Objectives of the study as given in the proposal do not focus on varietal differences. However, an attempt is made to locate varietal differences. A study focussing on varietal differences across agro-climatic zones will require a different study design. We have not attempted that.
13.	Why sprinkler sets are not suited and highest expenditure on this item (World Bank).	Already explained in point 3 above.

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