Study No. 173

EXECUTIVE SUMMARY

PROBLEMS AND PROSPECTS OF OILSEEDS PRODUCTION IN WEST BENGAL

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PREFACE

The present study entitled "*Problems and Prospects of Oilseeds Production in West Bengal*" was undertaken at the instance of the Directorate of Economics and Statistics, Ministry of Agriculture, Government of India, Krishi Bhavan, New Delhi as a coordinated study, where the task of coordination has been entrusted with the Centre for Management of Agriculture (CMA), Indian Institute of Management (IIM), Ahmedabad. This report has been an individual centre's report on the study concerned carried out in West Bengal and prepared by our centre, AERC, Visva-Bharati, Santiniketan.

Given the competing demands on agricultural land from various crops, the production or oilseeds can be increased only if productivity is improved significantly and farmers get remunerative and attractive prices. It is here that the present study attempts to examine trends and pattern of growth of different edible oilseeds over time and to identify major constraints in the edible oilseed cultivation.

The study has been primarily entrusted with Mr. D. Roy and Mr. F. H. Khan, while Mr. Md. A. Fazal, Mr. S. Kulkarni, Mr. K. P. Paul, Mr. S. Banerjee, Mrs. P. Dey and Ms. S. Sadhu provided immensely valuable assistance in data collection and processing under the active supervision of the undersigned. Extensive support has also been obtained from Mr. D. Mondal, Mr. A. R. Patra, Mr. M.A. Khaleque, Mr. P. Hazra, Mr. N Maji, Mr. S. Sadhu and also Mr. S. Hemram. I offer my deepest thanks to all of them.

On behalf of this centre, the undersigned takes the opportunity to thank the coordinating center (CMA, IIM-Ahmedabad) for their painstaking work on coordination of this immensely important study across the individual centers, especially for organizing the entire study design with detailed chapterization and table formats and valuable comments.

Sd/-

Santiniketan
Date: 18.05.2013

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EXECUTIVE SUMMARY

1. INTRODUCTION

1.1: BACKDROP OF THE STUDY

On the oilseeds map of the world, India occupies a prominent position, both in regard to acreage and production. India contributes about 10 percent of the world oilseeds production, 6-7% of the global production of vegetable oil and protein meal and is the 4th largest edible oil economy in the world. This sector has also an important position in the India agricultural sector covering an area of about 26.8 million hectares, with total production of about 27.9million tones in Triennium Ending(Te) 2010-11(GOI,2011).This constitutes about 14.9 percent of the gross cropped area in the country. The oilseeds accounted for about 9.7 percent (at 2004-05 prices) of the total value of output from agriculture in TE 2009-10 (CSO 2011).

1.2: ROLE OF AGRICULTURE IN THE STATE

West Bengal happens to be the 3rd biggest economy in India. The main contributing factor in economy and business of this Indian state is agriculture and it is the main occupation of the people of West Bengal. In the year 2009 and 2010 agriculture sector contributed a total of 18.7 percent to the state's total GDP. The cropping pattern of this state is dominated by food crops which account for about 78 per cent of the area under principal crops. Rice is cultivated in 58.48 lakh hectares (production of 161.48 lakh MT) followed by Cereals (all combined) in 63.49 lakh hectares and oilseeds in 7.14 lakh hectares, Jute in 6.09 lakh hectares and potato in 3.67 lakh hectares. The state is second largest producer of Potato after Uttar Pradesh and one of the highest producers of vegetable in the country. Traditionally, West Bengal has been the highest producer of jute. The State also accounts for 25 per cent of tea production in the country, next only to Assam. Against the ultimate irrigation potential of 67.43 lakh hectares, the gross irrigation potential created through major, medium and minor irrigation in the State till the end of March 2009 was 55.01 lakh hectares. The percentage utilization of potential created is 81.73 percent in major and medium irrigation structures and 81.64 percent in minor irrigation.

1.3: IMPORTANCE OF OILSEEDS IN THE STATE AGRICULTURE

In West Bengal, the share of cereals declined over the years, while those of fruits & vegetables increased from their 1980-81 levels. In particular, the share of cereals decreased from 52.76% in 1980-81 to 32.82% in 2005-06, while the share of

fruits & vegetables registered a massive increase from 17.74% in 1980-81 to 44.84% in 2005-06. The share of condiments & spices showed marginal increase from 0.92% in 1980-81 to 2.07% in 2005-06, while pulses, sugarcane and fibre showed marginal decline. The share of oilseeds fluctuated over the years, and somehow succeeded to retain its relative importance more or less same over time.

1.4: Problems in Oilseeds Production

West Bengal does not occupy any significant position in terms of either acreage or production of oilseeds. In terms of both acreage and production rape and mustard are by far the most important oilseed crops both in terms of area and production. Sesame and linseeds are the other two oilseed crops raised in this state.

A brief review of literature regarding the performance of oilseeds yield and production reveals that a number of factors can be held responsible for the poor performance of the oilseeds sector in the state. These may be put as-

a) Shortage of HYV seeds,
b) Lack of use of irrigation, fertilizer and pesticide in appropriate doses,
c) High risk and uncertainty factors in production
d) Tendency to raise pulses mixed with other crops
e) Poor managerial attention, and
f) Inadequately of extension facilities.

1.5: Objectives of the Study

The specific objectives of the study are:

1. To examine trends and pattern of growth of different edible oilseeds over time in West Bengal and identify the sources of growth in edible oilseeds output in the state;
2. To identify major constraints in the edible oilseed cultivation and suggest policy options to increase oilseeds production and productivity in the state.

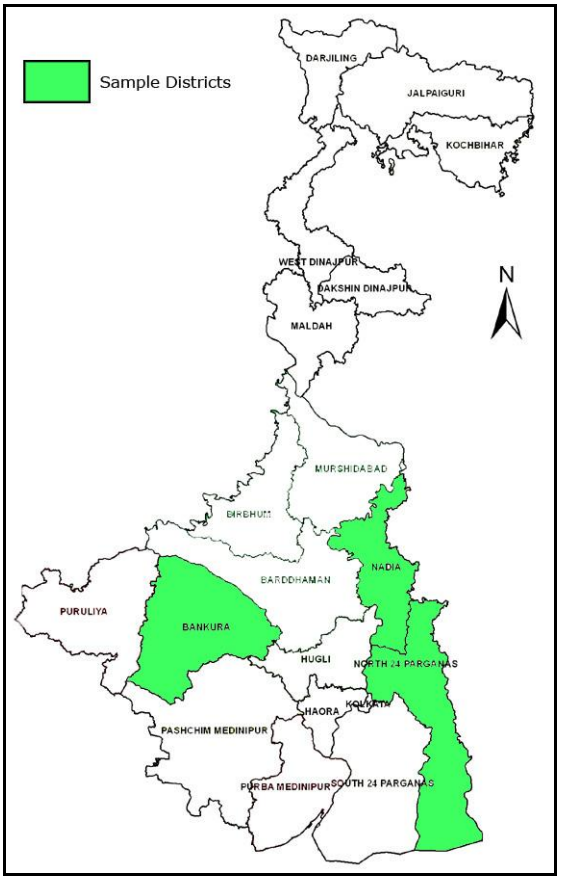
2. Coverage, Sampling Design and Methodology

The study is based on both primary and secondary data pertaining to edible oilseeds. In order to meet the first two objectives of the study a substantial amount of collection and analysis of secondary data related to area, production and productivity of oilseeds is undertaken. In order to identify major constraints in edible oilseeds production in the country, primary data from households growing oilseeds is collected and analyzed.

A multistage, purposive sampling method is used to select the districts, blocks and farm households based on acreage & yield rate as has been depicted in the following table 2.1.1. At first stage, one district each from high acreage & high yield districts, high acreage & low yield districts, and low acreage & high yield districts have been selected. Since HH,HL and LH districts have potential for increasing production of oilseeds; we have selected at least one district each from these 3 categories for household survey. The 3 selected districts are Nadia, Bankura and North 24 Parganas respectively.

At second stage, major oilseeds producing blocks is selected and an appropriate number of villages is selected for household survey. From each selected village an appropriate number of farmers representing different farm categories (Marginal 0-1 ha, Small 1-2 ha, Semi-medium 2-4 ha, and Medium 4-10 ha) based on probability proportional to size in each district, such that we get a minimum of 20 households in each category in the final sample pool. However, we finally club the semi-medium category with medium category, and treat the clubbed category as 'medium' category. In way, a total number of 250 sample households have been selected for the study distributed over different size-categories in selected districts, as shown here in table 2.1.2.

The Study Area



3. Overview of Oilseeds Sector: Current Status and Growth Behaviour

3.1: Cropping Pattern Changes in the State

After the introduction of the high yielding varieties of seeds and other land augmenting technologies, agriculture in West Bengal has witnessed remarkable changes over time. This has particularly influenced the cropping pattern of the state at large, bringing about increase in acreage of certain crops and decline in particular cases also. It is to be noted here that the impact of Green Revolution spread across West Bengal with a time-lag of one or two decades, as compared to western states like Punjab, Haryana, etc. This is reflected in a rapid in crease in the acreage of certain crops in the 1970s and 1980s. During the last four decades, acreage under foodgrains hardly increased. On the part of the oilseeds, it is quite inspiring to observe that area under oilseeds (especially mustard) registered a sharp increase over time. In particular, while proportional allocation of land under rapeseed and mustard increased from 1.70 percent during TE 1973-74 to 5.80 percent during TE 2009-10, that for other oilseeds (including sesame) increased from 1.10 percent to 4.00 percent over the same period of time. As a result of these changes, proportional acreage allocation (as percent of gross cropped area) under oilseeds registered a sharp increase from 1.10 percent in TE 1973-74 to 9.80 percent in TE 2009-10. As such, it comes out that over the last few decades, while cultivation of foodgrains lost its importance to some extent, cultivation of oilseeds has gained significance in the cropping pattern in West Bengal agriculture.

3.2: Factors Underlying Changes in Cropping Pattern

The changes in cropping pattern over the last few decades in the state resulted from situational advantage or disadvantage for specific crops to grow in acreage and yield rate. This was actively backed by several government schemes to promote specific crops like HYV rice or newer breeds of oilseeds over definite time periods. Though with a sufficient time-lag, the results are clearly reflected in the changes that took place in the cropping pattern of the state.

3.3: Growth Trends in Area, Production and Yield of Major Oilseeds

Among the major changes that took place in the cropping pattern of West Bengal agriculture, growth of oilseeds sector is no doubt a significant change. Data on area, production and yield rate of oilseeds in the state clearly reflects the growth trajectory of oilseeds sector over the last five decades, thanks to various government schemes and favourable condition for the growth of the sector. In fact, area, production and yield rate of oilseeds exhibited a continuous growth over the last five decades, viz. since the 1960s. There has been a quantum jump

especially in the area and production of oilseeds during the 1970s. During this decade area under oilseeds more than doubled itself, while production grew by nearly four times. This has been especially due to a rapid increase in area under rapeseed and mustard in the state. In the later decades, viz., during the 1980s, oilseeds sector grew further, but at a slower rate as compared to the earlier decade. Since the 1990s, however, the growth in the oilseeds sector can largely be attributed to oilseeds like sesame, sunflower, groundnut, etc. But the fact remains that oilseeds sector in West Bengal have witnessed a consistent growth in area, production as well as yield rate throughout the last fifty years. This is especially impressive considering a corresponding slowdown in the foodgrains sector in the state, especially since the 1990s.

Trends in Average Area, Production, and Yield of Oilseeds in West Bengal

	1951-52 to 1960-61	1961-62 to 1970-71	1971-72 to 1980-81	1981-82 to 1990-91	1991-92 to 2000-01	2001-02 to 2009-10
Area ('000 hectares)	-	161.80	208.09	433.11	525.30	659.32
Production ('000 tonnes)	-	59.40	84.89	306.80	426.23	605.00
Yield (kg/ha)	-	367.50	402.99	683.44	809.32	915.32

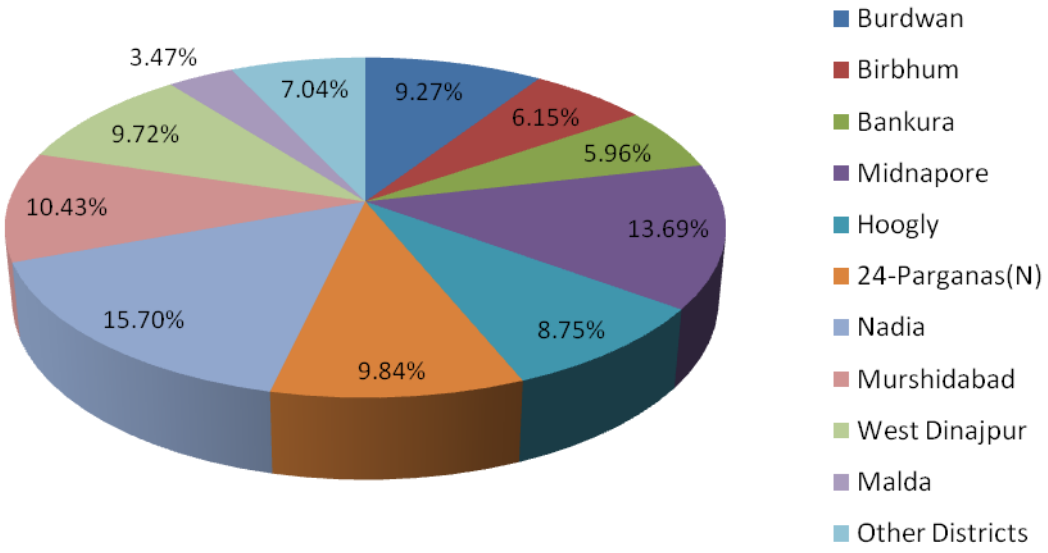
Source: Statistical Abstract (Govt. of West Bengal)-Various Issue.

3.4: VARIABILITY IN AREA, PRODUCTION AND YIELD OF SESAME

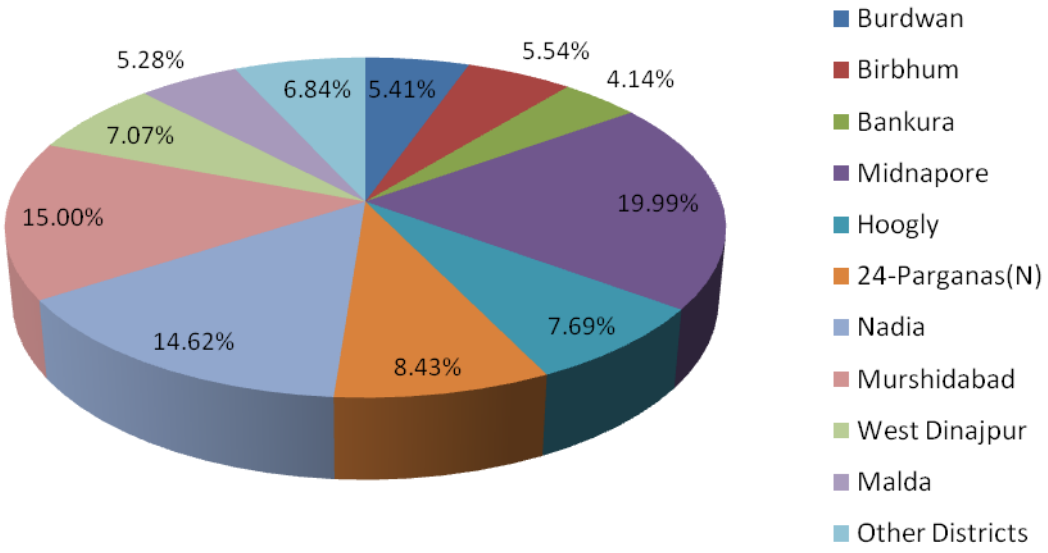
Though in West Bengal mustard has been the major oilseed thought the last few decades, but very recently (especially since the 1990s) there has been a slowdown in the growth of mustard while sesame is fast coming up as a major oilseed in the state. In fact, growth in area, production and yield rate of sesame has been quite impressive throughout the decades. Over the last four decades, area under sesame grew by more than four times from 40.46 thousand hectares during the 1970s to 162.46 thousand hectares during the last decade 2000s. Production of sesame on the other hand grew even sharper from 21.82 thousand tonnes in 1970s to as high as 138.02 thousand tonnes during 2000s, thanks to increasing trend in the yield rate from 554 kg/ha to 851 kg/ha over the same period of time. All these in turn have placed sesame as a major oilseed crop in the state commanding over 28 percent area under oilseeds. From our earlier analysis, it is also observed that along with the major oilseed producing districts, sesame (or sesame) has grown in areas which are not traditionally known as oilseed producing districts, and has come up as a situational solution to farming in summer under non-availability or poor availability of irrigation conditions.

Share of Major Districts under Oilseeds Production in the State: TE1993-94 and TE2009-10

TE 1993-94



TE 2009-10



Source: Statistical Abstract (Govt. of West Bengal)-Various Issue.

3.5: Variability in the Growth of Area, Production and Yield of Sesame

To examine the variability in the growth of area, production and productivity of oilseeds (particularly sesame) across districts of the state, we classify districts according to the direction and magnitude (level of significance) of growth achieved during specific time periods. During the period 1981-82 to 2009-10, it can be observed that as many as 6 districts in the state have witnessed significant positive growth in area under sesame. These districts include Nadia, Midnapore (E & W), Murshidabad, 24 Parganas (North & South), Bankura and Hooghly. In contrast, a number of districts have experienced significant negative growth in area under sesame, which include districts like Malda, Dinajpur (North & South), Darjeeling, Birbhum, Howrah, Coochbehar and Purulia. At the same time, some districts have exhibited negative stagnant growth in area under sesame, which include districts like Burdwan and Jalpaiguri, while none of districts has experienced a positive stagnant growth.

4. Problems and Prospects of Oilseeds Production: An Empirical Analysis

4.1: Main Features of Sample Households: Land Ownership Pattern, Cropping Pattern, etc.

In case of socio-economic status of the sample households, it is observed that primary occupation of an overwhelming majority of respondents is agriculture. The farm families are mostly from Other Backward Classes and male dominated in nature, where average age of the heads is about 47 years. Average level of education (12.73) and family size (about 6 persons per family) tends to increase with increase in farm-size.

The pattern of land ownership by the sample households reveal that the average size of operational holding stands at 1.23 hectares, which gets irrigation from various sources. Only parts of owned land remains un-irrigated, which is left fallow as well. On the whole, data reveals that area covered under the present survey largely remains irrigated with little fallow land to waste. The incidence of leasing-in of land is much higher for the smaller farms, especially the marginal farms (17.2 percent) as compared to the medium farms (0.40 percent). Furthermore, an overwhelming majority (93.75 percent) of these lease contracts/arrangements are carried out on fixed rent in cash. The major source of irrigation is found to be groundwater sources.

The principal crops of the study region are kharif paddy, followed by summer paddy and wheat among the cereals. Among the non-cereal crops, a large area under cultivation is devoted to mustard, followed by sesame and sunflower. The principal oilseed crop comes out to be mustard. it is observed that yield rate of

kharif paddy stands at 53.32 quintals per hectare, and that for boro (summer) paddy stands at 48.67 quintals per hectare. In case of kharif paddy, average yield rate shows a sharp increase over increase in size, though such pattern is not observed in case of summer paddy. However, average yield of wheat stands at 26.11 quintals per hectare, which too shows a direct relationship with farm size. In case of yield rate of oilseeds, it is observed that average yield rate for mustard stands at 10.80 quintals per hectare, while that for sesame stands at 11.36 quintals per hectare.

4.2: PRODUCTION, RETENTION AND MARKETED SURPLUS PATTERN OF OILSEEDS

4.2.1: PRODUCTION, RETENTION AND SALE OF RABI OILSEED I (MUSTARD)

In case of production of mustard, it is observed that average production of mustard steadily increases with increase in farm-size, which is quite obvious under the present circumstances. However, in case of retention, it is observed that a progressively lower proportion of mustard produced is retained back, while a progressive higher proportion of mustard is marketed over increase in farm-size. This in turn indicates that as farm size increase, retention for family consumption also increases but at a proportionately lower rate than marketed surplus.

4.2.2: PRODUCTION, RETENTION AND SALE OF RABI OILSEED II (SUNFLOWER)

In case of production of sunflower, similar trends may be observed as in case of mustard, but at a lower magnitude. In particular, average production of sunflower shows an increasing trend over increase in farm-size. Retention and marketed surplus of sunflower also tends to increase with increase in farm size, but that increase is proportionate much sharper in case of marketed surplus of sunflower than its retention.

4.2.3: PRODUCTION, RETENTION AND SALE OF SUMMER OILSEED I (SESAME)

In case of production, retention and sale of summer oilseed, viz. sesame, we also witness likewise pattern as mustard and sunflower. In particular, average production and average marketed surplus shows an increasing pattern with increase in farm size. However, in case of retention such a pattern is not well established. Also, average prices fetched per quintal of sesame remains the highest for the small farms, followed by the medium and the marginal farms.

4.3: COMPARATIVE ECONOMICS/PROFITABILITY OF OILSEEDS VIS-À-VIS COMPETING CROP(S)

4.3.1: PROFITABILITY OF MAJOR OILSEEDS AND COMPETING CROPS

In case of profitability in cultivation of oilseeds (here, sesame), the results of our field investigation shows that though costs of production per unit of land is much less for sesame cultivation as compared to competing crop (summer paddy), profitability of sesame cultivation is much lower. In particular, profitability in sesame cultivation stands out to be as low as 1/3rd of that in cultivation of summer paddy. Even though costs on account of seeds, fertilizers, insecticides & pesticides, etc. are much lower for sesame cultivation as compared to cultivation of summer paddy, lower gross value of output per unit of land in sesame cultivation in turn brings down profit.

Profitability of Major Oilseeds and Competing Crops ***(Rs/ha)***

Cost items	**Oilseed I: Sesame**				
	Marginal	Small	Medium	Large	All Farms
Total Operational Costs	22503.00	24090.00	25181.00	-	23364.00
Yield (Quintals)	11.00	12.00	12.00	-	11.00
Price	2690.00	2762.00	2762.00	-	2712.00
Value of main-product	29590.00	33144.00	32928.00	-	29832.00
Value of by-product	0.00	0.00	0.00	-	0.00
Net Income (2+3) – (1)	7087.00	9054.00	7747.00	-	6468.00
Cost of production/q	2046.00	2008.00	2098.00	-	2124.00
Cost of production/ha	22503.00	24090.00	25181.00	-	23364.00
	Competing Crop I : Summer Paddy				
	Marginal	Small	Medium	Large	All Farms
Operational costs					
Total Operational Costs	32782.00	33671.00	34103.00	-	33203.00
Yield (Quintals)	50.00	50.00	51.00	-	50.00
Price	900.00	885.00	905.00	-	898.00
Value of main-product	45000.00	44250.00	46155.00	-	44900.00
Value of by-product	7233.00	7340.00	7454.00	-	7355.00
Net Income (2+3) – (1)	19451.00	17919.00	19506.00	-	19052.00
Cost of production/q	656.00	673.00	682.00	-	664.00
Cost of production/ha	32782.00	33671.00	34103.00	-	33203.00

Source: Field Survey

4.3.2: PROFITABILITY VIS-À-VIS RISKS IN OILSEEDS PRODUCTION

In terms of risks involved, cultivation of oilseeds appears much riskier as compared to cultivation of summer paddy. This has been true in respect of risks involved in yield, price of output as well as net income from cultivation of oilseeds, especially for the smaller farms. Variability in yield is also higher in case

of oilseeds cultivation, which too is more pronounced for the smaller farms, though at the aggregative level yield variability in oilseeds cultivation is lower than that in cultivation of summer paddy.

Profitability vis-à-vis Risks in Oilseeds production

Indicators	Marginal	Small	Medium	Large	All Farms
Main Crop Oilseed I (Sesame)					
Acreage variability	76.36	78.18	66.50	-	97.23
Yield Risk	52.91	45.56	41.98	-	49.89
Price Risk	44.95	41.50	33.76	-	42.43
Net Income Risk	144.35	88.01	116.85	-	127.52
Main Competing Crop (Summer Paddy)					
Acreage variability	47.56	41.84	64.29	-	129.87
Yield Risk	18.58	6.74	7.31	-	15.56
Price Risk	16.53	5.64	6.32	-	13.83
Net Income Risk	33.99	22.26	27.23	-	31.33

Computed values of coefficient of variation of area, yield, price and net income of main oilseeds and main competing crops
Source: Field Survey

4.4: ACCESS TO IMPROVED TECHNOLOGY AND MARKETS FOR OILSEEDS

With regard to access to technology in oilseeds cultivation, the survey finds that all the sample farms belonging to all size-classes use high yielding varieties of seeds. This in turn shows acceptance of modern technology among the farms in terms of use of HYV seeds. However, a majority of the farms have been found using seeds obtained from various sources, while about 38.8 percent of farms purchase seeds directly from the market, especially the larger farms.

4.5: YIELD GAP ANALYSIS

It is interestingly observed that actual farm yield is higher than both experimental yield (in demonstration plots of department of agriculture, government of West Bengal) and potential yield. This holds true consistently for all the size-classes.

4.6: PERCEIVED CONSTRAINTS IN CULTIVATION OF OILSEED CROPS

There are practically numerous constraints in the cultivation of oilseeds in the study region. It is practically not feasible to address each of them, but a few of them is highlighted here. Among the technological constrained as perceived by the farmers, it is observed that the major bottlenecks are poor crop germination (96.3 percent), followed by non-availability of suitable varieties of sesame (88.5 percent). Considering various agro-climatic factors acting as constraints in sesame cultivation, it is observed the on the one extreme, drought at critical stages of crop growth (91.2 percent) and excessive rains (91 percent) on the other

extreme. Among the various economic constraints, a few important ones are low and fluctuating prices (92.5 percent), high input costs (80.1 percent) and shortage of human labour (80.6 percent). Among the institutional bottlenecks, the problem of timely availability of seeds stands out as the single major bottleneck in the cultivation of sesame, as perceived by 90.9 percent of the respondents. Lastly, among the constraints faced in the post-harvest period, the single major bottleneck appears to be exploitation by market intermediaries as perceived by as high as 98.4 percent of the respondent farmers.

4.7: MARKETING PATTERN OF OILSEEDS

Marketing of oilseeds (sesame) mostly occurs in a personalized manner where a major part of the output is sold to the processing mills (46.89 percent), followed by the local village traders (36.24 percent) and the commission agents (16.89 percent). However, there are variations in preference for particular marketing agencies among different size-class of farms. It comes out that while the smaller farms prefer to market their product to local village traders, majority of the larger farms sell their product to processing units.

4.8: SOURCES OF TECHNOLOGY AND MARKET INFORMATION

The technical know-how about variety of seeds to be used is largely obtained from two major sources, viz. State Department of Agriculture (40.8 percent) and Retail Market (38.8 percent). Apart from farmers using of homestead seeds (14.4 percent), only about 6.0 percent of farmers obtain information about seeds from fellow farmers. While considering extension services, it has been observed that State Department of Agriculture is the only extension service provider for all the sample farms. No other agencies like state agriculture universities, krishi vigyan kendras, etc. have provided extension services to the farmers regarding sesame cultivation.

4.9: SUGGESTIONS FOR IMPROVING PRODUCTION AND PRODUCTIVITY OF OILSEEDS

Among the suggestions forwarded by the sample farms for improving production and productivity of oilseeds (sesame), the most strongly suggested factor is the requirement of improved high yielding varieties of oilseeds, especially sesame. The other suggested measures according to their importance assigned by the farmers include suggestion on account of necessity of regulated markets (58.8 percent), soil testing and proper application of fertilizers (47.2 percent) and use of modern farm equipments (42.0 percent).

5. CONCLUDING OBSERVATIONS

Based on the major findings of the present study, a number of important concluding observations can be made. However, we may highlight some of these observations as follows:

Analysis of secondary data on area, production and productivity of oilseeds over the decades reveal that while there has been a slowdown in the foodgrains sector in West Bengal agriculture, oilseeds sector in the state has experienced a remarkable development in terms of area, production as well as productivity. Though there has been a shift in the importance of specific crops in the composition of oilseeds sector, the growth trajectory has remained intact over the decades. In particular, during the 1970s and partly in 1980s, spread of cultivation of mustard acted as the engine of growth in the oilseeds sector in West Bengal. However, over time, especially since the 1990s, situation turned in favour of cultivation of sesame. A number of districts which are not traditionally known as oilseed producing district came up as important contributors to state's oilseed map. At present, while growth of area, production and productivity of mustard has slowed down, that of sesame has picked up momentum and fast becoming a major crop in the oilseeds sector in state agriculture.

This impressive growth in the oilseeds sector led by spread of cultivation of sesame has its root planted in some of the situational and economic advantages in West Bengal agriculture, as has been observed from an empirical investigation carried out for this study. In particular, it is observed that as spread of irrigation facilities came to a halt, sesame appeared as a major crop to take advantage of the situation. It is observed that cultivation of sesame requires much less irrigation and operational cost. Though it involves many risks in terms of yield and price, cultivation of sesame complemented cultivation of summer paddy to a large extent. In particular, sesame is observed to be cultivated in plots that would have been left fallow otherwise. This is particularly why after so much risks and low yield rate, sesame is fast becoming a major crop in the oilseed map of West Bengal.

Further, it is impressive to note that cultivation of sesame has made a remarkable progress even after confronting a number of technological, economic and infrastructural constraints. It thus comes out that to further promote growth in the cultivation of oilseeds, such constraints need to be addressed in future intervention schemes, particularly relating to price risks and economic uncertainties. Such efforts are expected to place cultivation of sesame in West Bengal on a self-sustained growth path.