Ad-hoc Study No.44

ECONOMICS OF PRODUCTION OF BANANA IN KHANDWA DISTRICT, MADHYA PRADESH

AGRO-ECONOMIC RESEARCH CENTRE
For Madhya Pradesh
JAWAHARLAL NEHRU KRISHI VISHWA VIDYALAYA
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Chapter I

I N T R O D U C T I O N

1.1 Introductory

A distinctive feature of the Indian agriculture since the beginning of the planning era is the spectacular increase in the production of foodgrains. In contrast, fruits and vegetables the other important components of agriculture have remained neglected.

The neglect of fruits and vegetables becomes starkly evident from the fact that there was no plan outlay for the development of horticulture till the end of the third plan. A beginning was made with the fourth plan when about Rs.5 lakhs were provided for horticulture. This amount was subsequently raised to about Rs.2 crores during the fifth plan period. Strangely the sixth five year plan does not make any specific provision for this item.

Our yields of fruits and vegetables are amongst the lowest in the world mainly because of inadequate research and lack of improved varieties of these commodities. It is well known that fruits and vegetables are the cheap sources of minerals and vitamins especially for vegetarians. Hence an increase in their consumption can go a long way in reducing the high level of malnutrition from which a major section of our population suffers.

Not only are the existing levels of production low, but nearly 25 per cent of our output of fruits and vegetables also perishes because of the non-availability of proper storage and marketing facilities.

The sixth plan aimed at an additional production of atleast 2.5 million tonnes of fruits and 4 million tonnes of vegetables.

Banana is the oldest fruit of the world. Edible banana is indigenous to the warm moist parts of Asia and probably originated somewhere in the mountainous regions of Assam, Burma, Thailand or Indo-china. It is a rich source of energy in the form of sugars and starch and is the cheapest fruit in India. The ripe fruit is a good source of Vitamin A and a fairly good source of vitamins C, B, and B_2. It also contains minerals like magnesium, sodium, potassium & phosphorus, calcium and iron. The ripe fruit contains upto 27 per cent sugars.

India, after Brazil, is the second largest producer of banana in the world. The total production of banana in the country was estimated to be 4,830 thousand tonnes during the year 1980-81[1]. Production could be raised in the coming years, if due attention is paid to the problems of storage, transport, pricing and marketing which are plaguing this commodity.

1.2 The Study

In Madhya Pradesh banana occupies an important place in the agricultural economy of Burhanpur tahsil of Khandwa district. It is the only tahsil in the state which produces banana worth about Rs.9.5 crores and yields considerable revenue, apart from earning some foreign exchange. The banana cultivation in this district is the mainstay for a very large number of growers as

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1, Area and production of Principal crops in India 1980-81, Directorate of Economics & Statistics, Government of India, New Delhi.

banana crop covered 7,065 hectares of area and 1,74,949 tonnes of banana were produced in 1980-81[1] in this belt and more than 4,500 persons were engaged in banana cultivation.

Banana is exported to Delhi and Lucknow from this region on a large scale and only one variety of Dwarf Cavendish (Basrai) is grown in this area.

Considering these aspects, it was decided that the study on "the Economics of banana production" should be taken up in Burhanpur tahsil of Khandwa district.

1.3 Objective

The objective of this study was to estimate the cost of cultivation of banana and its profitability.

1.4 Sampling Design

Khandwa was the most important banana growing district of the State. Further in the district Burhanpur tahsil ranked first both in area as well as in production of this crop. Therefore, it was decided to conduct the study in Burhanpur tahsil of khandwa district.

Seven villages having a substantial number of banana growers were selected. In the selected villages the number of farmers were selected proportionately to the total banana growers in the village so as to have a total sample of 200 farmers.

The sampled farmers were classified under three groups on the basis of area under banana of their holdings. The three groups were upto 0.81 hectare, 0.81 to 1.61 hectares and 1.61 and more hectares (Table 1.1)

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1. Agricultural Situation in India, Vol. XXXVII, No.11, Feb.1983, p.731.

Table 1.1 Distribution of sample farmers

S.No.	Name of the village	Holding size groups (In hactares)			Total
		Small (uptc 0.81) hactares	Medium (0.81 to 1.61 hactares)	Large (1.61 hactares & above)	
1.	Sirpur	2	13	4	19
2.	Sindhkheda	19	7	1	27
3.	Shahpur	9	14	6	29
4.	Chapora	-	19	6	25
5.	Ichhapur	30	6	4	40
6.	Bambhada	27	7	6	40
7.	Dapora	-	6	14	20
	Total	87	72	41	200

Needed information on various aspects on production was collected from the selected respondents . Related secondary information was collected from the officials of Directorate of Agriculture at Burhanpur tahsil and Khandwa district.

1.5 Schedules etc.

Schedules and questionnaires were specially prepared and canvassed for collection of field data and information.

1.6 Limitations of Data

The data were collected for one year only and therefore yearly variations in the production on account of climatic conditions could not be accounted for.

The data on cost of production were collected from farmers and in the absence of farm records the information was based on the memory.

1.7 Period of the Study

Data were collected for the year 1980-81 crop year. This period covered the Mrigbahar banana planted in June 1980 and its harvesting started from July 1981 and lasted till April, 1982. The bananas take nearly fourteen months to mature and being perishable have to be marketed immediately after the harvest.

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Chapter II

AREA AND PRODUCTION OF BANANA

Brazil is the foremost banana producing country and occupies the first position in the world production accounting for 16.80 per cent of the world production. India is the second largest producer of banana in the world forming 10.56 per cent. Brazil and India together account for more than one-fourth of the total world output of banana. Next to India in the production of banana are Equador (6.87 per cent), Philipines (6.60 per cent), Thailand (4.74 per cent), Columbia (3.62 per cent) and Honduras (3.39 per cent). (Table 2.1)

Table 2.1 : Production of banana in major producing countries of the world

Country	Production ('000 tonnes) (Average for 1976-77, 1977-78) and 1978-79	Percentage to total
Brazil	6029.33	16.80
India	3787.00	10.56
Ecuador	2465.67	6.87
Philippines	2367.00	6.60
Thailand	1700.00	4.74
Columbia	1300.00	3.62
Honduras	1215.67	3.39
Others	17014.00	47.42
World Total :	35,878.67	100.00

Source : Bulletin on Commercial Crops Statistics; 76-77 to 78-79 Directorate of Economics & Statistics, Government of India, New Delhi.

2.1 Production Among Different States

The total area under banana in India for the triennium ending 1977-78 was 244.2 thousand hectares. The principal banana growing States and Union Territories in India were Kerala, Tamil Nadu, Maharashtra, Assam, Gujrat, Orissa, and Andhra Pradesh which together accounted for 82.92 per cent of the total area. The area under banana in Madhya Pradesh formed 2.09 per cent.

The average annual production of banana for the triennium ending 1977-78 was 3728.6 thousand tonnes. The two states of Maharashtra and Tamil Nadu contributed little over half the total production of banana in the country. Maharashtra registered the highest production closely followed by Tamil Nadu. It is interesting to note that while Kerala with 48.7 thousand hectares (19.95 per cent) has highest area, its production was only 9.90 per cent of the total production of the country. Maharashtra having the third place in area (43.4 thousand hectares or 17.77 per cent) registered the highest production of 1063.5 thousand tonnes or 28.52 per cent of the country's production. Tamil Nadu having 19.16 per cent of the area had a share of 27.83 per cent occupying the second place in production. Other states producing banana were Gujrat (7.66 per cent), Assam (6.94 per cent), Andhra Pradesh (3.97 per cent) and Orissa (3.03 per cent). Madhya Pradesh produced only 2.86 per cent of the total production of banana in India and ranked eighth.

So far as yield was concerned, Maharashtra ranked first with 249 quintals/ha followed by Tamil Nadu (222 qtls/ha). The yields in Madhya Pradesh and Gujrat were lower(210 and 196 qtls/ha respectively) and that of Assam (131 qtls/ha) was lower than the national average (152 qtls/ha)(Tabla 2.2)

Table 2.2 : Area, production and yield of banana in different states

(Average for 1975-76 to 1977-78)

State	Area ('000 ha)	Percentage of total	Production ('000 tonnes)	Percentage to total	Yield Quintal/ ha
1. Kerala	48.7	19.95	369.2	9.90	75.78
2. Tamil Nadu	46.8	19.16	1037.7	27.83	222.09
3. Maharashtra	43.4	17.77	1063.5	28.52	248.53
4. Assam	19.8	8.11	258.8	6.94	180.56
5. Gujrat	15.6	6.39	285.7	7.66	195.77
6. Orissa	15.6	6.39	112.8	3.03	72.29
7. Andhra Pradesh	12.6	5.15	148.2	3.97	122.79
8. Bihar	8.2	3.36	53.9	1.45	68.57
9. Madhya Pradesh	5.1	2.09	106.6	2.86	210.50
10. Tripura	2.8	1.15	17.4	0.47	62.98
11. Other States	25.6	10.48	274.8	7.37	--
All India	244.2	100.00	3728.6	100.00	152.02

Source : Bulletin on commercial crops statistics, 1976-77 to 1978-79, Directorate of Economics & Statistics, Ministry of Agriculture, Govt. of India.

2.2 Fruit Production in M.P.

The total area under fruits was 50,599 hectares, out of which mango occupied 22,830 hectares accounting for 45 per cent of the total area under fruits. Banana came next covering 8,995 hectares (18 per cent) and guava was the third major fruit . (Table 2.3)

Table 2.3 : Area under different fruits in Madhya Pradesh during 1979-80

Name of the Fruit	Area (Hect.)	Percentage of total
Guava	6,439	12.72
Papaya	846	1.67
Banana	8,995	17.78
Orange	4,967	9.82
Mango	22,830	45.12
Lemon	661	1.31
Other fruits	5,861	11.58
Total :	50,599	100.00

Source : Department of Agriculture, Govt.of M.P.

2.3 Banana Production in M.P.

It is observed that area under banana increased by 226.02 per cent from 2,759 hectares in 1970-71 to 8,995 hactares in 1979-80. The production of banana increased by 185.12 per cent during the same period. Banana production showed a marked increase during 1978-79 which was 428.12 per cent more than that of 1970-71. On the other hand in 1973-74 the production of banana declined from 52,905 tonnes in 1970-71 to 25,335 tonnes or about half of what it was in 1970-71. (Table 2.4)

Table 2.4 : Area, Production and Yield of Banana in Madhya Pradesh from 1970-71 to 1979-80

Year	Area (hect.)	Percent increase/ decrease(-) over 1970-71	Production (Tonnes)	Percent increase/ decrease(-) over 1970-71	Yield (kg/ hect)	Percent increase/ decrease(-) over 1970-71
1970-71	2759	--	52905	--	36236	--
1971-72	2500	- 9.39	37443	- 29.23	31672	-12.68
1972-73	2358	- 14.54	50176	- 5.16	21279	-41.28
1973-74	2535	- 8.12	25335	- 52.12	26414	-27.11
1974-75	3547	28.56	52389	- 0.98	33669	- 7.09
1975-76	4710	70.71	93439	76.61	19838	-45.25
1976-77	5573	101.99	118057	123.15	21183	-41.54
1977-78	6501	135.62	224261	323.89	34496	- 4.80
1978-79	7603	175.57	279403	428.12	36749	+ 1.42
1979-80	8995	226.02	150841	185.12	35417	- 2.26

2.4 Banana Producing Districts of M.P.

In Madhya Pradesh, Khandwa is the only major banana producing district and had 77.42 per cent of the total area in the state under banana and produced 82.44 per cent of the state's total production. Khargone and Dhar produced 5.50 per cent and 5.42 per cent respectively of the total production. (Table 2.5)

Table 2.5 : Area,production and yield of banana in the districts of Madhya Pradesh

(Average for 1975-76 to 1977-78

S. No.	District	Area (Hect.)	Percentage to State total	Production (Tonnes)	Percentage to State total	Yield Kg/ha
1.	Khandwa	4331.7	77.42	11957.7	82.44	2761
2.	Khargone	392.7	7.02	7989.3	5.50	2034
3.	Dhar	358.7	6.41	7879.0	5.42	2197
4.	Baster	101.7	1.82	1953.3	1.34	1921
5.	Raigarh	91.7	1.64	1656.3	1.14	1806
6.	Surguja	74.0	1.32	1368.7	0.94	1850
7.	Bilaspur	68.3	1.22	1641.3	1.13	2403
8.	Shahdol	24.0	0.43	376.7	0.26	1570
9.	Durg	19.7	0.35	256.3	0.18	1301
10.	Raipur	18.0	0.32	416.7	0.29	2315
11.	Sagar	12.3	0.22	343.0	0.24	2789
12.	Rewa	7.0	0.13	169.3	0.12	2419
13.	Tikamgarh	5.7	0.10	173.3	0.12	3040
14.	Chhatarpur	2.7	0.05	84.0	0.06	3111
15.	Panna	1.3	0.02	43.7	0.03	3362
16.	Others	85.2	1.53	1143.7	0.79	1342
M.P. State		5594.7	100.00	145252.3	100.00	2596

CHAPTER III

CULTURAL PRACTICES OF BANANA

In this chapter the cultural practices of banana have been described.

3.1 Climate and Soil

Banana plants can be seen growing from the southern tip of India upto a height of a few thousand metres in Himalayas. However, banana is essentially a tropical plant requiring a warm humid climate. In warm dry weather, the fruit stops growth and in the cold weather it is damaged by frost. It stops growth at temperatures below 10°C. Some varieties can withstand the cold better. Monthan variety is often grown in North India in sheltered positions in Kitchen gardens. Basarai is affected by cold even if the minimum temperature remains 4.4°C-7.2°C for about a week. Rainfall of 1778.0-2032 Millimetres well distributed throughout the year is desirable for banana, but it can stand rainfall upto 3810 millimeters. Stagnation of water is injurious and may cause diseases like "panama wilt".

Banana is a voracious feeder and requires a rich, well drained soil with plentiful organic matter. Heavy soils should be avoided.

The ideal season for planting is the beginning of monsoon when the plants get established even with less irrigation. It also needs good fertiliser use.

3.2 Varieties

Many varieties of banana are grown in India, but the Champa, Poovan or Lal Velchai pre-dominate. In the centres of

consumption of north India, there is a demand only for variety Basrai with soft, sweet, non-starchy, aromatic, non-acidic pulp, but in the south and in western India varieties like Rasthali and Rajabale with firm slightly acidic pulp are favourites. Important varieties are as follows:-

Poovan : (Champa, Lal Velchi, Chinni Champa):- It is hardy, high yielding, with good keeping quality. The fingers are small and yellow. The bunch is large, weighs about 25 kg. and has on as average 220 fingers.

Basrai : (Kabuli, Bhusaval): Dwarf suited for cultivation in dry interior windy areas under irrigation. It is susceptible to cold and is grown mostly in East Khandesh for export to North India, where it is sold under the name chittidar. A bunch contains about 130 fingers of large size sweet acidless taste, and there are black spots on fruits when ripe at high temperature. The fingers drop off from the bunch when ripe. It is resistant to 'panama wilt' but suffers from 'bunchy top' disease.

Harichal : (Bombay green, sapri) which is similar to Basrai except that the fruit is more green and straight.

Monthan is a small, stout, straight and angular banana. It is essentially for cooking, but can also be eaten fresh. It can withstand cold and is found in sheltered areas in U.P.

Chakkrakeli or Rajabale gives excellent fruit but has a poor keeping quality.

3.3 Planting and after care

Suckers are used for new plantation. It is also propagated by rhizome which is an underground bulbous stem. A plantation is generally kept for three years.

Planting is generally done in the beginning of south west monsoon. Pits of ½ x ½ x ½ metre are dug at a distance of 1½ x 1½ metres for dwarf varieties. Pits are filled with soil alongwith 20 kilogrammes of farm yard manure.

3.4 Manuring

Banana requires heavy manuring near the surface of the soil on account of its shallow root system. Green manuring before planting is desirable. Quick growth during the first three months to get the largest leaf area is important for a high yield.

The application of potash has not been found beneficial. The doses of fertilizers depend upon the climate, the variety and the soil. Following fertilizer mixture should be given four times in a year (July, October, January, March) per plant.

Ammonium sulphate - 250 gms.
Super phosphate - 150 gms.
Muriate of potash - 100 gms.

3.5 Inter-culture

In summer the irrigation should be given at an interval of four to six days and during November to February the interval

should be from 10 to 15 days. Weeding should be done from time to time. Suckers should be removed every two months. Plants should be protected from hot and cold winds by providing wind-breaks on North and west side.

3.6 Harvesting and Handling

Banana is harvested raw and ripened artificially. The fruit is harvested after the fingers begin to turn light green and the ridges on their surface change from angular to rounded. The top leaves at this stage begin to dry up and the dry remains of the flowers at the end of the fruits drop off easily. The banana takes nine months to a year to flower for the first time and at least another three months for the fruit to mature. Subsequent fruiting in the same plantation takes place after another six to ten months. The bunch is cut keeping at least 30 cm. long stalk, which acts as a handle. The bunch should be protected from the sun and rain after harvesting and handled carefully.

3.7 Yield

Yield varies greatly according to the locality and the variety. The average yield in Madhya Pradesh was 24,659 kg per hectare in the year 1980-81[1].

3.8 Ripening

Banana is commonly ripened in a closed room with smoke, but it can also be ripened at room temperature.

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1. Area and Production of Principal Crops in India 80-81. Directorate of Economics & Statistics, Government of India, New Delhi.

3.9 Marketing Aspects

The present marketing facilities for banana fruits are grossly inadequate and the major part of the production is disposed off at low prices during the post-harvest months. The wastage during the glut period is also very high because of its perishable nature and absence of adequate infrastructure like roads, fast transportion, well equipped market yards etc. This results in the lower returns to the growers.

At present, banana fruits are sold through auction to wholesalers. Since there are only a few wholesalers the banana growers generally get low prices. Thus the wholesaler manages a lion's share of the consumer's rupee resulting in a low share to banana growers. Any increase in the retail price is reflected in the higher share of middleman rather than higher price paid to the producer. Also due to large number of intermediaries, the sale and distribution procedure becomes very complex, which becomes incomprehensible for the farmer who is unable to decide about the right place and the right time and the right manner of the disposal of his produce.

Another problem with regard to the production of a perishable commodity like banana is that of high fluctuations in the prices which dip to the unremunerative level for the farmer during period of glut and rise to high levels during periods of short supply, which hurt the interests of the consumer. Thus there is a negative relationship between market arrivals and prices.

3.10 Banana Exports

India is the leading producer of banana in the world followed by Brazil and Ecuador. But it stands nowhere in the international market.

Indian cultivators are not conscious of the export potential of this nutritious fruit and hence are not growing the exportable varieties. Banana is cultivated mainly on small holdings which raises the cost of cultivation per unit of area. Besides, the high cost of packaging of this perishable commodity and high freight charges make it difficult for the Indian cultivator to enter the export market.

Banana is mainly in demand in USA, USSR, France, Germany, Italy and Japan. Some of the important exporters to these markets are South and North America, Carribean Islands and the Far-East.

Being a traditional producer of banana, India cultivates nearly 45 to 50 varieties and has the potential to grow for the export market particularly to the countries like Japan, and the USSR.

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followed and its proportion was 15.87. Human labour was an equally important item of cost as it formed 15.25 per cent of the total cost. It was observed that the proportions of these items did not vary much among different size groups except that the proportion of F.Y.M. was slightly higher on the largest group. The other items of cost were the charges of tractor hiring (8.43 per cent), bullock labour (7.57 per cent) and suckers (6.02 per cent) (Table 4.1)

4.2 Yield and Output

The average yield per hectare was 448.51 quintals. It was lowest (419.57 quintals) on the smallest size group and highest (469.86 quintals) on the medium size group. On the largest group the yield was 444.46 quintals per hectare. The average value of output per hectare for the sample farms came to Rs.28,974.95. In other words the average price fetched was Rs.64.60 per quintal. It may be mentioned that although the smallest size group harvested the lowest yield it got the highest price (Rs.69.33). On the other hand the medium size group which had the highest yield could get a lower price than the smallest group. The largest size group earned the lowest price. (Table 4.2)

Table 4.1 Laid out cost of baneba per hectare, selected farms

Item of cost	SIZE GROUPS							
	Small		Medium		Large		Total	
	Rs.	Percentage	Rs.	Percentage	Rs.	Percentage	Rs.	Percentage
1. Seed (suckers)	990.75	6.86	969.47	5.96	955.07	5.65	968.76	6.02
2. Farm Yard Manure	2091.85	14.49	2290.66	14.09	3087.02	18.27	2554.00	15.87
3 Chemical Fertilizers	4183.85	28.99	4941.33	30.39	4827.66	28.58	4723.83	29.36
4. Insecticides	167.46	1.16	169.68	1.04	172.94	1.02	170.42	1.06
5. Irrigation	2326.99	16.12	2883.75	17.73	2596.70	15.37	2644.98	16.44
6. Bullock labour	1090.20	7.55	1255.83	7.72	1257.14	7.44	1218.43	7.57
7. Human Labour	2259.80	15.66	2561.56	15.75	2460.15	14.56	2453.16	15.25
8. Tractor hiring Charges	1323.29	9.17	1190.06	7.32	1538.69	9.11	1355.76	8.43
Total	14,434.19	100.00	16,262.34	100.00	16,895.37	100.00	16,089.34	100.00

Table 4.2 Yield, price and output of banana per hectare

Size group	Yield (quintals)	Price (Rs.)	Output (Rs.)
Small	419.57	69.33	29,087.95
Medium	469.86	67.07	31,541.00
Largest	444.46	59.40	26,399.37
	448.51	64.60	28,974.95

4.3 Profitability :

Average profit per hectare of banana was Rs.12,885.60. The profit per hectare was highest (Rs.15,251.63) on the medium size group and lowest (Rs.9,504.13) on the large size group. The profit per hectare on the small size group was Rs.14,653.75 or Rs.597.88 less than the medium size group. It shows that the profitability was lower on large size of farms but with only three groups of farms no definite relationship between the size and profitability could be established. (Table 4.3)

Table 4.3 Profitability per hectare

Size group	Out put	Input	Profit	Out put input ratio
Small	29,087.95	14,434.20	14,653.75	2.02
Medium	31,514.00	16,262.37	15,251.63	1.94
Large	26,399.37	16,895.24	9,504.13	1.56
Average	28,974.95	16,089.35	12,885.60	1.80

4.4 Output Input Ratio

The output input ratio is a very important criterion of profitability measurement. On the selected farms the average ratio was 1.80. It was highest (2.02) on the small size group and decreased with the size to 1.94 and 1.56 on the medium and large size groups respectively. This clearly shows that small farms are economically more efficiently operated. (Table No.4.3)

4.5 Profit Per Quintal

The average profit per quintal was Rs.28.73. It was highest (Rs.34.93) on the small size group and decreased in the subsequent groups to Rs.32.46 and Rs.21.38 respectively. The higher profitability per quintal on small farms is attributed mainly to lower cost per hectare although yield was lowest on that size group. The low profitability per quintal on large size group is because of lower output value. (Table 4.4)

Table 4.4 Profit per quintal

Size group	Total Profit (Rs.)	Yield (quintal)	Profit per quintal (Rs.)
Small	14,653.75	419.58	34.93
Medium	15,251.63	469.86	32.46
Large	9,504.13	444.46	21.38
Average	12,885.60	448.51	28.73

4.6 Sorting and Grading

Systematic sorting of banana fruits, based on scientific grade standards, is almost completely absent in this area. Sorting of the produce on the farm by the producer himself is seldom practised. At best, what the grower does is to remove from the bulk, the immature, rotten or diseased fruits. Some sort of grading is attempted by the traders only at the assembling stage. Banana fruits are graded on the basis of weight, size and variety at the despatching points before sending them to terminal market. The entire sorting of banana fruits commences at farm and is carried out by the producers themselves in two grades viz. good quality and low grade.

The average consumer wants banana of good quality having good shape and inviting appearance, with sweet and melting pulp, clean and smooth skin which can be peeled off easily. In other words, it may be said that the banana fruits of good quality fetch better prices to the growers than the low quality fruits. Though there is no significant difference in the nutritive value of the two grades it is the liking and preferance of consumer that accounts for the price differential.

4.7 Culled Bananas

The low grade fruits are known as culls and are used by the banana growers for domestic consumption and are fed to animals.

It was observed that of the total production 97.11 per cent was of good quality fit for sale whereas 2.89 per cent formed culled bananas. The proportion of culled bananas varied slightly among different size groups.

It was found to be highest (3.28 per cent) in large sized farms and lowest (2.53 per cent) in medium sized farms. On the smallest size group the proportion was 2.86 (Table 4.5).

It may be noted that the quantity of culled bananas mentioned above is what is reported at the farmers' level. However at the assembling centres the traders also reject some quantity of fruits as culls. Estimation of this quantity was not done in the present study. However it was reported that the proportionate value of culls is deducted by the traders at the time of assembling.

4.8 Utilization of culls

The whole part of culled banana which remained unsold is consumed at home.

Table : 4.5 Proportion of culls on the sample farms

(Production- quintals)

Particulars	Size Groups						Total	
	Small		Medium		Large			
	Production	Percentage	Production	Percentage	Production	Percentage	Production	Percentage
Good quality banana	23,178.00	97.14	43,450.00	97.47	41,596.00	96.72	1,08,224.00	97.11
Culls	682.00	2.86	1,129.00	2.53	1,410.00	3.28	3,221.00	2.89
Total	23,860.00	100.00	44,579.00	100.00	43,006.00	100.00	1,11,445.00	100.00

It may be seen that of the total culled banana a major proportion (61.97 per cent) is used as feed to livestock and the remaining (38.03 per cent) is consumed by the family members and is given as gift to relatives. (Table 4.6)

The practice of feeding culled banana to livestock is prevalent in the whole area. The growers do not know the alternative techniques, if any, of preparation of different kinds of products. The reason for the disposal of culled banana as a feed to animals and direct consumption, is the lack of market for culled bananas.

4.9 Method of sale

Most of the banana growers of this tehsil sell their produce through commission agents/wholesalers. At Burhanpur assembling market, the same firm acts both as a commission agent and wholesaler. Irrespective of the channels followed, the major portion of banana passes through commission agents/wholesalers. There is a sort of collusion among the commission agents and wholesalers and whole of the produce is cornered by just fifteen to twenty traders who have an overwhelming power to manipulate the prices. Commission agents have their auction shed collectively and the growers do not bring their produce in the market yard. These merchants visit the orchards about a day or two prior to harvest, study the bunches of the fruit, count the number of bunches and

Table 4.6 : Utilization of culls, sample farms

Particulars	Size Groups						Total	
	Small		Medium		Large			
	Quantity (Qtl.)	Percentage	Quantity (Qtl.)	Percentage	Quantity (Qtl.)	Percentage	Quantity (Qtl.)	Percentage
Consumed by farmers family	254.80	37.36	466.00	41.28	504.00	35.74	1224.80	38.03
Fed to cattle	427.20	62.64	633.00	58.72	906.00	64.26	1996.20	61.97
Total	682.00	100.00	1129.00	100.00	1410.00	100.00	3221.00	100.00

estimate the average weight of bunches and thus ascertain the production to be marketed immediately. They also negotiate and mutually settle with the growers the day when sales are to be conducted through open bidding.

The auction is conducted at Burhanpur market usually in the evening between 5 P.M. to 6 P.M. In the auction yard there are black boardsplaced on the dais on which the names of growers and the commission agents as well as estimated average weight of bunches (commonly called 'Rasi') are written. Besides, there is also an indication whether the produce is to be brought to the roadside/collecting point on head loads or by bulock carts. The term 'head load' in local lauguage is known as 'Sirka'. The produce brought on head load fetches consistently high premium over the produce brought by bullock carts. Normally the commission agents, wholesalers, retail merchants and growers assemble there in sufficient number in the evening to participate in the auction. In this method of sale a black board is brought turn by turn before the assembled merchants and auction sale starts. Based on the estimated average weight of bunches of fruit, the price varies. In the meantime, the purchasers also enquire about the other details of the produce and decide the day when the lot is to be harvested. The lot is sold to the highest bidder. After the sale is effected the harvesting of the fruit is generally started on the next day. When purchaser takes the lot and finds that the actual average

weight is lower than the estimated average weight mentioned at the time of auction he immediately intimates the fact to the commission agent/wholesaler and the grower. In that case, certain percentage or amount is deducted from the predecided price of the lot.

Commission agent/Wholesaler of the area takes up this work during banana marketing season which starts in July and lasts for about 9 to 10 months. Such functionaries have established improvised structures at convenient points on road-heads and within the banana producing areas inside the whole tahsil. They also accept the responsibility of loading, unloading, weighing, forwarding and transportation of the fruit in distant markets and charge for their services at the rates agreed mutually.

The perishable nature of banana requires its entire movement from the fields to the ultimate consumers as expeditiously as possible so that the fruit remains reasonably fresh by the time it reaches the consumers. It may be interesting to note that the harvesting of banana is started after the sale of a particular lot is effected. Thus the sale precedes harvesting.

4.10. Harvesting

The stage of maturity is judged by seeing that the ridges of the fruit have disappeared. Banana is picked when still green to withstand haulage over long distances and is

never allowed to ripen on the plant and is picked green at different stages of developments to suit different commercial needs. Banana growers judge the stage of maturity by observing the general appearance of the fruit on the bunch. Generally the fruit is considered fit for harvesting after the fingers have attained their full size and appear properly filled. The harvesting operation is important as the bunch can get smashed easily even with a little carelessness on the part of the cutter. In this tahsil the bunches are cut from the aerial stem by means of a sickle and the plant is then pulled down slowly for severing the bunch from it. Proper precaution is taken to see that the sap from the cut stalk does not stain the fruit. The cut is made well above the bunch to facilitate easy handling of the bunch in transit. The harvesting of banana is important for enabling the growers in fetching a better price and requires the services of skilled persons.

4.11 Handling

After the bunch of the banana fruit is given a clean cut it is carried away to the loading point/collecting point on the road-head. It was observed that in the case of orchards which are situated at a distance of less than a kilometer from the road-head the bunches are carried as head-loads to avoid damage in transit. In the other

orchards where the distance is more than a kilometer the growers carry the bunches in bullock carts to the collecting points at road-side. However, in this case the damage to the fruit by bruising is considerable. In this way each bunch is handled about three to five times before it is ready for despatch to the market. Thus, unless the handling is very careful, there is every likelihood of the fruit getting spoiled during the handling itself.

Bulk movement of naked bunches of bananas from Burhanpur tahsil to almost all the northern markets of the country and especially to the distant Delhi market is done in wagons, lined with banana leaves on sides, floor and ceiling. Bunches are also moved by road in trucks and these are also lined with banana leaves. Loading of banana in wagons is a specialised job, entrusted to the labourers well experienced in the work, as all efforts made in planting and growing of banana would go waste if the fruit is not handled properly.

4.12. Market Surplus

Generally whole of the banana produce is available for sale after the harvest. But like other horticultural crops some quantity is not saleable as it is of substandard quantity- commonly known as culls (see paragraph 4.7) Besides, some quantity of produce is retained for home consumption and for meeting social obligations.

4.13 Assembling & Forwarding

After the harvesting the bunches of banana are assembled at a convenient place on the road head for preliminary sorting whereby rotten, deformed or diseased and damaged fruits are separated out. The produce is carried to the road head on head loads or in bullock carts immediately after harvesting. Assembling and transportation upto road head is the responsibility of banana growers. Arrangements of transporting beyond the road head are made by the purchasers or commission agents, as the case may be. From road head bananas are carried up to Burhanpur market and onwards and both rail and roads are used. Burhanpur is the nearest railway station and the distance between road head and Burhanpur is covered by trucks only.

Bananas are sent from Burhanpur to Delhi by railway on large scale. Railway is more popular. The main reason for this is the lower freight. The use of trucks is confined to the neighbouring areas of Madhya Pradesh.

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C H A P T E R V

SUMMARY AND CONCLUSIONS

Khandwa district of Madhya Pradesh was selected to study the cost of cultivation and profitability of banana with 1980-81 as a reference year. The fruit occupies an important place in the agricultural economy of Burhanpur tahsil of Khandwa district.

5.1 Data and Sample

Time series data on area, production and yield for the period 1970-71 to 1979-80 and survey data of Burhanpur market have been used in the study. A sample of 200 farmers was interviewed with the help of a schedules prepared for this purpose.

5.2 Banana Production

Madhya Pradesh contributed about 3 per cent of the total production of banana of the country during the triennium 1975-76 to 1977-78. Its yield level (210.5 qtls/ha) was third in rank as compared to highest that of Maharashtra (248.5 qtls/ha) followed by Tamil Nadu (222 qtls/ha), the national average being 152 quintals per hectare. In Madhya Pradesh, Khandwa is the only major banana producing district and had 77.42 per cent of the total area in the state under banana and produced 62.44 per cent of the state's total production.

5.3 Economics of Banana Cultivation

Our sample survey data of 200 farmers in Burhanpur tahsil showed that the average cost of production per hectare on the selected farms was Rs.16,089.34. It was Rs.14,434.19 on the smallest size group and increased with the increase in the size. It was Rs.16262.34 and Rs.16,295.37 on the medium and large groups respectively. The most expensive item of cost of banana cultivation was fertilizer which accounted for 29.36 per cent of the total expenditure. Irrigation was the next important item and accounted for 16.44 per cent. Farm Yard Manure closely followed and its proportion was 15.87. Human labour was an equally important item of cost as it formed 15.25 per cent of the total cost. The other items of cost were the charges of tractor hiring (8.43 per cent), bullock labour (7.57 per cent) and suckers (6.02 per cent). It was observed that the proportion of these items did not vary much among different size groups.

5.4 Yield and Output

The average yield per hectare was 448.51 quintals. The average value of output per hectare for the sample farms came to Rs.28,974.95. In other words, the average price fetched was Rs.64.60 per quintal.

5.5 Profitability and Output-Input Ratio

The average profit per hectare of banana was Rs. 12,885.60. On the selected farms the average output input ratio was 1.80.

It was highest (2.02) on the small size group and decreased with the size to 1.94 and 1.56 on the medium and large size groups respectively. Evidently the small farms were economically more efficiently operated. The average profit per quintal was Rs.28.73. It was highest (Rs.34.93) on the small size group and decreased in the subsequent groups to Rs.32.46 and Rs.21.38 respectively.

5.6 Culled Banana

The low grade fruits are known as culls and are either used for domestic consumption or fed to animals. Of the total production 97.11 per cent was of good quality-fit for sale-whereas 2.89 per cent formed culled bananas.

5.7 Utilization of Culls

The major proportion (61.97 per cent) of the total culled banana is used as feed to livestock and the remaining (38.03 per cent) is consumed by the family members and is given as gift to relatives. The reason for the disposal of culled banana as a feed to animals and direct consumption is the lack of market.

Our study reveals significant growth in production of banana in Madhya Pradesh which may be attributed to relatively higher profitability of the crop as well as

technological developments. It is necessary to maintain this growth in future possibly through increasing yield rates which are lower than other states. Further, farmers should be provided with necessary infrastructural facilities relating to marketing. To mitigate the hardships of the farmers caused by seasonal fluctuations in prices, effective price support policy is needed. This may be in the form of a guaranteed minimum price . Measures such as cooperative marketing and cheap transport facility can further benefit the farmers.

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