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Development and economic analysis of Agro Processing Centre in production catchment of Vidarbha region

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ABSTRACT

A survey was undertaken of village Kokardaand nearby villages in Vidarbha region of Maharashtra with respect to agriculture production, population and existing processing machines available in Kokarda. Based on survey a potential was assessed andAgro Processing Centre has been developedvillage Kokarda, Dist. Amravati (M.S.) consisting of PKV Mini dal mill, flour mill, PDKV Cleaner-grader and pulverizer under the technical guidance of All India Coordinated Research Project on Post Harvest Technology, Dr. Panjabrao Deshmukh Krishi Vidyapeeth, (Agricultural University), Akola. The entrepreneur processed 8 q food grains through cleaner grader, 315 q pulses through dal mill, 72 q cereals (wheat, sorghum) through flour mill and 80 kg spices through pulverizer during year 2013-14 and some part of 2014-15. The entrepreneur earned an amount of Rs 1,32,560/- as a profit within six months beside providing employment to three persons with an investment of Rs 99,000/- on machines.

Key words: Agriculture production, Agro Processing Centre, Entrepreneur

Introduction

Agro-Processing Centre is an establishment, where required facilities for processing, storage, drying of cereals, pulses, oilseeds, spices, fruits and vegetables are available. Processed and packed food products are prepared and marketed with specific brand name (Kumar and Ilyas, 2003). Entrepreneurship is the ability to take the factors of production (land, labour and capital) and use them to produce new goods and services (Stoner *et al*, 1995). The entrepreneurship of APC may be of an individual, community, cooperative orvoluntary organization. The APC creates additional value to a product so as to increase marketability of surplus produce available in the village, cluster of villages or surrounding locality. The agro-processing centers play a key role in providing post harvest infrastructure at rural level for value

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addition of crop produced by farmers. It is an enterprise where the required facilities for primary and secondary processing of agricultural produce e.g. cereals, pulses, oilseeds etc. are made available. In it, agro-based value added products are made at village level itself which may be sold to nearby markets. The post harvest losses may be reduced and value addition may be done at rural / farm level itself. So, it is a mean of providing income and employment to rural people / entrepreneurs through agro-based processing activities of various locally available agricultural produce.

To create more employment opportunities in rural areas and to prevent wastages of raw materials like pulses, cereals, oilseeds, fruits and vegetables, the development of agro processing centres in production zone can play an important role for the economic growth of the state concerned in particular and the nation in general. Post harvest processing is one of the necessary steps in conversion, value addition and prevention of loss of agricultural produce. It is essential operation being carried out prior to consumption of agro produce. Most of the post harvest processing operations are performed at urban side resulting into increased cost of transportation and storage requirement besides loss of some important by-products and post harvest losses. Primary or secondary processing of agricultural produce at village level will help to reduce the cost of processed material, giving additional income source to the entrepreneur.

On this basis an agro processing centre has been establishedat Kokarda, Dist. Amravati.

Material and methods

Survey

The benchmark survey of village Kokarda was conducted to see the feasibility of establishing Agro-Processing Centre in this village. The village Kokarda is situated at a distance of 20 km from Anjangaon Surji and 65 km away from Akola city (Fig. 1). The village fall in Anjangaon block of the Amravati district. The village is fully electrified. The purpose of the survey was to assess the information regarding resources, demand for consumption, potential for processing the produce and scope for introduction of the processing technologies for processing the local agricultural produce into value added products. Based on the survey, the equipments, technologies and processes were identified.

Economic analysis of processing equipments

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The different economic parameters of processing machines such break even point, pay back period and return on investment were calculated.

1. Input parameters

The following data was used for the calculation of economic parameters.

Cost of machine (Rs.); Useful life of the machine (years); Salvage value (% of cost of machine); Interest rate per annum (%); Cost of housing or rent (Rs/month); Number of skilled workers; Wages of skilled workers (Rs/day); Number of unskilled workers; Wages of unskilled workers (Rs/day); Operating hours per day; Motor hp; Fuel consumption (litre/h); Fuel cost (Rs/litre); Capacity of machine (kg/h); Operating days of machine per year; Custom rate for material (Rs/kg); Raw material rate for material (Rs/kg); Main produce recovery (%); Main produce price (Rs/kg); By-product recovery (%); By-product price (Rs/kg); Custom hiring (%); and Self procurement & sale (%)

2. Calculation of

(i) Annual sales revenue

(ii) Depreciation per year

(iii) Interest per year

(iv) Housing or rent per year

(v) Maintenance per year

(vi) Annual fixed cost (Rs/year)

(vii) Wages (Rs/year)

(viii) Material cost (Rs/year)

(ix) Electricity/fuel cost

(x) Calculation for grease, lubricants, breakdown, repair etc.

(xi) Annual variable cost

(xii) Hourly variable cost

(xiii) Total annual cost

(xiv) Annual net profits

3. Output parameters

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(i) Quantity handled (kg/year)

(ii) Return on investment

10. Results and Discussion

The cropwise production of Kokarda and nearby villages is shown in Table 1. Pigeonpea, soybean, green gram, black gram, chickpea and cotton are the major crops grown. At present the farmers use to sell the farm produce either to the commission agent or APMC or to the local market of Anjangaon Surji.

Table 1. Cropwise production in Kokarda and nearby villages

Crops	Kokarda	Deulgaon	Bramhanwada	Sayadgaon	Bombada	Lakhanwadi
Pigeon pea (q)	700	670	460	150	500	1500
Wheat (q)	600	-	-	-	-	-
Green gram (q)	240	180	120	54	342	294
Black gram	420	280	294	154	602	539
Chickpea	450	450	450	150	300	3000
Cotton	750	285	150	75	450	750
Soybean (q)	2660	1400	800	600	2200	4000

Crops	Kotegaon	Rampura	Narayanpur	Total
Pigeon pea (q)	700	400	400	5480
Wheat (q)	-	-	-	600
Green gram (q)	114	180	288	1812
Black gram	539	140	308	3276
Chickpea	600	240	150	5790
Cotton	900	300	450	4110

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Soybean	3000	800	2600	18060

Table 2. Population of Kokarda and nearby villages

Kokarda	Deulgaon	Bramhanwada	Sayadgaon	Bombada	Lakhanwadi
3100	495	590	137	438	1158

Kotegaon	Rampura	Narayanpur
635	737	150

According to the crop production as shown in Table 1 and population as shown in Table 2, the machinaries were selected for establishement of Agro Processing Centre (APC).

From the Table 1, it is clear that the major crops grown in this village are pigeon pea, green gram during rabi season and soybean during kharif season. Demographic and geographical details of village Kanzra of Akola district are given Table 3.

The existing farm level processing facilities in this village and in nearby villages are stated in Table 4. The process of harvesting is manual and threshing is fully mechanized. Milling of cereals and pulses is done by domestic level flour mill. The existing processing facilities available in these villages were also studied (Table 5). There are three community flour mills in village Kokarda which has the capacity to process 70 to 100 kg/h. Average utilization of the mill is approximately 4 hours per day. After doing the survey it was observed that, the group can fetch higher price merely by cleaning, grading and processing of pulses into dal thus enhancing the profit. Considering the demand of spice powder, there is scope for establishment of pulverizer for making powder of chilli and other spices. Considering the scope, machines identified for Agro Processing Centre at Kokarda are:

Machines identified for agro-processing centre

1. Cleaner grader
2. Mini dal mill
3. Flour mill

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4. Spice grinder/pulverizer
5. Weighing balance
6. Loading trolley

The layout of Agro Processing Centre at Kokarda is shown in Fig. 2.

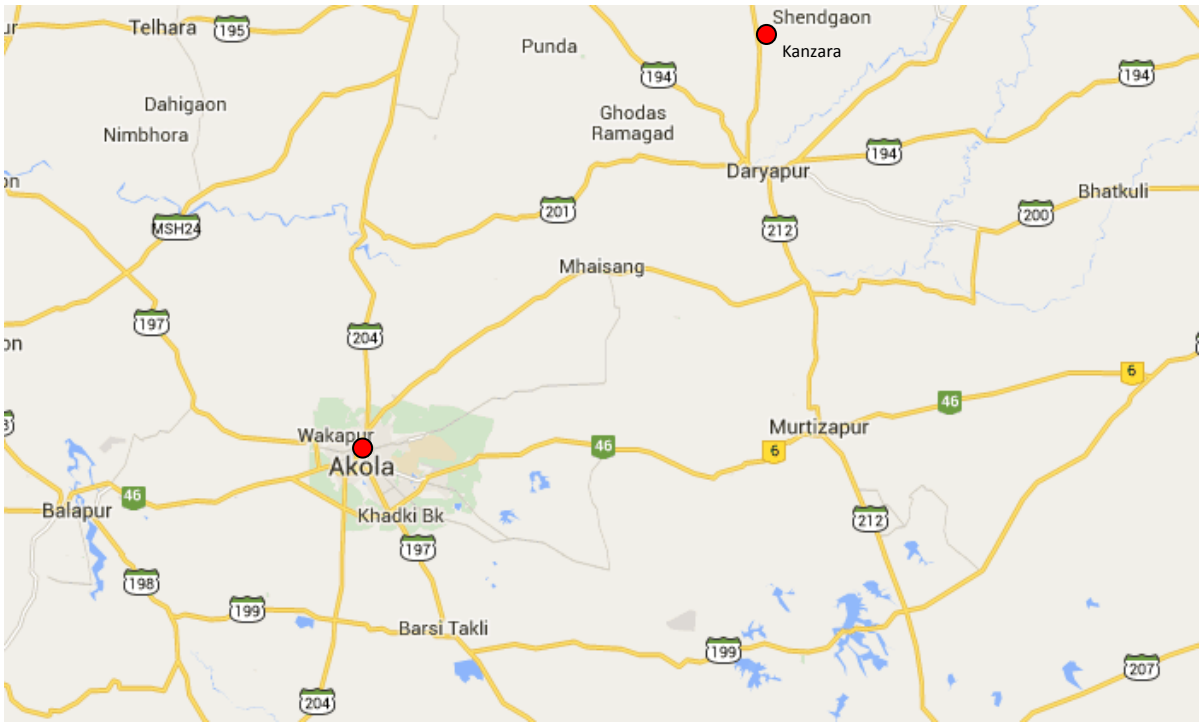

Fig. 1. Location of the site of Agro Processing Centre at Kokarda

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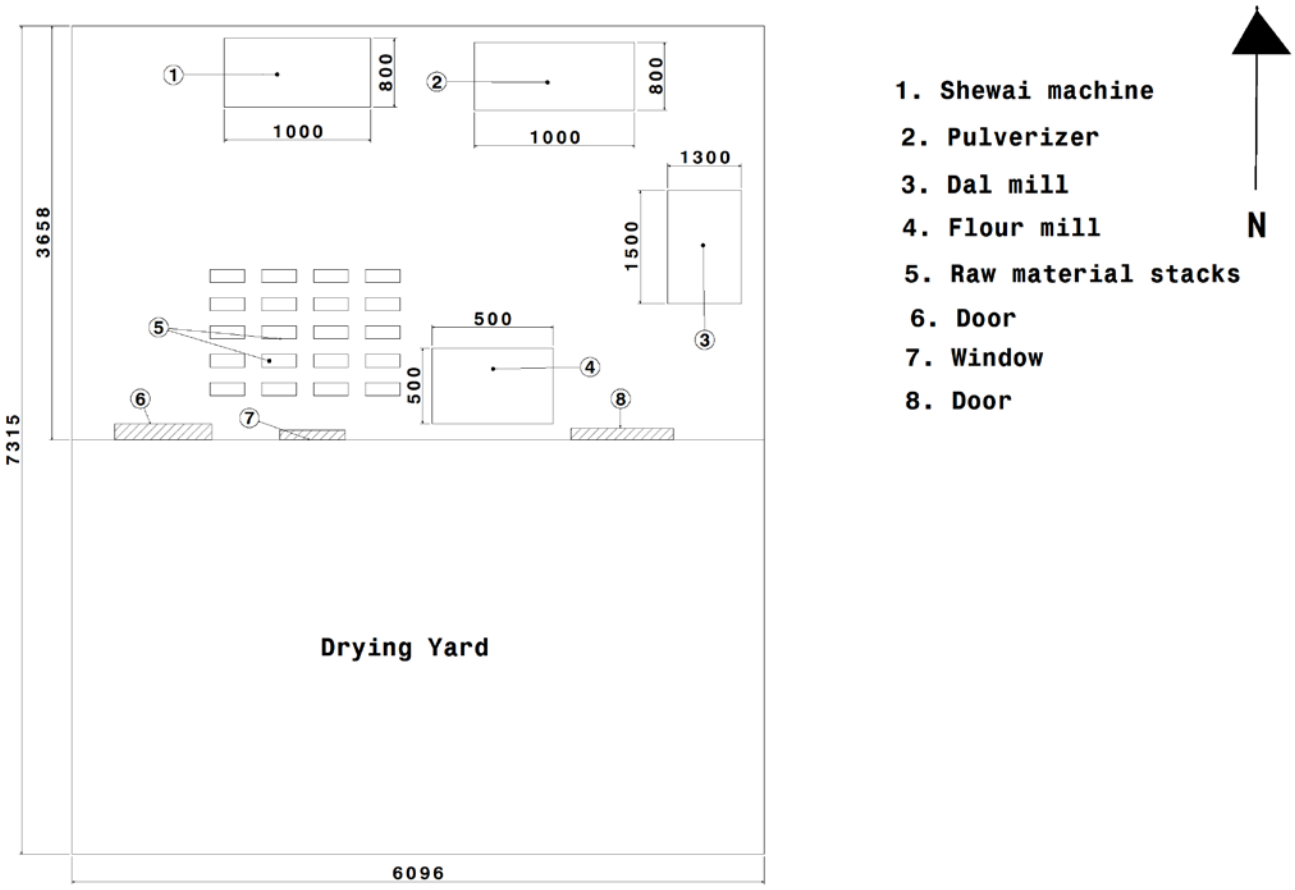

Fig. 2. Layout of Agro Processing Centre at Kokarda

Details of equipments/machines at Agro Processing Centre at Kokarda enlisted in Table 6. Table 7 depicts economic analysis of Agro Processing Centre at Kokarda. The entrepreneur processed 8 q food grains through cleaner grader, 315 q pulses (235 q pigeonpea + 80 q chickpea) through dal mill, 72 q cereals (wheat, sorghum) through flour mill and 80 kg spices (chilli and turmeric) through pulverizeer.An economic analysis of agro-processing centre indicate that an entrepreneur earned an amount of Rs 1,32,560/- as a profit during last year beside providing employment to three persons with an investment of Rs 99,000/- on machines.

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Table 3. Demographic and geographical details of village Kokarda of Amravati district

S.No.	Particulars	Name of the village
		Kokarda
1	Total population Total number of houses Total geographical area (ha) Total cultivated area (ha) Area irrigated (ha) Area unirrigated (ha)	3100 900 451.44 383.4/ (3171 ha incl. nearby villages) 30 --
2	Females	1200
3	Children below 14 years	500
4	Number of farming families	700
5	Land holding of farmers (No. of families) (a) Less than 1 acre (b) 1 to 5 acre (c) 5 to 10 acre (d) 10 to 15 acre (e) 15 to 20 acre (d) More than 20 acre	 20 200 150 15 04 00
6	Number of landless labourers (No. of families)	60
7	Livestock population (a) Bullock (b) Cows (c) Buffaloes (c) Calves (d) Goat (e) Sheep (f) Pigs (g) Poultry birds	 40 100 20 50 400 - - -
8	Farm machines (a) Cultivator (b) Seed drill (c) Thresher (d) Chaff cutter (e) Winnowing fan (f) Sprayer (Tractor operated) (g) Tractor (h) Trolley	 12 12 08 - - - 12 06

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Table 4. Existing farm level processing facilities in village Kokarda of Amravati district

Sr. No.	Operation	Traditional method	Improved method
1	Harvesting	Manual with sickle	--
2	Threshing	---	Mechanical threshers
3	Winnowing	Manual	--
4	Cleaning & grading	Manual	--
5	Drying	Open sun drying	--
6	Bagging & weighing	Manual	--
7	Storage	Gunny bags, Kothar type storage structures	--
8	Milling	Manual hand grinding	Electric operated domestic flour mill

Table 5. Processing facilities available in village Kokarda

S. No.	Name of the machine	Specification	No. of units
1	Domestic flour mill	14” diameter vertical type operated by 7 HP three phase electric motor (100 kg/h)	3

Table 6. Details of equipments/machines in Agro Processing Centre at Kokarda

S.No.	Machines	Capacity	Cost (Rs)
1	Mini dal mill	100 kg/h	30,000
2.	Cleaner grader	250 kg/h	30,000
2	Spice grinder/pulverizer	50 kg/h	7,000
3	Flour mill	50 kg/h	10,000
4	Weighing balance	30 kg	5,000
5.	Electric motor with fittings	3 hp	17,000
TOTAL COST			**99,000**

Table 7. Economic analysis of Agro Processing Centre at Kokarda

S.No.	Component	Amount (Rs)
FIXED COST		
1	Depreciation @ 10% per annum	9,900
2	Interest @ 12% per annum	11,880
3	Repair & maintenance (5% per annum)	5,940
4	Rent @ Rs 1000 per month	12,000
TOTAL FIXED COST		**39,720**
VARIABLE COST		
1	Wages (3 unskilled workers @ Rs 3600/- pm)	21,600
2	Electricity consumption (3 hp load)	9,720
3	Miscellaneous	10,000
TOTAL VARIABLE COST		**41,320**
TOTAL COST PER YEAR (FC+VC)		**81,040**

RETURNS

S. No.	Operation	Amount (Rs)
1	Cleaning grading Quantity processed 8 q @Rs 100/q	800
2	Dal milling Quantity processed in a year 315 q (120 days) @Rs 500/q	1,57,500
3	Flour mill Quantity processed 72 q @Rs 200/q	14,400
4	Grinding of spices/pulverizing Quantity processed 80 kg @Rs 10/kg	800
TOTAL		**1,73,500**

ANNUAL PROFIT = 1,73,500 – 41,320 = 1,32,560

or Rs. 11,047/- per month

Conclusion

The new Agro Processing Centre established at Kokarda is running successfully and earned a profit of Rs. 1,32,560/- by generating an employment of 120 days in a year.Agro Processing Centre played a vital role not only in income generation but also helped in providing the employment to rural farmers/youths.

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