

CHAPTER - 3

Analytical Study on Various Trends of Food Processing Industries

3.1 Introduction

The food processing industry plays a vital role in socio-economic development. A developed food processing industry will reduce wastages, ensure value addition, generate additional employment opportunities as well as export earnings and thus lead to a better socio-economic condition of the region. Food Processing industries contribute significantly to economic and social development and act as a bridge between the agriculture and allied sector. That is why food processing industries treated as one of the important wheels in the socio-economic development of the region. It has revealed that more than 50 % of people of Kokrajhar District engaged in agricultural activities. Hence, the present study attempts as how these abundant agricultural raw materials have been fruitfully used through the food processing industry. So that thereby both the food processing industry sector, as well as the agricultural sector, is benefited. Moreover, the development of both the Food processing Industry and related agricultural activities are immensely important to lead the socio-economic development of the Kokrajhar District. In this regards, through the study of the growth of the Food Processing industry, many important dimension pertaining to this sector can be identified.

It is circumstantial evidence in case of Kokrajhar District is that the growth rate of the food processing industry is not at all satisfactory. In support of which, it is to be mentioned that in spite of having availability of raw materials and labour, it is seen that the growth of the food processing industry is not satisfactory in the district. The central problem of the study is that without satisfactory trend of growth, the food processing industry of the Kokrajhar district cannot be considered as a wheel of socio-economic development. Particularly, after the formation of BTAD in 2003, the increase in migrated population leads to increasing the demand of both durable and nondurable goods. Apart from this, the demand for products of the food processing industry under study has also been growing.

Notwithstanding, its growing demand these selected industries have measurably fail to capture the growing customer's needs and demands, where a major portion of demand is satisfied by the products of nationally and internationally reputed outside firms. Consequently, the local food processing industries are facing problems in selling their products due to their quality aspect of products, lack of modern marketing strategy, inefficient utilization of technology etc. Hence, it is urgently required to revive the food processing industry of Kokrajhar district from their various problems because of which their rate of growth is seen to be unsatisfactory.

3.2 Objective and methodology of the Chapter

The systematic study on the progress of the food processing industry is immensely important to depict the real picture of the industrial development of the District. Notwithstanding it's important still no careful study is done covering the importance of food processing industries of Kokrajhar District. The devoid of proper study on the progress of food processing industries in Kokrajhar Districts makes difficulties to take necessary decisions and to formulate effective policy and schemes for the development of these industries. Keeping in the purpose of these needs, the present chapter attempts to illustrate the position of the progress as well as the status of food processing industries in Kokrajhar districts. In order to analysis, the growth position 90 number of selected industry under five categories are taken into observation. Basically, six factors are considered for analysis the growth position of the selected industry sectors. These are number of the unit , initial investment , employment level , cost and net profit respectively covering the 10 years from 2007-08 to 2016-17. The data has collected through questionnaire from the DICCC, Kokrajhar and field survey. After collecting the data TR , AR, TC , AC and net profit have calculated and the data are presented through the table and graph. Lastly, the Compound annual growth rate of unit and employment has calculated through using the linear regression model and net profit has calculated through log-linear regression model and tested through SPSS which is explained in the relevant part.

3.3: Overview of Indian Food Processing Industry

India is the world's second largest producer of food next to China and has the potential of being the biggest with the food and agricultural sector. The food processing industries are one of the largest industries in India, ranked fifth regarding production, consumption, export and expected growth (Singh, R. 2015). Food processing contributes about 10 percent of India's manufacturing sector GDP. In dollar terms, it is estimated to grow to USD 482 billion in 2020, from USD 258 billion in 2015, leveraged by consistently rising domestic and export market demand. The exports of this sector during Financial Year 2011-16 grew at a CAGR of 11.74 percent. The maximum products of the food processing industry are export to the Middle East and South East Asian countries (Advantage Assam report).

The following table shows the registered food processing units and employment of all over India as per annual survey of industries 2014-15.

Table No. 3.1**State-wise number of Registered Food Processing Industry and employment level in India**

SI No.	State	Factories (no)	Share of Factories	Employment (Total Person Engaged)	Share of Employment
1	A & N Islands	6	0.02%	116	0.01%
2	Andhra Pradesh	5833	15.11 %	152848	8.62%
3	Arunachal Pradesh	28	0.07%	1375	0.08%
4	Assam	1317	3.41%	87970	4.96%
5	Bihar	838	2.17%	35881	2.02%
6	Chandigarh	19	0.05%	903	0.05%
7	Chhattisgarh	1141	2.96%	25427	1.43%
8	Dadra & Nagar Haveli	6	0.02%	295	0.02%
9	Damon & Diu	43	0.11 %	2820	0.16%
10	Delhi	165	0.43%	13735	0.77%
11	Goa	88	0.23%	7299	0.41%
12	Gujarat	2001	5.18%	97624	5.51%
13	Haryana	881	2.28%	49518	2.79%
14	Himachal Pradesh	166	0.43%	11919	0.67%
15	Jammu & Kashmir	162	0.42%	7501	0.42%
16	Jharkhand	219	0.57%	6470	0.36%
17	Karnataka	2084	5.40%	113143	6.38%
18	Kerala	1525	3.95%	153853	8.68%
19	Madhya Pradesh	816	2.11%	45977	2.59%
20	Maharashtra	3014	7.81%	239344	13.50%
21	Manipur	23	0.06%	536	0.03%
22	Meghalaya	19	0.05%	868	0.05%
23	Nagaland	20	0.05%	267	0.02%

24	Odisha	969	2.51%	27225	1.54%
25	Puducherry	65	0.17%	5023	0.28%
26	Punjab	2840	7.36%	106618	6.01%
27	Rajasthan	857	2.22%	39641	2.24%
28	Sikkim	18	0.05%	1670	0.09%
29	Tamilnadu	5149	13.34%	204648	11.54%
30	Telangana	3967	10.28%	60315	3.40%
31	Tripura	75	0.19%	1998	0.11%
32	Uttar Pradesh	2055	5.32%	158491	8.94%
33	Uttarakhand	386	1.00%	28381	1.60%
34	West Bengal	1808	4.68%	83656	4.72%
	Total	38603		1773355	

Source: Annual Survey of Industries, 2014-15 (available at www.mofpi.nic.in)

The table no : 3.1 , reflects that as per annual survey of Industries 2014-15, the total number of registered food processing units in India is 38,603 and employed 17,73,355 number of people. The number of registered factories in Assam during 2014-15 is 1,317 which accounts for only 3.46 % share of the total registered factories in the country, and it has employed 88449 people of 5.08 % of the country. But in case of number of food processing unit the top five positions have occupied by Andhra Pradesh , Tamilnadu , Telangana , Maharashtra and Punjab respectively. It has been observed that from the table that Assam's share is quite minimal and the food processing sector needs to be developed to improve the socio-economic situation of the state.

The following table shows the growth trends of various categories of registered food processing units in India.

Table No 3.2

Growth trends of various categories of registered food processing units in India

Sl. No.		2007-08	2008-09	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15
1	Meat	77	90	85	115	146	140	148	170
2	Fruits and Vegetables	735	709	832	1052	1078	1110	1101	1133
3	Dairy Products	1096	1100	1112	1493	1653	1695	1753	1783
4	Grain Mill Products	12807	13464	13397	17792	18244	18131	18272	18953
5	Bakery Products	955	993	1056	1450	1399	1519	1498	1613
6	Cocca ,Chocolate and Sugar confectionery	404	456	466	509	560	539	505	594
7	Noodles and Similar Products	73	61	51	83	75	129	105	91
8	Manufacture of Wines	64	79	69	74	77	78	71	74
9	Vegetable & animal oils and fats	2515	2429	2421	3307	3394	3312	3300	3240
10	Prepared meals & dishes	--	45	139	343	416	352	298	277
11	Sugar	778	733	744	895	906	859	791	763
12	Production of mineral water & other bottled water , soft drinks	887	896	834	1264	1401	1483	1520	1597

Source: Annual Survey of Industries, 2014 -15 (available at www.mofpi.nic.in)

In the light of the table no: 3.2, it has identified that the growth trends of some of the food processing industry sector are not satisfactory. But this table reflects that India has the scope to establish a wide variety of food processing industry.

3.4: Analysis of Various Trends of Rice Mills of Kokrajhar District

In case of almost all rural areas of India, paddy field occupies a major portion. Consequently, it uplifts the demand for rice mill. The demand for rice mill of Kokrajhar district also emerged from its highest production of rice made by rural people because maximum number of people in Kokrajhar district depends upon agriculture for their livelihood (Das, D., 2014). Among the five categories of selected industries, the rice mill is the oldest industry in Kokrajhar District, which is still playing a dominant role so far as the number of food processing industry is concerned. The following table specifies the above fact of rice mills in Kokrajhar District.

Table No 3.3

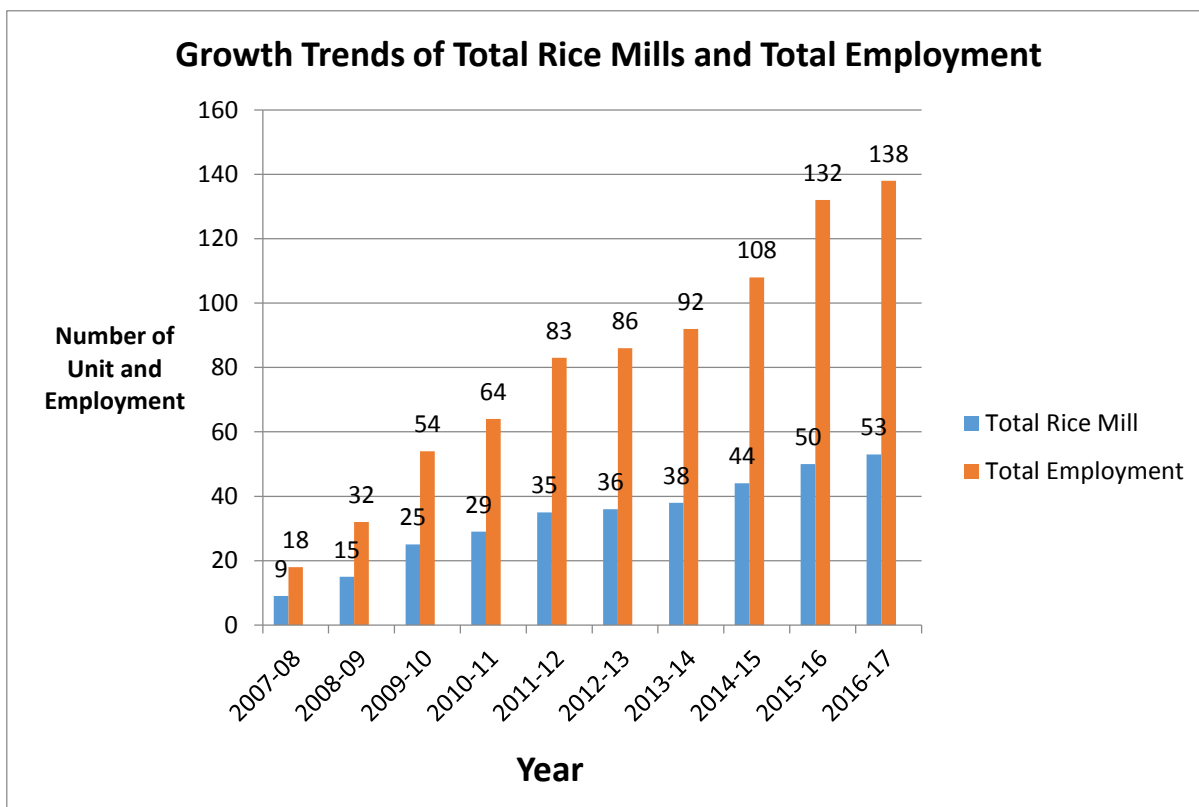
Various Economic Trends of Rice Mills of Kokrajhar District

S l N o	Year(as on 31 st Mar ch)	Unit		Initial Investment		Employment		Revenue		Cost		Net Profit	
		Marginal units	Total units	Total	Average	Total	Average	TR	AR	TC	AC	Total	Average
1	2007-08	---	9	510000	56667	18	2	3720000	413333	1860000	206667	1860000	206667
2	2008-09	6	15	1050000	70000	32	2.13	8520000	568000	4560000	304000	3960000	264000
3	2009-10	10	25	1800000	72000	54	2.16	19800000	792000	10680000	427200	9120000	364800
4	2010-11	4	29	2250000	77586	64	2.21	23400000	806897	12240000	422069	11160000	384828
5	2011-12	6	35	2780000	79429	83	2.37	30000000	857143	16200000	462857	13800000	394286
6	2012-13	1	36	2930000	81389	86	2.38	31200000	866667	17040000	473333	14160000	393333
7	2013-14	2	38	3250000	85526	92	2.42	33000000	868421	20160000	530526	12840000	337895
8	2014-15	6	44	3950000	89773	108	2.45	37200000	845455	24600000	559091	12600000	286363
9	2015-16	6	50	4680000	93600	132	2.64	42000000	840000	29040000	580800	12960000	259200
10	2016-17	3	53	5130000	96792	138	2.60	44160000	833208	30960000	584151	13200000	249057

Source: Compiled from field Survey, personal interview, Questionnaire and DICC, Kokrajhar

The following diagram has shown the growth trends of total rice mill and total employment level Year wise under the study period in Kokrajhar district.

Figure: 3.1



In the light of the table No 3.3, the following explanations are made regarding the growth trends of various factors of rice mills in case of Kokrajhar district.

1.No of unit: The number of unit of rice mill can be explained in two ways, such as number of rice mill established per year and the total number of rice mill in a cumulative basis. During the ten years under study, it is observed that the number of rice mill established in per year is very much fluctuating. In the year 2007-08, number of newly established rice mills was 09 and in the year 2008-09 newly established rice mill was 06 and again newly established rice mill increase to 10 in 2009-10. Further, it has reflected that the number of rice mill was decreased to 04 in 2010-11 and increase to 06 in 2011-12. In 2012-13 it was suddenly decreased to 01 and increase to 02 in 2013-14. Again it was increased to 06 in 2014-15 which was unchanged in 2015-16 and fall to 03 in 2016-17. Further, in case of a total number of unit of rice mills , it is found that

against the frequent fluctuation of the number of units established per year, total rice mill has gradually increased during the ten years under study. The total number of rice mill was 09 in 2007-08 which has increased to 53 in the year 2016-17.

2. Initial Investment: In case of total initial investment, it is to be mention that it is gradually increasing from Rs 5, 10,000 in 2007-08 to Rs 51, 30,000 in 2016-17. On the other hand, the average initial investment is also gradually increasing from Rs 56,667 in 2007-08 to Rs 96,792 in 2016-17. The total initial investment was increase at 10.06 times in 2016-17 over the year 2007-08. On the other hand, average investment increased 1.70 times in 2016-17 over the year 2007-08.

3. Employment: In the light of Table No 3.3, it has found that both the total and average employment is increasing gradually for the ten years under study. In this regards, it is to be mentioned that the total employment has 18 in 2007-08, which has increased to 138 after ten years in 2016-17. The increasing growth rate in 2016-17 is 7.66 times more than over the year of 2007-08. On the other hand, average employment was 2 in the year 2007-08 which has increased after ten years up to 2.60, i.e., in the year 2016-17. The growth rate of which is 1.3 times more in 2016-17 over the year 2007-08.

4 Revenue: From the observation of revenue aspects made from table No 3.3, it has identified that the TR has been increasing throughout the ten years under study, i.e., from Rs 37,20,000 in 2007-08 to Rs 4,41,60,000 in 2016-17. Hence the rate of growth of TR is recorded 11.87 times more during the ten years. In case of AR, it was started Rs 4,13,333 in 2006-07 and after ten years, i.e., in 2016-17 it was increased to Rs 8,33,208 which reflected the growth rate of 2.015 times more in the year 2016-17. The AR has been gradually increasing for the first 07 years, i.e., Rs 4, 13,333 in 2007-08 to Rs 8, 68,421 in 2013-14. For during the subsequent three years the AR was declined as Rs 8,45,455, Rs 8,40,000 and Rs 8,33,208 for the year 2014-15, 2015-16 and 2016-17 respectively.

5. Cost: After going throughout the observation of cost aspects as given the table No: 3.3, it is identified that the TC has been continuously increasing from Rs 18,60,000 in 2007-08 to Rs 3,09,60,000 in 2016-17. In case of AC provides the peculiar trend of

growth. Barring one the year 2010-11, the AC was also gradually increasing from Rs.2, 06,667 in 2007-08 to Rs 5, 84,151 in 2016-17 respectively.

6. Net Profit: From Table No: 3.3, in case of Net Profit it has identified that out of 10 years, total net profit was continuously increasing for the first 06 years from Rs 18, 60,000 in 2007-08 to Rs 1, 41, 60,000 in 2012-13. But suddenly total profit was decrease from Rs 1,41,60,000 in 2012-13 to Rs 1,28,40,000 in 2013-14. Again it was decrease to Rs 1,26,00,000 in 2014-15. Of course, the last two years total profit was increased from Rs 1, 26,00,000 in 2014-15 to Rs 1,29,60,000 in 2015-16 and from Rs 1, 29,60,000 in 2015-16 to Rs 1,32,00,000 in 2016-17. In the case of average profit, it has noticed that out of 10 years first five years it was continuously increasing from Rs 2, 06,667 in 2007-08 to Rs 3, 94,286 in 2011-12. During the last five years, average profit was continuously declining from Rs 3, 94,285 in 2011-12 to Rs 2, 49,057 in 2016-17. Here it is found that total profit has increased due to the rise in a number of the industry, but average profit falls because all the industries are not able to earn the equal profit because of entry of various national level branded rice mill companies in kokrajhar district.

3.5: Analysis of Various Trends of Oil Mills of Kokrajhar District

Uses of oils in various purposes of food items is the reason as for why its demand has been day by day increasing among both vegetarian as well as nonvegetarian consumers of the world. In case of Kokrajhar district also it is found that in spite of existing a sizeable number of state and national level oil products, many local based oil mills are also surviving in the district. In order to depict the growth trend of the oil mill in the Kokrajhar District, the following table is prepared where six factors related to various economic trends of this industry are reflected.

Table No: 3.4

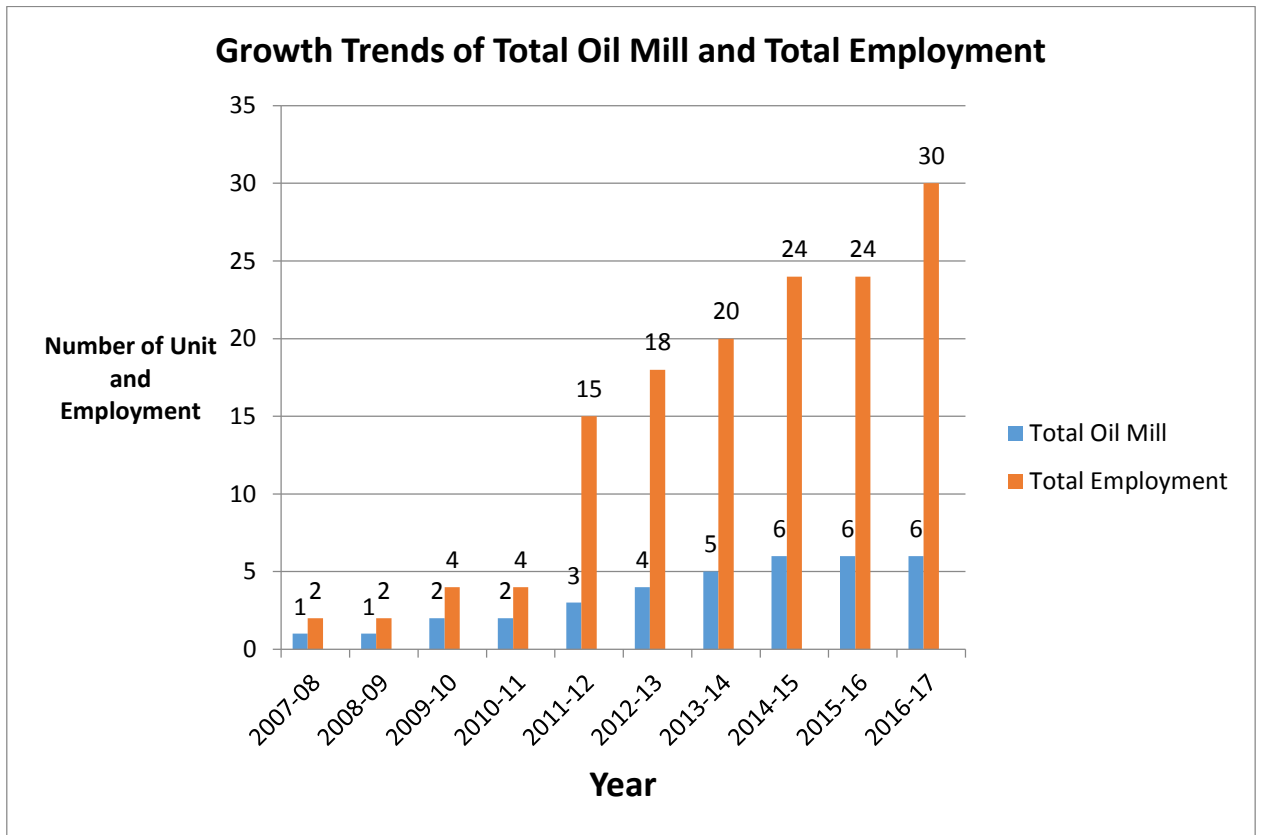
Various Economic Trends of Oil Mills of Kokrajhar District

S l N o	Year (as on 31 st March)	Unit		Initial Investment		Employment		Revenue		Cost		Net Profit	
		Marginal units	Total units	Total	Average	Total	Average	TR	AR	TC	AC	Total	Average
1	2007-08	-----	1	150000	150000	2	2	300000	300000	160000	160000	140000	140000
2	2008-09	-----	1	150000	150000	2	2	330000	330000	170000	170000	160000	160000
3	2009-10	1	2	320000	160000	4	2	680000	340000	430000	215000	250000	125000
4	2010-11	-----	2	320000	160000	4	2	720000	360000	420000	210000	300000	150000
5	2011-12	1	3	1320000	440000	15	5	1400000	466667	800000	266667	600000	200000
6	2012-13	1	4	1520000	380000	18	4.5	1700000	425000	880000	220000	820000	205000
7	2013-14	1	5	1750000	350000	20	4	2120000	424000	1050000	210000	1070000	214000
8	2014-15	1	6	2040000	340000	24	4	2350000	391667	1230000	205000	1120000	186667
9	2015-16	----	6	2040000	340000	24	4	2385000	397500	1250000	208333	1135000	189167
10	2016-17	----	6	2040000	340000	30	5	2460000	410000	1280000	213333	1180000	196667

Source: Compiled from the Field Survey, personal interview, Questionnaire and DICC Kokrajhar

The following diagram has shown the growth trends of oil mills and total employment level from 2007-08 to 2016-17 in Kokrajhar District.

Figure No: 3.2



On the basis of the table No 3.4, following points have been identified so far as growth trend of six dimensions of oil mills are concerned.

1. No of Unit: In the case of a number of the unit, it is seen that cumulatively the number of industries are gradually increasing from 01 in 2007-08 to 06 in 2016-17. Hence, throughout the ten years, the growth rate is not so high, but the future scope is bright in this industry because now people are moving towards buying the local cum organic product. So, local oil mill has a great scope in the near future in the district.

2. Initial Investment: The growth trends of initial investment in case of oil mill reflect two opposite trend. One is that the total initial investment is gradually increasing from Rs 1, 50,000 in 2007-08 to Rs 20, 40,000 in 2014-15, where average initial investment has also increased progressively from Rs 1, 50,000 in 2007-08 to Rs 3, 50,000 in 2013-14. Of course, for the last two years, the total initial investment of capital is seen to be constant, i.e., Rs 20,40,000 and similarly last three years average initial investment also

remain constant, i.e., Rs 3,40,000 respectively. It is because during the last two years there is no new oil mill has established in the district.

3. Employment: The growth trend of employment reveals the fact that the total employment is gradually increased from 2 in 2007-08 to 30 in 2016-17, where the average employment remains constant for four years from 2 in 2007-08 to 2 in 2010-11, whereas, it is suddenly increased from 2 in 2010-11 to 5 in 2011-12. Further, it is a decline from 5 in 2011-12 to 4.5 in 2012-13. In the years, i.e., 2013-14 to 2015-16 the average employment remain constant, i.e., 4 and it increase to 5 in the year 2016-17. During ten years from 2007-08 to 2016-17, the average total employment of per year is 3.

4. Revenue : The collection of TR has been gradually increasing from Rs 3,00,000 in the year 2007-08 to Rs 24,60,000 in the year 2016-17. In case of AR it is increase from Rs 3,00,000 in 2007-08 to Rs 4,66,667 in 2011-12 and then it fall Rs 4,25,000 in 2012-13 , Rs 4,24,000 in 2013-14 , Rs 3,91,667 in 2014-15 respectively and then it increase from Rs 3,97,500 in 2015-16 to Rs 4,10,000 in the year 2016-17 respectively.

5. Cost: After going through total and average cost for ten years it comes into light that total cost of production of oil mill is gradually increasing throughout the ten years under study. It was Rs.1, 60,000 for the year 2007-08 to Rs 12, 80,000 in the year 2016-17. As like total cost Average cost does not increase gradually. It was from Rs 1, 60,000 in 2007-08 to Rs 1, 70,000 in 2008-09 and Rs 2, 15,000 in the year 2009-10. Further, it was decreased to Rs 2,10,000 in the year 2010-11 and again it increases to Rs 2,66,667 in the year 2011-12. Again it was decrease to Rs 2,20,000 in 2012-13 ,Rs 2,10,000 in 2013-14 and Rs 2,05,000 in 2014-15 respectively. After that, it has increased to Rs 2, 08,333 and Rs 2, 13,333 for the year 2015-16 and 2016-17 respectively. Hence, the trend of Average Cost is ups and down frequently.

6. Net Profit: The total net profit was gradually increasing from the year 2007-08 from Rs 1, 40,000 to Rs 11, 80, 00 in the year 2016-17. In the case of average profit, it has seen that for the seven years it was gradually increased from Rs 1, 40,000 in 2007-08 to Rs 2, 14,000 in 2013-14. It is a point to be noted that suddenly the average profit decreased from Rs 2, 14,000 in 2013-14 to Rs 1, 86,667 in the year 2014-15 and again it was increased to Rs 1, 89,167 in 2015-16 and Rs 1, 96,667 in 2016-17 respectively.

3.6 Analysis of Various Trends of Flour Mills of Kokrajhar District

The increasing rate of consumption as well as use as an input of bakery items, the demand for flour has been rapidly expanding throughout the world. This phenomenon leads in accelerating the demand of flour mills in Kokrajhar District also. That is why; the study of growth trend is of great analytical importance for a flour mill. Keeping this purpose into consideration the growth trend of flour mill is reflected in the following table covering the ten years from 2007-08 to 2016-17.

Table No 3.5

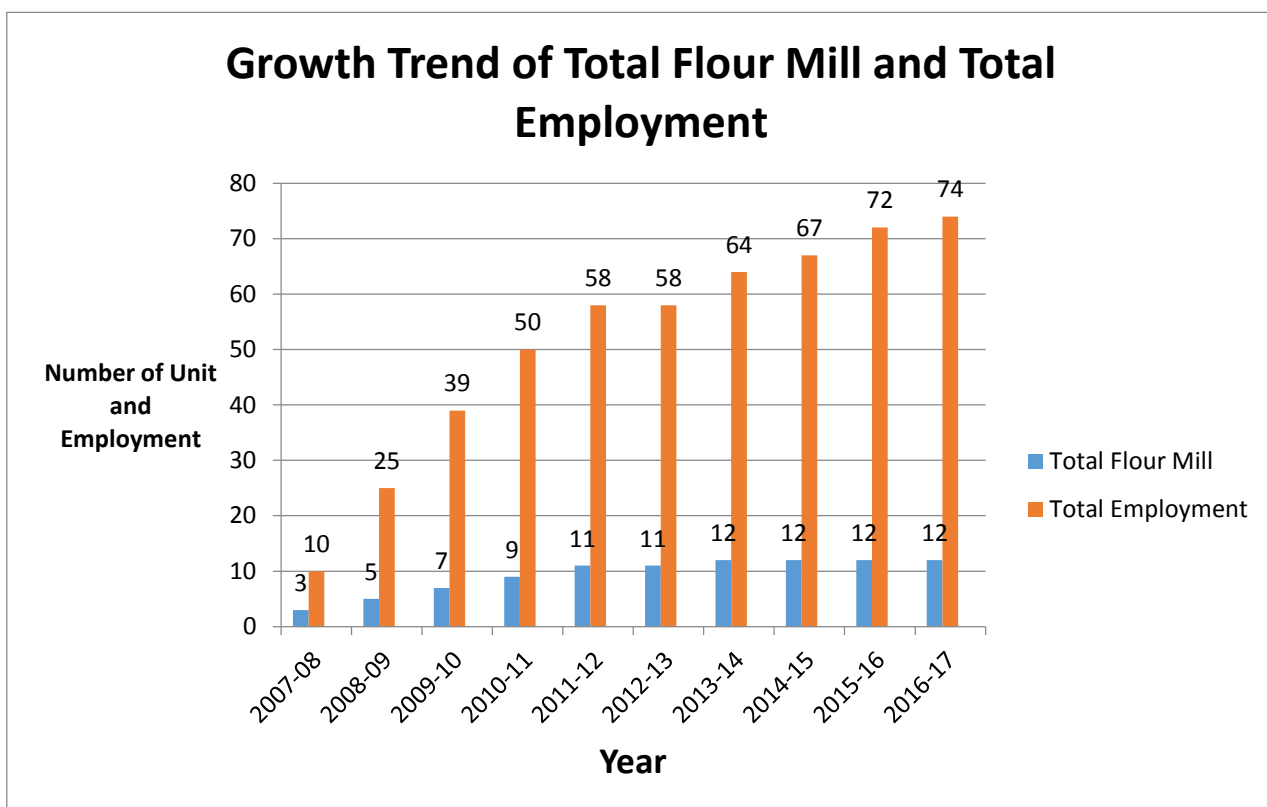
Various Economic Trends of Flour Mills of Kokrajhar District

S l N o	Yea r (as on 31 st Mar ch)	Unit		Initial Investment		Employment		Revenue		Cost		Net Profit	
		Marg inal Unit	To tal uni ts	Total	Aver age	To tal	Aver age	TR	AR	TC	AC	Total	Aver age
1	200 7- 08	----	3	1200 000	4000 00	10	3.33	1080 000	360 000	5400 00	180 000	5400 00	1800 00
2	200 8- 09	2	5	3500 000	7000 00	25	5	1920 000	384 000	1150 000	230 000	7700 00	1540 00
3	200 9- 10	2	7	5700 000	8142 86	39	5.57	2650 000	378 571	1450 000	207 142	1200 000	1714 29
4	201 0- 11	2	9	7400 000	8222 22	50	5.55	3900 000	433 333	2000 000	222 222	1900 000	2111 11
5	201 1- 12	2	11	7800 000	7090 91	58	5.27	4700 000	427 273	2500 000	227 272	2200 000	2000 00
6	201 2- 13	---	11	7800 000	7090 91	58	5.27	4950 000	450 000	2550 000	231 818	2400 000	2181 81
7	201 3- 14	1	12	8350 000	6958 33	64	5.33	5650 000	470 833	2700 000	225 000	2950 000	2458 33
8	201 4- 15	---	12	8350 000	6958 33	67	5.58	5950 000	495 833	2780 000	231 667	3170 000	2641 67
9	201 5- 16	---	12	8350 000	6958 33	72	6	6400 000	533 333	3050 000	254 167	3350 000	2791 67
10	201 6- 17	---	12	8350 000	6958 33	74	6.16	6630 000	552 500	3100 000	258 333	3530 000	2941 67

Source: Compiled from field Survey, personal interview, Questionnaire, and DICCC, Kokrajhar

The following diagram showed the growth trends of total flour mills and total employment level with effect from 2006-07 to 2016-17 in Kokrajhar district.

Figure : 3.3



In the light of the table no 3.5, the following explanations are made related to various trends of flour mills of Kokrajhar district under the study period.

1. Number of Units: It is revealed from the table no. 3.5, that the growth trend of number of flour mill in Kokrajhar District in the study period is not encouraging, which is restricted in between 2 to 3 from the year 2007-08 to 2011-12. From the year 2012-13 to the year 2016-17 even no flour mill has established in the Kokrajhar district barring 01 flour mill in the year 2013-14. The total number of flour mill increased from 03 in 2007-08 to 12 in 2016-17.

2. Initial Investment: As compared to growth of number of flour mill its growth of initial investment of capital is found higher. From table No 3.5, it is noted that the growth of capital investment gradually increases throughout the ten years right from Rs 12, 00,000 in the year 2007-08 up to Rs 83, 50,000 in the year 2016-17. In between these two years, the growth of the initial investment is Rs 35,00,000 in 2008-09, Rs. 57,00,000 in 2009-10 , Rs 74,00,000 in 2010-11 , Rs 78,00,000 in 2011-12 and 2012-13, Rs 83,50,000 in the year 2013-14 , 2014-15 ,2015-16 and 2016-17 respectively. Against the gradually increasing growth of total initial investment, the average initial investment is found to be ups and down. The average initial investment was Rs 4,00,000 for the year 2007-08, and it has increased to Rs 7,00,000 in the year 2008-09, Rs 8,14,285 in the year 2009-10 and Rs 8,22,222 for the year 2010-11 respectively. Further, it again declined to Rs 7, 09,091 for the year 2011-12 and 2012-13 respectively. Further , it has declined to Rs 6, 95,833 for the year 2013-14, 2014-15, 2015-16 and 2016-17 respectively.

3. Employment: In the case of employment both the growth trend of total and average employment has been gradually increasing. The total number of employees has increased from 10 to 74 for ten years from 2007-08 to 2016-17. On the other hand, the average growth of employment is also increased from 3.33 to 6.16 for ten years from 2007-08 to 2016-17. Here it is found that average employment of per industry are encouraging because all the flour mill has used modern technology and they try to capture the market in the state as well as national level.

4. Revenue: The collection of TR has been gradually increased from Rs 10, 80,000 in the year 2007-08 to Rs 66, 30,000 in the year 2016-17. Of course against which the average revenue has not increased gradually. It has increased from Rs 3, 60,000 in 2007-08 to Rs 3, 84,000 in the year 2008-09, which again decrease to Rs 3, 78,571 in the year 2009-10. After that, it has increased to Rs 4, 33,333 in the year 2010-11. Further, it has decreased to Rs 4,27,273 in the year 2011-12, After that, it has observed that the Average Revenue has increased gradually from Rs 4,50,000 at 2012-13 to Rs 5,52,500 at the year 2016-17.

5. Cost: From the observation of the cost it can be highlighted that the total cost was increased gradually from Rs 5, 40,000 in 2007-08 to Rs 31, 00,000 in the year 2016-17.

Against the gradual increase in total cost, the average cost frequently fluctuated during the study period. Average cost was increased from Rs 1, 80,000 in 2007-08 to Rs 2, 30,000 at 2008-09. Again it has increased from Rs 2, 07,142 at the year 2009-10 to Rs 2, 31,818 in the year 2012-13 gradually. Further, it has decreased to from Rs 2, 31,818 at 2012-13 to Rs 2, 25,000 at 2013-14. In the last three years, i.e. , 2014-15, 2015-16, 2016-17 the Average Cost has increased gradually from Rs 2,31,667 ,Rs 2,54,167 and Rs 2,58,333 for the year 2014-15, 2015-16 and 2016-17 respectively.

6. Net Profit: As like total cost the total net profit has gradually increased during the ten years under study from Rs 5, 40,000 in 2007-08 to Rs 35, 30,000 in 2016-17. But the average net profit has gradually increased only during the last six years, i.e., from Rs 2, 00,000 in 2011-12 to Rs 2, 94,167 at 2016-17. On the other hand , during the first four years the average profit was fluctuated , i.e. ,Rs 1,80,000 ,Rs 1,54,000, Rs 1,71,429 and Rs 2,11,111 for the year 2007-08, 2008-09 , 2009-10 and 2010-11 respectively.

3.7 Analysis of Various Trends of Fruits & Vegetable Processing Industries of Kokrajhar District

Kokrajhar district of Assam is the agriculture-based region. Among the sub-sectors of Indian Food processing industry, fruits & vegetable processing has greater potentiality in this region. Vegetable such as potato, tomato, cabbage, cauliflower etc. and fruits like banana, mango, orange etc. have been reported to be around 20 % of the total production of the State. On the basis of these products, the region has a great potentiality to set up lots of industry like Juice, Chips, pickle industry, biscuit industry, Juice or beverage industry, Jelly industry etc. (Sarma, G. and Devi, M. 2016) That is why the fruits & vegetable processing industry as one of the most important industries in Kokrajhar District is needed to be taken under the study of growth trend. In the study are in case of fruits & vegetable processing industry sector include spice mill, pickle industry, puffed industry and processed food making industry. Keeping in purpose the above circumstance the following table is prepared to analyses the various trends of fruits & vegetable processing industry covering the ten years from 2007-08 to 2016-17.

Table No: 3.6

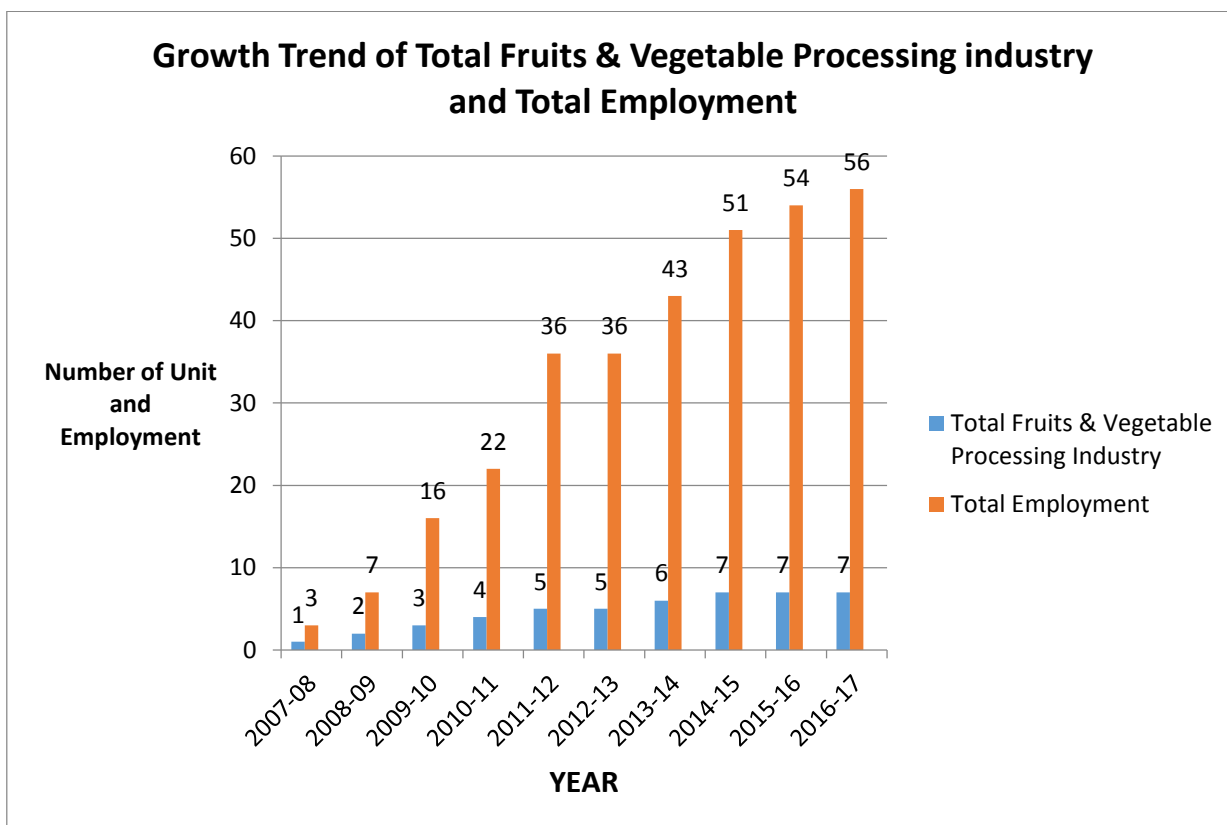
Various Economic Trends of Fruits & Vegetable Processing Industries of Kokrajhar District

Sl No	Year (as on 31 st March)	Units		Initial Investment		Employment		Revenue		Cost		Net Profit	
		Marginal units	Total units	Total	Average	Total	Average	TR	AR	TC	AC	Total	Average
1	2007-08	----	1	100000	100000	3	3	360000	360000	200000	200000	160000	160000
2	2008-09	1	2	400000	200000	7	3.5	900000	450000	500000	250000	400000	200000
3	2009-10	1	3	800000	266667	16	5.3	1500000	500000	850000	283333	650000	216667
4	2010-11	1	4	1600000	400000	22	5.5	2300000	575000	1200000	300000	1100000	275000
5	2011-12	1	5	1710000	342000	36	7.2	2660000	532000	1300000	260000	1360000	272000
6	2012-13	---	5	1710000	342000	36	7.2	2720000	544000	1340000	268000	1380000	276000
7	2013-14	1	6	1830000	305000	43	7.17	3015000	502500	1450000	241667	1565000	260833
8	2014-15	1	7	1950000	278571	51	7.29	3340000	477143	1470000	210000	1870000	267143
9	2015-16	---	7	1950000	278571	54	7.71	3500000	500000	1490000	212857	2010000	287143
10	2016-17	----	7	1950000	278571	56	8	3650000	521429	1520000	217143	2130000	304286

Source: Compiled from field survey, personal interview, questionnaire and DICC, Kokrajhar

The following diagram has shown the growth trends and employment trends of fruits & vegetable processing industry sectors under the study period in Kokrajhar district.

Figure 3.4



Taking the table No 3.6, as a basis following explanation is made on the growth trends of Fruits & vegetable processing industries of Kokrajhar District.

1.No of Unit: Barring three years, i.e., 2012-13, 2015-16 and 2016-17 only one industry per year has established during the ten years from 2007-08 to 2016-17. It has revealed from the table that the number of industries is gradually increasing from 01 in 2007-08 to 07 in 2016-17.

2. Initial Investment: The observation of initial investment trends in Fruits & vegetable processing industry reveals that against frequent fluctuation of average initial investment; the total initial investment has been gradually increasing for ten years under study. The total initial investment for the year 2007-08 was Rs 1,00,000 against one industry, which was increased up to Rs 19,50,000 against seven industry after ten years

in the year 2016-17. On the other hand, Average Initial Investment has increase for the first four years, i.e., Rs 1, 00,000 in the year 2007-08 to Rs 4, 00,000 in the year 2010-11. After that, it has decreased up to Rs 3, 42,000 in the year 2011-12 and 2012-13. Then it has increased to Rs 3, 05,000 in the year 2013-14 and after that again fall to Rs 2,78,571 for the year 2014-15, 2015-16 and 2016-17 respectively.

3. Employment: It has identified from Table no 3.6 that both the number of totals and average employment has been gradually increasing throughout the ten years under study. The total employment has increased from 03 in the year 2007-08 to the number 56 in the year 2016-17. Likewise, the average employee has been increasing gradually from 3 in the year 2007-08 to 8 in the year 2016-17 respectively during the study period.

4. Revenue: During the ten years under study the TR has been gradually increasing from Rs 3, 60,000 in 2007-08 to Rs 36, 50,000 in 2016-17. Hence, it has calculated that the total revenue has raised more than ten times in the last year, i.e., 2016-17 over the first year, i.e., 2007-08. Of course, AR has also been increased gradually barring in the year 2011-12 and 2012-13 as in this year it is suddenly decreased from Rs 5, 75,000 in 2010-11 to Rs 5,32,000 and from Rs 5,44,000 in 2012-13 to Rs 5, 02,500 in 2013-14. Otherwise, AR was increased from Rs 36,000 in 2007-08 to Rs 521,429 in 2016-17.

5. Cost: It is seen from table No 3.8, that the total cost has been gradually increasing. It has recorded that Total Cost has increased from Rs 2, 00,000 in 2007-08 to Rs 15, 20,000 in the year 2016-17. On the other hand, against the continuous increasing of TC, the AC fluctuates within ten years. For the first time, AC is gradually increasing for four years from Rs 2, 00,000 in 2007-08 to Rs 3, 00,000 in 2010-11. For the second time, AC has decreased in the year 2011-12 from Rs 3, 00,000 to Rs 2, 60,000. For the third time, AC has increased in the 2012-13 from Rs 2, 60,000 to Rs 2, 68,000. For the fourth time it is decreasing for 02 years , i.e. , Rs 2,68,000 in 2012-13 to Rs 2,41,667 in 2013-14 and from Rs 241667 in 2013-14 to Rs 2,10,000 for the year 2014-15 respectively. For the fifth and last time AC is increased from Rs 2,10,000 in 2014-15 to Rs 2,12,857 in 2015-16 and Rs 2,17,143 in 2016-17 respectively.

5. Net Profit: After throughout observation of both total net profit and average net profit of fruits & vegetable processing industry for ten years, it has found that against

the gradually increasing of total net profit, the average net profit fluctuates during the ten years. The total net profit has increased from Rs 1, 60,000 in 2007-08 to Rs 21, 30,000 in 2016-17. The average net profit has increased from Rs 1, 60,000 in 2007-08 to Rs 3, 04,286 in 2016-17.

3.8 Analysis of Various Trends of Bakery of Kokrajhar District

The nature of regular consumption of bakery items enhances its volume of total consumption among the entire customers of all parts of the world. Consequently, this sort of affairs of the bakery items creates ample potentialities for selling a huge amount of bakery items and parallelly leads to increases its market share (Kiumarsi, S. and et al., 2014). Due to increasing the various categories of the population the demand of bakery industries has also been gradually increasing in Kokrajhar District regarding quantity and quality. As a prominent sector of the food processing industry, the study of the growth trend of bakery industries is needed to be studied in the light of its significant factors. The following table revealed the growth position of bakery in the Kokrajhar district of Assam.

Table No. 3.7

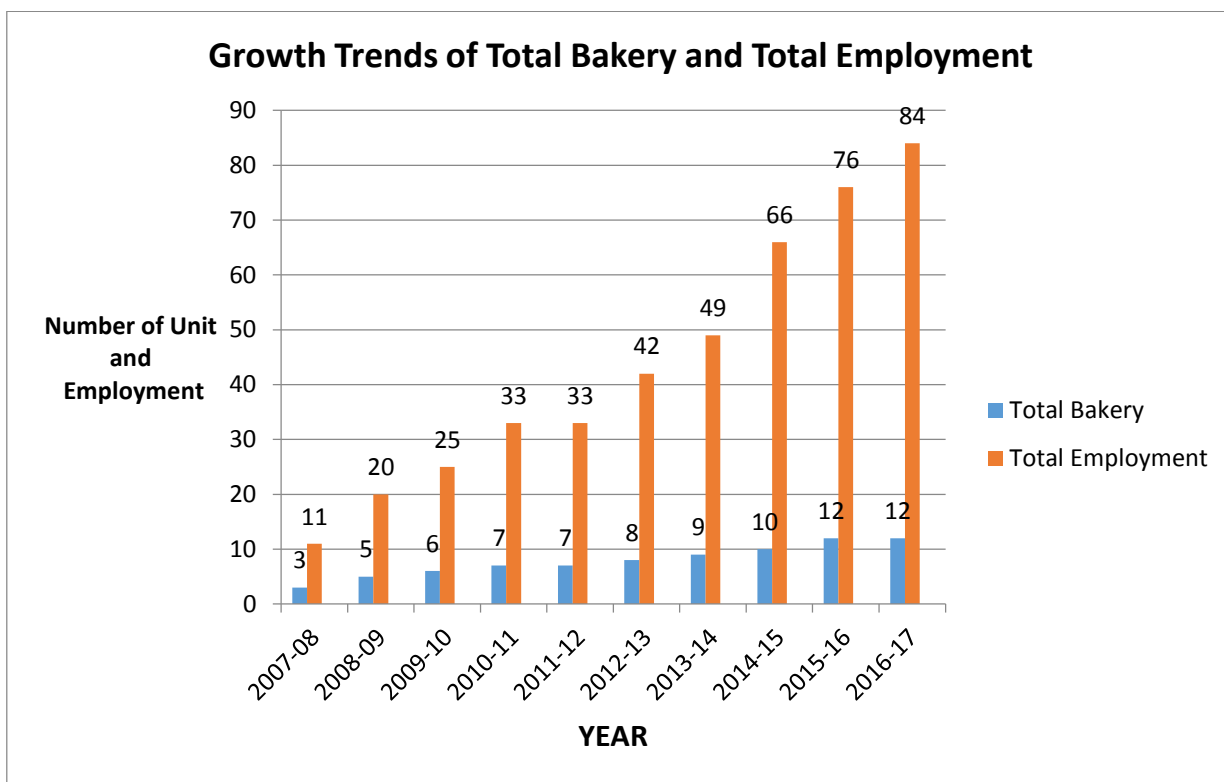
Various Economic Trends of Bakery Industries of Kokrajhar District

S l N o	Yea r (as on 31 st Mar ch)	Unit		Initial Investment		Employment		Revenue		Cost		Net Profit	
		Marg inal units	To tal un its	Tota l	Aver age	To tal	Aver age	Total	Aver age	Tota l	Aver age	Tota l	Aver age
1	200 7- 08	----	3	2000 000	6666 67	11	3.67	3600 000	1200 000	2520 000	8400 00	1080 000	3600 00
2	200 8- 09	2	5	3100 000	6200 00	20	4	5760 000	1152 000	3945 000	7890 00	1815 000	3630 00
3	200 9- 10	1	6	3700 000	6166 67	25	4.17	6484 500	1080 750	4305 000	7175 00	2179 500	3632 50
4	201 0- 11	1	7	4350 000	6214 29	33	4.71	7200 000	1028 571	4655 000	6650 00	2545 000	3635 71
5	201 1- 12	----	7	4350 000	6214 29	33	4.71	7350 000	1050 000	4730 000	6757 14	2620 000	3742 86
6	201 2- 13	1	8	4750 000	5937 50	42	5.25	8150 000	1018 750	5090 000	6362 50	3060 000	3825 00
7	201 3- 14	1	9	5150 000	5722 22	49	5.44	9127 500	1014 167	5475 000	6083 33	3652 500	4058 33
8	201 4- 15	1	10	5500 000	5500 00	66	6.6	1042 0000	1042 000	5860 000	5860 00	4560 000	4560 00
9	201 5- 16	2	12	6250 000	5208 33	76	6.33	1219 0000	1015 833	6710 000	5591 67	5480 000	4566 67
10	201 6- 17	---	12	6250 000	5208 33	84	7	1257 0000	1047 500	6974 200	5811 83	5595 800	4663 17

Source: Compiled from field survey, personal interview, questionnaire and DICC Kokrajhar

The following diagram has shown the growth trends of total unit and total employment level of bakery industries in Kokrajhar district during the study period.

Figure: 3.5



In the light of the table No: 3.9, the following explanation comes into existence related to bakery industry of Kokrajhar district.

1. No of Unit: The growth rates of the bakery industry during the study period are not the satisfactory level. The total number of the bakery was increased from 3 in 2007-08 to 12 in 2016-17. In spite of gradually increasing the number of total bakery industries, the per year growth gives a poor picture. In the two years, i.e., 2011-12, and 2016-17 no bakery industry was established in the Kokrajhar district. It has found during the field survey that the bakery is coming in the district with the diversified way and they try to compete with other substitute national as well as state-level competitors.

2.Initial Investment: In case of initial investment of bakery industry it is detected that against the gradual increase of total initial investment from Rs 20,00,000 in 2007-08 to Rs 62,50,000 in 2016-17 and average initial investment has been decreasing from Rs 6,66,667 in 2007-08 to Rs 5,20,833 in 2016-17.

3. Employment: The growth trend of employment in the bakery industry of Kokrajhar District has been gradually increasing both regarding total and average employment during the ten years under study. The number of total employees has risen from 11 in 2007-08 to 84 in 2016-17, the rate of growth of which has recorded 7.64 times. The average employment was 3.67 in 2007-08 which was increase 1.90 time in 2016-17, i.e., up to 7.

4. Revenue: After observation of the total revenue it is seen that it has raised from Rs 36, 00,000 in 2007-08 to Rs 1, 25, 70,000 in 2016-17. The AR has also increased from Rs 12, 00,000 in 2007-08 to Rs 10, 47,500 in the year 2016-17.

5. Cost: Under the period of study the total cost has incurred at Rs 25, 20,000 in 2007-08, which has increased after ten years up to Rs 69, 74,200, the growth rate of which has calculated 277. On the other hand, the average cost is Rs 8, 40,000 in the year 2007-08 and increase up to Rs 5, 81,183 in 2016-17, which indicate the growth rate of 0.69 during the ten years under study.

6.Net Profit: Under the study period 03 industries earned the total net profit of Rs 10,80,000 in the starting period, i.e., 2007-08 which was gradually increasing up to Rs 55,95,800 in the year 2016-17. On the other hand, the average profit has calculated in the year 2007-08 at Rs 3, 60,000 which was gradually increasing and after ten years it was Rs. 4, 66,317 in the year 2016-17.

3.9 Compound Annual Growth Rates (CAGR) of Unit, Employment and Net Profit of the Five Categories of Industries under Study in Kokrajhar District

For better understanding of the economic significance and the growth status of the five categories of industries under study, the CAGR of the unit, employment and net profit have been estimated. For estimating the Compound Annual Growth Rates of unit and employment the following linear regression models have been fitted for calculation.

$$Y = \beta_0 + \beta_1 t + U$$

Where,

Y is the value of the variable under consideration.

β_0 is the constant term.

β_1 is the coefficient to be estimated.

U is the error term.

Ordinary least square technique is used to determine the value of the respective coefficients. The compound growth rate (r) has been calculated as follows.

$$r = (e^{\beta_1} - 1) * 100$$

Where,

e^{β_1} is the exponential value of the regression coefficient β_1

Further to estimate the CAGR of net profit of selected industry under study the following semi log-linear regression models have been fitted for calculation.

$$\ln Y = \beta_0 + \beta_1 t + U$$

Where,

$\ln Y$ is the logarithmic value of the variable under consideration.

β_0 is the constant term.

β_1 is the coefficient to be estimated.

U is the error term.

Ordinary least square technique is used to determine the value of the respective coefficients. The compound growth rate (r) has been calculated as follows.

$$r = (e^{\beta_1} - 1) * 100$$

Where,

e^{β_1} is the exponential value of the regression coefficient β_1

3.9.1 Compound Annual Growth rate of Rice Mill

The following table shows the estimated values of the Compound Annual Growth Rates of rice mills in unit, employment and net profit under the study period.

Table No. 3.8

Estimated Compound Annual Growth Rates (CAGR) of the unit, employment and the net profit of Rice Mills in Kokrajhar district during 2007-08 to 2016-17

Variables	Compound Annual Growth Rate	R ² Value
Unit	-51.5**	.295
Employment	-76.4*	.100
Net Profit	17.0***	.578

Source: Self-estimates based on survey data

Note: *** refers significant at 1 percent level, ** refers significant at 5 percent level and * refers significant at 10 percent level.

It is revealed from the table that during the study period 2007 -08 to 2016-17 , in case of rice mill compound annual growth rate of the unit has -51.5 % , employment has -76.4 % and net profit has 17.0 % respectively. It is found that the growth rate of unit and employment is negative and growth rates of net profit is positive .It is found that growth rate of unit is 5 percent, employment is 10 percent and net profit is highly significant at 1 percent level. It is also noted that the R² value of the unit has .295 , employment has . 100 and net profit has .578 respectively.

3.9.2 Compound Annual Growth rate of oil Mills

The following table shows the estimated values of the Compound Annual Growth Rates of oil mills in unit, employment and net profit under the study period.

Table No. 3.9

Estimated Compound Annual Growth Rates (CAGR) of the unit, employment and net profit of Oil Mills in Kokrajhar district during 2007-08 to 2016-17

Variables	Compound Annual Growth Rate	R ² Value
Unit	-3.6	.045
Employment	26.7	.056
Net Profit	27.0***	.915

Source: Self-estimates based on survey data

Note: *** refers significantly at 1 percent level, ** refers significant at 5 percent level and * refers significant at 10 percent level.

It is revealed from the table that during the study period 2007 -08 to 2016-17 , in case of oil mill compound annual growth rate of the unit has -3.6 % , employment has 26.7 % and net profit has 27.0 % respectively. It is noted that the growth rate of unit is negative and employment is positive, but both the variables are not significant. It is important to note that growth rates of net profit of oil mills are found to be positive and it is highly significant at 1 percent level. It is also noted that the R² value of the unit has .045 , employment has .056 and net profit has .915 respectively.

3.9.3 Compound Annual Growth rate of Flour Mills

The following table shows the estimated values of the Compound Annual Growth Rates of flour mills in unit, employment and net profit under the study period.

Table No. 3.10

Estimated Compound Annual Growth Rates (CAGR) of the unit, employment and net profit of Flour Mills in Kokrajhar district during 2007-08 to 2016-17

Variables	Compound Annual Growth Rate	R ² Value
Unit	-33.9***	.819
Employment	-133.3***	.631
Net Profit	20.3***	.882

Source: Self-estimates based on survey data

Note: *** refers significant at 1 percent level, ** refers significant at 5 percent level and * refers significant at 10 percent level.

It is revealed from the table that during the study period 2007 -08 to 2016-17 , in case of flour mill compound annual growth rate of the unit has -33.9 % , employment has -133.3 % and net profit has 20.3 % respectively. It is noted that the growth rate unit and employment is negative and the net profit is found to be positive. It is important to note that growth rates of unit, employment and net profit are found to be highly significant at 1 percent level. It is also noted that the R² value of the unit has .819 , employment has .631 and net profit has .882 respectively.

3.9.4 Compound Annual Growth rate of Fruits & Vegetable Processing Industry

The following table shows the estimated values of the Compound Annual Growth Rates of fruits & vegetable processing industries in unit, employment and net profit under the study period.

Table No. 3.11

Estimated Compound Annual Growth Rates (CAGR) of the unit, employment and net profit of Fruits & vegetable Processing Industry in Kokrajhar district during 2007-08 to 2016-17

Variables	Compound Annual Growth Rate	R ² Value
Unit	-10.3**	.417
Employment	- 19.4	.021
Net Profit	24.8***	.814

Source: Self-estimates based on survey data

Note: *** refers significant at 1 percent level, ** refers significant at 5 percent level and * refers significant at 10 percent level.

It is revealed from the table that during the study period 2007 -08 to 2016-17 , in case of fruits & vegetable processing industry compound annual growth rate of the unit has -10.3 % , employment has - 19.4 % and net profit has 24.8 % respectively. It is noted that the growth rate of unit and employment has found to be negative. It is found that the growth rate of net profit has positive and it is found to be highly significant at 1 percent level. It is to note that growth rates of the unit are 5 percent significant level, but the growth rate of employment is not significant. It is also noted that the R² value of the unit is .417 , employment is .021 and net profit is .814 respectively .

3.9.5 Compound Annual Growth rate of Bakery

The following table shows the estimated values of the Compound Annual Growth Rates of bakery in unit, employment and net profit under the study period.

Table No. 3.12

Estimated Compound Annual Growth Rates (CAGR) of the unit, employment and net profit of Bakery in Kokrajhar district during 2007-08 to 2016-17

Variables	Compound Annual Growth Rate	R ² Value
Unit	-15.8*	.270
Employment	-27.9	.038
Net Profit	16.6***	.952

Source: Self-estimates based on survey data

Note: *** refers significant at 1 percent level, ** refers significant at 5 percent level and * refers significant at 10 percent level.

It is revealed from the table that during the study period 2007 -08 to 2016-17 , in case of bakery compound annual growth rate of initial investment has -15.8 % , employment has -27.9 % and net profit has 16.6 % respectively. It is noted that the growth rate of net profit is found to be positive , but the growth rate of unit and employment are found to be negative. It is pointed out that the growth rate of unit is 10 percent significant level, net profit is 1 percent significant level, but employment is not significant. It is also noted that the R² value of the unit has .270 , employment has .038, and net profit has .952 respectively .

3.10 Conclusion

In the light of the above discussion and analysis, it has found that the growth rates of unit and employment of the selected industries are not satisfactory. It is found that CAGR of unit of all categories of industries are found to be negative. During the 10 years under the study period, only 53 numbers of rice mills, 6 numbers of oil mill, 12 numbers of flour mill, 12 numbers of bakery and only 7 numbers of fruits & vegetable processing industries have been established in the district. Hence the hypothesis no: 1,

i.e., it is assumed that the rates of growth of food processing industries in Kokrajhar district are not satisfactory is accepted. The study revealed that although the growth rate of the unit of the selected industries is not satisfactory, but these industries have scope to expand their business because the CAGR of profit of all the selected industry under study is found to be positive at 1 percent significant level.

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