CHAPTER – I

INTRODUCTION

1.1 Background

Agro processing is defined as set of techno–economic activities, applied to all the produces, originating from agricultural farm, livestock , aquaculture sources and forests for their conservation, handling and value-addition to make them usable as food, feed, fibre, fuel or industrial raw materials. Agro processing sector has experienced expansion during last 5 decades, starting with a handful of facilities which were mainly operating at domestic/cottage level.

The scope of the agro-processing industry, thus, encompasses all operations from the stage of harvest till the material reaches the end users in the desired form, packaging, quantity, quality and price. Ancient Indian scriptures contain vivid account of the post harvest and processing practices for preservation and processing of agricultural produce for food and medicinal uses. Inadequate attentions to the agro-processing sector in the past have put both the producer and the consumer at a disadvantage affecting the economy of the Country as a whole.

Appreciably of late agro processing has been recognized as the sunrise sector of the Indian economy in view of its large potential for growth and likely socio-economic impact specifically on employment and income generation. Some estimates suggest that in developed countries, up to 14.00 per cent of the total work force is engaged in agro-processing sector directly or indirectly. However, in India, only about 3.00 per cent of the work force finds employment in this sector revealing it’s under developed state and vast untapped potential for employment. Properly developed agro-processing sector can make India a major player at the global level for marketing and supply of processed food, feed and a wide range of other plant and animal products.

Agro-Processing Industries (APIs) based on both food-products' and agro non-food products' are faced with various constraints/problems, that will be dealt in detail in subsequent chapters containing scenario of Bihar. However, it has been more important in the wake of increasing emphasis on nutritional food security to ward off the 'silent-hunger.' It was also suggested that the quality consciousness and preference for health food by the high income domestic consumers should also be capitalized up on through development of agro-based high value processed and branded products, which also should be marketed aggressively. The Self Help Groups (SHGs) and local co-operatives need to be encouraged to develop the small, but economically viable agro-processing units to meet the local/regional/ethnical specific demand. This will help generate local employment and improve rural incomes. The examples ranged from 'local co-operative managed by women groups,' to 'the large number of dairy co-operatives,' which have helped to make a clear impact on the role of private sector increasing the producers' share in the consumers' rupee by acting as price leaders in the market in most of the states.

The role of contract farming in promoting the agro-processing sector was deliberated with great enthusiasm. It was felt that the terms of the contract are generally or at least more in favour of the processor rather than the farmers. The contracts are short-term, inequitable and ambiguous. It was felt that there are examples where the system can be devised to establish general win-win situation by involving all the stakeholders including the government departments as facilitators rather than keeping them outside the ambit. There are economies in the contractual arrangement mainly through the dis-intermediation in the wider context of the marketing system. The large scale processors input in the technology of production of the raw material and the flexibility to in corporate the market uncertainties by adjustment in the contracted price are important to maintain the continuity of the agro-processing establishments. The system should help in harnessing the economies of scale in producing large quantity of quality produce by larger number of small producing units. The need to analyse the economies of contract involvement price, quality, quantity and terms of payment was largely felt.

The need for assessing, appraising and evaluating and then establishing the food park, agro-processing centres, agri-export zones are the demand of the day. These should focus on minimizing the losses, repeat minimizing losses, creating the scale

economics, improving the quality of the product throughout the processing system. It also needs to be oriented and directed to improve the efficiency in production, processing, employment and income generation. The financial constraints need to be adequately and appropriately addressed. There is need to improve and impart education to develop agro-processing entrepreneurs. The emphasis on the 'quality' should remain the focus in all the discussion in order to meet the requirements of the sanitary and phyto-sanitary system in the context of competition in the export markets.

Some of the issues in Indian's context identified earlier relating to impediments of growth and prospects of APIs, did not adequately address the real problems. Some more issues are to be also urgently taken care of. Some of them have been briefly explained as hereunder:

- Inter regional inequality in the development of the agro-processing industries needs to be investigated. In particular, the constraints that have led to the location/development of the large scale agro-processing industries in regions away from the raw-material production centres need to be studied for devising the appropriate policies and strategies for promoting balanced development of the sector.
- With production, procurement and establishment systems need to be developed to improve the productivity of the quality produce of the farmers' level and the productivity and efficiency of the agro-processing industry at the processors' level and further, what marketing systems need to be adopted to reduce the costs and margins from the processor to the consumer level.
- Why is the capacity utilization lagging far behind the capacity available in the agro-processing sector? What steps or policies need to be followed to improve capacity utilization?
- Different models of developing the organized markets and market systems for improving the productivity of the agro-processing industry need to be focused. What are the strategies for developing the aggressive marketing system for agro-processed products?

- What sort of specific public and private capital formation in the agro-processing sector need to be promoted to improve the backward and forward linkages and increase the effectiveness of the multiplier effects?
- How to develop the institutional mechanism to strengthen the contractual arrangements in the farmer processor-consumer chain for the betterment of all the stakeholders? What should be the facilitator's role and how best it can be achieved?
- How to develop the food parks, agro-processing centres or export zones, etc., with what type of infrastructure, investment, institutions and incentives to capitalize upon the economics of scale, cut down costs, create quality products with brand images, etc., especially to conform to the sanitary and phyto-sanitary standards.

Post-harvest technology and management play crucial role in value addition to agricultural produce. Realizing the potential that Agro-Food Processing holds for improving value realization to the farmers and creation of additional employment, due thrust was provided in the Union Budget 2006-07 to this sector. The Hon'ble Finance Minister has announced that food processing will be treated as a priority sector for bank credit. Further, in terms of the Union Budget announcement, a special window of Rs. 1000 crore has been opened in NABARD for refinancing agro processing infrastructure and market development. Further, Government of India is to set up a National Institute of Food Technology Entrepreneurship and Management and also a Paddy Processing National Institute at Tanjavur. These initiatives are on account of the enormous potential benefits that the processing industry can bring to agriculture, job creation, and to the consumers.

Governments of India as well as State Government have accorded high priority for development of Agro/Food Processing Sector. The establishment of AEZS, food parks and efforts made under contract farming are such steps towards popularization of Agro/Food processing sector in Indias. Investments in agro/food processing sector have not been commensurate with the large potential available in the country and marketing including export largely remain weak. This is in spite of a large production base available under the agriculture and allied sectors. Against the back drop of the WTO agreement and opening up of international markets, in addition to a

huge domestic market, agro food processing has assumed significance and has thrown open new opportunities and challenges. The Indian corporate are keenly exploring the present scenario to seize these new opportunities in the rural sector.

It also ensures consumption of locally available raw material and availability of goods of daily needs to the rural masses. These industries also prevent disparate migration of population, especially rural areas.

The employment potential of land based activities is no doubt limited. With increasing population and limited land resources, it is imperative to find alternative employment opportunities. A substantial portion of surplus rural labour can be absorbed in this sector and stop migration of rural people to urban areas and to distant places/regions.

In view of the preserving contribution of agro-processing industries (APIs) to sustain rural economy, its strengths weaknesses and prospects have to be examined in totality.

1.2 Need for the Study

India being an agrarian economy setting up agro-industries that make use of produces of agriculture directly and indirectly becomes imperative for sustained inclusive economic development. In agro based industries, the basic elements are surplus inputs from agriculture and their processing to suit the requirements of the consumers. Agro-processing not only stimulates value addition but also generates direct and indirect employment particularly in rural areas to absorb the surplus work force. A number of studies have indicated the potential of this sector as far as value addition and employment generation are concerned. On the demand side, with the growth of population, breakdown of the joint family system, increasing number of working women and change in the food habits, the demand for processed foods has been increasing substantially. There has been increasing tendency for purchasing processed items like processed atta, bread, dressed meat, fruit juice and items ready to cook and ready to consume.

The agro-industrial potential becomes manifold when the processing possibilities of the entire commodity system are taken into account. For example, a farmer cultivates paddy on his farm and the paddy plants produce paddy, straw, husk, bran

and rice kernel. Thus, with an initial investment for growing paddy, producer of paddy has potential of supporting a complex of processing industries rice mills, solvent extraction plant for rice bran oil, processing of husk for variety of products and straw paper/board mills, etc. Similarly, in animal based products we get the raw materials like meat, bones, hides, skin, wools, etc. and thus, the processing of these raw materials opens up large value addition possibilities. In India, the processing units based on grains, horticultural products, livestock products, fish have ample opportunities. India with 2.5 per cent of global area, supporting 16.7 per cent of world population produces 22.4 per cent of world paddy production, 11.7 per cent of wheat, 15.00 per cent of rapeseed, 7.70 per cent of potato, 24.60 per cent of sugarcane, 43.30 per cent of jute and 27.28 per cent of pulses produced globally. In the current scenario, India contributes 10.30 per cent and 9.20 per cent to the global production of fruits and vegetables respectively. Moreover, in spite of strong base in horticultural products very negligible per cent of fruits and 0.5 per cent of vegetables are processed as against 70.00 per cent in Brazil (Source: Sharma et. al 2003) Moreover, India losses over 30.00 per cent of its produce of fruits and vegetables annually in the absence of proper infrastructural facilities. Agro-processing industries have, thus, vast potential in India.

In view of the above discussed wide formation, rural and agrarian economy forwarding, pertinence of agro-food and agro non-food products' preserving potentials of APIs, the study in reference has been undertaken with the objectives mentioned hereunder:

1.3 Objectives of the Study

i. *To present a profile of the agro-processing industries and the recent trend.*
ii. *To examine the existing location pattern of selected agro industries.*
iii. *To study the impact of agro-processing industry on agriculture.*
iv. *To study the economics of agro processing units.*
v. *To analyse the marketing behavior of agro-processed products.*
vi. *To study the employment potential from agro-processing industries.*
vii. *To analyse the constraints on acceleration of production.*
viii. *To review the export performance of various agro-based commodities and constraints faced in accelerating the growth of export from the sector.*

1.4 Data Base

Secondary data, such as the quinquennial National Sample Survey data (NSS data) on unorganized manufacturing and Annual Survey of Industries (ASI) data for the organized segment' have been used to gain a comprehensive view of the agro-processing sector. With a view to have an overview of organized sector, industrial statistics for a period of 31 years from 1973-74 to 2003-04 was taken into the consideration.

In view of tiny and small scale agro-based industrial enterprises being highly heterogeneous, it was worthwhile to look into each of the three layers namely: OAMEs, (Own Account Manufacturing Enterprises), NDMEs (Non-Directory Manufacturing Establishments) and DMEs (Directory Manufacturing Establishment) that are covered mainly under unorganized entrepreneurs.

As our sample agro-processing enterprises cover mainly unorganized enterprises, so only three layers namely OAMEs, NDMEs and DMEs have been covered for sample survey.

In India, bulk of the units in agro processing sector is small and unregistered. It was, therefore, necessary to conduct some comprehensive case studies of selected agro-processing units, so that the problems at grass root level are understood and recommendation for policy formulation could be made.

1.5 Sample Design, Methodology and Coverage of the Study

Based on secondary data, the third objective, viz., to study the impact of agro-processing industry on agriculture, has been studied by examining the association between the location of agro based industries' and crop/resource base of the state. Other five objectives of the study, viz., Sl Nos (4) to (8) have been addressed with the help of primary data collected from the selected agro-processing units of the study area.

As the products of agro-industries are both edible and non-edible, as per the suggested methodology by the Co-ordinator of the study, i.e., Agro-Economic Research Centre, Visva-Bharati, the primary data have been collected from the selected processing units chosen from both agro food industries and agro non-food

industries. This was done in order to have a comprehensive view of agro-processing sector.

As per the design Co-ordinator of the study, all together 30 sample processing units had to be selected at random proportionately spread over food and non-food processing segment of agro-based enterprises. For selecting the units, the District Industries Centres (DIC) of the concerned districts were also approached. Considering the sheer dominance of food processing activity (60 per cent of the total agro-based enterprises at the all India level based on Annual Survey of Industries data in the total number of agro-based industries, 18 processing units have been selected within the group of food processing and the rest 12 had to be selected from non food processing segment of agro-based enterprises.

But, paper and its products-based enterprises were not taken up for detail study due to its non-existent/very poor concentration under 'organized sector' and even under unorganized sector in the state.

Again, the food processing activities were broadly divided in three categories, viz.,

i Primary food processing units mainly grain processing units,
ii Spice and horticultural products, and;
iii Livestock based processing units including fish processing.

Non food processing units were broadly divided into three categories, namely:

i. Textile products, (II) Wood and its products, and; (III) Leather and its products.

Within the group of food processing and non food processing agro based activities, for each category of enterprise, the dominant processing activity was selected considering the concentration of units in the state. In the case of food processing component of agro-based enterprises, for each selected processing enterprise, six units of different sizes, namely:

OAMEs run without the help of any hired worker, NDMEs an establishment employing less than six workers, and; DMEs the one employing a total of six or more

workers, but less than 10 workers (along with power supply) with their distribution as 3:2:1 have been covered.

Within non food processing segment of Agro-based industry, for each selected processing units, three units of different sizes, namely: OAMEs, NDMEs and DMEs in the ratio of 1:1:1 were selected. Having chosen processing activities, the districts have been selected according to the concentration of selected agro based enterprises. As such, the selected districts are more than one (five districts) depending on the location of the specific agro-processing activity chosen for the study.

Table No. 1.1: Sample Processing Units and the Selected Districts for the State of Bihar

SN	Processing Activity	Selected District	Number of Sample Units
Food Processing			
a.	Paddy Processing	Rohtas	06
b.	Fruit (Litchi) Processing	Muzaffarpur	06
c.	Milk Processing	Khagaria	06
	Total		18
Total Non-Food Processing			
a.	Textile Products	Bhagalpur	03
b.	Wood and its Products	Patna	03
c.	Leather and its Products	Patna	03
	Total		09
	Total Sample Size		**27**

CHAPTER – II

STATUS OF AGRO-BASED INDUSTRIES IN THE STATE

Bihar occupies a prominent place in the agriculturally potential states in the country as the state is blessed with large tracts of fertile land and suitable climate which can support a variety of crops. A vast majority of population in the state depend on agriculture for their livelihood. However, in spite of being one of the leading producers of many crops, fruits and vegetables, the post harvesting net work and processing is quite inadequate in the state. As a result, there is huge wastage in the sector and thus not only reduces the income level of the farmers but also affects the state economy adversely. Spread of adequate post harvesting and modern processing facilities in the state would not only reduce wastages but also add greater value realization for farmers. This would also result in productivity gains in the sector and additional employment generation. With this in view and particularly having considered the potential of the food processing industry for diversification and commercialization of agriculture, employment generation in rural and urban areas, value addition and export possibilities, the state has identified the food processing and agro-based industry as a thrust areas. The agro processing industries hold significant potential for Bihar's future development. About 14 per cent of the total production of fruits and vegetables of India is being shared by Bihar. The conducive climate and fertile soil with an annual rainfall of 1247 mm is a great blessing of nature for Bihar. The area under cultivation of fruits and vegetables is about 10.64 lakh hectares with a production of 151.47 MT per annum. Bihar has now emerged as one of the largest producer of fruits and vegetables and rank first in the production of litchi and guava, third in mangoes and sixth in banana production. Eastern Bihar leads in the production of fruits and vegetables. The major fruit crops grown in this region are many banana, pineapple, guava, papaya, litchi and citrus fruits. The major items of vegetables produced in this region are potato, cabbage, cauliflower, brinjal, tomato, okra, onion, chilies, parwal, etc. However, there is a huge gap in production and processing of fruits and vegetables against the immense scope for its growth and potentials for export market agro-based industries.

The Government is particularly keen that any strategy should be holistic and develop the sector in the cluster mode so as to ensure balanced regional development and economy of scale as also to benefit the farmers. This approach should stress on strengthening both backward and forward linkages for the food processing industry with focus on institutional development and capacity building. The vision document in brief, will provide an in sight to the strategies, techniques and activities that should be proposed to achieve the revitalization of the food processing sector in the state. Key objectives in this sector are identified as stimulating demand for appropriate processed food, achieving maximum value addition and by product.

Bihar has remained a state dominated by agrarian economy. After the division of the state on 15 November 2000 all the minerals, went in the geographical territory of Jharkhand. As a result of this, despite the availability of natural resources in larger quantities viz., highly fertile land, adequate water reserves, very high quality of various fruits, vegetables, adequate grain production, abundant availability of dairy animals, high potential for fisheries, poultry, piggeries, etc., the status of industrial development, particularly trend of expansion, of Agro Processing Industries (APIs) has remained fluctuating and discouraging. As a matter of fact, division has given back push to the state of Bihar. This has resulted into decline of the level of industrial development in comparison to the level of undivided one. During the 10th Five Year Plan, the industrial sector of Bihar recorded the growth rate of 9.80 per cent. During the year 2002-03, the Gross State Domestic Product (GSDP) of Bihar on 1993-94 prices was Rs. 32,004 crore. Out of it, the contribution of income from industrial sector was only Rs. 1,020 crore (3.19%), whereas the same at the national level was as high as 20.10 per cent. It can also be seen from the table that total income of industrial sector in Bihar came to only 0.4 per cent of the national figure.

Table No. 2.1: Size of Industrial Sector in Present Bihar

SN		Particular	Bihar	India	% age share of Bihar
1.		**Gross Domestic Product (Rs. Crore)**	32,004	11,89,773	2.7
2.		**Income of Industrial Sector (In Crore Rs.)**			
	a.	Registered	445	1,58,240	0.3
	b.	Un-registered	575	80,904	0.7
	c.	Total	1,020	2,39,144	0.4
3.		**Share of 2 in 1**			
	i.	Percentage share of 2 (a)	1.4	13.3	--
	ii.	Percentage share of 2 (b)	1.8	6.8	--
	iii.	Percentage share of 2 (c)	3.2	20.1	--

Note: Data related to income are based on the prices prevailing during 1993-94 and are the triennium average of years nearer to the year 2002-03.

The table also reveals that the percentage share of unregistered industrial units (1.8) is greater than that of registered ones (1.4). It is much below the percentage share

of all India (6.8). The dominance of unregistered industrial units, through frigid the pace of expansion of big and medium industrial units, however, it intensely reflects a bright future prospect for substantial development and/expansion of unregistered units more particularly Agro Processing Industries/Activities (APIs) in Bihar (table 2.1).

2.1 The Nature and Composition of Agro-based Industries

Prior to discussing the nature and composition of agro-based industries in Bihar, it will be preferable to aluminates in brief the extent and composition of small industries mainly comprising SSIs, Tiny/Micro units and artisans. It is more so desired because the exuberance and good performance of APIs helps in sustainability of SSIs either directly or indirectly. The explication of this statement can be described in this way also APIs and SSIs Tiny/Micro units' are related and dependent on each other.

Small Industries

Small industries, dominated by tiny enterprises and artisan based industries, occupies a significant place in the industrial development of a region. Their contribution to employment generation is substantial even when the levels of productivity and total production remain low. Total employment provided by this sector in 2007-08 'up to December, 2007) was 5.5 lakh mandays. It was further estimated that the state had 1.5 thousand Small Scale Industries (SSIs) 98,000 tiny micro industrials units, and 68,000 artisan based industry units with a total investment of Rs. 88,752 lakh.

It is a matter of concern that after the division of the state, there had emerged an enervation in regard to declining number of tiny/micro units. Up to 31st March 2000, the number of permanent SSI registered units in Bihar was 1,261. The data related to year-wise permanent SSI registered units reveals its number at 35 in 2000-01. It declined subsequently to 20 till the year 2006-07, but picked up during the year 2007-08 (46). A loom of tiny/micro industrial units could be seen in the state during the last eight years' period of 2000-01 to 2007-08. It was 3,249 in number in the year 2000-01 which came down to 1,537 showing a decline of 1,712 (52.69%). Though there was a marginal increase of 60 from 2530 to 2590 in the number of artisans i.e., an increase of (2.32%) during the period, however, frequent fluctuations in its number over the period fluster to have a clear cut and concrete picture of the

small industrial sector (table No. 2.2). As regards investment, it was Rs. 44,701.38 lakhs up to 31st March 2000. After the division of the state, investment for small industries' sector in Bihar excluding Jharkhand was Rs. 3805.15 lakh in the year 2000-01. Except declines of Rs. 58.60 lakh in the year 2004-05 and Rs. 674.48 lakh in 2005-06 in comparison to its pervious years' amount of investment, it went on constantly increasing. In this sector, the total investment increased by 126.97 per cent during the seven years period of 2000-01 to 2007-08. It increased from Rs. 3805.15 lakh of 2000-01 to Rs. 8636.49 lakh in 2007-08. The general essay of creating employment opportunities through expansion and strengthening of small scale industries seems to be discouraging. It showed a decline of nearly 8.72 per cent during the period. As a matter of fact, 14015 persons got employment in small scale industries in the year 2000-01, which went down to 12793 in 2007-08 (table No. 2.2).

Table No. 2.2: Year wise Permanent SSI Registered Units of Bihar (excluding Jharkhand)

SN	Year	Achievement					
		SSI	Tiny/ Micro	Artisan	Total	Investment (In lakhs)	Employment (In No)
1.	Up to 31/03/2000	1261	72767	44413	118441	44701.38	433808
2.	2000-01	35	3249	2530	5814	3805.15	14015
3.	2001-02	31	3206	3314	6551	4192.04	15283
4.	2002-03	24	3290	2983	6297	4638.07	13622
5.	2003-04	21	3462	2616	6099	5430.39	14346
6.	2004-05	17	3335	2897	6249	5371.79	13346
7.	2005-06	24	3584	3333	6941	4697.31	15732
8.	2006-07	20	3472	3612	7104	7279.79	16738
9.	2007-08	46	1537	2590	4173	8636.49	12793
	Total	1479	97902	68288	167669	88752.41	549683

Source: Department of Industry, Government of Bihar. (Economic Survey, Finance Dept. Government of Bihar, 2007-08, p. 87)

The fall in number of employment created may be the outcome of a decrease in number of tiny/micro units in Bihar over the period.

The small industrial units are, however, faced with the problems of registration of these units, and, therefore, its categorization in the national census of industries. For example, the third All-India Census of SSI Industries 2001-02 records only 72,600 permanently registered small scale units in Bihar, out of which 52,100 (71.76%) units are functional. One of the major revelations of the survey is that the share of tiny industrial units among all the SSIs, both registered and unregistered, is

as high as 99.90 per cent. So, if the desirability and expansion of agro processing activities are to be ensured, then its value added products have to be planned according to the demand of tiny industrial units. These units are evenly spread throughout the state with a relatively low employment potential. It is, however, notable that while the small, medium and large industrial units display geographical concentration, the tiny and artisan based industries are spread across the state.

In terms of marketing pattern there were 1675 exporting units in the industrial sector till March, 2008. This sector is also dominated by unregistered units. Of the total 1675 export oriented industrial units, only 80 (4.77%) are registered and the remaining 1596 (95.23%) are unregistered. Needless to mention here that out of the 95.23 per cent units, a quite significant proportion belongs to or is directly or indirectly related to or is based upon value added products of agro-food and agro non-food processing activities. The gross exports of the exporting units amounts to Rs. 25.30 crore, which is 0.68 per cent of the gross output in the sector estimated at Rs. 3703 crore. Also, there is regional concentration in the export oriented industrial units in the state. The major export products include non-alloy steel, surgical dressings, rice, flour, door and windows, agricultural tools, wooden furniture, cement and asbestoses products, locks, printing, book bindings, etc. The litchi export from the state is very significant. In 2003-04 export of litchi was 393 MT, constituting around 82.00 per cent of the total exports of litchi from India. Installation of a good number of litchi based processing industries in Bihar would have fetched quite higher amounts of foreign money by way of exporting value added products. It will be also instrumental in promoting its demand in domestic market and will ensure realization of higher income for the entrepreneurs coupled with the prospects of creating larger and more sustainable employment opportunities. Prior to having a glance upon the status, trend of expansion and growth prospects of APIs in Bihar, it will be desirable to understand and assess the share/contribution of small, tiny and artisan based industries (ABIs) in Bihar. It is more so necessary because these small and tiny industries are directly or indirectly dependent related with, or are associated in backward or forward linkages with APIs role in the industrial sector for growth and sustainability. The agro based industries account for almost half of the net value added to the industrial sector. There remains substantial scope in the sector for further expansion. The current performance level is not very impressive from a

national point of view. For instance, the ASI 2002-03 estimated the total agro-based industrial output at Rs. 330.72 thousand crore for India as a whole, out of which the contribution of Bihar is only Rs. 2.01 thousand crore (0.60%) table No. 2.4. Rough estimates of inputs production for agro-based industries suggest that the state can push up this share up to 5.00 or 6.00 per cent; if suitable initiatives with galvanizing measures/incentives to entrepreneurs are taken up for installing agro food and agro non-food based processing enterprises' in the areas/regions of their abundant productions. The potential of agro based industries can also be fully utilized by undertaking suitable policy and expanding other area specific technical dimensions.

The almost halting condition of textile/textile products (0.0039%) of the output value of India and paper/printing/publishing industry (0.6%), which shows lowest share after textile products in Bihar (as per the ASI data 2002-03), Overdo the expansion initiatives of agro non-food based industries.

Table No. 2.3: Division wise Share/Distribution of Small, Tiny and Artisan based Industries in Bihar

Percentage					
Division	**Small**	**Tiny**	**Artisan Based**	**Total**	**Percentage share of population**
Patna	43.40	26.40	22.80	25.10	17.40
Magadh	5.80	14.10	13.90	14.00	10.60
Bhagalpur	4.50	4.30	3.50	3.90	4.90
Munger	10.30	7.90	8.30	8.10	9.00
Saran	7.80	9.90	4.80	7.80	9.80
Tirhut	10.20	17.40	18.30	17.70	20.00
Darbhanga	3.10	9.40	15.10	11.80	12.40
Koshi	1.90	3.70	5.60	4.50	5.80
Purnea	13.00	7.00	7.80	7.40	10.10
Bihar	100.00	100.00	100.00	100.00	100.00

Source: Economic Survey – 2008-09 Government of Bihar

One of the major determinants of the agro based industrial development is the nature and structure of the farm sector and the relative importance assigned to different crops in the existing crop mix. For instance, high value agriculture offers more scope of processing and value addition compared to grains. Processing of fruits, vegetables, milk, egg etc., are very important in this context. The area under fruits and vegetables in the state was 27,000 ha and the production was around 1.33 lakh MT in 2006-07. The state also ranks top in the production of honey with an annual output of 8,400 MT (2002). It is observed in this context that the average yield of honey in Bihar is 60 kgs per box as against the national average of only 20

kgs. One of the major significance of this activity has been that more than 1 lakh families are directly engaged in the honey sector.

Table No. 2.4: Size of Selected Agro-Based Industries in Bihar (ASI 2002-03) *(Rs. In Crore)*

NIC Code 1998	Industry Group	Output Value India	Bihar	Share of Bihar (In %)
15	Food/beverages	168565	1295	0.8
16	Tobacco products	15649	418	2.7
17-18	Textile/Textile products	103450	04	0.0039
19	Leather/Leather products	10309	77	0.7
20	Wood/Wood products	2522	22	0.9
21-22	Paper/Printing/publishing	30228	188	0.6
	Total	**330723**	**2004**	**0.6**

Source: Economic Survey (2007-08), Government of Bihar, March, 2008, p 89.

Under the disestablish sector of agro processing activities, the inclinable and significant contribution of dairy processing activities in the state can not be under estimated. As a matter of fact, the two prominent agro based industries in the state are dairy and tea. The dairy sector has grown through the co-operatives. The co-operative brand of milk and milk products under the brand name of Sudha provides significant rural employment and income, involving significant number of women. The sector, however, holds large untapped potential for more intensive activities to serve a growing market for dairy products, both domestic and international.

Besides larger potential of dairy processing activities, vivid concentration and extent of food grain products and enterprises based on their value addition related activities have its dominant presence. No doubt, Bihar has a great potential for food processing industries. There also exists potential for doubling the current agricultural production levels. The increased agricultural produce through such steps, as (i) increased crop intensity, (ii) crop rotation, (iii) irrigation, (iv) scientific crop management, higher seed replacement rate (SRR) etc., would lead to higher marketable surplus.

This sector has the potential to generate additional employment to the tune of around 0.5 million. In order to help the food processing units to develop, a food park was to be established at Hajipur in Vaishali district of Bihar with common facility centre, quality control testing lab, cold chain, etc. Other food parks at Uda Kishanganj in Madhepura district and Begusarai were under consideration of the Government of India. Besides, a container depot was to be established at Shitalpur,

which would have container freight station and inland container depots for infrastructure and agro products. It is really encouraging, but merely enchasing the food processing industries by distant work smoothening infrastructural facilities would not work, some specific fostering measures will have to be taken for providing input based required technical, financial, managerial, supervisory and befitting assistances have to be extended to the existing and willing food processing entrepreneurs.

2.2 Recent Trend in Agro Based Industries

This section presents a descriptive picture of change in economic structure of factories, agro food and agro non-food processing units/industries in Bihar during 1994-95 to 2000-01. The change/growth pattern of factories covered by Annual Survey of Industries (ASI) data for census and non-census sectors has been formally discussed in regard to the following:

i. Manufacture of food products, (ii) beverages and tobacco products, (iii) food processing industries, (1+2), (iv) cotton textiles, (v) wool, silk and synthetic fibre textiles, (vi) jute hemp and mesta textiles, (vii) textile products (including wearing apparel other than foot wear), (viii) wood and wood products, furniture and fixtures, (ix) paper and paper products, printing, publishing and allied industries, (x) leather and leather and fur products (except repair), and (xi) total non agro based industries. The table 2.2.1 registers that in regard to working units, non-agro based industries dominated (75.08%) over total agro based industries (24.92%) as per the data of 1994-95. Besetting fact in this regard is that the share of food processing industries and 'agro non-food processing industries' in Bihar in the referred year were quite lower at 12.03 per cent and 12.90 per cent respectively. As regarding investment, the data in table 2.2.1 finds out very low share of total agro based industries in the state (3.61%) in comparison to total non agro-based industries. However, within the category of agro-based industries, the data brings at a stage of heartenment in regard to the status of agro food processing industries by cornering only 3.05 per cent of the total investment. Agro non-food processing industries shared the advantage of very negligible proportion (0.56%) in Bihar. As per 1994-95 data, major investment could be seen in favour of non-agro based industries (96.40%). Data in the table further signal bloated/major share, and contribution of non-agro based industries in regard to providing employment, gross output and net value

added. It provided employment to 2,22,172 workers, with gross output of Rs. 17,77,327 lakh and Rs. 4,08,507 lakh as net value added. In comparison to these, the same figures for total agro based industries in Bihar were 41,779, Rs. 1,39,601 lakh and Rs. 33,444 lakh respectively. It could be seen from the table that the share and contribution of agro food processing industries on the parameters of employment (number of workers'), 'gross output' and 'net value added' in the state were 1.85, 4.30 and 3.61 times more than those of agro non-food processing industries (table No. 2.2.1).

A glance on the table reveals a decline in the number of working units belonging to food processing industries' group (10.74%) in the state (as per available data for the year 1997-98). In comparison to the status of industries in 1994-95, the share of non-food processing industries increased by 3.48 per cent. Its share was 16.38 per cent in the referred year. However, it is evident from the table that in regard to the number of working units, there was an expansion in total agro-based industries (27.11%) in the year 1997-98 over its earlier of 24.92 per cent. In regard to investment, there was a significant increase in total agro based industries (1.32 times). In the later year also, the dominance of non-agro based industries (68.33%) could be observed on this parameter over total agro based industries. With a decline in the existing number of units under food processing industries, a fall in the size of employment could be seen. Similarly, increase in the number of working units under the group of

Table No. 2.2.1: Economic Structure of Factories covered by Annual Survey of Industries (Census & Non-census Sectors in Bihar)

1994-95

SN	Industry	Working Unit		Investment		Employment		Gross Output	Net Value added
		No.	%age share	Amount (In Rs)	%age share	No. of Workers	No. of Employees	Rs. (In Lakh)	Rs. (In Lakh)
1.	Manufacture of food products	281	7.80	48810	2.52	12300	17908	70636	7656
2.	Manufacture of beverages, tobacco & tobacco products	151	4.22	10299	0.53	14836	15861	42630	18542
3.	Food processing industries (1+2)	433	12.03	59109	3.05	27136	33769	113266	26198
4.	Manufacture of cotton textiles	63	1.75	1523	0.08	3637	4206	4318	730
5.	Manufacture of wool, silk & synthetic fibre textiles	09	0.25	101	0.01	159	188	185	64
6.	Manufacture of jute, hemp & mesta textiles	04	0.11	1612	0.08	2299	2483	2230	767
7.	Manufacture of textiles products (including wearing apparel other than footwear)	14	0.39	207	0.01	1702	1783	400	84
8.	Manufacture of wood & wood products	252	7.00	2673	0.13	2240	2772	2820	473
9.	Manufacturing of paper and paper products	105	2.92	3678	0.18	2648	3481	8558	3378
10.	Manufacture of leather and leather products (excepted repair)	17	0.47	1152	0.06	1958	2520	7824	1750
B.	Non-food processing industries (4 to 8)	464	12.90	10946	0.56	14643	17433	26335	7246
C.	Total agro-based industries (3 + 11)	897	24.92	70055	3.61	41779	51202	139601	33444
D.	Total non-agro based industries	2703	75.08	1866933	96.40	222172 (84.17%)	291652 (85.06%)	1777327 (92.72%)	408507 (92.43%)
E.	All industries (12 + 13)	3600	100.00	1936988	100.00	263951	342854	1916928	441951

2000-01*									
SN	Industry	Working Unit		Investment		Employment		Gross Output	Net Value added
		No.	%age share	Amount (In Rs)	%age share	No. of Workers	No. of Employees	Rs. (In Lakh)	Rs. (In Lakh)
1.	Manufacture of food products	271	8.22	64832	22.20	9706	14994	135817	18693
2.	Manufacture of beverages, tobacco & tobacco products	83	2.52	12956	04.43	4750	5616	69208	33158
3.	Food processing industries (1+2)	354	10.74	77788	26.64	14456	20610	205025	51851
4.	Manufacture of cotton textiles	30	0.91	1240	0.42	2576	3123	4460	307
5.	Manufacture of wool, silk & synthetic fibre textiles	06	0.18	52	0.02	22	44	55	15
6.	Manufacture of jute, hemp & mesta textiles	08	0.24	2042	0.70	3750	4108	4729	997
7.	Manufacture of textiles products (including wearing apparel other than footwear)	13	0.39	533	0.78	320	416	1096	28
8.	Manufacture of wood & wooden products	316	9.58	7122	2.44	4857	5868	11190	2900
9.	Manufacturing of paper and paper products	151	4.58	2445	0.84	6472	7297	7621	578
10.	Manufacture of leather and leather products (excepted repair)	16	0.48	1287	0.44	1781	2317	10062	964
B.	Non-food processing industries (4 to 8)	540	16.38	14721	5.04	19778	23173	39213	5789
C.	Total agro-based industries (3 + 11)	894	27.11	92509	31.68	34234	43783	244238	57640
D.	Total non-agro based industries	2403	72.90	199524	68.33	14956 (30.40%)	22874 (8.39%)	2649252 (91.56%)	870639 (93.79%)
E.	All industries (12 + 13)	3297	100.00	292033	100.00	49190	272524	2893490	928279

* *Data in the table relates to figures of 1997-98 (as per availability).*

Source: Annual Survey of Industries, Appendix – 1.9, physical characteristics by states.

non-food processing industries (76) led to increase in the size of employment to workers and employees under this category. Increases in gross output and net value added is well visible in regard to agro based (food and non-food) and non-agro based industries both. But, in these two parameters also, emaciation of agro based industries could be seen (table No. 2.2.1).

In view of the fact that nearly half of the gross value added by small scale industries in Bihar is contributed by agro based industries (ABIs), edifying contrivances have to be designed for installation of a good number of agro food based industries in those areas/regions, where surplus production of some agricultural commodities, crops/fruits or vegetables results into wastage for want of remunerative markets transportation facilities or storage facilities.

Economic Structure of Unorganized Manufacturing Sector

Table No. 2.2.2 presents data based picture of the status (share) and changes in agro-food, agro non-food based processing industries and non-agro based industries in Bihar. Change in the number of working units for different categories of industries has been measured by taking into account data available for the years 1994-95 and 2000-01 meant for unorganized manufacturing sector and provided by National Sample Survey Organization. On having a leaf through the table, it is clear that in the year 1994-95, agro based industries (including agro food and agro non-food based processing industries) dominated sharing 53.00 per cent (7, 11,279) number of the total working units. Non-agro based industries shared a little less 47.00 per cent than total agro based industries. Among the agro-based industries, number of units related to agro food based processing activities was higher estimated at 3, 81,810 (28.45%) than agro non-food processing industries 3, 29,469 (24.55%) table 2.2.2.

Table No. 2.2.2: Nature and Composition of Agro based Industries in Bihar.

SN	Industries	Working Units Numbers		
		Unorganized Sector		%age Change
		1994-95	2000-01	
1.	Manufacture of food products	278474	89634	-67.81
2.	Manufacture of Beverages, tobacco and tobacco products	103336	37264	-63.94
3.	Food processing industries (1+2)	381810 (28.45%)	126898 (15.55%)	-66.76
4.	Manufacture of textile & its products	18117	15011	-17.14
5.	Manufacture of wood & wood products	255658	80939	-68.34
6.	Manufacture of paper & paper products	6710	1430	-78.69
7.	Manufacture of leather & its products	48984	3352	-93.15
8.	Non-food processing industries (4 to 8)	329469 (24.55%)	100732 (12.45%)	-69.43
9.	Total agro-based industries (3 + 8)	711279 (53.00%)	227630 (28.15%)	-68.00
10.	Total non-agro based industries	630756 (47.00%)	580974 (71.85%)	-07.89
11.	All industries (9 + 10)	1342035 (100.00%)	808604 (100.00%)	-39.75

Source: 1. Report No. 434-- Unorganized Manufacturing Enterprises in India; silent features (NSS-51st Round).

2. NSS Report No. 480: Unorganized Manufacturing Sector in India, 2000-01: input, output and value added.

Data in the table for the year 2000-01 betoken significant declines in the number of working units under the groups of 'agro food,' 'agro non-food' and 'non-agro based industries' as compared to that of 1994-95. On overall level, though the decline was to the tune of 39.75 per cent, however, it varied from 93.15 per cent in case of manufacturing of leather and leather based products to a low of 17.14 per cent in case of textile and its products and 7.89 per cent for 'total non-agro based industries.' In the referred year, the share of non-agro based industries in Bihar is seen to have made good efforts to surfeit the economy of Bihar by achieving expansion in size estimated at 5,80,974 (71.85%) table 2.2.2. However, declines in the number of working units based on agro-food (15.55%) and agro non-food based processing activities (12.45%), i.e., about 1.89 times less than the existing strength of 1994-95 suggest state of uncertainty in the field of unorganized manufacturing industries based on processing of agro food and agro non-food commodities (particularly OAMEs) during the period 1994-95 to 2000-01. Some other factors for this decline might be attributed to collapse of infrastructural

facilities, lack of promotional policies for this sector, fall in demand of processed agro food and agro non-food and items (particularly in absence of standardization or brand name), poor power and ‘law and order’ positions in the state.

It is to be noted that if the economy of Bihar is to be inspirited on sustainable basis, ‘agro processing industries’ under ‘unorganized manufacturing sector’ should be suitably and adequately promoted and strengthened. This is more so desirable as the state has no other sector of industrial activities, which has ‘required inputs available so abundantly’ as existing in case of agricultural sector (both related with ‘agro food’ and ‘agro non-food commodities’).

Table No. 2.2.3: Economic Structure of Unorganized Manufacturing Enterprises in Bihar.

SN	Description	Estimated Number of Manufacturing Enterprises	Estimated Number of Workers Engaged in Manufacturing Enterprises	Estimated Gross Value Added (In Rs.)	Value Added per Enterprise (In Rs.)	Value Added per Worker (In Rs.)	Estimated Employment per Enterprise
			1994-95				
1.	Food products	278474	544141	---	---	---	1.95
2.	Beverages, etc.	103336	250027	---	---	---	2.42
3.	Food processing	381810	794168 (31.30%)	---	---	---	2.08
4.	Cotton-Wool-Jute textile & textile products	18117	87091	---	---	---	4.81
5.	Wood & wood products	255658	533446	---	---	---	2.07
6.	Paper & its products	6710	7886	---	---	---	1.17
7.	Leather & its products	48984	58558	---	---	---	1.19
8.	Non-food processing	329469	686981 (27.07%)	---	---	---	2.08
9.	Total agro-based	711279	1481149 (58.38%)	---	---	---	2.08
10.	Total Non-Agro based	630756	1056111 (41.63%)	---	---	---	1.67
11.	All industries	1342035	2537260	---	---	---	1.89
			2000-01				
1.	Food products	89634	435091	5777568	64457	13279	4.85
2.	Beverages, etc.	37264	119218	1375423	36910	11537	3.20
3.	Food processing	126898	554309 (36.97%)	7152991 (34.07%)	56368	12904	4.37
4.	Cotton-Wool-Jute textile & textile products	15011	97540	867426	57786	8893	6.50
5.	Wood & wood products	80939	342371	4223827	52185	12337	4.23
6.	Paper & its products	1430	7801	126245	88283	16183	5.45
7.	Leather & its products	3352	21355	323661	96558	15156	6.37
8.	Non-food processing	100732	469067 (31.29%)	5541159 (26.39%)	55009	11813	4.66
9.	Total agro-based	227630	1023376 (68.26%)	12694150 (60.46%)	55767	12404	4.50
10.	Total Non-Agro based	580974	475882 (31.74%)	8302954 (39.54%)	14291	17447	0.82
11.	All industries	808640 (39.75%)	1499258 (40.91%)	20997104	25967	14005	1.85

Source: National Survey Organization on unorganized manufacturing, Report No. – 434.

Data related to employment, Gross Value Added (GVA), value added per enterprise, value added per worker and employments per enterprise have been displayed in table – 2.2.3. The table demonstrates a significant decline of about 40.91 per cent in the estimated number of workers engaged in unorganized manufacturing enterprises during the period 1994-95 to 2000-01. It lodges, nearly proportionate fall (39.75%) as observed in case of number of manufacturing enterprises,' which, in regard to all industries declined from 13,42,035 in 1994-95 to 8,08,640 as per 2000-01 data. Though the share of agro food processing enterprises out of 'total number of industries' in the year 2000-01 increased, however, in number terms of workers engaged, it declined from 7,94,168 of 1993-94 to 5,54,309 in 2000-01. Similarly, an increase in the percentage share of workers engaged in these manufacturing enterprises based on agro non-food processing industries (31.29%) of the total number of industries under unorganized sector could be seen in the year 2000-01, but in number terms, the size of employment decreased significantly over the period (from 6,86,981 to 4,69,067). Data in table 2.2.3 grounds that employment in total non-agro based processing industries also declined sharply in 2000-01. It came down from 10,56,111 to 4,75,882. Out of the total employment created by all industries, the share of non-agro based enterprises declined from 41.63 per cent to 31.74 per cent during the period.

The data in the table related to estimated gross value added for the year 2000-01 reveals quite higher share (60.46%) to have been contributed by agro-processing industries (both food and agro non-food based activities). Out of the total GVA by all industries, non-agro based processing activities accounted for Rs. 83,02,954 (39.54%). The contribution of agro non-food processing industries i.e., Rs. 55,41,159 (26.39%) was well below agro food industries i.e., Rs. 71,52,991 (34.07%) As far as value added per enterprise is concerned, data in the table provides ground to dilate that the agro food processing enterprises were ahead (Rs. 56,368) of agro non-food processing activities (Rs. 55,009) as per data available for the year 2000-01 only. On overall level, value added per enterprise for agro-processing activities under unorganized manufacturing segment was about 3.90 times more (Rs. 55767) than that of non agro-based processing activities (Rs. 14,291). In regard to all industries taken together the same was as low as Rs. 25,967. Among agro non-food processing activities, leather and its products based activities showed highly

encouraging performance on this parameter (Rs. 96,558) followed by paper, textiles and wood (table 2.2.3).

Data showing value added per worker for different types of processing industries meant for the year 2000-01 interestingly embody very strong and encouraging picture in regard to non-agro based processing activities (Rs. 17,447). Agro food and agro non-food processing activities recorded lower value addition per worker (Rs. 12,404 and Rs. 11,813) respectively. On overall level it was Rs. 14,005 for all industries. Among agro non-food processing activities, amount of value added per worker was highest for paper (Rs. 16,183) trailed by leather, wood and textile based enterprises (Rs. 15,156, Rs. 12,337 and Rs. 8,893) respectively. Since no data related to estimated GVA, value added per enterprise and value added per worker were available for the year 1994-95, so comparative picture/change in the status on these parameters couldn't be drawn.

On the parameter of estimated employment per enterprise, data for both the years, i.e.; 1994-95 and 2000-01 are available. So, a comparative picture could be cogitated. Data in table 2.2.3 clearly manifest a marginal decline in regard to all industries in the year 2000-01 (1.85%) in comparison to 1994-95 (1.89). However, agro food processing segment showed remarkable increase (from 2.08 to 4.50) over the period. Maintaining pari passu tempo of positive change, agro non-food processing industries also showed encouraging picture (from 2.08 to 4.66) during the period 1994-95 to 2000-01). A fall of 0.85 could be seen in case of non- agro based activities over the period, which has declined from 1.67 to 0.82. Estimated employment per enterprise for total agro based activities also increased by more than two times (from 2.08 to 4.50).

In view of larger share/contribution and gargantuan presence of agro based industries (including agro food and agro non-food based processing enterprises) in Bihar, all possible measures should be taken for the expansion, strengthening and maintenance of operational efficiencies of the existing units. It is more so desirous in view of the clear dominance of agro-processing activities (under unorganized manufacturing segment) particularly in terms of employment provided, Gross Value Added (GVA), GVA per enterprise, GVA per worker and employment per enterprise.

The process of agro-based industrialization is already on in our country in response to increasing demand for various agro-based products for direct consumption, industrial use and export. Therefore the significance of agro industry in India's industrial sector in general and rural sector in particular needs to be underlined. At all–India level, the share of agro based industry in terms of number of units, employment and output in the manufacturing sector is 65.00 per cent, 63.00 per cent, and 35.00 per cent respectively (Chadha & Sahu, 2003). In rural India, the three figures corresponding to its share in the number of units, employment and output is 71.30 per cent, 70.60 per cent and 43.40 per cent. It is equally important to underline that agro-industry is largely a house of small scale enterprises. As recorded in 1994-95 the unorganized segment of the agro industrial sector largely characterized by small and tiny enterprises sharing as many as 99.40 per cent of enterprises, 86.80 per cent of employment and about 36.40 per cent of output as against their share of 99.40 per cent in total agro based industrial enterprises in India. The rural component of the agro industrial sector is more dominated by the unorganized segment with its share in the number of units, employment and output being 99.70 per cent, 93.00 per cent and 42.60 per cent respectively (Chadha & Sahu, 2003). In sum, agro industry has a strong presence in the industrial sector of the Indian economy and is largely a house of small and tiny enterprises.

The unorganized sector, being predominantly a house of small and tiny industrial enterprises, tends to concentrate more and more on agro based manufacturing activities with less than one-fifth of its manufacturing units being engaged in non-agro based activities. On the other hand, the organized sector housing relatively larger size enterprises experiences opposite trend. As evidenced by pre and post reform growth trends (source: Chadha & Sahu, 2003) in the number of enterprises in the unorganized segment, food processing units grew from 1.90 per cent during pre reform period to 5.00 per cent during post reform period while non food processing enterprises increased from 5.80 per cent to 7.80 per cent. In terms of total number of agro based enterprises, within the unorganized segment the changes in the rate of growth are from 4.40 per cent to 6.70 per cent against the big decline from 0.40 per cent to 7.90 per cent in the case of non agro based industries. On the other hand, within the organized segment, changes in total agro based enterprises are from 2.3 per cent to a decline of 0.80 per cent against no change in the case of non agro

based enterprises. This confirms that the organized manufacturing segment tended to shift its priority to non agro based activities, while the unorganized segment clearly signaled the internal restructuring in favour of agro based enterprises. Given the sheer dominance of the unorganized sector in India's industrial economy, it follows that the post reform trend has been to push agro processing industries into the fold of tiny and small enterprises.

Agro-based activities in the unorganized segment, being predominantly a house of small scale enterprises, are highly heterogeneous in terms of capital investment, technology in use, scale of operation, product range, quality and quantum of output, composition and level of employment. Distressingly, levels of productivity among tiny and small enterprises (unorganized sector) are also low. There must be a host of institutional, technological and marketing constraints that are holding up productivity of the agro industry units to low levels. There is therefore need to address these constraints so that productivity of the agro industry sector may be improved. Moreover, the growth profile of the number of agro based enterprises is uneven across the regions of India. In the state of West Bengal, the rapidly increasing production of vegetables and foods has created a vast potential for food processing industries. In terms of investment potential, West Bengal has been ranked third after Maharashtra and Tamil Nadu (NABARD, 2000-01). The state government of West Bengal has also been developing infrastructure for tapping the potential for food processing industries in the state. Despite all these, when we look at the Annual Survey of Industries data, agro-industry does not appear to be the dominant constituent of the industrial sector of West Bengal. The strength of agro based industry in West Bengal is comparatively less than those of non agro-based industries. This can be gauged through their 35.71 per cent share in the total number of manufacturing industrial units covered by the Annual Survey of Industries. In terms of employment however, agro based industry shared more than those provided by the non agro-based industries, its share being 54.89 per cent in employment of workers. Within the group of agro based industries, food processing industries predominate with their share being 54.20 per cent in total number of agro based industrial enterprises, although, in terms of employment food processing industries lagged behind non food processing industries. In terms of share in investment non agro based industries rank much ahead of agro based industries. As

a whole, the strength of agro based industry in the state is comparatively less than those of non agro based industries. The observed trend relates to the organized segment of manufacturing enterprises and closely corresponds to all India trends of organized manufacturing units. It is this trend in the growth of agro processing manufacturing enterprises which calls for undertaking the study with the specific objective of studying the problems and prospects of agro processing industries.

The dominance of agro industry stands out more ambiguously when we look at the unorganized segment of the Indian industry as a whole, most markedly in the rural areas. For example, in rural India, as many as 71.40 per cent of the unorganized manufacturing 71.50 per cent of workers employed by them, and as high as 69.50 per cent of value added in this segment were contributed by agro based manufacturing around mid 1990s. In urban areas too, the relative strength of agro based industry can be gauged through their 48.30 per cent share in the number of unorganized units, 51.20 per cent share in employment and 46.90 per cent share in value added. In sum, agro industry has a strong presence in the industrial sector of the Indian economy. Not only in rural India, but in rural Bihar also, agro industry simply dominates.

The garniture of the industrial sector of Bihar, particularly small scale industries by agro based industries could be demonstrated through the fact that the Agro Based Industries (ABIs) in Bihar accounted for nearly half of the gross value added. If the remaining smaller units are also taken into account, the share of agro based industries will be still higher. However, the potential of ABIs could not be fully utilized. The development of ABIs is largely dependent on the importance assigned to fruits and vegetables, vis-a-vis other crops. Here the distressing fact about Bihar is that there are hardly 10 fruits based processing industries functioning here.

The names, location and production capacities of such fruits' based APIs have been given below:

It is interesting to note that fruits based processing industries in Bihar have been making use of litchi only. Despite increases in areas and productions of other important fruits in Bihar viz., mango, guava, litchi, banana, pineapple and other fruits during the period 2004-05 to 2006-07, no processing industry based on these fruits

grown abundantly could be installed in any part of Bihar. Another astonishing fact in this regard is that extraordinarily good and tasty varieties of Maldah and Zardalu mangoes are grown in the state in larger quantities (table 2.5). But, no processing industries based on these varieties of mango do exist here.

Table No. 2.5: Area, Production and Yield of Miscellaneous Crops in Bihar (2004-05 to 2007-08)

(Area '000 hectares, production '000 tone Yield kg/ha)

Crops	2004-05			2005-06			2006-07		
	Area	Prodn	Yield	Area	Prodn	Yield	Area	Prodn	Yield
Potato	145.00	1110.70	7658.00	142.30	1232.70	8663.00	151.40	1178.10	7781.10
Onion	14.20	104.70	7378.90	15.90	128.10	8078.10	15.10	120.50	7988.70
Sweet Potato	5.00	69.00	13877.70	--	--	--	5.50	73.50	13386.20
Sugarcane	104.50	3769.20	36083.20	101.30	4337.90	42826.80	117.20	5338.80	45561.00
Tobacco	16.00	18.60	1161.00	14.90	17.30	1160.90	1.40	16.10	11446.80
Chilies (dry)	3.00	2.20	728.80	3.10	3.10	998.70	2.90	3.00	1048.60
Ginger (dry)	--	0.60	1512.70	0.80	1.20	1495.00	--	0.80	1551.00
Turmeric	2.80	2.70	964.60	3.50	3.40	957.50	3.00	3.00	980.30
Coriander	2.20	1.60	737.70	2.30	1.70	724.20	2.30	1.70	740.10
Garlic	2.60	3.90	1506.30	2.80	4.10	1461.50	--	3.80	15916.70
Cauliflower	59.70	955.20	16000.00	19.90	1.40	71.30	60.10	1009.00	16778.50
Cabbage	36.50	598.80	16400.00	9.60	--	--	37.90	623.50	16849.00
Tomato	46.00	735.80	16000.00	2.30	--	174.10	46.50	916.80	19732.00
Bhindi	56.20	730.20	13000.00	12.30	--	--	--	--	--
Brinjal	53.70	1073.00	20000.00	--	1.20	2415.70	54.10	1120.60	20723.80
Pumpkin	29.10	582.90	20000.00	9.90	6.10	617.90	--	--	--
Cucumber	--	--	--	1.30	13.90	11078.20	1.50	15.70	10671.20
Bitter gourd	8.40	50.50	6000.00	8.50	49.30	5800.00	8.70	59.40	6803.70
Parwal	4.60	45.90	10000.00	4.60	47.80	10300.10	--	--	--
Bode	11.60	69.50	6000.00	11.60	86.10	7399.30	--	--	--
Pea	--	--	--	8.10	50.50	6243.80	8.70	53.10	6072.80
Radish	--	--	--	14.40	217.30	15136.60	14.90	226.60	15178.70
Carrot	--	--	--	4.00	46.10	11642.00	--	--	--
Mango	140.10	865.60	6178.30	140.20	1222.70	8720.00	140.80	1306.90	9283.20
Guava	27.70	256.10	9257.30	27.70	199.00	7180.00	28.00	248.00	8857.60
Litchi	28.40	204.90	7219.00	28.40	200.10	7044.50	28.80	211.90	7368.60
Lemon	16.80	122.90	7310.50	16.80	112.30	6670.00	17.10	121.60	7102.00
Banana	28.00	920.00	32872.80	28.00	959.30	34210.00	29.00	1125.10	38779.10
Pineapple	4.20	122.50	29077.80	4.20	108.00	25540.10	4.50	121.10	27179.40
Coconut	15.20	150.80	9952.30	15.20	123.80	8160.00	--	--	--
Others Fruits	30.90	277.50	8970.30	31.00	267.00	8615.00	31.30	291.90	9331.30

Source: Economic Survey 2008-09, Government of Bihar, p. 66.

Table No. 2.6: Pulp, Squash and Canning Manufactured from Litchi (Tin Packed)

SN	Name of the Agency	Production (In MT)	Products
1.	M/s Radha Krishna Impacts Pvt Ltd., Patahi, Muzaffarpur	500	Fresh Litchi, Pulp
2.	M/s D Company Agrico, Turky, Muzaffarpur	400	Fresh Litchi, Pulp
3.	M/s Litchika International, Muzaffarpur	600	Fresh Litchi, Pulp
4.	M/s Shyam Agri Foods & Expon, Ratwara, Muzaffarpur	200	Litchi Squash & Canning
5.	M/s Premium Food Products, Khaghra Road	200	Litchi Squash & Canning
6.	M/s Thakur Litchi Industries, Bochha, Muzaffarpur	200	Squash & Canning
7.	M/s Pager Agro Menwarsa Pvt. Ltd., Industrial Park, Hazipur	200	Fresh Litchi Pulp
8.	M/s Amrapali Foods Pvt. Ltd.	400	Pulp
9.	M/s Sugan Watika, Hazipur	250	Squash, Pulp & Canning
10.	M/s Farm Solution Trading Pvt. Ltd, Vaishali	300	Fresh Litchi, Squash, Pulp, Canning, Dabba Packing
	Total Production of Litchi based Value Added Products	**3250**	

Incisive explanation of table No. 2.6 is that the only fruits processing industries in Bihar are confined in only two neighbouring districts, viz., (i) Muzaffarpur and (ii) Vaishali. Litchi is also widely grown in north-eastern side of river Ganges under Bhagalpur district, but there is no litchi based processing industry in the region.

2.2.1 Food Processing

The food processing industry has a great potential in the state. If developed properly, it may generate additional employment for at least 5 lakh persons. Besides processing of cereals, great potential remains to be tapped in fruits and vegetables. The processing of mango, litchi, banana, etc. will also take care of seasonal glut, storage and retention of their nutritive value, apart from providing income and employment. Makhana is another leading local crop that may help to enhance the income and employment of rural people. Makhana cultivation is spread over an area of 16.90 thousand hectares in about 10 districts in the north and north-eastern part of the state. Already a Makhana processing plant is successfully functioning at Patna. In view of huge potential for development of food processing industry in Bihar, the Industry Department has planned a Rs. 1,760 crore project for development of food processing industry in Bihar. Under the project, Rs. 500 crore would be spent on 100 rural commercial and primary processing centres. Rs. 250 crore is earmarked for creation of two integrated food zones. For Fish Industry, there is a provision of Rs. 200 crore. In order to help the food processing units, a food park is being established at Hajipur by the Central Government with state's contribution in the form of land. For the entire Eleventh Plan Period, the plan outlay for the purpose is Rs. 4.00 crore.

As a step towards promoting agro-industries, Kishanganj area has been identified as an ideal zone for tea plantation and processing. The State Government welcomes private investment for comprehensive development of tea industry. Capital subsidy is available for setting up tea processing units in the area. Further, the potential for development of farming and processing of medicinal, herbal and aromatic plants in the state is abundant because of its natural environment. The active participation of private sector and non-governmental organization is encouraged and incentives are provided under the new industrial policy.

2.2.2 Dairy Processing Activity

With a view to improve the socio-economic conditions of rural households, intented initiative was taken up for providing additional income earning scope' to emulous farmers. This could be done by bringing them under dairy co-operative network. The dairies suffered losses in Bihar due to low level of operations, In order to overcome the losses and turn around the situation, several measures were taken in 1994, which included procurement of cow milk that was normally retained by farmers for own consumption/religious purposes and regularizing payment to them. The DA (Dearness Allowance) installments were not released to the employees till the dairies were able to plan and generate extra funds enabling them to bear the additional financial burden, thus, gradually making the officers and staff cost conscious and cutting down various operational costs. Production of value added milk products was taken to improve the financial viability of dairies and emphasis on quality of milk and milk products and marketing thereof was laid. As a result of implementation of turn around plan, the dairies started wiping out their accumulated losses. No doubt, the agrarian economy of Bihar can be more effectively nurtured by undertaking development and expansion plans/schemes related to strengthening dairy based processing activities/enterprises.

As far as the exhorting endeavours of the Government in regard to strengthening diary products based processing activities is concerned, tremendous progress could be observed through intervention of COMPFED. It is, however notable that the plants which were taken over from the government, are too old. COMPFED not only expanded the processing capacity of plants taken over, but established new dairy plants also. Presently there are 12 dairy plants and 08 chilling centres, besides 10 bulk coolers with a total 835 TLPD processing facility and 242 TLPD chilling facility. Besides these plants, there is one Ice cream plant of 03 thousand per day capacity, 09 out of 12 plants are ISO and HACCL.

As a matter of fact, liquid milk marketing was a neglected area till a few years ago. Progress was very slow initially. It moved at snail's speed, from around 55000 litres in 1985-86 to 106,000 litres in 1992-93. However, the strategies adopted in 1994 under turn around plan helped to move faster. It rose to 2, 45,000 litres per day in 1997-98 and thereafter it grew steadily. Year 2003 was declared as Market

Development Year. The present marketing level is 5.65 lakh litres per day. Liquid milk is being marketed in 85 cities and towns in Bihar, Jharkhand, Uttar Pradesh and West Bengal.

With a view to improve the financial viabilities of dairies broaden the product mix to serve a larger section of the population and improve the disposal of milk procured by the DCS, the dairies have resorted to the production of long shelf life, value added and fresh milk products (indigenous milk based products/sweets). The product mix comprises of : (i) ghee, (ii) table butter, (iii) ice-cream, (iv) dahi (Misti and plain), (v) lasi, (vi) matha, (vii) sterilized flavoured milk, (viii) peda, (ix) kalakand, (x) gulabjamun, (xi) rasogulla, (xii) paneer (vacuum packed), (xiii) milk cake, (xiv) balushahi, and; (xv) khoa. Besides these products, surplus milk is conserved in the form of (i) white butter, (ii) skim milk powder, and; (iii) whole milk powder, which are mainly consumed by own dairies for reconstitution purposes. It is worth mentioning here that milk and milk products are sold under Sudha brand name through a chain of 7,000 outlets, which include 400 whole day booths.

The progress of dairy based milk based processing activities under co-operative sector in Bihar (COMPFED) is encouraging. However, it is desirable to find ways and means for strengthening milk and other dairy products' based processing industries/activities' to be undertaken by rural entrepreneurs.

2.2.3 Agro Non-food Based Processing Industries in Bihar

Agro non-food based processing activities in Bihar mainly comprise (i) textiles (ii) wood and; (iii) leather based processing activities. The content, contribution/share and developmental trend/initiatives for expansion of textile based APIs in Bihar are presented below:

2.2.3.1 Textile Based Processing Activity

For the development of textile and handloom sectors, the state government has planned to establish a textile park in public/private partnership (ppp). Of the total cost of this plan, 40.00 per cent or a maximum of Rs. 40 crore will be invested by the Central Government as share money and 9.00 per cent by the state government as subsidy and share money. Again, a handloom park at Bhagalpur is also being planned, wherein the entire necessary basic infrastructure and other facilities, like

raw material bank, pre and post processing facilities, artisan village, R & D Centre, testing laboratory, information and training centre, etc. will be made available for the weavers. A detailed project report, prepared by ILSFS for Rs. 34.03 crore, has been submitted and the state government has already transferred 25 acres of land as part of its contribution. Conjugating for the development expansion and sustainability of textile based processing industries by the state government is an encouraging initiative. But, a positive trend of expansion/development of textile based APIs' could only be achieved by disembroiling the credit, availability of required inputs, lack of technical support, lack of experts supervision, poor power supply and marketing related constraints/problems of small weavers of the state.

2.2.3.2 Handloom

The handloom industry assumes great significance in the context of Bihar, because of large number of weaver in the state. They are primarily concentrated in the districts of Bhagalpur, Patna, Gaya, Banka, Darbhanga, Arwal, Jehanabad, Aurangabad, Nawada, Nalanda, Bhabua, Khagaria, Madhubani and Siwan. There are around 1071 weavers' co-operative societies in the state, with 10,827 handlooms. Besides, 23,503 handlooms are outside the co-operative sector. Around 1.33 lakh weavers are engaged in this sector, of which nearly a lakh are outside the co-operative sector. The state government has introduced welfare schemes for weavers in the form of marketing assistance, modernization of training centres and repair of shed-cum housing. Under the debt waiver scheme, the state government has approved waiving of loan worth Rs. 12.24 crore.

If proper training, designing and marketing facilities are extended, this sector, including the power loom sector, has great potential of providing employment and enhanced income to the appreciable number of families.

During the Eleventh Five Year Plan, the Central Design Centre at Rajendra Nagar, Patna has been revived to provide the theoretical and practical training to the weavers for preparation of sophisticated and designed clothes. The trainees are paid a stipend of Rs. 300 per month. Besides, for door to door marketing of the handloom products in rural and urban areas, there is a scheme of providing bicycles to the weavers. Under the 20 point programme, the weavers in both co-operative and non co-operative sector are provided Rs. 1500 each as 100 per cent subsidy for

purchasing equipments and furnishing the looms. Under modernization scheme, during 2007-08, there has been a provision of Rs. 47 lakh for 470 weavers of 94 societies in 10 districts of Patna, Gaya, Nalanda, Aurangabad, Rohtas, Siwan, Gopalganj, East Champaran, Madhubani and Banka.

Handloom Cluster Scheme

For the integrated development of weavers in seven district of Bhagalpur, Patna, Gaya, Darbhanga, Madhubani, Siwan and Nalanda a diagnostic study and business plan has been prepared by 118 FS, New Delhi. It recommended the project cost of Rs. 68.65 crore, of which a sum of Rs. 24.00 crore is to be provided by the state government and the remaining to be borne by the beneficiaries. Under this scheme, the looms of the weavers within the cluster will be modernized and a handloom park with needed amenities and facilities will be established.

2.2.3.3 Power loom

There are around 11.36 thousand power looms in the state. One power loom service centre has been established in the state by the Union Ministry of Textiles. Under the scheme 120 trainees are imparted training for two months each in one year with a stipend of Rs. 3000 each. There is also a scheme under the Industrial Policy, 2006 to provide generators at 50.00 per cent subsidy to weavers in the power loom sector.

2.2.3.4 Leather and Leather Products

According to Annual Survey of Industries (ASI), 2004-05, leather and leather products in Bihar has a small share (0.56 per cent) in its total production of Rs. 1922 thousand crore from the agro-based industries. However, considering the magnitude and quality of livestock wealth, there appears to be a good potential for industries relating to leather and leather products in the state.

Above data based analytical discussion reveals that there is much scope of value addition activities in the areas of agro food and agro non-food based enterprises. A few encouraging measures have been taken by the present state government of Bihar to strengthen and expand APIs. It is, however, a matter of concern that no concrete plan could have yet been made for expansion, strengthening/maintaining and renovating the processing activities based on paper, wood and leather. The need of the hour is to explore such resources/inputs surplus areas/regions of

agricultural and agro non-food products, based on which, a good number of APIs can be installed in specific areas. Then, the potential market for 'value added agro products' will have to be developed on local, regional, state and national levels also. These measures will, undoubtedly, bring a qualitative change in the economic scenario of Bihar by creating large number of additional employment opportunities on sustainable basis.

CHAPTER – III

PROFILE OF SAMPLE DISTRICTS AND SELECTED PROCESSING ACTIVITIES

Graphic presentation (brief description) of sample districts and 'selected processing activities' is useful for better understanding the growth and prospects of APIs in the state.

3.1 Selection of Sample Districts

With a view to address the objectives at Serial Numbers 4 to 8, as detailed in preceding Chapter – I, detail survey of 'food processing activities' and 'non-food processing units' have been conducted. In pursuance of the study design, within the group of food processing and non-food processing agro based activity, dominant processing activity has been selected considering the concentration of units in the State.

In the case of food processing component of agro-based enterprises for (i) primary food processing units, mainly grain processing units (rice mills in Rohtas district), (ii) Horticultural products based enterprises (i.e., litchi based processing activities in Muzaffarpur district, and; (iii) Livestock based processing units (operational in Khagaria district of Bihar under unorganized sector) have been selected.

Within non-food processing segment of agro based industries (i) Bhagapur district for textile products based processing activities, (ii) Patna district for wood and its products based processing enterprises, and; (iii) again Patna district for leather and its products based processing activities were selected for the study in hand. As paper and its products based processing industries were not functional in Bihar, in organized and, unorganized sector as well, so no paper processing unit was selected for the study. Here as such 05 districts are selected for the study depending on the location of the specific agro-processing activity.

Table No. 3.1: Sample Processing Units and the Selected Districts for the State of Bihar

SN	Processing Activity	Selected District	Number of Sample Units
Food Processing			
a.	Paddy Processing	Rohtas	06
b.	Fruit (Litchi) Processing	Muzaffarpur	06
c.	Milk Processing	Khagaria	06
	Total		18
Total Non-Food Processing			
a.	Textile Products	Bhagalpur	03
b.	Wood and its Products	Patna	03
c.	Leather and its Products	Patna	03
	Total		09
	Total Sample Size		**27**

3.2 Profile of the Districts Selected for the Study

This section of the Chapter encircles secondary data based analytical discussions related to the following components of district profile:

(i) Demographic profile, Work Participation Rate (WPR), Literacy Rates (LR) and areas of selected districts,

(ii) Classification of working population and number of workers under different economic classifications,

(iii) GDDP, per capita GDDP, small savings in Post Offices and PPF,

(iv) Rainfall, Gross Area Irrigated (GAI), area under principal crops, principal pulses and principal commercial crops in selected districts, and;

(v) Area, Production and Yield (APY) of major crops (2006-07) in selected districts.

3.2.1 Demographic Profile, WPR, Literacy Rates and Areas

A glance on (table No. 3.2.1) reveals that out of the five districts surveyed during the course of the study, Patna district is the most populous (47,18,592) followed by Muzaffarpur (37,46,714), Rohtas (24,50,748), Bhagalpur (24,23,172) and Khagaria (12,80,354). In regard to density of population, Muzaffarpur district (1,471) is well ahead followed by Bhagalpur (946), Khagaria (859) and lowest being in case of Rohtas (636), the whole state (Bihar) figure being as 880. The deductive reason for this is that Rohtas district possesses the largest geographical area (3851 sq. km) followed by Patna (3202 sq km), Muzaffarpur (3172 sq km), Bhagalpur 2569 sq. km), and; Khagaria (1486 sq km). As far as urbanization of the selected districts are concerned, the data in table clearly places Patna district as the most urbanized one

with lowest concentration of rural population (58.4%) followed by Bhagalpur (81.30%), Rohtas (86.70%), Muzaffarpur (90.70%), and; Khagaria (94.00%). The percentage of rural population for Bihar (89.50%) is more than Patna, Bhagalpur, and; Rohtas. Sex-ratio data reveals Muzaffarpur district to be in the most comfortable position (920 women per 1000 male) followed by Rohtas (909, Khagaria (885), Bhagalpur (876), and; Patna (873). Only Muzaffarpur district is better positioned on sex ratio parameter better than that of Bihar (919). The table further reveals child sex ratio to be highly in favour of Bhagalpur district (966) followed by Rohtas (951), Khagaria (932), Muzaffarpur (928), and; Patna 923). The state average on this front was 942. Concentration of scheduled caste population was found highest in Rohtas district (18.10%) followed by Muzaffarpur, Patna, Khagaria, and; Bhagalpur at 15.90, 15.50, 14.50, and; 10.50 respectively. The state's figure on this front is 15.70 per cent. Bhagalpur district had the highest concentration of Scheduled Tribe (ST) population (2.3%) followed by Rohtas (1%), Patna (0.2%), and; Muzaffarpur (0.1%). On the state level of Bihar, it is 0.1 per cent.

The work participation rate (WPR) for the state of Bihar was higher than in the districts of Rohtas, Muzaffarpur and Patna. Male WPRs in all the surveyed districts were as per the prevailing trend in the state, i.e., higher than that of female WPR. Having a glance on table 3.2.1, it is inferred that except Khagaria and Bhagalpur districts (42.20% & 38.40%), the concentrations of SC population were lower in Rohtas, Muzaffarpur and Patna districts (36.10%, 35.20%, and; 37.60%) respectively than the state figure (38.20%). Concentration of WPR for scheduled tribe population was highest in Khagaria district (53.00%) followed by Patna (46.10%), Bhagalpur, Rohtas, and; Muzaffarpur districts (40.80%, 39.40% and 31.90%) respectively. The state average was as high as 45.20 per cent. Here also female WPR was about half in most of the surveyed districts than respective percentages of male WPR. Data on literacy cell reveal highest literacy rate in case of Patna district (62.90%) followed by Rohtas (61.30%), Bhagalpour (49.50%), Muzaffarpur (48.00%), and; Khagaria (41.30%). Except Khagaria district, all surveyed districts have higher literacy rates than that of Bihar (47.00%). Female literacy rates in all the districts are, of course, quite lower than that of male. Except Rohtas district, literacy rates among scheduled castes' people in rest of the four districts are lower than that of scheduled tribe. The overall picture reveals Patna, Muzaffarpur and Bhagalpur districts to be in better

condition in regard to demographic profile and other components in comparison to Rohtas and Khagaria districts.

3.2.2 Classification of Working Population and Number

Economic activity wise classification of working population in surveyed districts corroborates the dominance of marginal workers over cultivators, agricultural labourers over household industry workers and other workers. Highest number of marginal workers could be seen in Bhagalpur district (274 thousand) followed by Patna (263 thousand), Muzaffarpur (244 thousand), Rohtas (199 thousand) and Khagaria (133 thousand) table No. 3.2.2. The data in table documents maximum concentration of cultivators in Patna district (43 thousand). It is followed by Muzaffarpur (40 thousand), Bhagalpur (36 thousand), Rohtas (33 thousand) and Khagaria (23 thousand). It implies that Patna; Muzaffarpur and Bhagalpur districts are more agrarian districts. As far as number of agricultural labourers is concerned, Bhagalpur district is at top (185 thousand) followed by Muzaffarpur (156 thousand), Patna (154 thousand), Rohtas (126 thousand) and Khagaria (94 thousand). The data provides sufficient ground to suggest that highest number of working population engaged in household industry were in Bhagalpur district (18 thousand). It is followed by Patna (12 thousand), Muzaffarpur (10 thousand), Rohtas (09 thousand) and Khagaria (only 3 thousand). Further, the data in table gauges largest number of other workers in Patna district 53 thousand. It is followed by Muzaffarpur (36 thousand) and Bhagalpur (33 thousand), Rohtas (29 thousand) and Khagaria (only 12 thousand).

Table in overall suggests that in regard to number of marginal workers, cultivators, agricultural labourers, household industry workers and other workers again the three districts of Patna, Muzaffarpur and Bhagalpur are ahead in comparison to the other districts, namely: Rohtas and Khagaria.

3.2.3 GDDP, Per Capita GDDP and Small Savings

The table No. 3.2.3 makes an attempt to lace the economic gradation/level of the districts selected for study through the thread of GDDP (as an average of 2003-04 and 2004-05), per capita GDDP, per capita saving and average per capita saving (for the years 2007-08 and 2008-09). The data presented in vivid tabular form reveals Patna district to be at top with highest average GDDP of Rs. 14,823 crore

(estimated for the years 2003-04 and 2004-05 calculated at 1999-2000 prices). Muzaffarpur district had second highest GDDP at Rs. 2852 crore followed by Bhagalpur at Rs. 2066 crore, Rohtas at Rs. 1822 crore and Khagaria only at Rs. 804 crore. The state GDDP was estimated at Rs. 62650 crore. In regard to per capita GDDP, the data emit a different picture. Here also, Patna district is at top with Rs. 29842. It was followed by Bhagalpur district (Rs. 8059), Muzaffarpur (Rs. 7225), Rohtas (Rs. 7056) and Khagaria (Rs. 5970). Per capita GDDP of Bihar Rs. 7168 was higher than Rohtas and Khagaria of the surveyed districts. The dimension of per capita saving also as 2007-08 data was found highest in Patna district Rs. 208.14. It was interestingly followed by Rohtas Rs. 93.56, Muzaffarpur, Bhagalpur and Khagaria districts Rs. 53.97, Rs. 29.06 and Rs. 21.28 respectively. Similar trend of average per capita saving in the surveyed districts could be observed in the year 2008-09. Average per capita saving in the districts calculated for the years 2007-08 and 2008-09 have been found in Patna district Rs. 188.40. It was followed by Rohtas Rs. 89.41, Muzaffarpur, Bhagalpur and Khagaria districts Rs. 57.82, Rs. 40.36 and Rs. 19.23 respectively. Having pored on data in table 3.2.3, it is revealed that Patna and Muzaffarpur, Bhagalpur and Rohtas districts are in better position on parameters of GDDP, per capita GDDP, per capita saving and average per capita savings.

3.2.4 Rainfall, Gross Area Irrigated, Areas under Crops

As far as rainfall in the districts selected for study is concerned, Khagaria district is blessed with highest average rainfall of 1147.70 mm followed by Bhagalpur 1111.60 mm, Muzaffarpur 1052.50 mm, Rohtas 836.2 mm and Patna 828.50 mm. Only two districts, Khagaria and Bhagalpur, did show higher average rainfall than the state average of 1098.30 mm (table No. 3.2.4). In regard to total area irrigated by different sources, Rohtas district had the largest area with 329253 ha there under. It was followed by Patna (190367 ha), Muzaffarpur (132998 ha), Khagaria (83155 ha) and Bhagalpur (79551 ha). Source wise data recount that largest area under irrigation in Rohtas district is by canals (82.59%) followed by tube wells (14.16%) and tank 2.98%). The percentage refers the area under irrigation by one source out of the gross irrigated area by all sources in the particular district. Tube well is the main source of irrigation in Muzaffarpur (99.60%) closely followed by Khagaria (99.15%), whereas Bhagalpur (78.12%) and Patna districts (69.88%) lagged behind. As per

the data available for the year 2002-03, Patna district has also significant proportion of land under canal irrigation (26.26%). Only Bhagalpur district has a meager area under irrigation through other wells (5.09%). Other sources of irrigation are also available in small extent in Bhagalpur, Patna, Khagaria and Rohtas districts (13.22%, 3.83%, 0.45% and 0.27%) respectively. A view of the table No. 3.2.4 reveals that in Rohtas, Muzaffarpur, Bhagalpur and Patna districts rice is the main food crop. In Bhagalpur district, maize occupies equally larger areas 46,000 ha. Wheat is the second prominently grown crop on all the surveyed districts except Khagaria, where maize and wheat are the main cereal crops. Maize and wheat also constitute significant proportion among principal crops. In Rohtas district, khesari, gram and masoor are major pulse crops, grown in 8000 ha, 5000 ha and 4000 ha respectively. In addition, arhar and peas are cultivated in 1000 ha each. In Muzaffarpur, Bhagalpur and Patna districts, masoor and khesadi are grown in quite larger areas. Gram is also grown in Rohtas, Bhagalpur and Patna districts. Only 1000 ha of land area are allocated for growing arhar in Rohtas, Muzaffarpur and Bhagalpur districts each.

In brief, Patna district leads in pulse production (59 thousand ha) followed by Rohtas 19 thousand ha, Bhagalpur 11 thousand ha, Muzaffarpur 4 thousand ha and Khagaria 03 thousand ha. Among cash crops, sugarcane is grown in Bhagalpur and Patna districts, only in small areas of 2 thousand and 1 thousand ha respectively. Potato is widely grown in Patna and Muzaffarpur districts in 7 thousand and 6 thousand ha respectively. Comparatively smaller areas are devoted for potato cultivation in Rohtas, Bhagalpur and Khagaria districts 3 thousand ha, 2 thousand ha and 1 thousand ha respectively (table No. 3.2.4).

3.2.5 APY of Major Crops in Surveyed Districts

Paddy

Area, production and yields of major crops in the districts selected for study have been presented in (table 3.2.5). The table estimates that Rohtas district have devoted largest area under paddy (rice) cultivation (166681 ha) among the surveyed districts as per data available for the year 2006-07. It was followed by Muzaffarpur, Patna, Bhagalpur and Khagaria districts (139377 ha, 88480 ha, 48200 ha and 22217 ha) respectively. The area under rice cultivation in Bihar has been estimated at

3364010 ha. Highest yield of rice in Rohtas district (2808kg/ha) has eventuated its production level to 468067 tones i.e., maximum among the five surveyed districts. It is about 1.87 times more than the average productivity of Bihar 1495kg/ha. The yield rates of Bhagalpur and Patna districts at 2370 kg/ha and 1643 kg/ha respectively were 1.58 times and 1.09 times more than that of Bihar. The yield of rice in Khagaria and Muzaffarpur districts are low at 861 kg/ha and 686 kg/ha respectively. In regard to production, after Rohtas district, position of Patna district was there followed by Bhagalpur, Muzaffarpur and Khagaria.

Wheat

As far as area, production and yield (APY) of wheat are concerned, the data in table 3.2.5 epitomize again Rohtas district having largest area under wheat cultivation 135644 ha (6.53%). It is trailed behind by Muzaffarpur 85448 ha, (4.11%), Patna 57643 ha, (2.77%), Bhagalpur 44159 ha (2.13%) and Khagaria 32229 ha (1.55%) of the total area under wheat in Bihar. Total area of Bihar under wheat cultivation has been estimated at 2076727 ha. In regard to yield of wheat, only two districts, namely: Rohtas and Patna, out of the five surveyed ones, had higher yield rates than the average yield of Bihar 2001 kg/ha. The same for Rohtas and Patna districts were 2436 kg/ha and 2147 kg/ha respectively. Yield rates of Muzaffarpur, Bhagalpur and Khagaria districts have been estimated at 1918 kg/ha, 1675 kg/ha and 1479 kg/ha respectively. With largest area and highest yield, naturally the total production of wheat in Rohtas district (330444 tones) is the highest. It is followed by Muzaffarpur (163884 tones), Patna (123775 tones), Bhagalpur and Khagaria (73965 tones) and (47665 tones) respectively.

Maize

Contrary to the trends of APY of earlier discussed two food crops rice and wheat, Khagaria and Bhagalpur districts showed their clear cut dominance over the other three districts regarding cultivation of maize. The largest area, highest production and productivity in case of maize could be observed in Khagaria district. These were 54737 ha, 224875 tones and 4108 kg/ha respectively. Though the yield of maize in Bhagalpur district (2361 kg/ha) is a bit lower than that of Patna district (2386 kg/ha), however, the area and production levels of former district are (44438 ha and 104899 tones) more than the later one (11965 ha and 28545) tones respectively. The

reason is that area in Patna district is 3.71 times less than that of Bhagalpur. It is interesting to note that except Khagaria district, the yield rates of maize in Patna, Bhagalpur, Muzaffarpur and Rohtas districts (2386 kg/ha, 2361 kg/ha, 2165 kg/ha and 1709 kg/ha) respectively are much lower than that of Bihar's average of 2738 kg/ha table No. 3.2.5. Rohtas district had only 591 ha of land under maize, while in Muzaffarpur it is estimated at 2543 ha.

Conclusively, in regard to area production and productivities of rice and wheat, Rohtas, Patna and Bhagalpur districts had edge. But, in regard to maize, Khagaria district followed by Bhagalpur and Patna were vividly in comfortable and better positions.

Table No. 3.2.1: Demographic Profile, WPR and Literacy Rates of Selected Districts

SN	Components	Rohtas	Muzaffarpur	Khagaria	Bhagalpur	Patna	Bihar
1.	Population	2450748	3746714	1280354	2423172	4718592	82998509
2.	Density	636	1180	859	946	1471	880
3.	Rural Population (%)	86.70	90.70	94.00	81.30	58.40	89.50
4.	Sex Ratio	909	920	885	876	873	919
5.	Child Sex Ratio	951	928	932	966	923	942
6.	Population of Scheduled Castes (%)	18.10	15.90	14.50	10.50	15.50	15.70
7.	Population of Scheduled Tribe (%)	1.00	0.1	0.00	2.30	0.2	0.9
8.	Work Participation Rates						
i.	Persons (All)	30.40	30.40	36.50	35.30	30.20	32.90
ii.	Male	45.70	46.70	48.50	47.40	44.90	46.30
iii.	Female	13.50	12.70	22.90	21.40	13.30	18.40
	Scheduled Castes						
i.	Persons (All)	36.10	35.20	42.20	38.40	37.60	38.20
ii.	Male	47.50	48.50	50.10	47.50	47.40	47.50
iii.	Female	23.40	20.90	33.50	28.00	26.50	28.20
	Scheduled Tribes						
i.	Persons (All)	39.40	31.90	53.00	40.80	46.10	45.20
ii.	Male	50.90	45.10	64.30	48.50	58.10	52.90
iii.	Female	26.80	17.80	39.30	32.10	29.50	36.90
9.	**Literacy Rates**						
i.	Male	75.30	59.10	51.80	59.20	73.30	59.70
ii.	Female	45.70	35.80	29.40	38.10	50.80	33.60
iii	Total	61.30	48.00	41.30	49.50	62.90	47.00
iv.	Scheduled Castes	41.30	28.90	24.20	33.70	38.60	--
v.	Scheduled Tribes	30.00	50.40	46.70	37.20	68.70	--
10.	Area in Sq. km	3851	3172	1486	2569	3202	94163

Source: Economic Survey (2008-09), Government of Bihar, February 2009

Table No. 3.2.2: Classification of Working Population and Number of Workers under Different Economic Classifications (in '000) According to Census 2001.

SN	Category of Workers	Rohtas	Muzaffarpur	Khagaria	Bhagalpur	Patna	Bihar
1.	Marginal Workers	199	244	133	274	263	6922
2.	Cultivators	33	40	23	36	43	1424
3.	Agriculture Labourers	126	156	94	185	154	4398
4.	Household Industry Workers	09	10	03	18	12	351
5.	Other Workers	29	36	12	33	53	750
6.	Total Number of Workers	744	1139	467	855	1425	--
7.	Agriculture Cultivators	255	291	120	169	313	--
8.	Agriculture Labourers	288	518	253	411	468	--
9.	Other Workers	201	330	94	275	644	--

Source: Bihar through figures, 2003 Directorate of Statistics & Evaluation, Bihar, Patna, Date of release 08/08/2007

Table No. 3.2.3: GDDP, Per Capita GDDP, Small Saving in Post Offices and PPF

SN	Components	Rohtas	Muzaffarpur	Khagaria	Bhagalpur	Patna	Bihar
1.	GDDP (1990-00 Prices) (Rs. in Crore), Average of 2003-04 & 2004-05	1822	2852	804	2066	14823	62650
2.	Per Capita GDDP (In Rs.)	7056	7225	5970	8059	29842	7168
3. a	Per Capita Saving (In Rs.) 2007-08	93.56	53.97	21.28	29.06	208.14	86.87
b	Per Capita Saving (In Rs.) 2008-09 up to November	85.27	61.67	17.18	51.66	168.67	77.01
c.	Average per capita Saving (In Rs.) Years 2007-08 and 2008-09	89.41	57.82	19.23	40.36	188.40	81.94

Source: Directorate of Statistics & Evaluation, Govt. of Bihar, Economic Survey 2008-09, February, 2009.

Table No. 3.2.4: Rainfall, Gross Area Irrigated, Area under Principal Crops, Principal Pulses, Principal Commercial Crops.

SN	Components	Rohtas	Muzaffarpur	Khagaria	Bhagalpur	Patna	Bihar
1.	Annual Average Rainfall (mm) 2001 to 20006	836.20	1052.50	1147.70	1111.60	828.50	1098.30
2.	Gross Area Irrigated Source wise Year 2002-03						
a.	Canals	271928 (82.59)	--	--	--	49992 (26.26)	1259338
b.	Tank	9824 (2.98)	532 (0.40)	332 (0.39)	2834 (3.57)	40 (0.03)	149071
c.	Tube wells	46645 (14.16)	132466 (99.60)	82,445 (99.15)	62147 (78.12)	133043 (69.88)	2965410
d.	Other wells	--	--	--	4050 (5.09)	--	18260
e.	Other sources	856 (0.27)	--	378 (0.45)	10520 (13.22)	7292 (3.83)	179503
f.	Total	3,29253	132998	83155	79551	190367	4571582
3.	Area under Principal Crops (Area in '000 ha 2002-03)						
i.	Rice	193	147	26	46	108	3585
ii.	Wheat	133	87	41	42	63	2127
iii.	Maize	01	33	48	46	11	603
iv.	Barley	02	--	--	02	01	17
4.	Area under Pulse Crops (Area in '000 ha)						
i.	Gram	05	--	--	03	08	69
ii.	Masoor	04	02	01	03	29	180
iii.	Arhar	01	01	--	01	--	34
iv.	Khesari	08	01	01	03	19	143
v.	Peas	01	--	01	01	03	22
vi.	Total Pulses	19	04	03	11	59	448
5.	Area under Cash Crops (Area in '000 ha)						
i.	Sugarcane	--	--	--	02	01	108
ii.	Potato	03	06	01	02	07	151
iii.	Tobacco	--	--	--	--	--	13
iv.	Jute	--	--	--	--	--	147
v.	Chilies	--	--	--	--	--	02

Source: Bihar through Figures, 2003 date of release 8th August, 2007

Table No. 3.2.5: Area, Production and Yield of major Crops in 2006-07, (Area, hectares, Production, tone, yield, kg/ha)

SN	Characteristics Features/Crops	Rohtas	Muzaffarpur	Khagaria	Bhagalpur	Patna	Bihar
1.	Rice						
i.	Area	166681	139377	22217	48200	88480	3364010
ii.	Production	468067	95559	19132	114288	145350	5027947
iii.	Yield	2808	686	861	2370	1643	1495
2.	Wheat						
i.	Area	135644	85448	32229	44159	57643	2076727
ii.	Production	330444	163884	47665	73965	123775	4155541
iii.	Yield	2436	1918	1479	1675	2147	2001
3.	Maize						
i.	Area	591	22543	54737	44438	11965	641215
ii.	Production	1010	48798	224875	104899	28545	1755949
iii.	Yield	1709	2165	4108	2361	2386	2738

Source: Economic Survey 2008-09, Government of Bihar, February 2009.

3.3 Selection of Activities

As per suggested methodology by the Co-ordinating Centre, selection of activities was to be made keeping in view the following points:

(i) Location and importance of the industries in terms of their share in units of enterprises in relation to comparative advantage of the cropping pattern and or resource base of the state and, (ii) For each category of enterprise, the dominant processing activity had to be selected considering the concentration of units in the state. As such, the selection of Agro Processing Activities (APAs) or Agro-Processing Industries (APIs) has been made as described hereunder:

3.3.1 Primary Food Processing Units (mainly Grain Processing Units)

Paddy being the main food crop of Bihar grown in largest area (33,02,000 ha) as per data available for the year 2007-08, 2nd Adv. Este, paddy based processing activity has been selected for study. The district has not only one of the largest areas under paddy in Bihar, but highest production of rice (468067 tones) was also recorded here. Further, under food processing activity, maximum number of rice mills (200) existed in Rohtas district, so this particular activity was selected for study.

3.3.2 Spice and Horticultural Products Based Processing Enterprise

Under this category of agro-food processing industries, horticultural products based industries were selected. Litchi is one of the most prominently grown fruits in Bihar (28.80 thousand ha) after mango and banana (29 thousand ha), on which processing enterprises are being run however, in a few number (Economic Survey, 2008-09, pp

63-66). Out of the total quantum of production of litchi in Bihar, highest proportion (81.91%) was grown in agro-climatic zone – I (comprising-- Saran, Siwan, Gopalganj, East Champaran, West Champaran, Muzaffarpur, Sitamarhi, Shehar, Vaishali, Darbhanga, Madhubani, Samastipur and Begusarai) districts. Muzaffarpur district in this zone was blessed with highest share in production of litchi (26.33%). It is due to this fact that out of 10 litchi based processing activities (as per information by Directorate of Horticulture, Government of Bihar), 06 are concentrated in Muzaffarpur district. So, litchi based processing activity was selected for study under this category.

3.3.3 Selection of Livestock Based Processing Activity

As a matter of fact, the dairy industry in the co-operative sector under the brand name Sudha is very successful in Bihar. The COMPFED markets milk and milk products and provides opportunities for significant rural employment and income, largely for women. There is growing consensus that the dairy sector has enough potential because of its symbiotic relationship with agriculture. In unorganized sector also, Milk based processing activity is the most prominent one. Maximum processing capacity of milk under co-operative sector was found in case of Barauni Dairy (BMU) estimated at 160 TLPD (as per the data of 2005-06). The highest capacity milk chilling centres/bulk coolers could be in Khagaria (40 TLPD) under BMU. Besides the advantage of having highest capacity of milk chilling centres under dairy co-operative system, the district of Khagaria had fairly large number of cows and buffaloes (174500 and 82700) respectively. These factors could positively contribute in greater concentration of milk based processing activities under unorganized manufacturing sector in the district. Larger concentration of milk products based processing activities (viz., khoa, paneer and butter) existed in Dhamaraghat-Badlaghat areas of Khagaria district. So, appropriately butter and khoa based activities were selected for study.

3.3.4 Agro-Non-food Processing Industries

Agro non-food processing industries had to be studied having divided (Source: Economic Survey 2008-09, p 93,95,97) it in groups of (i) textile, (ii) wood, (iii) paper and (iv) leather based processing activities. As the presence of any big/medium paper mill/paper based processing, enterprises could not be recorded in a good

operative condition under public/private sector in Bihar, so the study of agro non-food processing industries could be detailed in three types of activities/enterprises only.

3.3.4.1 Selection of Textile Based Processing Activities

The handloom industry under textile based processing enterprises assumes great significance in the context of Bihar. They are primarily concentrated in the districts of Bhagalpur, Patna, Gaya, Banka, Darbhanga, Arwal, Jehanabad, Aurangabad, Nawada, Nalanda, Bhabua, Khagaria, Madhubani and Siwan. For development of textile and handloom sectors, the state government has planned to establish a Textile Park under Public-Private Partnership (PPP). Of the total cost of this plan, 40.00 per cent or a maximum of Rs. 40 crore will be provided by the Central Government as share money and 9.00 per cent by the State Government as subsidy and share money. Again, a handloom park at Bhagalpur is also being planned having all the necessary basic infrastructure and other facilities, like: raw material bank, pre and post processing facilities, artisan village, R & D Centre, testing laboratory, information and training, etc. It is to be noted here that and silk units are located mainly in and around Bhagalpur. The silk weaving and printing works are largely and predominantly carried out here. As per the report of the Directorate of Industries, Government of Bihar, largest number of handlooms and power looms have been operational in Bhagalpur (6488 and 6393) respectively engaged in weaving of silk cloth. Besides, number of weavers having traditional expertise in weaving silk cloth was highest in the district. Raw materials are also available in surrounding districts of Banka, Jamui, Munger and other districts of Jharkhand state. These resource based factors resulted in highest concentration of silk weaving processing activities in the district. So, cloth (mainly silk) manufacturing activity was selected for study under textile based processing activity.

3.3.4.2 Selection of Wood based Processing Activity

The stems and trunks of trees are primarily used to make solid wood products, such as furniture, sofa, cot, bet, chairs, tables, musical instruments, sporting equipments, etc. All these are made from definite cut sizes, purposively processed and shaped pieces and specifically designed/measured pieces of wood. It is worth mentioning that these inputs are provided after first stage processing of stems of trees by shaw

mills. Patna is the capital of the state and the district, having highest population (4718592) and highest per capita GDDP (Rs. 29842), had very high demand of wood based processed items. Though forest areas are located in distant district of Jharkhand and North-Western border districts of East & West Champaran and far flung areas of Assam also. However, very high demand of wood products has caused concentration of wood based enterprises in the capital city of Patna. Patna district with the largest number of Saw mills in Bihar (93) houses largest number of furniture making enterprises. In this way, furniture making processing activity was selected under wood based processing activity in Patna district.

3.3.4.3 Selection of Leather based Processing Activities

According to Annual Survey of Industries (ASI), 2004-05, leather and leather products in Bihar had a small share (0.56 %) in its total production of Rs. 1922 thousand crore from the agro-based industries. However, considering the magnitude and quality of livestock wealth, there appears to be a good potential for industries relating to leather and leather products in the state. As per information available with the Directorate of Industries, Government of Bihar, shoes and other foot wear making enterprises' were the dominant leather based processing activity in Bihar. Patna district had larger number of cows and buffaloes (315100 & 265800) respectively. The magnitude and quality of livestock wealth created potential for industries related to leather and leather products in the district. Secondly, Patna is directly linked with Kolkata, Delhi & other major cities of the country by rail and road both. Raw materials for leather based processing activities are largely brought from Kolkata. In addition to these promoting factors, Patna has very high demand and purchasing power for leather based products (mainly foot wears and other wearing apparels). These resource based advantages have resulted in emergence of very high concentration of leather based processing units in the district. So, foot wear based leather processing activity has been selected for study in Patna district itself (table No. 3.3.1).

3.4 Profile of Sample Entrepreneurs of Agro-Processing Activities

Table 3.4.1 provides the data based structure of socio-economic profile of sample entrepreneurs. It is evident from the table that processing activity – IV (textile based processing activity) is run by members of momin community (100%). Processing

activity – V (i.e., wood based processing activity) has been undertaken by entrepreneurs of carpenters belonging to OBC group. Processing activity – VI (i.e., leather based processing activity) was run by run by entrepreneurs of SC class only. Processing activity Nos. I, II and III (i.e., cereals based processing enterprises, horticultural crop based processing activity and livestock based processing activities) were run by the entrepreneurs of OBC and others (50.00%, 33.34% and 66.66% for activity – II and 16.66 % and 83.34% for activity – III) respectively.

Regarding the age of sample entrepreneurs, data in table 3.4.1 embraces only 16.66 and 33.33 per cent of them in the senior citizen's age group of above 60 years to be engaged in processing activities – I, II and IV respectively. Most of the sample entrepreneurs belonged to the age group of 45-60 years. Almost equal percentages of 66.67 of sample entrepreneurs in this age group were found running processing activities – IV, V and VI.

As far educational status scenario of the sample entrepreneurs is concerned, only 16.66 per cent of them were found to be illiterate undertaking processing activity – III (i.e., in dairy based activity). 16.66 per cent and 33.34 per cent of sample entrepreneurs engaged in processing activities – I & II respectively were technically qualified. Majority of the sample entrepreneurs undertaking different processing activities were educated up to 10^{th} standard.

In regard to economic status in the form of land holding the table 3.4.1 depicts 66.67, 100 and 33.33 per cent of the sample entrepreneurs owning processing activities – IV, V and VI respectively to have owned <1 ha and 1-2 ha of land. Only 16.66 per cent and 50.00 per cent of them is running processing activities I and II (i.e., cereal based and horticultural crop based processing activities), were found owning more than 10 ha of land area. Rest of the sample entrepreneurs running agro food based processing activities – I, II and III were in the land holding groups of 2 to 4 ha and 4-10 ha.

For previous experience in selected activities, the table inscribes all of the sample entrepreneurs to have more than five years' experience. Only 16.67 per cent and 33.34 per cent of the entrepreneurs running activities – I and IV (i.e., cereal based

processing activity and textile based processing activity) possessed more than 30 years experience.

Further, 16.66 per cent, 50.00 per cent and 33.33 per cent of sample entrepreneurs in activities I, III and VI did have previous experience of 20-30 years. However, maximum concentrations of entrepreneurs with previous experience in selected activities were in the ranges of 5 to 10 years and 10-20 years. Nature of experience was mostly learned traditionally and through working experience. Only 16.67 per cent of the sample entrepreneurs running processing activity – II (i.e., horticultural products based processing activity) was, to a great extent, inspired by training element.

Traditional background, higher profit margin and previous experience were the main deserving factors that motivated the entrepreneurs of both agro food and agro non-food processing activities to undertake the enterprise. Demand for the products was also one of the factors for motivating the NDME entrepreneurs of horticulture, livestock and textile based activities. However, only OAMEs of cereal based and horticultural products based processing activities were found to have been motivated by lack of avenues, demonstration effect and to get employment (16.67%, 16.67% and 16.66%) respectively table (3.4.2).

Table 3.4.3 documents the composition of the average family size of the sample entrepreneurs. The average size of the family varied between 5.67 to 15.00 for agro food and 8.00 to 12.00 for agro non-food enterprises. It can also be seen that for OAME and NDME of cereal and horticultural products based activities, women acted as earning members. Under agro non-food activities, participation of women as earners could be seen in case of OAMEs of textile and wood based activities and NDME and DME of leather based activities (the later two participated in managerial roles).

In nutshell, socio-economic profile of sample entrepreneurs reveals that entrepreneurs with mostly secondary level or lower education, belonging to different land holding classes have been prompted by traditional learning and working experience to undertake agro-processing activities. The literacy and land holding status of sample entrepreneurs running agro non-food processing activities are

comparatively poor. Location and available resources based specific measures to train the willing and prosperous entrepreneurs with the provision of making required inputs (machines, tools, equipments and physical capital at subsidized rates) will definitely brighten the prospects of APIs in particular and the economy of Bihar in general.

Table No. 3.3.1: District wise and Activity wise Selection of Sample Processing Units (Number)

Processing Activity		District – I			District – II			District – III			District – IV			District – V			District - VI			Total			
		OAME	DME	NDME	OAME	DME	NDME	OAME	DME	NDME	OAME	DME	NDME	OAME	DME	NDME	OAME	DME	NDME	OAME	DME	NDME	Total
A.	Food Processing	03	01	02																			
1.	Paddy Based Processing Activity (Grain Processing Units, i.e., Rice Mill)																						
2.	Horticultural Products (Litchi Based)				03	01	02																
3.	Livestock Based Processing Units (Dairy Related Activity)							03	01	02													
B.	Non-Food Processing																						
1.	Textile Products (Silk Cloth Manufacturing)										01	01	01										
2.	Wood and Its Products													01	01	01							
3.	Leather and its Products (Footwear Making Activity)																01	01	01				
	All Activities	03	01	02	03	01	02	03	01	02	01	01	01	01	01	01	01	01	01	12	06	09	27

District – I :Represents Rohtas, District – II is meant for Muzaffarpur, District – III Khagaria, District – IV Signifies Bhagalpur, District – V Symbolizes Patna, District – VI is also meant for Patna district.

Table No. 3.4.1: Socio Economic Profile of Sample Entrepreneurs (Numbers)

SN	Variables	Category	Food Processing Units Reporting			Non Food Processing Units Reporting		
			Processing Activity –I (6)	Processing Activity – II (6)	Processing Activity – III (6)	Processing Activity – IV (3)	Processing Activity – V (3)	Processing Activity – VI (3)
1.	Social Group	SC/ST	--	--	--	03 (Momin) (100.00)	--	03 (100.00)
		OBC	03 (50.00)	02 (33.34)	01 (16.66)	--	03 (100.00)	--
		Others	03 (50.00)	04 (66.66)	05 (83.34)	--	--	--
2.	Age (Years)	< 25						
		25-45	02 (33.34)	03 (50.00)	03 (50.00)	--	01 (33.33)	01 (33.33)
		45-60	03 (50.00)	02 (33.34)	03 (50.00)	02 (66.67)	02 (66.67)	02 (66.67)
		>60	01 (16.66)	01 (16.66)	--	01 (33.33)	--	--
3.	Education	Illiterate	--	--	01 (16.66)	--	--	--
		Up to 10th Standard	02 (33.34)	01 (16.66)	03 (50.00)	03 (100.00)	02 (66.67)	02 (66.67)
		Above 10th Standard	03 (50.00)	03 (50.00)	02 (33.34)	--	01 (33.33)	--
		Technically Qualified	01 (16.66)	02 (33.34)	--	--	--	01 (33.33)
4.	Land Holding	Nil	--	--	--	--	--	--
		< 1 ha	--	--	--	02 (66.67)	03 (100.00)	03 (100.00)
		1-2 ha	02 (33.34)	--	02 (33.34)	01 (33.33)	--	--
		2-4 ha	01 (16.66)	02 (33.34)	01 (16.66)	--	--	--
		4-10 ha	02 (33.34)	01 (16.66)	03 (50.00)	--	--	--
		>10 ha	01 (16.66)	03 (50.00)	--	--	--	--
		Secondary	--	--	--	--	--	--
5.	Previous Experience in Selected Activity	Nil	--	--	--	--	--	--
		< 5 years	--	--	--	--	--	--
		5-10 years	01 (16.67)	02 (33.33)	01 (16.66)	01 (33.33)	01 (33.33)	01 (33.34)
		10-20 yrs	03 (50.00)	04 (66.67)	02 (33.34)	01 (33.33)	02 (66.67)	01 (33.33)
		20-30 yrs	01 (16.66)	--	03 (50.00)	--	--	01 (33.33)
		>30 years	01 (16.67)	--	--	01 (33.34)	--	--
6.	Nature of Experience	Learned Traditionally	03 (50.00)	01 (16.66)	04 (66.67)	02 (66.67)	02 (66.67)	01 (33.33)
		Working Experience	03 (50.00)	04 (66.67)	02 (33.33)	01 (33.33)	01 (33.33)	01 (33.34)
		Trained	--	01 (16.67)	--	--	--	01 (33.33)

Note: Figures in brackets indicate percentages.

Table No. 3.4.2: Motivating Factors for the Sample Entrepreneurs (Number) Entrepreneurs reporting

SN	Name of the Processing Activity	Type of Enterprise (OAME/ NDME/ DME)	Traditionally Followed (1)	Previous Experience (2)	Demonstration/ Effect (3)	Persuasion by Others (4)	Higher Profit Margin (5)	Demand for The Product (6)	Lack of other Avenues (7)	To get Employment (8)
A	**Food Processing**									
1.	Grain Processing Activity (Paddy)	OAME	1 (16.67)	1 (16.67)	--	--	--	--	1 (16.67)	-
		NDME	--	1 (16.67)	--	--	1 (1.65)	--	--	--
		DME	--	1 (16.67)	--	--	--	--	--	--
2.	Horticultural based Processing Activity (Litchi)	OAME	--	1 (16.67)	1 (16.67)	--	--	--	--	1 (16.66)
		NDME	1 (16.67)	--	--	--	--	1 (16.66)	--	--
		DME	--	--	--	--	1 (16.67)	--	--	--
3.	Livestock based Processing Activity (Dairy)	OAME	3 (50.00)	--	--	--	--	--	--	--
		NDME	--	--	--	--	1 (16.67)	1 (16.66)	--	--
		DME	--	1 (16.67)	--	--	--	--	--	--
B.	**Non-food Processing**									
1.	Textile based Processing Activity (Silk)	OAME	1 (33.33)	--	--	--	--	--	--	--
		NDME	--	--	--	--	--	1 (33.34)	--	--
		DME	--	--	--	--	1 (33.33)	--	--	--
2.	Wood based Processing Activity	OAME	1 (33.34)	--	--	--	--	--	--	--
		NDME	--	--	--	--	1 (33.33)	--	--	--
		DME	--	--	--	--	1 (33.33)	--	--	--
3.	Leather based Processing Activity (Shoe/Foot wearing)	OAME	1 (33.33)	--	--	--	--	--	--	--
		NDME	--	1 (33.34)	--	--	--	--	--	--
		DME	--	--	--	--	1 (33.33)	--	--	--

Note: Figures in brackets indicate percentages of total entrepreneurs in the category of enterprise.

Table No. 3.4.3: Average Size of the Family and its Composition of the Sample Entrepreneurs (Numbers)

SN	Name of Processing Activity	Type of Enterprise (OAME/ NDME/ DME)	Men		Women		Children	Total	Average Size of Family
			Earner	Dependent	Earner	Dependent			
A.	**Agro Food**								
1.	Grain Processing Based Units (Paddy)	OAME	O6	07	02	05	06	26	8.67
		NDME	04	06	01	03	05	19	8.50
		DME	03	06	00	03	03	15	15
2.	Horticultural Products Based Processing Activities (Litchi)	OAME	04	05	02	00	06	17	5.67
		NDME	02	02	00	04	04	12	6.0
		DME	03	00	00	03	04	10	10
3.	Livestock based Processing Activity (Dairy)	OAME	06	03	00	04	05	18	06
		NDME	04	04	00	03	04	15	7.5
		DME	02	01	00	03	02	08	08
B.	**Non-food Processing**								
1.	Textile based Processing Activity (Silk)	OAME	02	01	02	01	03	09	09
		NDME	02	02	00	02	02	08	08
		DME	02	03	00	03	04	12	12
2.	Wood based Processing Activity	OAME	02	00	01	03	02	08	08
		NDME	02	01	00	03	03	09	09
		DME	01	02	00	03	02	08	08
3.	Leather based Processing Activity (Shoe/Foot wearing)	OAME	03	00	00	03	03	09	09
		NDME	02	01	01	02	03	09	09
		DME	03	01	01	03	02	10	10

CHAPTER - IV

COST OF INVESTMENT AND ITS FINANCING

This chapter enounces analytical details related to
(i) Status of the sample units;
(ii) Cost of Investment, and
(iii) Financing of the investment

4.1 Status of the sample Units

Table 4.1 Presents the status of the sample units. It reveals that most of the units are existing ones. It can also be seen that most of the surveyed processing units have been working in unorganized sector tiny, small and artisan based enterprises and so they are mostly unregistered. Paddy based processing industry i.e, rice mill in Rohtas district under the category of DME, Litchi based processing industry at Muzaffarpur 'Litchika International,' are registered under agro food processing activities, Directory Manufacturing Enterprises (DME), in the fields of leather and 'wood–based processing enterprises both in Patna district are registered. Except, one OAME under food processing activity and one NDME under horticultural products based processing activity, all the sample units were existing ones. Average age of the sample processing units ranged between 08 to 35 years (table No. 4.1).

DMEs under cereal based processing activity in Rohtas district occupied largest area (35,865sq.ft.). It was followed by DMEs of horticultural product based activity (8,000sq.ft.), wood based processing activity (1,400sq.ft.) and livestock based processing activity also spread in a significantly larger area of 1,500sq.ft.

4.2 Cost of Investment

Table 4.2 presents the details of investment made by the sample entrepreneurs. On having a glance at the table, it is revealed that generally within a particular group of processing activity, investment increased with the size of the unit. The size of the total investments went on increasing with the size of the enterprises. OAMEs showed lower total investments in comparison to that of NDMEs and DMEs. The percentages of working capital were found lower in case of OAMEs than NDMEs

and DMEs except in case of livestock based processing activity and textile product enterprises. Data in Table No. 4.2 also suggest that size of the investments which were higher in case of DMEs meant for primary food based processing unit i.e., rice mill (Rs.77,96,000/-), litchi based processing activity (Rs.1,59,60,000/-), livestock based processing activity (Rs.10,50,000) wood based and leather based DMEs (RS.16,00000/-) and (RS. 9,00000/-) respectively . Percentages of block capital have remained much higher than respective working capitals in all the three groups (OAMEs, NDMEs and DMEs), in case of both agro-food processing activities and agro non-food processing enterprises except NDME and DME of wood–based processing activities. Possible reason for this may be that the machineries, tools, equipments, do not require heavy expenditure for this enterprise. Besides, comparatively higher expenses are incurred in procuring raw materials (wood from Assam, Bettiah and distant remote areas of Jharkhand and West Bengal). Share of block capital is seen to be very high in all cases. It varied from 86.96 per cent to 57.15 per cent in regard to agro-food processing activities and from 72.23 per cent to 39.66 per cent in case of agro non-food processing activities.

4.3 Financing of Investment

Table 4.3 elaborates the extent /magnitude of own fund, institutional loan and non – institutional loan that are used for financing the investment. The NDME and DME under' cereal based processing activity and DMEs of horticultural crop based 'wood and its products based' and 'leather and its products based processing activities' were found to have taken institutional loans in varying degrees (7.44%, 25.65%,10%, 31.25% and 16.67%) respectively . As the larger processing activities, particularly DMEs under both agro-food and agro-non–food categories are registered ones, so they could have received institutional loans under DIC/KVI or other schemes. Except DMEs of Cereal based and 'wood based processing activities' and OAME of livestock based entrepreneurs only, all other sample entrepreneurs had taken loans from non-institutional sources for meeting their respective investments. In all cases the share of own funds were quite higher than that of institutional and non-institutional finances. It ranged from a minimum of 60.00 per cent incase of DME of textiles products to a maximum of 100 percent in case of OAMEs of 'livestock products–based processing activity.'

Concluding Observation

For most of the sample entrepreneurs, respective processing activities are main occupation except OAMEs of all the three types of food processing activities. In view of the short to medium–term (years) experiences of the entrepreneurs in their respective traditional or motivated activities, if they are provided with ensured and remunerative marketing facilities, there will be copious expansion in the number of APIs in Bihar.

Higher share of non – institutional loan for running APIs (both agro-food based and agro –non –food based) reveal the comparatively easy accessibility and availability of near desired quantum of financial assistance by non-formal sources. Procedural complexities in procuring loans from formal sources of credit have not encouraged the entrepreneurs to the mark to seek financial assistance from banks. The small entrepreneurs (OAMEs and NDME levels) may be provided all financial assistances by formal credit institutions. They should be provided technical and supervisory assistance by the personnels of District Industries Centres (DICs). Such assistance/helps may also be extended by experts and faculties of 'food processing and preservation departments' of local or regionally existing agricultural colleges.

Table No. 4.1: Status of the Sample Units (Numbers)

SN	Name of the Processing Activity	Type of Enterprise (OAME/ NDME/ DME)	By Occupation of the Entrepreneurs		By Year of Existence		Average age of the Sample Units (Yrs)	Registration Status		Average Area (Sq ft)
			Main	Secondary	New	Existing		Registered	Not Registered	
1	2	3	4	5	6	7	8	9	10	11
A.	**Agro Food**									
1.	Grain Processing Based Units (Paddy)	OAME	02	01	01	02	20	--	03	170
		NDME	02	--	--	02	22	--	02	1500
		DME	01	--	--	01	24	01	--	35865
2.	Horticultural Products Based Processing Activities (Litchi)	OAME	00	03	--	03	13	--	03	100
		NDME	01	01	01	01	08	--	00	225
		DME	01	--	--	01	20	01	00	8000
3.	Livestock based Processing Activity (Dairy)	OAME	02	01	--	03	15	--	03	360
		NDME	02	--	--	02	16	--	--	600
		DME	01	--	--	01	18	--	--	1000
B.	**Agro-Non-food**									
1.	Textile based Processing Activity (Silk)	OAME	01	--	--	03	22	--	03	260
		NDME	01	--	--	02	25	--	02	600
		DME	01	--	--	01	30	--	01	750
2.	Wood based Processing Activity	OAME	01	--	--	03	15	--	03	350
		NDME	01	--	--	02	18	--	02	700
		DME	01	--	--	01	14	01	00	1400
3.	Leather based Processing Activity(Shoe/Foot wearing)	OAME	01	--	--	03	18	--	03	100
		NDME	01	--	--	02	16	--	02	400
		DME	01	--	--	01	35	01	-	350

Table No. 4.2: Details of Investment made by Entrepreneurs of Sample Processing Units

SN	Name of the Processing Activity	Type of Enterprise (OAME/ NDME/ DME)	Per Unit Investment (In Rs.)			
			Block Capital	Working Capital	Total	
1	2	3	4	5	6	7
A.	**Agro Food**					
1.	Grain Processing Based Units (Paddy)	OAME	82,000 (80.39)	20,000 (19.61)	1,02,000 (100.00)	***Note:***
		NDME	4,10,000 (76.34)	1,27,100 (23.66)	5,37,100 (100.00)	**Block Capital** Includes (i) Machinery, (ii) Tools, (iii) Equipment, (iv) Electric Items, (v) Building/Work shed.
		DME	50,00000 (64.14)	27,96,000 (35.86)	77,96,000 (100.00)	
2.	Horticultural Products Based Processing Activities (Litchi)	OAME	70,000 (86.96)	15,000 (13.04)	80,500 (100.00)	
		NDME	3,60,000 (83.72)	70,000 (16.28)	4,30,000 (100.00)	
		DME	1,02,00000 (63.91)	57,60,000 (36.09)	1,59,60,000 (100.00)	
3.	Livestock based Processing Activity (Dairy)	OAME	1,50,000 (66.67)	75,000 (33.33)	2,25,000 (100.00)	**Working Capital** Comprises (i) Expenditure on procurement/ storing of raw materials, (ii) Payment to human labour, (iii) Transportation charges (iv) Expenses in Marketing (v) Tax (vi) Insurance payment, etc.
		NDME	5,00,000 (57.15)	3,75,000 (42.85)	8,75,000 (100.00)	
		DME	7,50,000 (71.43)	3,00,000 (28.57)	10,50,000 (100.00)	
B.	**Non-food Processing**					
1.	Textile based Processing Activity (Silk)	OAME	70,000 (58.34)	50,000 (41.66)	1,20,000 (100.00)	
		NDME	2,53,000 (63.41)	1,46,000 (36.59)	3,99,000 (100.00)	
		DME	4,00,000 (57.81)	2,92,000 (42.19)	6,92,000 (100.00)	
2.	Wood based Processing Activity	OAME	45,000 (69.23)	20,000 (30.77)	65,000 (100.00)	
		NDME	2,30,000 (39.66)	3,50,000 (60.34)	5,80,000 (100.00)	
		DME	7,00,000 (43.75)	9,00,000 (56.25)	16,00,000 (100.00)	
3.	Leather based Processing Activity (Shoe/Foot wearing)	OAME	52,000 (72.23)	20,000 (27.77)	72,000 (100.00)	
		NDME	2,25,000 (52.89)	2,00418 (47.11)	4,25,418 (100.00)	
		DME	5,00,000 (55.56)	4,00,000 (44.44)	9,00,000 (100.00)	

Note: Figures in brackets indicate percentage of total.

Table No. 4.3: Financing of Investment (In Rs.)

SN	Name of the Processing Activity	Type of Enterprise (OAME/ NDME/ DME)	Average Gross Value of Investment Per Unit	Sources of Fund per Unit		
1	2	3	4	5	6	7
				Own Fund	**Institutional Loan**	**Non-Institutional Loan**
A.	**Agro Food**					
1.	Grain Processing Based Units (Paddy)	OAME	1,02,000	87,860 (86.14)		14,140 (13.86)
		NDME	5,37,100	3,37,970 (62.93)	40,000 (7.44)	1,59,130 (29.63)
		DME	77,96,000	57,96,000 (74.35)	20,00,000 (25.65)	---
2.	Horticultural Products Based Processing Activities (Litchi)	OAME	80,500	64,400 (80.00)	--	16,100 (20.00)
		NDME	4,30,000	3,44,00 (80.00)	--	86,000 (20.00)
		DME	1,59,60,000	1,08,52,800 (68.00)	15,96,000 (10.00)	35,11,200 (22.00)
3.	Livestock based Processing Activity (Dairy)	OAME	2,25,000	2,25,000 (100.00)	--	--
		NDME	8,75,000	7,43,750.00 (85.00)	--	1,31,250 (15.00)
		DME	10,50,000	7,87,500 (75.00)	--	2,62,500 (25.00)
B.	**Agro Non-food**					
1.	Textile based Processing Activity (Silk)	OAME	1,20,000	96,000 (80.00)	--	24,000 (20.00)
		NDME	3,99,000	2,79,300 (70.00)	--	1,19,700 (30.00)
		DME	6,92,000	4,15,200 (60.00)	--	2,76,800 (40.00)
2.	Wood based Processing Activity	OAME	65,000	45,000 (69.23)	--	20,000 (30.77)
		NDME	5,80,000	4,80,000 (82.75)	--	1,00,000 (17.25)
		DME	16,00,000	11,00,000 (68.75)	5,00,000 (31.25)	--
3.	Leather based Processing Activity (Shoe/Foot wearing)	OAME	72,000	60,000 (83.33)	--	12,000 (16.67)
		NDME	4,25,418	3,40,418 (80.02)	--	85,000 (19.98)
		DME	9,00,000	6,50,000 (72.21)	1,50,000 (16.67)	1,00,000 (11.12)

Note: Figures in brackets indicate percentage of total Investment.

CHAPTER - V

ECONOMICS OF INVESTMENT IN AGRO PROCESSING UNITS

This chapter seeks to examine: (i) Production and operation cycle of the activities, (ii) Sources of raw materials and marketing linkages of the processed product, (iii) Cost of production, (iv) Net income of the investment, and; (v) Employment generation.

5.1 Production and Operation Cycle of the Activities

Table No. 5.1 conveys the details of the functioning of sample processing units. Number of working days per month as well as working hours per hour were seen uniform in most of the cases, except in horticultural crop (litchi) based, dairy products' based and textile products' based processing activities. As litchi based processing activity is run hardly for 22 days to one month, so, in case of DME of this, double shift work is undertaken. In regard to textile processing activity also, two production activities in two shifts, or more than 08 hours are undertaken. So, in these cases, per working hours/day is longer. Livestock based processing activity is everyday business without fail on priority basis; however, its work hour is shorter (05 hours). Depending upon the nature of activities, number of days required for other components of the whole operation cycle (viz., input stock, production process, output stocking, marketing and credit realization) was seen to be different for different processing activities table No. 5.1. The number of production cycles, which the unit completes in a year, also differs with the type and size of the processing unit. Except for 'cereal based processing activity and litchi based processing activity, the numbers of working days/year were quite higher (ranging from 300 to 355) for all other activities. The reason being the fact that litchi is a very short duration crop (available for processing from 22 days to a maximum of 30-35 days). Paddy is also not available for continuous processing in abundant quantum for more than three to four months. Number of days taken for credit realization was lower in case of OAMEs and NDMEs of most of the processing activities as they generally took loans from non-formal agencies. In regard to production cycle/year, the data in table

discloses that it, was, quite higher only in cases of livestock (300) and leather and its products based processing activity (ranging from 312 to 355). In all other activities, numbers of production cycle were quite lower depending upon the availabilities of raw materials, time taken in bringing them to consumable form and scale of operation.

5.2 Sources of Raw Materials and Marketing Linkages of the Processed Product

This section explains about the markets, from where agro food processing based and agro non-food based processing activities' obtained their raw materials and used to sell their finished products. This provides on idea about the number of linkages the entrepreneurs had with input and output markets.

As OAMEs and NDMEs are small units often working with mainly family labour, they couldn't prefer or manage to reach out to various markets (table No. 5.2) underlines four type of sources, from where the sample entrepreneurs generally obtained raw materials (required production inputs). These are (i) source – l, Local farmers/Local growers, (ii) Source –II, 'Local Market/Farmers' Co-operative Societies/PACS (meant for paddy based processing activity)/wholesaler providing order (meant for textile based and litchi based processing activities,' (iii) Middlemen/carrier/Established Trade Channel (mainly meant for silk thread) and (iv) source – iv, Market(s) outside the district/state/established trade channel (meant for litchi, silk, thread, wood, leather).

Source – I of procuring raw materials was used by a good number of sample entrepreneurs of OAMEs, NDMEs and DME categories under agro-food processing activities (25% to 100%). Except OAMEs of paddy and livestock and NDMEs and DMEs of textile, wood and leather based processing activities, all sample entrepreneurs under different classes used source – II for procuring raw materials. NDMEs of textile and wood and DME of textile based processing activities used source – III in a big way (100% and 50%) respectively. DMEs of all the three food processing activities also used source – III (25%, 25% and 50%) respectively. Source- IV of procuring raw materials was prominently used by agro non-food processing activities. DME of cereal based processing activity also used this source (25%).

The table No. 5.3 contains data to look up the use of terminal markets, where processed goods' are sold by sample processing units. It is revealed that ecept OAMEs, NDMEs and DMEs of livestock based processing units' and textile based activities; all other processing activities used Market – I (local market). Butter cream and Khoa like 'value added products of milk were found to have been sold in wide market of Kolkata. Textile and 'livestock products based goods' are sold to wholesaler/retailer. The marketing is also done through middlemen' OAMEs and NDMEs of 'paddy' and 'litchi' based products' used both market-I and market – II (i.e., wholesaler and retailer/middlemen (33.34%, 66.66% and 50.00% each for 'cereal based' and 33.34%, 66.66% and 100% for 'horticultural crop based activities) respectively. It was interesting to note that market-I was prominently used by all the three categories of activities under 'agro non-food based processing activities (wood and leather 100%). Market-II was fully used by livestock and textile based activities (100.00 per cent table No. 5.3). Here, it can be suggested that with a view to enhance the size of net income earned by the entrepreneurs, the presence of middlemen will have to be reduced by forming, strengthening and expanding Co-operative Marketing Channel.

It is notable that since the units are small with the maximum number of workers being 9 (except DME of litchi processing activity' undertaken for a very short duration of hardly one month or so with the help of quite a larger number of workers for that period, and after that again the number of workers are reduced to less than 10 for other pretty pulp, juice, and syrup making activities) no unit in the total sample were found to exporting the produce. Hence, table No. 5.4 does not carry any information about the exports of the value added products. Thus, for all the sample entrepreneurs, 100.00 per cent of the output could be seen sold domestically. Table No. 5.4 includes data related to values of total output of processed products, outputs marketed (average for all the units in the category). Total output of processed products were different across the type of enterprises in different and within the particular group of processing activities. The average values of total output of processed products were as high as Rs. 5,71,39,992, Rs. 1,29,40,000, Rs. 15,19,481.50, Rs. 13,20,000, Rs. 19,80,000 and Rs. 13,47,500 for DMEs of cereal based, horticultural products, livestock products, textile, wood and leather

based processing activities respectively. The value added products' were marketed wholly in domestic markets.

Whereas the earlier tables showed the number of channels of marketing, table Nos. 5.5 and 5.6 reveal the sources, from where raw materials have been purchased and markets, where the produces were sold. It also shows that processing activity-III (livestock based activity) purchased raw materials mainly from farmers directly (05) and farmers' co-operative society (01) through the latter's retail channel. Other two types of agro-food based processing activities' used all the three channels for purchasing raw materials. Among non-food agro processing activities, raw materials, were wholly purchased from channel – III (i.e., through established trade channels and market channels table No. 5.5).

Table No. 5.6 encompasses the data showing marketing channels, where the sample entrepreneurs were found selling processed products domestically. It can be seen from the table that half of the total sample entrepreneurs for 'cereal based activity' sold their processed product (rice) directly in the terminal markets. Channel of middlemen came second (02) and wholesaler (01) followed it. Entrepreneurs of processing activity-II (horticulture based activity) mainly used the channel –I, i.e., terminal market (4) and channel – 2(b) middlemen (02). Sample entrepreneurs of processing activities-III and IV (livestock based and textile based) were seen to have sold their products through channel – 2 (a) and 2 (b), means wholesalers and middlemen table No. 5.6). It was interesting to note that under agro non-food processing activities –IV and V (wood based and leather based activities) the entrepreneurs used cent per cent, terminal market (03 each). It can thus be inferred that terminal market for processing activities –III and IV and other market functionaries for activities – II, V and VI have to be strengthened and made easily available with remunerative prices.

5.3 Cost of Production

Table No. 5.7 embodies fixed costs which recur throughout the process of production. Interest on capital (containing: own fund, bank loan and other loan), and depreciation and other fixed costs form the part of this section. Within each category, the quantum of fixed costs is seen to be increasing with the size of the unit. As most of the small, enterprises belonging to various food and agro non-food

processing activities have been working under unorganized sectors, so they are not registered and feel difficulty in achieving bank loan. Only NDMEs and DMEs of cereal based and horticultural products based activities (under agro food processing activities) and DMEs of wood and leather based activities (under agro non-food processing category) were found to have taken loans from banks. The percentages of their bank loans to total fixed costs were: 6.34, 18.24, 27.12, 12.35, 21.37 and 13.20 respectively (table No. 5.7). It is, therefore, interest that forms a part of fixed capital only for these six units which took loans for running their enterprises. Other fixed costs (periodic maintenance, rent, insurance premium, taxes and salaries, bonus) and depreciation are the main components of the recurring fixed costs. It is obvious that major part of recurring fixed costs is shared by own fund ranging between 61.70 per cent to 85.15 per cent for agro-food based processing activities' and from 64.51 per cent to 82.19per cent in case of agro non-food based processing activities.

As far as recurring variable costs of the investments by sample entrepreneurs are concerned, it refers to costs that vary with the level of production almost proportionately. It confiscates within its purview components like: (i) Repairs and replacement of machinery, (ii) cost on raw materials, (iii) wages, (iv) marketing cost, (v) electricity charges, and; (vi) interest on working capital. Table No. 5.8 reveals that cost on raw materials is the major component of the variable cost for most of the activities, except DME of horticultural products (36.89%) and NDME, (31.90%), DMEs of textile (29.91%) and NDMEs and DMEs of wood and leather based processing activities (18.61%, 43.50%, 21.52% and 20.04%) respectively. In all these cases, share of investment on wages slightly dominated. For these agro non-food based processing activities, generally, proportion of cost on raw materials is seen to be declining with increase in the size of the units in the respective categories. This is because with increase in the size, other costs like: those on wages, electricity charges (in some cases) and interest on working capital are seen to be increasing. The cost on raw materials is lower for the non-food units (in particular), like textiles and wood because the units did not have to buy full quantum of the basic raw materials to be processed. As a matter of fact, the units were provided with the raw materials for processing by some of the customers, who took back the processed products.

5.4 Net Income of the Investment

Table No. 5.9 compares gross value of the output of the processed products vis-à-vis investment and presents the amount of net income earned by the sample units. Out of the total 18 processing activities surveyed (06 each under three types of agro food based activities and 09 processing activities (03 each under agro non-food processing activities).Out of this, in 12 cases variable costs were found higher. However, in cases of OAMEs of horticulture, wood and leather based processing activities, DME of textile and NDMEs and DMEs of leather based activities fixed costs could be seen higher. In absolute terms, the textile and wood processing units were seen to have had heavy total investments as compared to other units under agro non-food processing activities. For all the units, the total investments were compared with the gross value of the outputs to find the net returns. All the activities and units showed positive net returns. Data in table reveal that except DME of livestock based processing activity, in all other cases under agro food processing activities net returns increased with the size of the units. This might be because of the higher interests on capital involved as own fund, other loan (under fixed costs and larger amount incurred as variable cost (Rs. 10,06,625/-). Under agro non-food processing activity group also, similar pattern could be observed except in case of net income by DME of textile based processing activity (Rs. 46,600/-), which is a bit lower than its NDME (Rs. 51850/-) table No. 5.9. This might be because of the heterogeneous nature of these non-food processing activities. It finally points out at the efficiency of the investments of the bigger units. Net incomes earned by larger units couldn't be seen to be proportionately higher as their total expenditures rose more than proportionately. Thus, the efficiency of processing units of smaller size also can not be denied.

5.5 Employment Generation

Table No. 5.10 contains data explaining scenario of employment generation of the surveyed processing units. It can be seen that the number of total labour in the units increased with the size. The highest number of total labourers' (who got employment in a year @ 8 hours/day) was seen in case of DME of horticultural products based activity figured at 24,200. It was followed by DMEs of cereal based, wood based, textile based, leather based and livestock based processing activities at 7796, 4050, 3000, 2700 and 2000 respectively. It could also be observed that only

OAMEs of cereal based, horticulture and textile based processing activities engaged female family labourers. In regard to hired female workers, the table suggests their involvement only in case of DMEs and NDME of two agro food processing activities viz., cereal and horticultural products based activities. It reveals that most of the processing activities (under both agro-food and agro non-food categories) did not prefer to employ female workers.

Conclusively, it may be inferred that though processing activities of larger size provide greater employment opportunities, however, the contribution of NDMEs and OAMEs can not be underestimated. It is so because these smaller units do also generate quite a good employment opportunities per year. There is, thus, need to make efforts for expansion and strengthening of smaller processing units (both of agro food and agro non-food categories). It is also desirable with the objectives of creating additional employment opportunities in rural areas and reducing the huge quantum of post production losses in food commodities.

Table No. 5.1: Details of Functioning of Units (Per Unit)

SN	Name of the Processing Activity	Type of Enterprise (OAME/ NDME/ DME)	Level of Working		Operation Cycle (Number of Days)					Working days Per Year	Production Cycle per Year
			Days/ Month	Hours/ Day	Input Stock	Production Process	Output Stock	Marketing	Credit Realization		
1	2	3	4	5	6	7	8	9	10	11	12
A.	**Agro Food**										
1.	Grain Processing Based Units (Paddy)	OAME	30	8	60	03	30	25	02	120	40
		NDME	30	08	45	03	15	24	06	120	40
		DME	30	12	105	03	60	75	09	273	91
2.	Horticultural Products Based Processing Activities (Litchi)	OAME	20 (only for 01 M)	08	20	02	--	10	03	25	11
		NDME	22	08	05	02	04	06	03	27	13
		DME	30	16	20	02	12	48	10	100	50
3.	Livestock based Processing Activity (Dairy)	OAME	30	05	300	01	--	300	--	300	300
		NDME	30	05	300	01	--	300	04	300	300
		DME	30	05	300	01	--	300	05	300	300
B.	**Agro Non-food**										
1.	Textile based Processing Activity (Silk)	OAME	30	10	05	07	07	50	04	355	50
	9x2 shifts = 18 h/day	NDME	25	18	08	10	--	--	03	300	30
		DME	25	18	07	08	--	--	05	305	38
2.	Wood based Processing Activity	OAME	30	08	03	06	03	03	02	325	54
		NDME	26	08	05	07	08	05	04	312	45
		DME	26	08	10	05	10	05	08	312	62
3.	Leather based Processing Activity (Shoe/Foot wearing)	OAME	28	08	03	01	--	02	02	336	336
		NDME	30	10	04	01	--	--	03	355	355
		DME	26	08	06	01	05	06	08	312	312

Table No. 5.2: Sources of Raw Materials (Production Inputs Reported by Sample Processing Units)

SN	Name of the Processing Activity	Type of Enterprise (OAME/ NDME/ DME)	Units Reporting Sources of Raw Materials (Nos)				Decoding of Sources
			Source-I	Source-II	Source-III	Source-IV	
1	2	3	4	5	6	7	8
A.	**Agro Food**						1. Local Farmers/Farmers Directly/Local Growers
1.	Grain Processing Based Units (Paddy)	OAME	3 (100.00)	--	--	--	
		NDME	1 (50.00)	1 (50.00)	--	--	2. Local Market/Farmers' Co-operative Societies/Order Giver Wholesaler
		DME	¼ (25.00)	¼ 25.00)	¼ (25.00)	¼ (25.00)	
2.	Horticultural Products Based Processing Activities (Litchi)	OAME	2 (66.66)	1 (33.34)	--	--	
		NDME	1 (50.00)	1 (50.50)	--	--	3. Middlemen/Carrier/ Established Trade Channel
		DME	½ (50.00)	¼ (25.00)	¼ (25.00)	-	
3.	Livestock based Processing Activity (Dairy)	OAME	3 (100.00)	--	--	--	4. Market(s) Outside the District/State/Established Market Channel.
		NDME	1 (50.00)	1 (50.00)	--	--	
		DME	¼ (25.00)	¼ (25.00)	½ (50.00)	-	
B.	**Non-food Processing**						
1.	Textile based Processing Activity (Silk)	OAME	--	1 (100.00)	--	--	
		NDME	--	--	1(100.00)	--	
		DME	--	--	½ (50.00)	½ (50.00)	
2.	Wood based Processing Activity	OAME	--	1 (100.00)	--	--	
		NDME	--	--	1 (100.00)	--	
		DME	--	--	--	1 (100.00)	
3.	Leather based Processing Activity (Shoe/Foot wearing)	OAME	--	1 (100.00)	--	--	
		NDME	--	--	--	1 (100.00)	
		DME	--	--	--	1 (100.00)	

Note: Figures in brackets indicate percentages of total reporting units.

Table No. 5.3: Terminal Markets where Produce is sold by Sample Processing Units

SN	Name of the Processing Activity	Type of Enterprise (OAME/ NDME/ DME)	Unit Reporting Terminal Markets (Nos)				Decoding of Sources
			Market-I	Market -II	Market -III	Market -IV	
1	2	3	4	5	6	7	8
A.	**Agro Food**						1. Terminal Market/Local Market
1.	Grain Processing Based Units (Paddy)	OAME	1 (33.34)	2 (66.66)	--	--	
		NDME	1 (50.00)	1 (50.00)	--	--	2.Whole Seller and Retailer/Middlemen
		DME	1 (100.00)	--	--	--	
2.	Horticultural Products Based Processing Activities (Litchi)	OAME	1 (33.34)	2 (66.66)	--	--	
		NDME	2 (100.00)	--	--	--	3. Exporting/Marketing through Domestic Middlemen's arrangements/Domestic Market outside the State
		DME	1 (100.00)	--	--	--	
3.	Livestock based Processing Activity (Dairy)	OAME	--	3 (100.00)	--	--	4. Terminal Markets through Co-operative Channel
		NDME	--	2 (100.00)	--	--	
		DME	--	1 (100.00)	--	--	
B.	**Non-food Processing**						
1.	Textile based Processing Activity (Silk)	OAME	--	1 (100.00)	--	--	
		NDME	--	1 (100.00)	--	--	
		DME	--	1 (100.00)	--	--	
2.	Wood based Processing Activity	OAME	1 (100.00)	--	--	--	
		NDME	1 (100.00)	--	--	--	
		DME	1 (100.00)	--	--	--	
3.	Leather based Processing Activity (Shoe/Foot wearing)	OAME	1 (100.00)	--	--	--	
		NDME	1 (100.00)	--	--	--	
		DME	1 (100.00)	--	--	--	

Note: Figures in brackets indicate percentages of total reporting units.

Table No. 5.4: Marketing of the Processed Product Value (In Rs.)

SN	Name of the Processing Activity	Type of Enterprise (OAME/ NDME/ DME)	Total Output of Processed Product (Average for All the Units in the Category		Output Marketed in (Average for all the Units in the Category)					Percent of Output sold Domesti cally	Percentage of Output sold in the Export Market
			Unit	Value (In Rs.)	Unit (In Qtls/kg)	Value (In Rs.)	Unit (In Qtls)	Value (In Rs.)	Total Value of Marketed Output		
1	2	3	4	5	6	7	8	9	10	11	12
A.	**Agro Food**										
1.	Grain Processing Based Units (Paddy)	OAME	217.12 qtls	280524.00	270.12 qtls	280524	--	--	280524	100.00	0.00
		NDME	2879.13 qtls	3719841.66	2879.13 qtls	3719841.66	--	--	3719841.66	100.00	0.00
		DME	44226.00 qtls	57139992.00	44226.00 qtls	57139992.00	--	--	57139992.00	100.00	0.00
2.	Horticultural Products Based Processing Activities (Litchi)	OAME	420.00 ltr	42000.00	420.00 ltr	42000.00	--	--	42000.00	100.00	0.00
		NDME	2250.00 ltr	225000.00	2250 ltr	225000.00	--	--	225000.00	100.00	0.00
		DME	129400 ltr	12940000.00	129400 ltr	12940000.00	--	--	12940000.00	100.00	0.00
3.	Livestock based Processing Activity (Dairy)	OAME	921.58 kg	152061.33	921.58 kg	152061.33	--	--	152061.33	100.00	0.00
		NDME	6190.06 kg	1021361.00	6190.06 kg	1021361.00	--	--	1021361.00	100.00	0.00
		DME	9208.98 kg	1519481.50	9208.98 kg	1519481.50	--	--	1519481.50	100.00	0.00
B.	**Non-food Processing**										
1.	Textile based Processing Activity (Silk)	OAME	4881.25 Mts	97625.00	4881.25 Mts	97625.00	--	--	97625.00	100.00	0.00
		NDME	40470 Mts	809400.00	40470 Mts	809400.00	--	--	809400.00	100.00	0.00
		DME	66000 Mts	1320000.00	66000 Mts	1320000.00	--	--	1320000.00	100.00	0.00
2.	Wood based Processing Activity	OAME	83 (18 Sft-Furniture)	99000.00	83 (18 Sft Furniture)	99000.00	--	--	99000.00	100.00	0.00
		NDME	666 (18 Sft Furniture)	799000.00	666 (18 Sft furniture)	799000.00	--	--	799000.00	100.00	0.00
		DME	1650 (18 Sft furniture)	1980000.00	1650 (18 Sft furniture)	1980000.00	--	--	1980000.00	100.00	0.00
3.	Leather based Processing Activity(Shoe/Foot wearing)	OAME	660 pairs foot wears	99000.00	660 pairs of Foot wears	99000.00	--	--	99000.00	100.00	0.00
		NDME	5325 pairs foot wears	798750.00	5325 pairs Foot wears	798750.00	--	--	798750.00	100.00	0.00
		DME	8984 pairs foot wears	1347500.00	8984 pairs foot wears	1347500.00	--	--	1347500.00	100.00	0.00

Table No. 5.5: Marketing Channels for Purchasing the Raw Materials

SN	Channel	Food Processing Units Reporting (Nos.)			Non-food Processing Units Reporting (Nos.)		
		Processing Activity – I (Cereal based) 6	Processing Activity – II (Horticultural Products) 6	Processing Activity – III (Livestock based) 6	Processing Activity – IV (Textiles) 3	Processing Activity – V (Wood based) 3	Processing Activity – VI (Leather based) 3
1.	Purchasing Raw Materials from Farmers Directly	04	04	05	--	--	--
2.	Purchasing Raw Materials from Farmers Co-operative Society	01	01	01	---	---	---
3.	Purchasing Raw Materials Through established Trade Channels and Market Channels	01	01	--	03	03	03

Table No. 5.6: Marketing Channels for Selling the Processed Products Domestically

SN	Channel	Food Processing Units Reporting (Nos.)			Non-food Processing Units Reporting (Nos.)		
		Processing Activity – I (Cereal based) 6	Processing Activity –II (Horticultural Products) 6	Processing Activity – III (Livestock based) 6	Processing Activity – IV (Textiles) 3	Processing Activity – V (Wood based) 3	Processing Activity – VI (Leather based) 3
1.	Selling the Processed Product Directly in the Terminal Market	03	04	--	--	03	03
2.	Selling the Processed Products through Market Functionaries:						
a.	Whole seller	01	--	03	01	--	--
b.	Middlemen	02	02	03	02	--	--
c.	Retailer	--	--	--	--	--	--

Table No. 5.7: Recurring Fixed Costs Per Unit (In Rs/year)

SN	Name of the Processing Activity	Type of Enterprise (OAME/ NDME/ DME)	Interest on Capital			Depreciation	Other Fixed Costs	Total
			Own Fund	Bank Loan	Other Loan			
1	2	3	4	5	6	7	8	9
A.	**Agro Food**							
1.	Grain Processing Based Units (Paddy)	OAME	35,000 (73.51)	--	5,270 (11.08)	3,730 (7.84)	3,600 (7.57)	47,600 (100.00)
		NDME	2,00,000 (85.15)	14,880 (6.34)	--	19,988 (8.51)	--	2,34,868 (100.00)
		DME	3,53,000 (71.09)	90,545 (18.24)	--	52,950 (10.67)	--	4,96,495 (100.00)
2.	Horticultural Products Based Processing Activities (Litchi)	OAME	17,400 (76.85)	--	3,500 (15.46)	1,740 (7.69)	--	22,640 (100.00)
		NDME	36,000 (65.07)	15,000 (27.12)	--	4,320 (7.81)	--	55,320 (100.00)
		DME	13,50,000 (61.70)	2,70,000 (12.35)	--	2,02,500 (9.26)	3,65,000 (16.69)	21,87,500 (100.00)
3.	Livestock based Processing Activity (Dairy)	OAME	42,000 (73.62)	--	10,000 (17.54)	5,040 (8.84)	--	57,040 (100.00)
		NDME	1,68,000 (78.19)	--	25,000 (11.64)	21,840 (10.17)	--	2,14,840 (100.00)
		DME	4,00,000 (80.00)	--	60,000 (12.00)	40,000 (8.00)	--	5,00,000 (100.00
B.	**Non-food Processing**							
1.	Textile based Processing Activity(Silk)	OAME	11,000 (74.06)	--	2,200 (14.82)	1,650 (11.12)	--	14,850 (100.00)
		NDME	2,50,000 (68.96)	--	75,000 (20.69)	37,500 (10.35)	--	3,62,500 (100.00)
		DME	4,98,000 (64.51)	--	1,99,200 (25.81)	74,700 (9.68)	--	7,71,900 (100.00
2.	Wood based Processing Activity	OAME	36,000 (73.77)	--	11,000 (22.54)	1,800 (3.69)	--	48,800 (100.00)
		NDME	2,35,000 (77.50)	--	40,000 (13.20)	28,200 (9.30)	--	3,03,200 (100.00)
		DME	4,00,000 (68.37)	1,25,000 (21.37)	--	60,000 (10.26)	--	5,85,000 (100.00)
3.	Leather based Processing Activity (Shoe/Foot wearing)	OAME	30,000 (82.19)	--	5,000 (13.70)	1,500 (4.11)	--	36,500 (100.00)
		NDME	2,60,000 (80.24)	--	51,000 (15.74)	13,000 (4.02)	--	3,24,000 (100.00)
		DME	5,20,000 (79.18)	86,685 (13.20)	--	50,000 (7.62)	--	6,56,685 (100.00)

Note: i. Recurring Fixed Costs referred to costs occurring at a periodic interval and generally not keeping with any correlation with the level of production.
ii. Figures in brackets indicate percentages of total recurring fixed costs.

Table No. 5.8: Recurring Variable Costs of the Investments Per Unit (In Rs. /year)

SN	Name of the Processing Activity	Type of Enterprise (OAME/ NDME/ DME)	Repair & Replacement On Machinery	Cost on Raw Materials	Wages	Marketing Costs	Electricity Charges	Interest on Working Capital	Total
1	2	3	4	5	6	7	8	9	10
A.	**Agro Food**								
1.	Grain Processing Based Units (Paddy)	OAME	5,000 (2.69)	1,73,943 (93.89)	--	1,800 (0.98)	1,500 (0.81)	3,026 (1.63)	1,85,269 (100.00)
		NDME	20,000 (0.56)	34,65,000(96.14)	90,000 (2.50)	6,000 (0.17)	4,000 (0.11)	19,065 (0.52)	36,04,065 (100.00)
		DME	1,50,000 (0.57)	2,51,10,000 (95.06)	6,48,000 (2.45)	42,480 (0.16)	20,000 (0.08)	4,45,682 (1.68)	2,64,16,162 (100.00)
2.	Horticultural Products Based Processing Activities (Litchi)	OAME	2,000 (11.10)	7,140 (39.60)	4,200 (23.30)	3,000 (16.64)	1,200 (6.65)	487 (2.71)	18,027 (100.00)
		NDME	6,000 (8.41)	36,300 (50.87)	14,700 (20.60)	9,400 (13.18)	2,500 (3.51)	2,450 (3.43)	71,350 (100.00)
		DME	2,03,000 (3.41)	21,99,800 (36.89)	24,20,000 (40.58)	2,00,000 (3.36)	76,200 (1.28)	8,64,000 (14.48)	59,63,000 (100.00)
3.	Livestock based Processing Activity (Dairy)	OAME	2,000 (2.38)	75,000 (89.28)	--	2,000 (2.38)	--	5,000 (5.96)	84,000 (100.00)
		NDME	10,000 (1.35)	5,00,000 (67.87)	1,80,000 (24.44)	12,000 (1.63)	960 (0.13)	33,750 (4.58)	7,36,710 (100.00)
		DME	13,000 (1.29)	7,43,225 (73.83)	2,00,000 (19.87)	18,000 (1.79)	2,400 (0.24)	30,000 (2.98)	10,06,625 (100.00)
B.	**Non-food Processing**								
1.	Textile based Processing Activity (Silk)	OAME	1,000 (1.75)	50,000 (87.10)	--	--	2,400 (4.19)	4,000 (6.96)	57,400 (100.00)
		NDME	6,000 (1.52)	1,26,000 (31.90)	2,40,000 (60.75)	--	4,800 (1.22)	18,250 (4.61)	3,95,050 (100.00)
		DME	10,000 (1.99)	1,50,000 (29.91)	3,00,000 (59.83)	--	5,000 (0.99)	36,500 (7.28)	5,01,500 (100.00)
2.	Wood based Processing Activity	OAME	1,000 (4.76)	15,335 (73.03)	--	1,565 (7.45)	1,200 (5.71)	1,900 (9.05)	21,000 (100.00)
		NDME	4,000 (1.06)	70,000 (18.61)	2,55,000 (67.81)	12,000 (3.19)	3,600 (0.95)	31,500 (8.38)	3,76,100 (100.00)
		DME	15,000 (1.63)	3,97,950 (43.50)	4,05,000 (44.26)	4,050 (0.44)	12,000 (1.31)	81,000 (8.86)	9,15,000 (100.00)
3.	Leather based Processing Activity (Shoe/Foot wearing)	OAME	1,000 (4.76)	16,300 (77.62)	--	1,040 (4.95)	960 (4.57)	1,700 (8.10)	21,000 (100.00)
		NDME	1,600 (0.52)	66,000 (21.52)	2,13,000 (69.47)	4,800 (1.56)	1,200 (0.39)	20,042 (6.54)	3,06,642 (100.00)
		DME	4,000 (0.99)	81,000 (20.04)	2,70,000 (66.84)	6,000 (1.48)	3,000 (00.74)	40,000 (9.91)	4,04,000 (100.00)

Note : i. Recurring variable costs refer to costs that vary with the level of production, almost proportionately.
ii. Figures in brackets indicate percentages of total recurring variable cost.

Table No. 5.9: Per Unit Net Income from the Investment (Rs./Year)

SN	Name of the Processing Activity	Type of Enterprise (OAME/ NDME/ DME)	Gross value of output of the processed product	Expenditure			Net Income
				Fixed	Variable	Total	
1	2	3	4	5	6	7	8
A.	**Agro Food**						
1.	Grain Processing Based Units (Paddy)	OAME	279000	47600	185269	232869	46131
		NDME	4010625	234868	3604065	3838933	171692
		DME	57139992	496495	26416162	26912657	30227335
2.	Horticultural Products Based Processing Activities (Litchi)	OAME	42000	22640	18027	40667	1332
		NDME	220000	55320	71350	126670	93330
		DME	12940000	2187500	5963000	8150500	4789500
3.	Livestock based Processing Activity (Dairy)	OAME	153333	57040	84000	141040	12293
		NDME	1022221	214840	736710	951550	70671
		DME	1519481	500000	1006625	1506625	12856
B.	**Agro Non-food**						
1.	Textile based Processing Activity (Silk)	OAME	97625	14850	57400	72250	25375
		NDME	809400	362500	395050	757550	51850
		DME	1320000	771900	501500	1273400	46600
2.	Wood based Processing Activity	OAME	99000	48800	21000	69800	29200
		NDME	799000	303200	376100	679300	112700
		DME	1980000	585000	915000	1500000	480000
3.	Leather based Processing Activity (Shoe/Foot wearing)	OAME	99000	36500	21000	57500	41500
		NDME	798750	394000	306642	700642	98108
		DME	1347500	656685	404000	1060685	286815

Table No. 5.10: Employment Generation under the Activity (Standard Man days of 8 Hours per Unit per Year)

SN	Name of the Processing Activity	Type of Enterprise (OAME/ NDME/ DME)	Family Labour		Hired Labour		Total Labour
			Male	Female	Male	Female	
1	2	3	4	5	6	7	8
A.	**Agro Food**						
1.	Grain Processing Based Units (Paddy)	OAME	180	100	--	--	280
		NDME	240	--	900	--	1140
		DME	--	--	6480	1316	7796
2.	Horticultural Products Based Processing Activities (Litchi)	OAME	42	38.50	--	--	80.50
		NDME	--	--	92	110 @ Rs. 50/-	202
		DME	--	--	14200	10000	24200
3.	Livestock based Processing Activity (Dairy)	OAME	300	--	--	--	300
		NDME	300	--	1500	--	1800
		DME	--	--	2000	--	2000
B.	**Agro Non-food**						
1.	Textile based Processing Activity (Silk)	OAME	295	60	--	--	355
		NDME	355	--	2045	--	2400
		DME	710	--	2290	--	3000
2.	Wood based Processing Activity	OAME	325	--	--	--	325
		NDME	312	--	2238	--	2550
		DME	--	--	4050	--	4050
3.	Leather based Processing Activity (Shoe/Foot wearing)	OAME	336	--	--	--	336
		NDME	--	--	2130	--	2130
		DME	--	--	2700	--	2700

CHAPTER – VI

PROBLEMS AND PROSPECTS OF AGRO PROCESSING INDUSTRIES

6.1 Problems

This chapter furnishes survey based constraints faced by the processing units at different stages of production process and during marketing of value added products. It also interprets the prospects of Agro Processing Industries (APIs) in Bihar.

Constraints in procurement of raw materials (table 6.1) enlist the problems as reported by the agro food processing activities and agro non-food processing units. Non availability of adequate raw materials due to lack of capital, supporting machines/equipments, and absence of required infrastructural facilities were reported by majority of the agro food processing units. Fluctuations in prices of raw materials, absence of information network and circumstantial need of purchasing raw materials from middlemen at higher rates were also prominently reported by the sample agro food processing units. Non-availability of skilled labourers, availability of raw materials (litchi) for a very short period and difficulty in determining prices of value added products were felt by DMEs of agro-food processing activities.

As far as agro non-food processing activities are concerned, table No. 6.1 en passant enunciates lack of capital poor quality of raw materials and no easy availability of bank credit to have been faced by OAMEs. Like agro food processing activities, NDMEs of agro non-food processing activities did come across the problems of poor electricity supply position, variability of prices of raw materials and purchasing of raw materials from distant market (Kolkata in case of leather).

Procurement of raw materials sometimes from informal trade channel, non availability of strong supporting infrastructure and raw materials not adequately available in the state (in case of leather), were the main constraints faced by DMEs of agro non food processing activities.

Marketing Related Problems

Table No. 6.1 also instances problems/constraints related to marketing of processed products in the domestic market faced by sample processing units. In case of agro food processing activities, long market channel causing lower net income, non-existing support by NGOs/Co-operative marketing societies and limiting factors causing processors to sell value added products' to local middlemen at lower prices were found to have been faced by entrepreneurs of small units. Seasonality of demand for the products, lack of mutual understanding among enterprises for preparing common marketing strategy and quality consciousness of consumers compelling the entrepreneurs to sell their products in distant markets for higher prices were experienced by all NDMEs. Existence of cut throat competition, absence of widespread network for marketing the products in Bihar (particularly litchi juice, syrup and pulp) and transport related problems in taking the value added products to terminal markets were the constraints faced mainly by DMEs of agro food processing activities.'

Regarding constraints faced by sample entrepreneurs of agro non-food processing activities, table 6.1 estimates determination of the price of the products by middlemen or big traders, no option of opting other profitable markets and demand for product mainly in the local market and preferred generally by low income group of people yielding lower returns as the main problems faced by OAMEs. Marketing through middlemen resulting in lower net profit, demand influenced by design oriented preferences and more quality, design and brand consciousness of consumers were felt by NDMEs. Lower returns as a result of scattered markets, existence of tough competition due to presence of a good number of entrepreneurs and uncertainty of ready demand and availability of value added products is generally ensured on order basis, could be found as main problems faced by DMEs of agro non-food processing activities category.

6.2 Prospects of APIs

Food Processing Units

It is to be mentioned here that growing incomes, changing food habits and lack of employment opportunities during post harvest and after sowing periods have encouraged the growth of agro-processing sector. Based on the industrial units

covered by the Annual Survey of Industries (ASI), the agro based industries in Bihar accounted for nearly half of the gross value added. If the remaining smaller units are also taken into account the share of agro based industries (ABIs) will be still higher. However, the potential of agro based industries is not fully utilized. The development of ABIs is largely dependent on the importance assigned to fruits and vegetables vis-à-vis other crops. It is to be noted here that significantly large areas are under different top qualities of fruits in Bihar. Mango, banana, litchi, guava, lemon, pineapple and others' occupy 140786 ha, 29013ha, 28758 ha, 27994 ha, 17122 ha, 4454 ha and 31284 ha respectively. Quantum of production of these fruits is quite higher. However, absence of required storage, preservation and proper marketing facilities within and outside the state, good quantum of these fruits are wasted and sometimes sold at unremunerative prices. Hence, there is great potential for installation of agro processing industries based on these fruits and vegetables too in areas/regions with their production in abundance. The processing of mango, litchi, banana, etc. will also take care of seasonal gluts, storage and retention of their nutritive values, apart from providing income and employment. Among cereal based processing activities, apart from paddy and wheat, there is high prospect for APIs based on maize in Bihar having total area under autumn and rabi maize estimated at 472.90 thousand ha, and total production is estimated at 1076.30 thousand tones. Bulk of maize is produced mainly in the north-eastern districts of Bihar. As per a rough estimate, nearly 25.00 per cent of maize produced is used for human consumption locally. 20.00 to 25.00 per cent is used in feeding the milch animals and other domestic animals. As good as 50.00 to 55.00 per cent of total quantum of maize produced is sent to Andhra Pradesh and other states from Bihar, which is processed there as value added products for human consumption, poultry feed, fish feed, animal feed, starch making, etc. If processing industries based on maize are installed at different points in the districts of its surplus production, it will not only make proper and optimum use of this cereal crop but also be instrumental in a big way in creation of additional employment opportunities in rural and urban areas both and help in enhancing the income of the farmers and the people in general. It is, thus, important to record here that maize based APIs can be effectively established for producing/manufacturing various value added products for human being, as animal feed and bio-diesel etc. As regard to livestock based processing activity, dairy industry in co-operative sector under the brand name Sudha has achieved

marked success in Bihar. In unorganized sector, also there is great potential and bright prospect for processing of milk into khowa, ghee, butter, cream, paneer, lassi, etc. It will, however, require proper input supply, exploitation free marketing mechanism, scientific preservation facilities, milk chilling plants at different places in the private sector, infrastructural facilities, marketing intelligence and information system, packaging facilities at producers' level and skill development training programmes for the entrepreneurs and workers of such processing units. Of course, there are some problems, weaknesses and lacuna in procurement of raw materials, operational aspects and marketing of value added products of agro food based processing industries. However, if these constraints could be removed strategically with vision and determination, the prospect of APIs in Bihar is undoubtedly brighter.

6.2.1 Agro Non-food Processing Units

As a result of increase in income, urbanization and demonstration effect causing change in preferences there has been a rise in the demand for value added products based on agro non-food processing, such as textiles, wood and leather. Though according to Annual Survey of Industries (ASI, 2004-05), leather and leather products in Bihar has a small share (0.56 %) in its total production of Rs. 1922 thousand crore from the agro based industries. However, considering the magnitude and quality of livestock wealth and traditional expertise of leather men in Bihar there appears to be a good potential for industries relating to leather and leather products in the state.

Similarly, if the traditional expertise of weavers and their presence in significantly good numbers in some districts of Bihar (particularly, Bhagalpur Gaya, Aurangabad, Patna, Banka, Madhubani, Siwan and Nawada districts) are utilized properly by (i) providing them necessary inputs, technical supervision, training on latest machine, remunerative marketing facility with reduced number of middlemen and better power supply, then the prospects of textile based processing industries in Bihar is undoubtedly bright. As regards wood based processing activities, it has also great potential in Bihar. Urbanization has been promoting the use of varieties of value added products of wood. As far as the sample units of agro non-food category are concerned, these are located in comparatively developed districts of Patna and Bhagalpur. If the problems/constraints faced by sample processing units at different

stages of production process (as mentioned in table No. 6.1), are suitably addressed to and the factors making agro non-food processing activities flabby are removed with vision, the prospects of agro non-food and agro food based processing industries in Bihar are sure to be very bright. What is needed is to use the inherent potential and available resources in different areas/fields.

Table No. 6.1: Constraints Faced by the Processing Units at Different Stages of Production Process

SN	Name of the Processing Activity	Type of Enterprise (OAME/ NDME/ DME)	Constraints faced in procurement of raw materials		Constraints faced in Marketing of Processed Product in the Domestic Market	
			Type of Constraints	Reporting Units (Nos)	Type of Constraints	Reporting Units (Nos)
1	2	3	4	5	6	7
A.	**Agro Food**					
1.	Grain Processing Based Units (Paddy)	OAME	Non-availability of adequate raw materials due to lack of capital.	3	Long market channel causing lower net income.	3
		NDME	Variability in prices of raw materials and, hence, difficult to fix prices of its product.	2	Seasonality of demand for the product.	2
		DME	Non-availability of skilled labour (in particular) for running the processing activity.	1	Existence of cut throat competition among processors.	1
2.	Horticultural Products Based Processing Activities (Litchi)	OAME	Lack of supporting machineries/equipments for processing	3	No existing support by NGOs/Co-operative Marketing Societies for better or remunerative marketing.	3
		NDME	Absence of information network regarding prices and availability of raw materials.	2	Non-existence of co-operation among enterprises for preparing a common marketing strategy.	2
		DME	Availability of raw materials for a very short period (22 to 25 days).	1	Absence of a strong, desired and widespread network for marketing the products in Bihar.	1
3.	Livestock based Processing Activity (Dairy)	OAME	Absence of supporting infrastructure (Electricity, Road, Communication)	3	Due to difficult terrain and poor communication, processors/entrepreneurs are compelled to sell products to local middlemen at lower prices.	3
		NDME	Purchasing raw materials from middlemen on higher rate.	2	Due to quality consciousness of consumers of the region, products are sold in distant places.	2
		DME	Difficulty in fixing prices of products due to variability in raw materials' prices.	1	Processed products are subjected to various transport related problems in reaching terminal market.	1

B.	**Non-food Processing**					
1.	Textile based Processing Activity (Silk)	OAME	Lack of capital.	1	Price of the product is fixed by the middlemen or big traders, who give order.	1
		NDME	Poor condition of supporting infrastructure (mainly electricity).	1	Marketing through middlemen resulting in lower net profit margin.	1
		DME	Sometimes raw materials have to be procured from informal trade channel.	1	Scattered market yields lower returns. So, price fixation is difficult for processors.	1
2.	Wood based Processing Activity	OAME	Dear and poor quality of raw materials	1	No option of more profit providing market, as they generally work on order basis.	1
		NDME	Variability of prices of raw materials makes the fixation of product prices' difficult.	1	Demand for the products' processed items is led by design oriented preferences.	1
		DME	Non-availability of strong supporting infrastructure (electricity and road).	1	Due to large number of entrepreneurs in the field, tough competition exists.	1
3.	Leather based Processing Activity (Shoe/Foot wearing)	OAME	No Bank credit is easily made available.	1	The demand for product is localized and preferred by low income group of people yielding low margin.	1
		NDME	Purchasing raw materials through established, but tough trade channel.	1	People have become more quality, design and brand conscious. So, demand is sometimes a problem.	1
		DME	Raw materials not adequately available in the state. Mostly procured from Kolkata (West Bengal).	1	They generally manufacture on order, so there is uncertainty of ready demand and hence, quantum of processing.	1

CHAPTER – VII

SUMMARY AND CONCLUSION

7.1 Introduction

Agro processing is defined as set of techno–economic activities, applied to all the produces, originating from agricultural farm, livestock , aquaculture sources and forests for their conservation, handling and value-addition to make them usable as food, feed, fibre, fuel or industrial raw materials. Agro processing sector has experienced expansion during last 5 decades, starting with a handful of facilities which were mainly operating at domestic/cottage level.

The scope of the agro-processing industry, thus, encompasses all operations from the stage of harvest till the material reaches the end users in the desired form, packaging, quantity, quality and price. Ancient Indian scriptures contain vivid account of the post harvest and processing practices for preservation and processing of agricultural produce for food and medicinal uses. Inadequate attentions to the agro-processing sector in the past have put both the producer and the consumer at a disadvantage affecting the economy of the Country as a whole.

Appreciably, of late, agro processing has been recognized as the sunrise sector of the Indian economy in view of its large potential for growth and likely socio-economic impact specifically on employment and income generation. Some estimates suggest that in developed countries, up to 14.00 per cent of the total work force is engaged in agro-processing sector directly or indirectly. However, in India, only about 3.00 per cent of the work force finds employment in this sector revealing it's under developed state and vast untapped potential for employment. Properly developed agro-processing sector can make India a major player at the global level for marketing and supply of processed food, feed and a wide range of other plant and animal products.

Agro-Processing Industries (APIs) based on both food-products' and non-food products' are faced with various constraints/problems. However, it has been more

important in the wake of increasing emphasis on nutritional food security to ward off the 'silent-hunger.' It was also suggested that the quality consciousness and preference for health food by the high income domestic consumers should also be capitalized up on through development of agro-based high value processed and branded products.

7.2 Need for the Study

India being an agrarian economy setting up agro-industries that make use of produces of agriculture directly and indirectly becomes imperative for sustained inclusive economic development. In agro based industries, the basic elements are surplus inputs from agriculture and their processing to suit the requirements of the consumers. Agro-processing not only stimulates value addition but also generates direct and indirect employment particularly in rural areas to absorb the surplus work force. A number of studies have indicated the potential of this sector as far as value addition and employment generation are concerned. On the demand side, with the growth of population, breakdown of the joint family system, increasing number of working women and change in the food habits, the demand for processed foods has been increasing substantially. There has been increasing tendency for purchasing processed items like processed atta, bread, dressed meat, fruit juice and items ready to cook and ready to consume.

The agro-industrial potential becomes manifold when the processing possibilities of the entire commodity system are taken into account. For example, a farmer cultivates paddy on his farm and the paddy plants produce paddy, straw, husk, bran and rice kernel. Thus, with an initial investment for growing paddy, producer of paddy has potential of supporting a complex of processing industries rice mills, solvent extraction plant for rice bran oil, processing of husk for variety of products and straw paper/board mills, etc. Similarly, in animal based products we get the raw materials like meat, bones, hides, skin, wools, etc. and thus, the processing of these raw materials opens up large value addition possibilities. In India, the processing units based on grains, horticultural products, livestock products, fish have ample opportunities. India with 2.5 per cent of global area, supporting 16.7 per cent of world population produces 22.4 per cent of world paddy production, 11.7 per cent of wheat, 15.00 per cent of rapeseed, 7.70 per cent of potato, 24.60 per cent of sugarcane, 43.30 per cent of jute and 27.28 per cent of pulses produced globally. In

the current scenario, India contributes 10.30 per cent and 9.20 per cent to the global production of fruits and vegetables respectively. In spite of strong base in horticultural products very negligible per cent of fruits and 0.5 per cent of vegetables are processed as against 70.00 per cent in Brazil. Moreover, India loses over 30.00 per cent of its produce of fruits and vegetables annually in the absence of proper infrastructural facilities. Agro-processing industries have, thus, vast potential in India.

In view of the above, the study in reference is highly needed particularly in understanding its growth pattern and thereon strategies.

7.3 Objectives of the Study

i. *To present a profile of the agro-processing industries and the recent trend.*
ii. *To examine the existing location pattern of selected agro industries.*
iii. *To study the impact of agro-processing industry on agriculture.*
iv. *To study the economics of agro processing units.*
v. *To analyse the marketing behavior of agro-processed products.*
vi. *To study the employment potential from agro-processing industries.*
vii. *To analyse the constraints on acceleration of production.*
viii. *To review the export performance of various agro-based commodities and constraints faced in accelerating the growth of export from the sector.*

7.4 Data Base

Secondary data, such as the quinquennial National Sample Survey data (NSS data) on unorganized manufacturing and Annual Survey of Industries (ASI) data for the organized segment' have been used to gain a comprehensive view of the agro-processing sector.

In view of tiny and small scale agro-based industrial enterprises, being highly heterogeneous, it was worthwhile to look into each of the three layers namely: OAMEs, (Own Account Manufacturing Enterprises), NDMEs (Non-Directory Manufacturing Establishments) and DMEs (Directory Manufacturing Establishment) and thus, covered in the sample.

Primary data was collected from different units through a duly structured schedule. Besides, some comprehensive case studies of selected agro-processing units have also been undertaken so that the problems at grass root level are understood.

7.5 Sample Design, Methodology and Coverage of the Study

The primary data have been collected from the selected processing units chosen from both agro food industries and agro non-food industries. As per suggested design, all together 27 sample processing units were selected at random proportionately spread over food and non-food processing segments of agro-based enterprises. 18 processing units have been selected within the group of food processing and 9 from non food processing segment of agro-based enterprises.

In non-food processing group, paper and its products-based enterprises could not be taken up for detail study due to its non-existence or very poor concentration.

The food processing activities were broadly divided in three categories, viz.,

i Primary food processing units mainly grain processing units,
ii Spice and horticultural products, and;
iii Livestock based processing units including fish processing.

Non food processing units were broadly divided into three categories, namely:

ii. Textile products, (II) Wood and its products, and; (III) Leather and its products.

Within the group of food processing and non food processing agro based activities, for each category of enterprise, the dominant processing activity was selected considering the concentration of units in the state. In the case of food processing component of agro-based enterprises, for each selected processing enterprise, six units of different sizes, namely: OAMEs run without the help of any hired worker, NDMEs an establishment employing less than six workers, and; DMEs the one employing a total of six or more workers, but less than 10 workers (along with power supply) with their distribution as 3:2:1 have been covered.

Within non food processing segment of Agro-based industry, for each selected processing units, three units of different sizes, namely: OAMEs, NDMEs and DMEs

in the ratio of 1:1:1 were selected. Having chosen processing activities, the districts have been selected according to the concentration of selected agro based enterprises. As such, the selected districts are more than one (five districts) depending on the location of the specific agro-processing activity chosen for the study.

Table No. 7.1: Sample Processing Units and the Selected Districts for the State of Bihar

SN	Processing Activity	Selected District	Number of Sample Units
Food Processing			
a.	Paddy Processing	Rohtas	06
b.	Fruit (Litchi) Processing	Muzaffarpur	06
c.	Milk Processing	Khagaria	06
	Total		**18**
Total Non-Food Processing			
a.	Textile Products	Bhagalpur	03
b.	Wood and its Products	Patna	03
c.	Leather and its Products	Patna	03
	Total		**09**
	Total Sample Size		**27**

7.6 Major Findings of the Study

I. Status of Agro-based Industries in the State

In regard to working units, non-agro based industries dominated (75.08%) over total agro based industries (24.92%) as per the data of 1994-95. Besetting fact in this regard is that the share of food processing industries and 'agro non-food processing industries' in Bihar in the referred year were quite lower at 12.03 per cent and 12.90 per cent respectively. As regards investment, the data in table 2.2 finds out very low share of total agro based industries in the state (3.61%) in comparison to total non agro-based industries. However, within the category of agro-based industries, the data brings at a stage of heartenment in regard to the status of agro food processing industries by cornering only 3.05 per cent of the total investment. Agro non-food processing industries shared the advantage of very negligible proportion (0.56%) in Bihar. As per 1994-95 data, major investment could be seen in favour of non-agro based industries (96.40%). Data in the table further signal bloated/major share, and contribution of non-agro based industries in regard to providing employment, gross output and net value added. It provided employment to 2,22,172 workers, with gross output of Rs. 17,77,327 lakh and Rs. 4,08,507 lakh as net value added. In comparison to these, the same figures for total agro based industries in Bihar were 41,779, Rs. 1,39,601 lakh and Rs. 33,444 lakh respectively. The share and

contribution of agro food processing industries on the parameters of employment (number of workers'), 'gross output' and 'net value added' in the state were 1.85, 4.30 and 3.61 times more than those of agro non-food processing industries.

A glance on the table reveals a decline in the number of working units belonging to food processing industries' group (10.74%) in the state (as per available data for the year 1997-98). In comparison to the status of industries in 1994-95, the share of non-food processing industries increased by 3.48 per cent. Its share was 16.38 per cent in the referred year.

In regard to the number of working units, there was an expansion in total agro-based industries (27.11%) in the year 1997-98 over its earlier of 24.92 per cent. In regard to investment, there was a significant increase in total agro based industries (1.32 times). In the later year also, the dominance of non-agro based industries (68.33%) could be observed on this parameter over total agro based industries. With a decline in the existing number of units under food processing industries, a fall in the size of employment could be seen. Similarly, increase in the number of working units under the group of non food processing industries (76) led to increases in the size of employment to workers and employees under this category. Increases in gross output and net value added is well visible in regard to agro based (food and non-food) and non-agro based industries both. But, in these two parameters also, emaciation of agro based industries could be seen.

In view of the fact that nearly half of the gross value added by small scale industries in Bihar is contributed by agro based industries (ABIs), edifying contrivances have to be designed for installation of a good number of agro food based industries in those areas/regions, where surplus production of some agricultural commodities, crops/fruits or vegetables results into wastage for want of remunerative markets transportation facilities or storage facilities.

Economic Structure and Status of Unorganized Manufacturing Sector

Data based picture of the status (share) and changes in agro-food, agro non-food based processing industries and non-agro based industries in Bihar has been discussed here. Change in the number of working units for different categories of industries has been measured by taking into account data available for the years 1994-95 and 2000-01 meant for unorganized manufacturing sector and provided by

National Sample Survey Organization. It is clear that in the year 1994-95, agro based industries (including agro food and agro non-food based processing industries) dominated sharing 53.00 per cent (7, 11,279) number of the total working units. Non-agro based industries shared a little less 47.00 per cent than total agro based industries. Among the agro-based industries, number of units related to agro food based processing activities was higher estimated at 3, 81,810 (28.45%) than agro non-food processing industries 3, 29,469 (24.55%).

Significant declines in the number of working units could be seen in regard to 'agro food,' 'agro non-food' and 'non-agro based industries' as compared to that of 1994-95. On overall level, though the decline was to the tune of 39.75 per cent, however, it varied from 93.15 per cent in case of manufacturing of leather and leather based products to a low of 17.14 per cent in case of textile and its products and 7.89 per cent for 'total non-agro based industries.' In the referred year, the share of non-agro based industries in Bihar is seen to have made good efforts to surfeit the economy of Bihar by achieving expansion in size estimated at 5,80,974 (71.85%). However, declines in the number of working units based on agro-food (15.55%) and agro non-food based processing activities (12.45%), i.e., about 1.89 times less than the existing strength of 1994-95 suggest state of uncertainty in the field of unorganized manufacturing industries based on processing of agro food and agro non-food commodities (particularly OAMEs) during the period 1994-95 to 2000-01. Some of the responsible factors for this decline might be attributed to collapse of infrastructural facilities, lack of promotional policies for this sector, fall in demand of processed agro food and agro non-food and items (particularly in absence of standardization or brand name), poor power and 'law and order' positions in the state.

It is to be noted that if the economy of Bihar is to be inspirited on sustainable basis 'agro processing industries' under 'unorganized manufacturing sector' should be suitably and adequately promoted and strengthened. This is more so desirable as the state has no other sector of industrial activities, which has 'required inputs available so abundantly' as existing in case of agricultural sector (both related with 'agro food' and 'agro non-food commodities').

Data related to employment, Gross Value Added (GVA), value added per enterprise, value added per worker and employments per enterprise demonstrates a significant decline of about 40.91 per cent in the estimated number of workers engaged in unorganized manufacturing enterprises during the period 1994-95 to 2000-01. It lodges, nearly proportionate fall (39.75%) as observed in case of number of manufacturing enterprises,' which, in regard to all industries declined from 13,42,035 of 1994-95 to 8,08,640 as per 2000-01 data. Though the share of agro food processing enterprises out of 'total number of industries' in the year 2000-01 increased, however, in number terms of numbers of workers it declined from 7,94,168 of 1993-94 to 5,54,309 in 2000-01. Similarly, an increase in the percentage share of workers engaged in these manufacturing enterprises based on agro non-food processing industries (31.29%) under unorganized sector could be seen in the year 2000-01, but in number terms, the size of employment decreased significantly over the period (from 6,86,981 to 4,69,067). Data reveals that employment in total non-agro based processing industries also declined sharply in 2000-01. It came down from 10,56,111 to 4,75,882. Out of the total employment created by all industries, the share of non-agro based enterprises declined from 41.63 per cent to 31.74 per cent during the period.

The data related to estimated gross value added for the year 2000-01 reveals quite higher share (60.46%) to have been contributed by agro-processing industries (both food and agro non-food based activities). Out of the total GVA by all industries, non-agro based processing activities accounted for Rs. 83,02,954 (39.54%). The contribution of agro non-food processing industries i.e., Rs. 55,41,159 (26.39%) was well below agro food industries i.e., Rs. 71,52,991 (34.07%).

As far as value added per enterprise is concerned, data provides ground to dilate that the agro food processing enterprises were ahead (Rs. 56,368) of agro non-food processing activities (Rs. 55,009) as per data available for the year 2000-01 only. On overall level, value added per enterprise for agro-processing activities under unorganized manufacturing segment was about 3.90 times more (Rs. 55767) than that of non agro-based processing activities (Rs. 14,291). In regard to all industries taken together, the same was as low as Rs. 25,967. Among agro non-food processing activities, leather and its products based activities showed highly

encouraging performance on this parameter (Rs. 96,558) followed by paper, textiles and wood.

Data showing value added per worker for different types of processing industries meant for the year 2000-01 interestingly embody very strong and encouraging picture in regard to non-agro based processing activities (Rs. 17,447). Agro food and agro non-food processing activities recorded lower value addition per worker (Rs. 12,404 and Rs. 11,813) respectively. On overall level it was Rs. 14,005 for all industries. Among agro non-food processing activities, amount of value added per worker was highest for paper (Rs. 16,183) trailed by leather, wood and textile based enterprises (Rs. 15,156, Rs. 12,337 and Rs. 8,893) respectively. Since no data related to estimated GVA, value added per enterprise and value added per worker were available for the year 1994-95, so comparative picture/change in the status on these parameters couldn't be drawn.

On the parameter of estimated employment per enterprise, data for both the years, i.e.; 1994-95 and 2000-01 are available. So, a comparative picture could be presented. A marginal decline in regard to all industries in the year 2000-01 (1.85%) in comparison to 1994-95 (1.89) could be seen. However, agro food processing segment showed remarkable increase (from 2.08 to 4.50) over the period. Maintaining pari passu tempo of positive change, agro non-food processing industries also showed encouraging picture (from 2.08 to 4.66) during the period 1904-95 to 2000-01). A fall of 0.85 could be seen in case of non- agro based activities over the period, which has declined from 1.67 to 0.82. Estimated employment per enterprise for total agro based activities also increased by more than two times (from 2.08 to 4.50).

In view of larger share/contribution and gargantuan presence of agro based industries (including agro food and agro non-food based processing enterprises) in Bihar, all possible measures should be taken for the expansion, strengthening and maintenance of operational efficiencies of the existing units. It is more so desirous in view of the clear dominance of agro-processing activities (under unorganized manufacturing segment) particularly in terms of employment provided, Gross Value Added (GVA), GVA per enterprise, GVA per worker and employment per enterprise.

II. Profile of Sample Districts and Selected Processing Activities

i. Selection of Sample Districts

In the case of food processing component of agro-based enterprises for (i) primary food processing units, mainly grain processing units (rice mills in Rohtas district), (ii) Horticultural products based enterprises (i.e., litchi based processing activities in Muzaffarpur district, and; (iii) Livestock based processing units (operational in Khagaria district of Bihar under unorganized sector) have been selected.

Within non-food processing segment of agro based industries (i) Bhagapur district for textile products based processing activities, (ii) Patna district for wood and its products based processing enterprises, and; (iii) again Patna district for leather and its products based processing activities were selected for the study in hand. As paper and its products based processing industries were not functional in Bihar, in organized and, unorganized sector as well, so no paper processing unit was selected for the study. Here as such 05 districts are selected for the study depending on the location of the specific agro-processing activity.

ii. Primary Food Processing Units (mainly Grain Processing Units)

Paddy being the main food crop of Bihar grown in largest area (33,02,000 ha) as per data available for the year 2007-08, 2nd Adv. Este, paddy based processing activity has been selected for study. The district has not only one of the largest areas under paddy in Bihar, but highest production of rice (468067 tones) was also recorded here. Further, under food processing activity, maximum number of rice mills (200) existed in Rohtas district, so this particular activity was selected for study.

iii. Spice and Horticultural Products Based Processing Enterprise

Under this category of agro-food processing industries, horticultural products based industries were selected. Litchi is one of the most prominently grown fruits in Bihar (28.80 thousand ha) after mango and banana (29 thousand ha), on which processing enterprises are being run however, in a few number (Economic Survey, 2008-09, pp 63-66). Out of the total quantum of production of litchi in Bihar, highest proportion (81.91%) was grown in agro-climatic zone – I (comprising-- Saran, Siwan, Gopalganj, East Champaran, West Champaran, Muzaffarpur, Sitamarhi, Shehar, Vaishali, Darbhanga, Madhubani, Samastipur and Begusarai) districts. Muzaffarpur district in this zone was blessed with highest share in production of litchi (26.33%). It

is due to this fact that out of 10 litchi based processing activities (as per information by Directorate of Horticulture, Government of Bihar), 06 are concentrated in Muzaffarpur district. So, litchi based processing activity was selected for study under this category.

iv. Selection of Livestock Based Processing Activity

As a matter of fact, the dairy industry in the co-operative sector under the brand name Sudha is very successful in Bihar. The COMPFED markets milk and milk products and provides opportunities for significant rural employment and income, largely for women. There is growing consensus that the dairy sector has enough potential because of its symbiotic relationship with agriculture. In unorganized sector also, Milk based processing activity is the most prominent one. Maximum processing capacity of milk under co-operative sector was found in case of Barauni Dairy (BMU) estimated at 160 TLPD (as per the data of 2005-06). The highest capacity milk chilling centres/bulk coolers could be in Khagaria (40 TLPD) under BMU. Besides the advantage of having highest capacity of milk chilling centres under dairy co-operative system, the district of Khagaria had fairly large number of cows and buffaloes (174500 and 82700) respectively. These factors could positively contribute in greater concentration of milk based processing activities under unorganized manufacturing sector in the district. Larger concentration of milk products based processing activities (viz., khoa, paneer and butter) existed in Dhamaraghat-Badlaghat areas of Khagaria district. So, appropriately butter and khoa based activities were selected for study.

v. Agro-Non-food Processing Industries

Agro non-food processing industries had to be studied having divided (Source: Economic Survey 2008-09, p 93,95,97) it in groups of (i) textile, (ii) wood, (iii) paper and (iv) leather based processing activities. As the presence of any big/medium paper mill/paper based processing, enterprises could not be recorded in a good operative condition under public/private sector in Bihar, so the study of agro non-food processing industries could be detailed in three types of activities/enterprises only.

vi. Selection of Textile Based Processing Activities

The handloom industry under textile based processing enterprises assumes great significance in the context of Bihar. They are primarily concentrated in the districts of Bhagalpur, Patna, Gaya, Banka, Darbhanga, Arwal, Jehanabad, Aurangabad, Nawada, Nalanda, Bhabua, Khagaria, Madhubani and Siwan. For development of textile and handloom sectors, the state government has planned to establish a Textile Park under Public-Private Partnership (PPP). Of the total cost of this plan, 40.00 per cent or a maximum of Rs. 40 crore will be provided by the Central Government as share money and 9.00 per cent by the State Government as subsidy and share money. Again, a handloom park at Bhagalpur is also being planned having all the necessary basic infrastructure and other facilities, like: raw material bank, pre and post processing facilities, artisan village, R & D Centre, testing laboratory, information and training, etc. It is to be noted here that and silk units are located mainly in and around Bhagalpur. The silk weaving and printing works are largely and predominantly carried out here. As per the report of the Directorate of Industries, Government of Bihar, largest number of handlooms and power looms have been operational in Bhagalpur (6488 and 6393) respectively engaged in weaving of silk cloth. Besides, number of weavers having traditional expertise in weaving silk cloth was highest in the district. Raw materials are also available in surrounding districts of Banka, Jamui, Munger and other districts of Jharkhand state. These resource based factors resulted in highest concentration of silk weaving processing activities in the district. So, cloth (mainly silk) manufacturing activity was selected for study under textile based processing activity.

vii. Selection of Wood based Processing Activity

The stems and trunks of trees are primarily used to make solid wood products, such as furniture, sofa, cot, bet, chairs, tables, musical instruments, sporting equipments, etc. All these are made from definite cut sizes, purposively processed and shaped pieces and specifically designed/measured pieces of wood. It is worth mentioning that these inputs are provided after first stage processing of stems of trees by shaw mills. Patna is the capital of the state and the district, having highest population (4718592) and highest per capita GDDP (Rs. 29842), had very high demand of wood based processed items. Though forest areas are located in distant district of Jharkhand and North-Western border districts of East & West Champaran and far

flung areas of Assam also. However, very high demand of wood products has caused concentration of wood based enterprises in the capital city of Patna. Patna district with the largest number of Saw mills in Bihar (93) houses largest number of furniture making enterprises. In this way, furniture making processing activity was selected under wood based processing activity in Patna district.

viii. Selection of Leather based Processing Activities

According to Annual Survey of Industries (ASI), 2004-05, leather and leather products in Bihar had a small share (0.56 %) in its total production of Rs. 1922 thousand crore from the agro-based industries. However, considering the magnitude and quality of livestock wealth, there appears to be a good potential for industries relating to leather and leather products in the state. As per information available with the Directorate of Industries, Government of Bihar, shoes and other foot wear making enterprises' were the dominant leather based processing activity in Bihar. Patna district had larger number of cows and buffaloes (315100 & 265800) respectively. The magnitude and quality of livestock wealth created potential for industries related to leather and leather products in the district. Secondly, Patna is directly linked with Kolkata, Delhi & other major cities of the country by rail and road both. Raw materials for leather based processing activities are largely brought from Kolkata. In addition to these promoting factors, Patna has very high demand and purchasing power for leather based products (mainly foot wears and other wearing apparels). These resource based advantages have resulted in emergence of very high concentration of leather based processing units in the district. So, foot wear based leather processing activity has been selected for study in Patna district itself.

III. Profile of Sample Entrepreneurs of Agro-Processing Activities

Data based structure of socio-economic profile of sample entrepreneurs infers that processing activity – IV (textile based processing activity) is run by members of momin community (100%). Processing activity – V (i.e., wood based processing activity) has been undertaken by entrepreneurs of carpenters belonging to OBC group. Processing activity – VI (i.e., leather based processing activity) was run by run by entrepreneurs of SC class only. Processing activity Nos. I, II and III (i.e., cereals based processing enterprises, horticultural crop based processing activity and livestock based processing activities) were run by the entrepreneurs of OBC

and others (50.00%, 33.34% and 66.66% for activity – II and 16.66 % and 83.34% for activity – III) respectively.

Regarding the age of sample entrepreneurs, data embraces only 16.66 and 33.33 per cent of them in the senior citizen's age group of above 60 years to be engaged in processing activities – I, II and IV respectively. Most of the sample entrepreneurs belonged to the age group of 45-60 years. Almost equal percentages of 66.67 of sample entrepreneurs in this age group were found running processing activities – IV, V and VI.

As far educational status scenario of the sample entrepreneurs is concerned, only 16.66 per cent of them were found to be illiterate undertaking processing activity – III (i.e., in dairy based activity). 16.66 per cent and 33.34 per cent of sample entrepreneurs engaged in processing activities – I & II respectively were technically qualified. Majority of the sample entrepreneurs undertaking different processing activities were educated up to 10^{th} standard.

In regard to economic status in the form of land holding, it is revealed that 66.67, 100 and 33.33 per cent of the sample entrepreneurs owning processing activities – IV, V and VI respectively to have owned <1 ha and 1-2 ha of land. Only 16.66 per cent and 50.00 per cent of them is running processing activities I and II (i.e., cereal based and horticultural crop based processing activities), were found owning more than 10 ha of land area. Rest of the sample entrepreneurs running agro food based processing activities – I, II and III were in the land holding groups of 2 to 4 ha and 4-10 ha.

For previous experience in selected activities, the table inscribes all of the sample entrepreneurs to have more than five years' experience. Only 16.67 per cent and 33.34 per cent of the entrepreneurs running activities – I and IV (i.e., cereal based processing activity and textile based processing activity) possessed more than 30 years experience.

Further, 16.66 per cent, 50.00 per cent and 33.33 per cent of sample entrepreneurs in activities I, III and VI did have previous experience of 20-30 years. However, maximum concentrations of entrepreneurs with previous experience in selected

activities were in the ranges of 5 to 10 years and 10-20 years. Nature of experience was mostly learned traditionally and through working experience. Only 16.67 per cent of the sample entrepreneurs running processing activity – II (i.e., horticultural products based processing activity) was, to a great extent, inspired by training element.

Traditional background, higher profit margin and previous experience were the main deserving factors that motivated the entrepreneurs of both agro food and agro non-food processing activities to undertake the enterprise. Demand for the products was also one of the factors for motivating the NDME entrepreneurs of horticulture, livestock and textile based activities. However, only OAMEs of cereal based and horticultural products based processing activities were found to have been motivated by lack of avenues, demonstration effect and to get employment (16.67%, 16.67% and 16.66%) respectively.

The average size of the family varied between 5.67 to 15.00 for agro food and 8.00 to 12.00 for agro non-food enterprises. It can also be seen that for OAME and NDME of cereal and horticultural products based activities, women acted as earning members. Under agro non-food activities, participation of women as earners could be seen in case of OAMEs of textile and wood based activities and NDME and DME of leather based activities (the later two participated in managerial roles).

In nutshell, socio-economic profile of sample entrepreneurs reveals that entrepreneurs with mostly secondary level or lower education, belonging to different land holding classes have been prompted by traditional learning and working experience to undertake agro-processing activities. The literacy and land holding status of sample entrepreneurs running agro non-food processing activities are comparatively poor. Location and available resource based specific measures to train the willing and prosperous entrepreneurs with the provision of making required inputs (machines, tools, equipments and physical capital at subsidized rates), will definitely brighten the prospects of APIs in particular and the economy of Bihar in general.

IV. Cost of Investment and its Financing

It is revealed that most of the units are existing ones. It can also be seen that most of the surveyed processing units have been working in unorganized sector tiny, small and artisan based enterprises and so they are mostly unregistered. Paddy based processing industry i.e., rice mill in Rohtas district under the category of DME, Litchi based processing industry at Muzaffarpur 'Litchika International,' are registered under agro food processing activities, Directory Manufacturing Enterprises (DME), in the fields of leather and 'wood–based processing enterprises both in Patna district are registered. Except, one OAME under food processing activity and one NDME under horticultural products based processing activity, all the sample units were existing ones. Average age of the sample processing units ranged between 08 to 35 years.

DMEs under cereal based processing activity in Rohtas district occupied largest area (35,865sq.ft.). It was followed by DMEs of horticultural product based activity (8,000sq.ft.), wood based processing activity (1,400sq.ft.) and livestock based processing activity also spread in a significantly larger area of 1,500sq.ft.

i. Cost of Investment

It is revealed that generally within a particular group of processing activity, investment increased with the size of the unit. The size of the total investments went on increasing with the size of the enterprises. OAMEs showed lower total investments in comparison to that of NDMEs and DMEs. The percentages of working capital were found lower in case of OAMEs than NDMEs and DMEs except in case of livestock based processing activity and textile product enterprises. Data also suggests that size of investments were higher in case of DMEs meant for primary food based processing unit i.e., rice mill (Rs.77,96,000/-), litchi based processing activity (Rs.1,59,60,000/-), livestock based processing activity (Rs.10,50,000), wood based and leather based DMEs (RS.16,00000/-) and (RS. 9,00000/-) respectively . Percentages of block capital have remained much higher than respective working capitals in all the three groups (OAMEs, NDMEs and DMEs) in case of both agro-food processing activities and agro non-food processing enterprises except NDME and DME of wood–based processing activities. Possible reason for this may be that the machineries, tools, equipments, do not require heavy expenditure for this enterprise. Besides, comparatively higher expenses are incurred

in procuring raw materials (wood from Assam, Bettiah and distant remote areas of Jharkhand and West Bengal). Share of block capital is seen to be very high in all cases. It varied from 86.96 per cent to 57.15 per cent in regard to agro-food processing activities and from 72.23 per cent to 39.66 per cent in case of agro non-food processing activities.

ii. Financing of Investment

The NDME and DME under' cereal based processing activity and DMEs of horticultural crop based, 'wood and its products based' and 'leather and its products based processing activities' were found to have taken institutional loans in varying degrees (7.44%, 25.65%,10%, 31.25% and 16.67%) respectively . As the larger processing activities, particularly DMEs under both agro-food and agro-non–food categories are registered ones, so they could have received institutional loans under DIC/KVI or other schemes. Except DMEs of Cereal based and 'wood based processing activities' and OAME of livestock based entrepreneurs only, all other sample entrepreneurs had taken loans from non-institutional sources for meeting their respective investments. In all cases the share of own funds were quite higher than that of institutional and non-institutional finances. It ranged from a minimum of 60.00 per cent incase of DME of textiles products to a maximum of 100 percent in case of OAMEs of 'livestock products–based processing activity.'

For most of the sample entrepreneurs, respective processing activities are main occupation except OAMEs of all the three types of food processing activities. In view of the short to medium–term experiences of the entrepreneurs in their respective traditional or motivated activities, if they are provided with ensured and remunerative marketing facilities, there will be copious expansion in the number of APIs in Bihar.

Higher share of non–institutional loan for running APIs (both agro-food based and agro –non –food based) reveal the comparatively easy accessibility and availability of desired quantum of financial assistance by non-formal sources. Procedural complexities in procuring loans from 'formal sources of credit' have not encouraged the entrepreneurs to the mark to seek financial assistance from banks. The small entrepreneurs (OAMEs and NDME levels) may be provided all financial assistances by formal credit institutions. They should be provided technical and supervisory assistance by the personnels of District Industries Centres (DICs). Such

assistance/helps may also be extended by experts and faculties of 'food processing and preservation departments' of local or regionally existing agricultural colleges.

V. Economics of Investment in Agro Processing Units

i. Production and Operation Cycle

Number of working days per month as well as working hours per hour were seen uniform in most of the cases, except in horticultural crop (litchi) based, dairy products' based and textile products' based processing activities. As litchi based processing activity is run hardly for 22 days to one month, so, in case of DME of this, double shift work is undertaken. In regard to textile processing activity also, production activities in two shifts, or more than 08 hours are undertaken. So, in these cases, working hours/day is longer. Livestock based processing activity is everyday business without fail on priority basis; however, its work hour is shorter (05 hours). Depending upon the nature of activities, number of days required for other components of the whole operation cycle (viz., input stock, production process, output stocking, marketing and credit realization) was seen to be different for different processing activities. The number of production cycles, which the unit completes in a year, also differs with the type and size of the processing unit. Except for 'cereal based processing activity and litchi based processing activity, the numbers of working days/year were quite higher (ranging from 300 to 355) for all other activities. The reason being the fact that litchi is a very short duration crop (available for processing from 22 days to a maximum of 30-35 days). Paddy is also not available for continuous processing in abundant quantum for more than three to four months. Number of days taken for credit realization was lower in case of OAMEs and NDMEs of most of the processing activities as they generally took loans from non-formal agencies. In regard to production cycle/year, the data in table discloses that it, was, quite higher only in cases of livestock (300) and leather and its products based processing activity (ranging from 312 to 355). In all other activities, numbers of production cycle were quite lower depending upon the availabilities of raw materials, time taken in bringing them to consumerable form and scale of operation.

ii. Cost of Production

Interest on capital (containing: own fund, bank loan and other loan), and depreciation and other fixed costs form the part of this section. Within each category, the quantum of fixed costs is seen to be increasing with the size of the unit. As most of the small, enterprises belonging to various food and agro non-food processing activities have been working under unorganized sectors, so they are not registered and feel difficulty in achieving bank loan. Only NDMEs and DMEs of cereal based and horticultural products based activities (under agro food processing activities) and DMEs of wood and leather based activities (under agro non-food processing category) were found to have taken loans from banks. The percentages of their bank loans to total fixed costs were: 6.34, 18.24, 27.12, 12.35, 21.37 and 13.20 respectively. It is, therefore, interest that forms a part of fixed capital only for these six units which took loans for running their enterprises. Other fixed costs (periodic maintenance, rent, insurance premium, taxes and salaries, bonus) and depreciation are the main components of the recurring fixed costs. It is obvious that major part of recurring fixed costs is shared by own fund ranging between 61.70 per cent to 85.15 per cent for agro-food based processing activities' and from 64.51 per cent to 82.19 per cent in case of agro non-food based processing activities.

Recurring variable costs of investments consist within its purview components like: (i) Repairs and replacement of machinery, (ii) cost on raw materials, (iii) wages, (iv) marketing cost, (v) electricity charges, and; (vi) interest on working capital. It reveals that cost on raw materials is the major component of the variable cost for most of the activities, except DME of horticultural products (36.89%) and NDME, (31.90%), DMEs of textile (29.91%) and NDMEs and DMEs of wood and leather based processing activities (18.61%, 43.50%, 21.52% and 20.04%) respectively. In all these cases, share of investment on wages slightly dominated. For these agro non-food based processing activities, generally, proportion of cost on raw materials is seen to be declining with increase in the size of the units in the respective categories. This is because with increase in the size, other costs like: those on wages, electricity charges (in some cases) and interest on working capital are seen to be increasing. The cost on raw materials is lower for the non-food units (in particular), like textiles and wood because the units did not have to buy full quantum of the basic raw materials to be processed. As a matter of fact, the units were

provided with the raw materials for processing by some of the customers, who took back the processed products.

iii. Net Income of the Investment

Out of the total 18 processing activities surveyed (06 each under three types of agro food based activities and 09 processing activities (03 each under agro non-food processing activities), in 12 cases variable costs were found higher. However, in cases of OAMEs of horticulture, wood and leather based processing activities, DME of textile and NDMEs and DMEs of leather based activities, fixed costs could be seen higher. In absolute terms, the textile and wood processing units were seen to have had heavy total investments as compared to other units under agro non-food processing activities. For all the units, the total investments were compared with the gross value of the outputs to find the net returns. All the activities and units showed positive net returns. Data in table reveal that except DME of livestock based processing activity, in all other cases under 'agro food processing activities,' net returns increased with the size of the units. This might be because of the higher interests on capital involved as own fund, other loan (under fixed costs and larger amount incurred as variable cost (Rs. 10,06,625/-). Under agro non-food processing activity group also, similar pattern could be observed except in case of net income by DME of textile based processing activity (Rs. 46,600/-), which is a bit lower than its NDME (Rs. 51850/-) . This might be because of the heterogeneous nature of these non-food processing activities. It finally points out at the efficiency of the investments of the bigger units. Net incomes earned by larger units couldn't be seen to be proportionately higher as their total expenditures rose more than proportionately. Thus, the efficiency of processing units of smaller size also can not be denied.

iv. Employment Generation

It can be seen that the number of total labour in the units increased with the size. The highest number of total labourers' (who got employment in a year @ 8 hours/day), was seen in case of DME of horticultural products based activity figured at 24,200. It was followed by DMEs of cereal based, wood based, textile based, leather based and livestock based processing activities at 7796, 4050, 3000, 2700 and 2000 respectively. It could also be observed that only OAMEs of cereal based,

horticulture and textile based processing activities engaged female family labourers. In regard to hired female workers, their involvement could be seen only in case of DMEs and NDME of two agro food processing activities viz., cereal and horticultural products based activities. It reveals that most of the processing activities (under both agro-food and agro non-food categories) did not prefer to employ female workers.

Conclusively, it may be inferred that though processing activities of larger size provide greater employment opportunities, however, the contribution of NDMEs and OAMEs can not be underestimated.

VI. Problems and Prospects of Agro Processing Industries

i. Problems

Non availability of adequate raw materials due to lack of capital, supporting machines/equipments, and absence of required infrastructural facilities were reported by majority of the agro food processing units. Fluctuations in prices of raw materials, absence of information network and circumstantial need of purchasing raw materials from middlemen at higher rates were also prominently reported by the sample agro food processing units. Non-availability of skilled labourers, availability of raw materials (litchi) for a very short period and difficulty in determining prices of value added products were felt by DMEs of agro-food processing activities.

As far as agro non-food processing activities are concerned, lack of capital, poor quality of raw materials and no easy availability of bank credit were the main problems faced by OAMEs. Like agro food processing activities, NDMEs of agro non-food processing activities did come across the problems of poor electricity supply position, variability of prices of raw materials and purchasing of raw materials from distant market (Kolkata in case of leather).

Procurement of raw materials sometimes from informal trade channel, non availability of strong supporting infrastructure and raw materials not adequately available in the state (in case of leather), were the main constraints faced by DMEs of agro non food processing activities.

ii. Marketing Related Problems

In case of agro food processing activities, long market channel causing lower net income and non-existing support by NGOs/Co-operative marketing societies are limiting factors causing processors to sell value added products' to local middlemen at lower prices. Seasonality of demand for the products, lack of mutual understanding among enterprises for preparing common marketing strategy and quality consciousness of consumers compelling the entrepreneurs to sell their products in distant markets for higher prices were experienced by all NDMEs. Existence of cut throat competition, absence of widespread network for marketing the products in Bihar (particularly litchi juice, syrup and pulp) and transport related problems in taking the value added products to terminal markets were the constraints faced mainly by DMEs of agro food processing activities.'

Regarding constraints faced by sample entrepreneurs of agro non-food processing activities, determination of the price of the products by middlemen or big traders, no option for other profitable markets and demand for product mainly in the local market preferred generally by low income group of people yielding lower returns were observed as the main problems faced by OAMEs. Marketing through middlemen resulting in lower net profit, demand influenced by design oriented preferences and more quality, design and brand consciousness of consumers were felt by NDMEs. Lower returns as a result of scattered markets, existence of tough competition due to presence of a good number of entrepreneurs and uncertainty of ready demand and availability of value added products is generally ensured on order basis, could be found as main problems faced by DMEs of agro non-food processing activities category.

iii. Prospects of APIs

Food Processing Units

It is to be mentioned here that growing incomes, changing food habits and lack of employment opportunities during post harvest and after sowing periods have encouraged the growth of agro-processing sector. Based on the industrial units covered by the Annual Survey of Industries (ASI), the agro based industries in Bihar accounted for nearly half of the gross value added. If the remaining smaller units are also taken into account the share of agro based industries (ABIs) will be still higher.

However, the potential of agro based industries is not fully utilized. The development of ABIs is largely dependent on the importance assigned to fruits and vegetables vis-à-vis other crops. It is to be noted here that significantly large areas are under different top qualities of fruits in Bihar. Mango, banana, litchi, guava, lemon, pineapple and others' occupy 140786 ha, 29013ha, 28758 ha, 27994 ha, 17122 ha, 4454 ha and 31284 ha respectively. Quantum of production of these fruits is quite higher. However, absence of required storage, preservation and proper marketing facilities within and outside the state, good quantum of these fruits are wasted and sometimes sold at unremunerative prices. Hence, there is great potential for installation of agro processing industries based on these fruits and vegetables too in areas/regions with their production in abundance. The processing of mango, litchi, banana, etc. will also take care of seasonal gluts, storage and retention of their nutritive values, apart from providing income and employment. Among cereal based processing activities, apart from paddy and wheat, there is high prospect for APIs based on maize in Bihar having total area under autumn and rabi maize estimated at 472.90 thousand ha, and total production is estimated at 1076.30 thousand tones. Bulk of maize is produced mainly in the north-eastern districts of Bihar. As per a rough estimate, nearly 25.00 per cent of maize produced is used for human consumption locally. 20.00 to 25.00 per cent is used in feeding the milch animals and other domestic animals. As good as 50.00 to 55.00 per cent of total quantum of maize produced is sent to Andhra Pradesh and other states from Bihar, which is processed there as value added products for human consumption, poultry feed, fish feed, animal feed, starch making, etc. If processing industries based on maize are installed at different points in the districts of its surplus production, it will not only make proper and optimum use of this cereal crop but also be instrumental in a big way in creation of additional employment opportunities in rural and urban areas both and help in enhancing the income of the farmers and the people in general. It is, thus, important to record here that maize based APIs can be effectively established for producing/manufacturing various value added products for human being, as animal feed and bio-diesel etc. As regards to livestock based processing activity, dairy industry in co-operative sector under the brand name Sudha has achieved marked success in Bihar. In unorganized sector, also there is great potential and bright prospect for processing of milk into khowa, ghee, butter, cream, paneer, lassi, etc. It will, however, require proper input supply, exploitation free marketing

mechanism, scientific preservation facilities, milk chilling plants at different places in the private sector, infrastructural facilities, marketing intelligence and information system, packaging facilities at producers' level and skill development training programmes for the entrepreneurs and workers of such processing units. Of course, there are some problems, weaknesses and lacuna in procurement of raw materials, operational aspects and marketing of value added products of agro food based processing industries. However, if these constraints could be removed strategically with vision and determination, the prospect of APIs in Bihar is undoubtedly brighter.

iv. Agro Non-food Processing Units

As a result of increase in income, urbanization and demonstration effect causing change in preferences, there has been a rise in the demand for 'value added products' based on agro non-food processing, such as textiles, wood and leather. According to Annual Survey of Industries (ASI, 2004-05), leather and leather products in Bihar has a small share (0.56 %) in its total production of Rs. 1922 thousand crore from the agro based industries. However, considering the magnitude and quality of livestock wealth and traditional expertise of leather men in Bihar there appears to be a good potential for industries relating to leather and leather products in the state.

Similarly, if the traditional expertise of weavers and their presence in significantly good numbers in some districts of Bihar (particularly, Bhagalpur Gaya, Aurangabad, Patna, Banka, Madhubani, Siwan and Nawada districts) are utilized properly by (i) providing them necessary inputs, technical supervision, training on latest machine, remunerative marketing facility with reduced number of middlemen and better power supply, then the prospects of textile based processing industries in Bihar is undoubtedly bright. As regards wood based processing activities, it has also great potential in Bihar. Urbanization has been promoting the use of varieties of 'value added products of wood.' As far as the sample units of agro non-food category are concerned, these are located in comparatively developed districts of Patna and Bhagalpur. If the problems/constraints faced by sample processing units at different stages of production process are suitably addressed to, and the factors making agro non-food processing activities flabby are removed with vision, the prospects of agro non-food and agro food based processing industries in Bihar are sure to be very

bright. What is needed is to use the inherent potential and available resources in different areas/fields.

7.7 Action Points

Keeping in view the vast potential for expanding agro-processing activities in the state, prevailing problems and existing potentials (prospects) of sample 'agro-processing units, following action points could be suggested:

1. Arrangement should be made for making capital available to the potential entrepreneurs engaged in agro-processing activities ***(Attn: NABARD, State Co-operative Banks, Commercial Banks and RRBs).***
2. Information Centres should be established. These can give information relating not only to market prices, availability of raw materials, technical know-how in connection with concerned activities, but also about various government schemes meant for promoting agro processing activities. ***(Attn: Department of Industries, Govt. of Bihar & State Department of Food Processing & Horticulture).***
3. Deficiency of supporting infrastructure should be removed by ensuring quality all weather roads to rural and urban areas, regular power supply, means of communication and strengthening formal credit institutions. ***(Attn: Road Commissioner, Govt. of Bihar, Bihar State Electricity Board, NABARD, Department of Institutional Finance, Govt. of Bihar).***
4. With a view to ensure the supply of raw materials at reasonable prices and in time, and marketing of the produces, Co-operatives be made instrumental and strengthened. ***(Attn: Department of Co-operation, Govt. of Bihar)***.
5. Locally available raw materials' based processing units related to fruits and vegetables have to be promoted**.** ***(Attn: Directorate of Horticulture, Directorate of Industries & Department of Agriculture, Govt. of Bihar and Ministry of Food Processing, Govt. of India).***
6. Emphasis should be given on formation and strengthening of Self-Help Groups (SHGs). ***(Attn: NABARD, Registrar (Co-operatives), Govt. of Bihar).***
7. There is need to recuperate the handloom and power loom industry of the state, particularly in potential districts. This can be effectively done by providing credit and capital (machinery) on easy terms without much

procedural complexities Skill Development Training Programmes for weavers can also help achieve the goal. ***(Attn: Union Ministry of Clothes and Textiles, Govt. of India & Dept. of Industries, Govt. of Bihar).***

8. For the development of textile based processing enterprises, handloom parks should be established in and around potential districts. In view of larger concentration of tasar and silk units in and around Bhagalpur, expansion measures by DIC should be taken. ***(Attn: Department of Industries, Govt. of Bihar).***
9. Technological and infrastructural back up be provided for preservation of raw materials and the agro food based processed products under PPP endeavour. ***(Attn: Dept. of Industries, Govt. of Bihar, BSIDC, Directorates of Horticulture and Dairy Development, Govt. of Bihar & Rajendra Agricultural University, RAU, PUSA).***
10. With a view to ensure quality standardization of the produces, particularly of agro-food products, Certification Centres/Laboratories be opened, preferably at KVC, at PUSA and BAC, Sabour under RAU ***(Attn: Dept. of Agriculture, Govt. of Bihar & RAU, PUSA).***
11. Exhibition of **agro-food** and **agro-non-food based processed products** should be arranged in all the government sponsored melas/fairs with a view to ensure wide publicity. ***(Attn: NABARD, RAU, Dept. of Agriculture & Dept. of Industry, Govt. of Bihar).***

REFERENCES

1. Economic Survey (2007-08), Finance Department, Government of Bihar (March, 2008), pp 85-96.
2. Chengappa, P G (2004) "Emerging Trends in Agro Processing in India," Indian Journal of Agricultural Economics, Vol.- 59, No. – 1, Jan-March, pp 55-74.
3. Department of Industry, Govt. of Bihar.
4. Chadha, G K & Sahu, pp (2003) "Small Scale Agro Industry in India, Low Productivity in its Achillas' Heel," Ind. Journal of Agri. Econ., Vol. – 58, No. 3, July-Sept, 2003 pp 518-543.
5. Economic Survey (2008-09), Finance Department, Government of Bihar, (Feb, 2009), pp 64-65, 91-98.
6. Jha, U M (2008) "Growth, Status and Prospects of Agro Processing Industries: An Overview: Workshop Papers' Vol on Understanding the Growth and Prospects of Agro Processing Industries in Bihar, 15-16 April 2008, pp 17-18.
7. Rahim, Kazi MB & Ghosh, Jiban Kumar "Status of Agro based Industries in Bihar and West Bengal: A Comparative Study" Ibid, pp 1-2.
8. Economic Survey (2008-09), Govt. of Bihar, p-66.
9. Roy, Nabin Kumar (2008), "Understanding the Growth and Prospects of Agro Processing Industries in Bihar: An Approach for Development of Micro Enterprises – Role of Self Help Groups," Workshop Vol. as at SN – 7, p 12.
10. Souvenir Silver Jubilee Celebrations (2008), COMPFED, Patna, pp-2-5
11. Bihar through Figures (2003), Directorate of Statistics and Evaluation, Bihar, Patna.
12. Report No. – 480. Unorganized Manufacture Sector in India (2000-01) Input, Output and Value Added NSS 56th Round (July, 2000-June, 2001), National Sample Survey Organization, Ministry of Statistics and Programme Implementation, Govt. of India, November, 2002.
13. Report No. 478, --- Unorganized Manufacturing Sector in India (2000-01), Characteristics of Enterprises, NSS 56th Round.
14. Report No. 477, Unorganized Manufacturing Sector in India (2000-01), Key Results NSS 56th Round.
15. Report No. 433, Unorganized Manufacturing Sector in India, Its Size, Employment and Some Key Estimates, NSS 51st Round, July 1994-June, 1995.
16. Report No. 434, Unorganized Manufacturing Enterprises in India: Salient Features, NSS 51st Round.

ANNEXURE – I

Comments on Draft Report

1. Title of the Draft Study Report Examined : Understanding the Growth and Prospects of Agro-Processing Industries in Bihar
2. Date of receipt of the Draft Report : 26/08/2009
3. Date of dispatch of Comments : 10/09/2009
4. Comments on Objectives of the Study :

   The first objective of the study is supposed to be studied using secondary data available from Annual Survey of Industries (ASI) data for the organized sector and quinquennial National Sample Survey (NSS) data for the unorganized segment of manufacturing. However, although in the introductory chapter, it has been mentioned (pp-7, Sec: 1.4 data base) that National Sample Survey (NSS) data on unorganized manufacturing and Annual Survey of Industries (ASI) data for organized segment have been used; the study did not use it. Such data must be incorporated in the study, using the prescribed table format sent to you for the secondary data analysis and are to be presented in Chapter-II. In examining the second objective, depending on availability of data, the location and concentration of selected agro-based industries needs to be correlated with the production/resource base of the state.
5. Comments on the Methodology :

   The Authors have followed the indicated methodology except the size of the sample which has been reduced to 27 instead of 30. At this stage, however, there is nothing to do in this regard.
6. Comments on Presentation and get up etc.:

   The overall presentation and get up of the report is quite satisfactory. However, the 2nd Chapter must provide an analysis based on the prescribed tables on secondary data using Annual Survey of Industries (ASI) data for the organized segment and National Sample Survey (NSS) data for the unorganized manufacturing. You must give priority for observing changes occurred between 1994-95 and 2000-01 which is specified in the table format.
7. Overall view on Acceptability of Report : Before finalization the above mentioned comments should be incorporated.

Sd/-
Kazi M B Rahim
Hon. Director
AER Centre, Visva Bharati
Santiniketan (WB)

ANNEXURE – II

Action Taken Report

1. Title of the Draft Study Report Examined : Understanding the Growth and Prospects of Agro-Processing Industries in Bihar
2. Date of receipt of Comments on Draft Report : 15/09/2009
3. Date of dispatch of the Report : 08/12/2009

4. Annual Survey of Industries (ASI) data for organized manufacturing sector and National Sample Survey (NSSO) data on unorganized manufacturing segment for Bihar have been incorporated in the prescribed tables, format in Chapter- II.

   Second Objective has also been attended as per availability of data.

   The location and concentration of selected agro-based industries have been correlated as far as possible.

5. Action not needed.

6. Analysis based on available Annual Survey of Industries (ASI) and National Sample Survey (NSSO) data and tables has been provided in the 2nd Chapter of the report.

7. Action not required.

Dr. Rajiv Kumar Sinha
Project Leader

Dr. Shambhu Deo Mishra
Co-Project Leader