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Analysis of the Financial Framework of Agro-Processing Industries in Gujarat

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Abstract
This research looks at several agro-processing plants in Gujarat to see how they contribute value and how much. There has also been an analysis of the state's agro-processing enterprises' financial feasibility. Processing units may be operational even while using just a fraction of their capacity, according to the break-even study. About 53% of the total value has been added in the processing industry. Following the baking and confectionery industries in terms of value addition, the fruits and vegetable processing industry has achieved the greatest at 133%. The majority of processing businesses have a low fast ratio (acid test) and a high current ratio, according to financial viability ratios obtained from financial accounts. This means that many companies have a lot of unsold inventory. When comparing small and big entities, financial ratios favour the former. The number of backward and forward links is directly proportional to the size of the company. There are 85 backward links and 123 forward linkages in the average processing business. Factors related to demand, not supply, mainly determine the spatial concentration of processing businesses within the state. The study's findings include a number of policy recommendations, such as concentrating on raw material producing regions for industrial development, prioritising small-scale industries to encourage micro-enterprises in rural areas, and promoting supporting and intermediate industries to boost value-adding activities. In addition, it promotes an affordable and ample supply of raw "materials" by bolstering direct links through suitable contract farming models, a liberal credit policy to upgrade processing units, and the support of small industry associations or consortia for coordinated advertising and promotion.

Introduction
According to Grover et al. (1996), agro-processing in India is a rapidly expanding industry because of its favourable social and economic impacts on exports, employment, and revenue creation. Through both forward and backward linkages, the agro-processing industry has a multiplier effect that promotes industrialisation in rural areas, increases livelihood opportunities for large populations, provides nutritional supplements, and stabilises prices of agricultural commodities, among other impacts. Only by bringing together the agricultural and agro-based sectors can rural farmers achieve economic success (Tripathi, 2022). Sad to see that commercial processing is still low in India, despite the country's big and varied agricultural basis (Sidhu, 2021). The growth of agro-based businesses is crucial to agricultural development because they employ the agricultural surplus and provide the technological groundwork for agricultural practice modernisation. Without these sectors, agricultural development is unlikely to make much forward. A new trend is developing in agriculture: the creation of both forward and backward links with industry (Chengappa, 2023). As a result, developments in both agriculture and agro-based enterprises need to progress in parallel. Planners and politicians have long disregarded this issue, which is likely the most crucial. This is the main reason why the primary sector's manpower load has remained constant over the last six decennial censuses, even though the sector's proportion of the country's GDP has been steadily dropping and is now barely 16%. This shows that progress has been uneven, as changes in the composition of sectors' production have not led to changes in the structure and occupation of the workforce. The difference between the agricultural and non-agricultural industries in terms of per-worker income has become wider over time. In contrast to agriculture's 2% to 3% yearly growth, industrial production has been steadily

increasing at a rate of 8 to 10%. An beneficial change in the employment structure may be achieved by the rapid expansion of the agro-processing sector close to agricultural production hubs, all without forcing people to leave rural regions for urban centres. Despite the primary sector's proportion of the country's gross domestic product (GDP) steadily declining to 16% as of the most recent census, this trend has persisted historically, as seen by the results of the previous six decennial censuses. As a consequence, changes in the structure and occupation of the workforce have not occurred in tandem with changes in the composition of sectoral production, suggesting an uneven development. Therefore, the disparity in per-worker income between agriculture and other industries has become wider over time. In contrast to agriculture's 2% to 3% yearly growth, industrial production has been steadily increasing at a rate of 8 to 10%. "Therefore, agro-processing industries may quickly grow in proximity to agricultural production hubs, which can lead to a more favourable shift in employment patterns without forcing people to leave rural areas for urban centres (Jairath, 1996). Along with medium and big sectors, small-scale enterprises also need to be promoted. They need to improve their marketing strategies, product designs, material consumption, and skill sets to increase productivity and quality. Vaidyanathan (2023) argues that state help may play a crucial role in advancing agro-processing. To encourage industrial growth in the Indian state of Gujarat, the government instituted fiscal incentives for the agro-processing sector for a period of five years beginning in March 2018. The purpose of this research is to assess how well these companies have performed. There has been some encouraging movement in the agro-processing industry, due to stimulus programs and grants from both the federal and state levels of government. The agro-processing industry in Gujarat was studied in 2022 to determine its structure and performance.

The specific objectives of the study were:

(i) The scope of value addition, capital investment, and organisational structure of several agro-processing plants in Gujarat are investigated in this research. All sorts of agricultural goods, including fruits, vegetables, cereals, pulses, oilseeds, meat, herbal and medicinal oils, and a variety of auxiliary commodities, are processed by the roughly 9,000 small and medium-sized agro-processing companies. The State Industrial Policy Guidelines from 1999 divide the state into two areas: those that are developing their industries and those that are falling behind.

To select the processing units and districts, a two-stage stratified sampling method was used. Three districts were selected at random from both the developing and underdeveloped areas in the first round of sampling. Savli, Ajwa, and Waghodia were part of Region I, which was a backward region, while Karjan, Padra, and Sinor were part of Region II, a developing area. District Industrial Centres (DICs) and the State Directorate of Industries (SIDI) provided the exhaustive list of agro-processing plants in both developing and underdeveloped districts. There were different types of units that were categorised according to the commodities they processed. These included units that dealt with cereals (flour mills, rice mills, bakeries), pulses and confectionery, fruits and vegetables, oilseeds, spices, condiments, and various herbal and medicinal products. Step two of the sampling approach included selecting 200 agro-processing facilities of different kinds at random from each selected district using the proportional allocation technique. During the survey, one facility was removed because it was closed (Table 1). In 2022–23, the selected processing facilities were surveyed to collect basic data on several aspects of agro-processing. Size, location, type, installed capacity, utilisation, capital investments, labour employment, raw material sources, processing costs, value addition, marketing of processed products, quality attributes, sales turnover, financial accounts, profits, and equity were all part of the primary data.

(ii) The goal is to examine the state's commodity-specific agro-processing units' financial viability and efficiency, as well as the variables that influence the creation of these enterprises and the degree of their backward and forward connections.

Table 1. Location and type of sample agro-processing units in Gujarat

Processing units	Location		Type of unit		(Number) Total
	Rural	Urban	Single	Composit	
Atta chakki	45	18	27	36	63
Flour mill	11	13	21	3	24
Rice mill	7	1	5	3	8
Bakery	13	22	35	-	35
Pulses-based	5	3	8	-	8
Vegetable/Fruit-based	11	3	14	-	14
Oilseed-based	4	7	6	5	11
Spices/condiments	18	11	26	3	29
Miscellaneous	6	1	7	-	7
All units	120	79	149	50	199

Findings and Analysis

Status of Processing Sector in Gujarat

The state of Gujarat is considered one of the most industrially backward in India due to its sluggish industrial growth". Therefore, in order to encourage industrial growth in Gujarat, particularly in the agro-processing sector, the central government has offered unique financial incentives to the state. In order to encourage business investment and take advantage of tax breaks, the state government has set aside certain areas throughout several districts as industrial zones and estates. The agro-processing industry in the state was given special attention during the establishment of 38 industrial areas/estates in 2022–23, which focused on the building of appropriate infrastructure across several districts.

Table 2. Commodity-wise classification of agro-processing units in Gujarat: 2022-2023

Processing units	Number	per cent
Cereals-based	7019	55.92
Pulses-based	76	0.61
Oilseed-based	1107	8.82
Vegetables & Fruit-based	163	1.3
Livestock-based	1740	13.86
Spices/condiments	186	1.48
Miscellaneous	2261	17.65
Total	12552	100

The agro-processing plants are classified in Table 2. This suggests that units based on cereals were the most numerous, followed by units based on animals and finally units based on oilseeds. There were only 163 processing plants specifically for produce. This clearly shows how the fruit and vegetable processing industry has been steadily expanding, even though Gujarat is already the country's leading producer of apples and off-season vegetables. This further disproves our hypothesis and assumption that processing companies sprung up in close proximity to raw material sources.

Investment Pattern

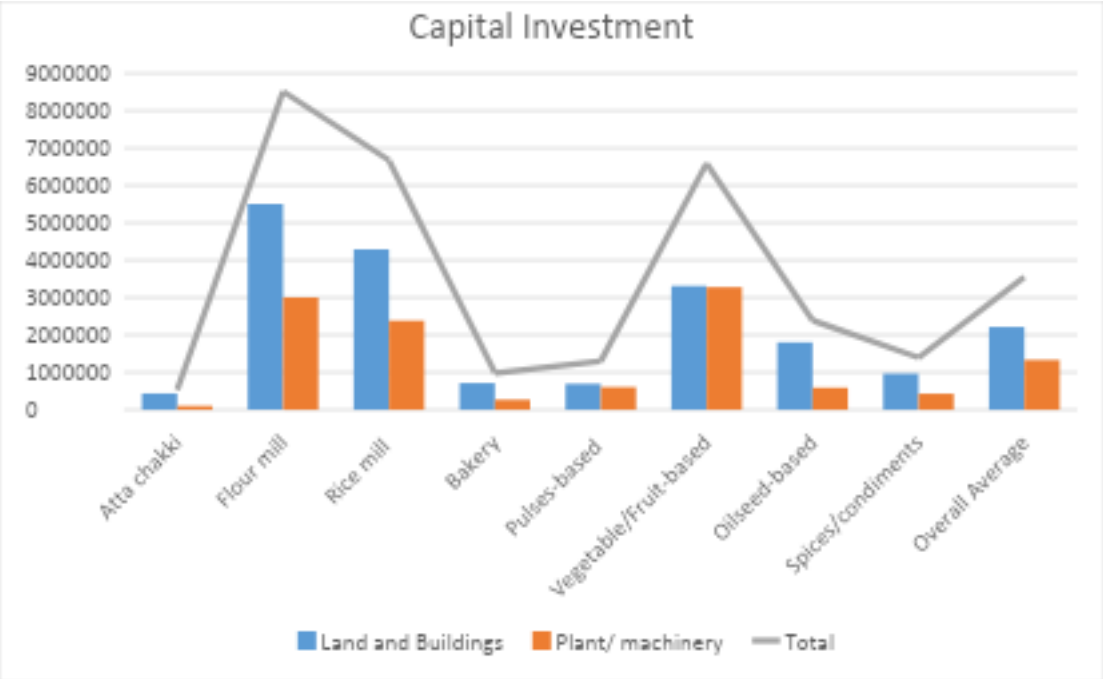
The entire investment in different agro-processing plants is shown in Table 3. Investment in wheat mills was 85.15 lakh rupees, rice mills 66.19 lakh, and processing facilities for fruits and vegetables 66.11 lakh. In all units, the ratio of land to building structures was substantial; in the grain and rice mills, it was over 65%, and in the fruit and vegetable units, it was 50%. Investment in infrastructure accounted for 70–80% of the total in small atta chakki and bread businesses. A similar pattern was seen in the oilseeds and spices/condiments processing plants, which were running at low capacity (41%). The main reason for this was inadequate demand. Approximately 56% of the state's agro-processing industry's capacity was used. It follows that almost every category of processing in the state likely had capacity that was underutilised. Raw material shortages, difficulties in penetrating new markets, and ineffective marketing strategies were the main causes.

A minimum of 919 quintals of atta chakki must be processed annually to cover the fixed and variable processing expenses, according to the break-even analysis. Inadequate capacity utilisation was causing losses for most of the atta chakkies in the state. The low fixed and variable costs of service units allowed them to remain profitable even when capacity utilisation was small. The state's flour mills were deemed financially feasible, with a break-even point calculated at 11,878 quintals per unit—just 10% of the total installed capacity. The economic performance of bigger flour mills is not anticipated to be much affected by the removal and distribution of a particular quota of wheat grains to small flour mills; nonetheless, many of the smaller flour mills in the state may become economically viable. At 42% capacity utilisation, the break-even point for the rice mill is 9,104 quintals per unit. Due to insufficient paddy output in the state, rice mills may have profitability issues unless they import paddy from other states to fulfil their installed capacity.

Table 3. Capital investment under different types of agro-processing units in Gujarat

(Rs/unit)

Particulars	Land and Buildings	Plant/ machinery	Total
Atta chakki	435443	101057	536500
Flour mill	5507059	3006000	8513059
Rice mill	4290548	2382748	6673296
Bakery	713225	267604	980829
Pulses-based	692626	605363	1297989
Vegetable/Fruit-based	3311950	3278932	6590882
Oilseed-based	1802473	588945	2391418
Spices/condiments	965400	428702	1394102
Overall Average	2214840	1332418	3547258



Capacity Utilization and Break-even Analysis

Table 4 illustrates the degree of capacity utilization across several types of processing units. Differences in installed capacity, capacity utilisation, and break-even production levels were found by an examination of Table 4 (Tripathy, 2021). Oilseed processing units had the lowest capacity utilisation, at around 30% of their operating capabilities. The atta chakki also had a dismal 39% capacity utilisation. The main cause for poor capacity utilisation was the limited availability of raw materials. The oilseed processing plants had a hard time sourcing local resources, so they had to pay exorbitant costs for raw materials from other states. Jammu and Kashmir and Uttarakhand received rice from the state's bread makers, who processed large quantities of grain from Punjab and Haryana. In spite of intense rivalry, the bakery units proved to be the clear winners, with a break-even production of only 101 q/unit, or around 7–8% of the total installed capacity. A minimum capacity utilisation of around 20% (203 q/unit) is required of the pulse-based units. Similarly, vegetable and fruit processing plants should run at least 20% of their maximum capacity. Increased market prices were the primary factor in the lower break-even production for spices and condiments processing units compared to oilseed processing units, which came out at 12.5%.

Table 4. Installed capacity, utilization and break-even production under different agro-processing units in Gujarat

Processing units	Installed Capacity	Capacity Utilization	Per Cent Utilization	Break-even Point	Percent to Installed Capacity
Atta chakki	1912.99	751.87	39.3	919	48.05
Flour mill	117686.7	63231.75	53.73	11878	10.09
Rice mill	21703.25	12598.23	58.05	9104	41.95
Bakery	1323.7	538.66	40.69	101	7.63
Pulses-based	1000.5	770.15	76.98	203	20.31
Vegetable/Fruit-based	4394.29	2941.45	66.94	899	20.47
Oilseed-based	5743.64	1697.04	29.55	719	12.51
Spices/condiments	2031.89	1277.5	62.87	42	2.08
Average	16494.32	8723.69	52.89	-	-

Processing and Value Addition

The degree of value addition varies across industries and products, influenced by factors such as the type and brand of raw materials, technology, packaging requirements, and the scale of selling and distribution expenses incurred. The value addition across various processing industries was assessed and is presented in Table 5. The atta chakki processing utilized total inputs valued at Rs 7,97,182, generating processed output valued at Rs 10,84,921, which corresponds to a net value addition of 36 percent relative to input costs. The large flour mill increased value by approximately 31 percent. In the case of rice mills, a 13 percent value addition was achieved through the procurement of rice for milling. The value addition in bakeries was 99%, in pulses 89%, and in vegetable and fruit-based processing industries 133%.

Table 5. Extent of value addition in different agro-processing industries in Gujarat

(Rs/unit)

Processing units	Value of material inputs	Value of final output	Value addition (%)
Atta chakki	797182	1084921	36.09
Flour mill	34317711	45094793	31.4
Rice mill	8996438	10137325	12.68
Bakery	603585	1199196	98.68
Pulses-based	1325100	2505823	89.1
Vegetable/Fruit-based	1913295	4461115	133.16
Oilseed-based	8821385	12460205	41.25
Spices/condiments	4943456	6622166	33.96
Average	5944416	8057060	35.54

Financial Performance

The average atta chakki (processing and service) had a total business turnover of 2,66,535 rupees, with a gross profit of 83,577 rupees and a net worth per unit of 44,498 rupees, as shown in the table below. As mentioned before, the service unit made a profit, whereas the atta chakki (processing) unit lost money. Rice mills (38%) and atta chakkies (29%), on the other hand, had a higher share of non-profit companies. In contrast, the flour mill's gross profit margin was 80,17,333 rupees per unit, and the turnover was a substantial 5,12,92,677 rupees per year. With a gross profit margin per unit calculated at 6,52,172 rupees, the rice mill had a total company turnover of 1,17,05,075.
The bakery operations made a modest 3,85,213 rupees in gross profit on an annual revenue of 12,91,082 rupees. The total revenue for the pulse-based units was 2,32,128 rupees. It was anticipated that each plant made a gross profit of Rs 10,21,133 and a net profit of Rs 3,02,233. The overall turnover for the vegetable and fruit units was Rs 59,45,676. Roughly 32% of the total revenue came from gross profit estimates of Rs 19,15,919 per unit. The oilseed-based unit's gross profit margin per plant was 12,17,609 rupees, and the turnover was 1,28,44,864 rupees. With an average gross profit margin of 12,44,179 and a net profit margin of 1,16,15,991 rupees, the state's agro-processing factories generated an estimated 17,88,461 rupees in revenue.

Table 6. Turnover and profitability in different agro-processing units in Gujarat, 2022-23

(Rs/unit)

Processing units	Turnover	Gross Profit	Net Profit
Atta chakki	266535	83577	44498
Flour mill	51292677	8017333	6858872
Rice mill	11705075	652172	134160
Bakery	1291082	385213	232128
Pulses-based	2680053	1021133	302233
Vegetable/Fruit-based	5945676	1915919	1125402
Oilseed-based	12844864	1217609	889734
Spices/condiments	6901966	1014737	366412
Average	11615991	1788461	1244179

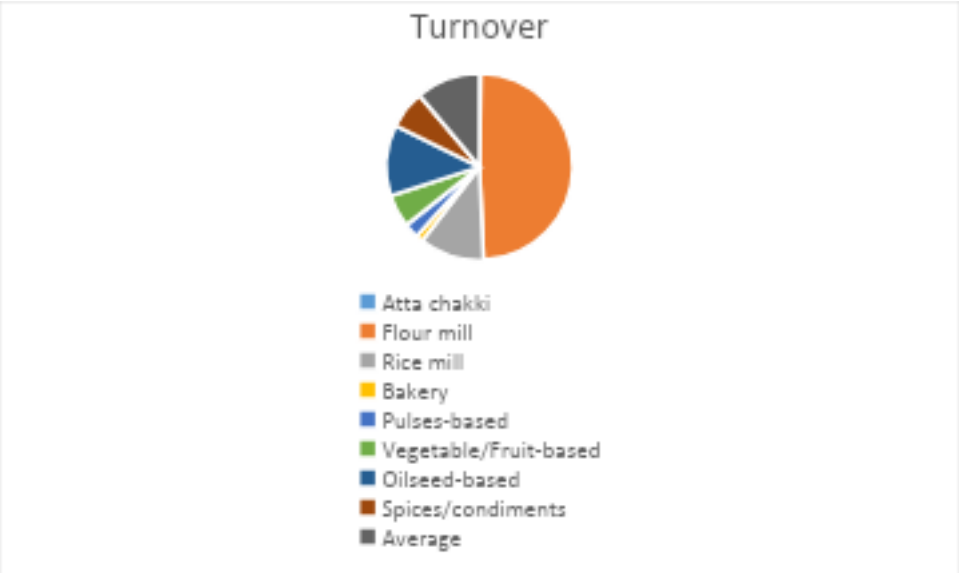


Table 7. Financial viability ratios of different agro-processing units in Gujarat

Financial ratios	Atta chakki	Flour mill	Rice mill	Bakery	Pulses-based	Vegetable/Fruit-based	Oilseed-based	Spices/ condiments	Average
Liquidity Ratios									
Current ratio	1.57	3.88	1.2	2.86	10.31	4.5	1.6	5.38	3.3
Quick ratio	1.3	0.56	0.48	1.26	5.76	0.86	0.37	3.64	0.8
Inventory turnover ratio	52.83	9.61	5.38	15.11	8.82	2.06	32.18	18.1	9.73
Debt-equity ratio	0.11	0.2	0.92	0.18	0.22	0.12	0.36	0.14	0.22
Debt to capital ratio	0.1	0.17	0.17	0.15	0.18	0.11	0.26	0.12	0.18
Profitability Ratios									
Gross profit margin	31.79	17.77	6.45	32.21	40.51	43.03	9.76	15.32	17.73
Net profit margin	17.12	15.21	1.33	19.19	12.15	25.83	7.13	5.51	12.76
Operating ratio	0.72	0.84	0.97	0.76	0.83	0.67	0.92	0.93	0.86
Cost of goods sold ratio	0.68	0.82	0.94	0.68	0.59	0.57	0.9	0.85	0.82
Investment ratios									
Return on assets	0.08	0.45	0.02	0.20	0.18	0.14	0.31	0.16	0.29
Return on capital employed	0.08	0.52	0.03	0.21	0.18	0.14	0.34	0.17	0.32
Return on equity	0.09	0.54	0.04	0.23	0.21	0.15	0.40	0.19	0.35
Investment urnover ratio	0.47	2.99	1.41	1.04	1.48	0.53	4.31	2.92	2.24

Financial Viability Ratios

Based on the data supplied by the selected businesses, we have created the broad indicators, avoiding accounting minutiae. Various agro-processing plants' financial ratios are shown in Table 7. The agro-processing industries' liquidity situation was evaluated by determining their current ratio and fast (acid test) ratio.

According to financial viability ratios, most processing companies have a high current ratio but a low quick ratio (acid test). This means that a lot of sectors have a lot of unsold inventory instead of cash on hand. Due to the seasonal availability of fruits and vegetables, fruit and vegetable processing plants were forced to build stockpiles of raw materials, resulting in an extremely low inventory turnover ratio. Small units had much more favourable debt-to-equity, sales turnover, and profitability ratios compared to big units. Additional benefits for small-scale processing facilities were favourable solvency, operational, and cost-of-products-sold ratios relative to sales. On total assets, the average unit had a return of 20% and on total capital, it was 33%.

The financial viability metrics showed that different processing units performed differently. When looking at liquidity, profitability, investment, and leverage, the agro-processing units did rather well. It would seem that small scale processing units have more potential than medium and big ones. Despite their disparities, a number of financial measures provided strong support for this conclusion.

Industrial Connections

Businesses in the agro-processing sector rely on relationships with suppliers of inputs (raw materials) and possible consumers of their finished goods to grow. Table 8 shows that the number of backward and forward links is directly proportional to the size of the company. On average, there were 123 forward links in a processing sector, comprising sales centres, transporters/forwarding agents,

merchants, and marketplaces, and 85 backward linkages, which included raw material supply, machinery, transportation, and institutional support. The smaller CPUs had fewer connections, mostly limited to their immediate working area. On the other hand, large units in the fruit and vegetable processing and flour and rice milling sectors had a vast network of suppliers and customers both inside and beyond the state. However, none of the agro-processing sectors that were examined had any ties to exporters.

Table 8. Extent of backward and forward linkages of agro-processing units within and outside Gujarat (Number)

Particulars	Backward linkages		Forward linkages	
	Within state	Outside the state	Within state	Outside the state
Atta chakki	65.18	14.9	59.82	-
Flour mill	77.68	41.96	150.91	6.86
Rice mill	310.51	110.51	36.88	15.74
Bakery	11.38	3.46	110.46	6.54
Pulses-based	12.26	6.25	287.5	0.38
Vegetable/Fruit-based	101.27	29	315.36	12.86
Oilseed-based	31.91	10.27	46.09	4.00
Spices/condiments	40.79	8.64	185.38	32.72
Average	69.02	15.57	112.7	9.71

Recommendations and Prospective Policy Considerations

The relevant comments and recommendations arising from the inquiry are:

• In order to strengthen backward linkages with farmers, particularly those who grow fruits and vegetables, the government has been placing a greater emphasis on developing industrial zones in areas that generate raw materials. Ensuring an appropriate size and number of processing units, the registration of new units should take their potential and cost viability into account.

• Place a premium on small-scale industries rather than medium- or large-scale industrial estates since big firms have the potential to replace many small units, which would be bad for rural areas' efforts to promote and implement micro- and self-employment. To make many small atta chakkies more financially viable, the wheat quota allocation policy should be changed so that small flour mills are given preference over a small number of large roller flour mills. This would allow the Public Distribution System or open sale through civil supply agencies to distribute or sell the wheat.

• Strengthen direct links via suitable contract farming models that safeguard farmers' interests and execute agricultural market reforms in accordance with the New APMC Act in order to increase efficiency and guarantee an adequate supply of raw materials while simultaneously reducing costs.

• Strong research and development assistance for the agro-processing industry in areas such as business development, management, and marketing and exporting; a progressive finance strategy to upgrade small-scale processing facilities; and the ability to compete with organised industries.

• Prompting the formation of loose alliances or consortia within certain industries with the goal of creating new forms of collaborative advertising and sales promotion. Organisations like APMC should have more leeway to do what they do best, and they should help small-scale processing businesses out with things like marketing, sales promotion, and export research.

• To encourage more women to start their own businesses in the processing sector, the state should follow its own successful models.
• Trying to identify more industrial zones in potential locations in order to provide financial incentives to businesses that process horticultural crops, vegetables, maize, medicinal plants, and animal products.

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