# THE EFFECTS OF COVID-19 ON THE FOOD PROCESSING INDUSTRY IN BHUTAN - IMPACT, RESPONSES AND POLICY INTERVENTIONS


A Thesis

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by

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## ABSTRACT

The paper examines the effects of the COVID-19 pandemic on 13 large and medium food processing firms using census data on the COVID-19 impact on large and medium food production and manufacturing industries in Bhutan. The findings suggest that food processing firms have suffered a significant revenue loss due to the pandemic and medium-sized firms have suffered a greater revenue fall than large-sized firms. However, the revenue share of the food processing industry in overall industrial revenue has increased during the pandemic.

The food processing industry has significant potential to cut dependency on imported food products. To support the growth and sustainability of food processing firms, the government could provide targeted interventions to improve the food value chain. In addition, the government could also improve the policy and regulatory environment to support the growth of agro-based startups and cottage and small industries, which will determine the future strength of the food industry in the country.

## BIOGRAPHICAL SKETCH

Sonam Norbu worked as a Program Analyst for the COVID-19 Economic Contingency Planning Team with the Office of the Prime Minister of Bhutan before joining Cornell University. He holds a Bachelor of Arts in Economics and Geography and a Postgraduate Diploma in Public Administration. Having topped third in the most competitive Bhutan Civil Service Examination, he joined Bhutan's Royal Civil Service Commission as an HR Planner. However, inspired by the poverty and rising inequality issues, he joined the Gross National Happiness Commission to work towards promoting equitable distribution of socio-economic development benefits.

He was awarded the prestigious Joint Japan World Bank Graduate Scholarship to study at Cornell University. He is completing his Master of Professional Studies in Global Development with a major in International Development Economics and Policy. He will continue to work for Gross National Happiness Commission and play a critical role in developing intelligent policies and targeted economic interventions to restore the livelihood of people affected by the pandemic.

*To my mother*

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| | |
|---|---|
| ADB | Asian Development Bank |
| BAFRA | Bhutan Agriculture and Food Regulatory Authority |
| BPC | Bhutan Power Corporation |
| BSIC | Bhutan Standard Industrial Classification |
| BIT | Business Income Tax |
| CIT | Corporate Income Tax |
| CSI | Cottage and Small Industries |
| DoFPS | Department of Forest and Park Services |
| DoI | Department of Industry |
| DRA | Drug Regulatory Authority |
| EDB | Ease of Doing Business |
| FYP | Five Year Plan |
| FDI | Foreign Direct Investment |
| G2B | Government to Business |
| GDP | Gross Domestic Product |
| GSB | Granular sub-base |
| HMRF | His Majesty The King's Relief Fund |
| IDG | Industrial Development Grant |
| IIDD | Industrial Infrastructure Development Division |
| IP | Industrial Park |
| ITC | International Trade Centre |
| KIL | *Koufuku* International Limited |

| | |
|---|---|
| LoI | Letter of Intent |
| LUC | Land Use Certificate |
| L&M | Large and Medium |
| MSME | Micro, Small and Medium Enterprises |
| MoAF | Ministry of Agriculture and Forest |
| MoEA | Ministry of Economic Affairs |
| MoF | Ministry of Finance |
| NCGS | National Credit Guarantee Scheme |
| NCSIDBL | National CSI Development Bank Limited |
| NECS | National Environment Commission Secretariat |
| NLC | National Land Commission |
| NRF | National Resilience Fund |
| NSB | National Statistics Bureau |
| OPM | Office of the Prime Minister' of Bhutan |
| RGoB | Royal Government of Bhutan |
| RMA | Royal Monetary Authority of Bhutan |
| SME | Small and Medium Enterprises |
| TVET | Technical and Vocation Education Training |
| TAT | Turnaround time |
| UN | United Nations |

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## 1. Background

This project paper examines the effects of the COVID-19 pandemic on medium and large food processing establishments in Bhutan. This industrial sector is important to Bhutan's economy and has been severely impacted by the disruption caused by COVID-19. This section discusses the context for food processing both in the industrial sector and in Bhutan's economy in general.

Industrialization in Bhutan started in the 1960s with the beginning of the first Five Year Plan (FYP) with public investment in the hydropower sector, which led to the growth of transportation, construction, and manufacturing sectors, particularly cement industries. In 1987, Bhutan commissioned the 336-megawatt *Chukka* Hydro-electricity Project, the first mega hydro-electric project, which exports 70% of its output to India. By 1995, Bhutan exported small volumes of ferro alloys, calcium carbide, particleboard, and processed foods to India.

In addition to the continuous effort to capitalize on Bhutan's comparative advantage in the hydropower sector, it is hoped that economic diversification will be a game-changer to sustain economic growth. Transformation of the production and manufacturing industries will be critical and have a huge potential to strengthen the economy – generate revenue, create jobs, and reduce imports. However, limited access to finance, poor technological adoption, and a shortage of skilled workers are common challenges confronting production and manufacturing industries, leading to low productivity and innovation in sector. In addition, supply chain inefficiencies and competition from foreign goods are the biggest challenges faced by the manufacturing sector.

The Economic Census of Bhutan 2018-2019 recorded 13,997 industrial establishments in various economic sectors of which 744 are categorized as manufacturing industries, including mining and quarry industries. The business establishments are classified based on ownership, size of capital investment, and nature of activities (MoEA & NSB, 2020).

Firm classification by ownership include:

- Single Proprietorship
- Partnership
- Private Limited Company (non-Foreign Direct Investment)
- Public Limited Company (non-FDI)
- State Owned Limited Company
- FDI Company based on ownership.

Firm classification by size of capital investment include:

- Cottage: Less than Nu. 1.0 million
- Small: Nu. 1.0 million – Nu. 10 million
- Medium: Nu. 10 million – Nu. 100 million
- Large: More than Nu. 100 million

Firm classification based on nature of activities include:

- Manufacture of food and related products
- Manufacture of beverages
- Manufacture of wood and wood products
- Manufacture of coke and refined petroleum products
- Manufacture of chemicals, plastics, and rubbers products
- Manufacture of cement and other concrete products
- Manufacture of basic metals
- Manufacture of electrical and other machinery equipment
- Mining and quarrying
- Others

The firms are dominated by wholesale and retail: motor vehicle (motorcycles) industries represent 62.5%, followed by 21% in accommodation and food service activities, and 5.3% are in the manufacturing sector (NSB, 2019). The growth in the manufacturing sector has dropped to 3.7% in 2018 from 6.5 percent in 2017 and it further dropped by -0.01% in 2019 (NSB, 2018). Despite this deceleration, the manufacturing sector's share of GDP in 2019 was 7.1%, a drop of 0.3% from 2018.

With the onset of the pandemic and its associated restrictions, disruption in global supply chains, labor migration, and reduced market, the growth of entire economy has been affected, particularly the manufacturing sector, which was already experiencing a decline in growth. The government's economic stimulus plans targeted hard hit sector like tourism and construction, and agriculture was targeted to ensure continuous food supply during pandemic. The other industries are also being supported through various monetary and fiscal measures - loan and tax deferment, new working capital, and uninterrupted supply of essential raw materials despite public health concerns. Under the agriculture sector economic stimulus plan, the government has allocated spending in the agriculture sector to increase production. However, in contrast to a reportedly good harvest, industries continue to face raw materials supply and market access issues.

## 2. Research Scope and Purpose

### 2.1 Research purpose

The purpose of this research paper is to:

i. Study the challenges of large and medium food processing firms and the impact of the COVID-19 pandemic on revenue.

ii. Study policy responses to the pandemic and the internal adjustments made by firms in response to the pandemic.

iii. Provide suggestions to build a vibrant and resilient agro-based food processing industry to help achieve economic diversification.

### 2.2 Research scope

Of about 744 manufacturing firms, 139 are large and medium (L&M) production and manufacturing firms, including nine units under a parent company, which were treated as separate entities given their unique activities and separate books of account. However, this research focused on 13 L&M food processing firms which represent about 10% of the total L&M manufacturing firms in Bhutan (MoEA, 2020 & NSB, 2020). These firms contribute about 5.4% to the overall industrial revenue [See Table A-8] and employ about 9.5% of the overall industrial workforce [See Table 6] during pandemic. The impact study was centered around the market and revenue, raw material and energy, and labor and employment in these 13 food processing firms.

## 3. Literature Review

There is almost no pre-existing literature on pandemic impacts specific to large firms, but given the smallness of firms in Bhutan, this paper reviews the literatures related to the COVID-19 impact on manufacturing Small and Medium Enterprises (SMEs) in countries with a similar context. Besides academic journals, this paper also reviews the government policies, systems, and processes to identify the gaps and challenges affecting the food processing sector.

### 3.1 Economic Performance

Bhutan continues to transform into a modern economy, with industrial and service sectors growing more rapidly than agriculture (AB, 2013). In 2019, the economy witnessed a growth of 5.5%, which is 2.4% higher than the growth recorded in 2018. The tertiary sector represents 48.1%, followed by the secondary sector with 36.1% and primary sector comprising 15.8%. The primary drivers of economic acceleration were education and health with 51.1% growth; followed by mining & quarrying with 33.1% growth; and transport, communication, and electricity with the growth of 12.1% (NSB, 2020).

The primary sector (agriculture, livestock, and forestry) recorded a growth of 1.3%, a drop of 3.0% from 4.3% in 2018, one of the lowest growth rates recorded in recent years. Likewise, industrial sector growth bounced back to 2.0% in 2019 from a negative growth of -5.0% in 2018, a spike of 7.0% compared to the previous year. In 2019, the growth of the service sector dropped to 9.2% compared to 10.3% in the previous year. The contribution from the secondary sector to GDP growth remains below 1% compared to above 4% from the tertiary sector (NSB, 2020).

In the past three years, the manufacturing sector has been struggling and witnessed continuous decelerated growth. In 2018, the growth of the sector declined to 2.6% from 6.5 % in 2017 and it further declined to -0.01% in 2019. The manufacturing sector's contribution to GDP was -0.0% during the year. Within the manufacturing sector, a decline in growth of the food processing sector by -16.6% and a decline in growth of cement manufacturing subsector by -5.9% largely contributed to the poor performance of the sector although other sub sectors experienced growth (NSB, 2020).

### 3.2 Ease of Doing Business

The Ease Doing Business (EDB) model has been adopted to identify business challenges that have intensified the impact of the pandemic on industries. Historical data shows that Bhutan has improved its EDB performance during the last ten years, and its ranking jumped to 89 in 2020 from 126 in 2010 (World Bank, 2010-2020). Bhutan ranked 89 in EDB out of 190 economies around the world in 2020 Bhutan is ranked 13 out of 137 lower-middle-income countries and 2 out of 8 economies in South Asia, but Bhutan is still a relatively unfavorable destination for business and investment.

In terms of ranking for specific indicator under EDB except for labor market regulations, Bhutan has performed better, in top 40-50 percent in Getting Electricity (78/190), Dealing with Construction Permits (91/190), and Getting Credits (94/190). But Bhutan was ranked bottom 15% in Resolving Insolvency (168/190); ranked in the bottom 50% in Protecting Minority Investors (111/190) and in Starting a Business (103/190) in 2020 (World Bank, 2020) [See Table 1]. This ranking indicates how difficult it is to do business in Bhutan.

Bhutan was ranked in the 46$^{th}$ percentile in *Starting a Business*. The review of the *business approval process in industrial parks* shows a classic example of a tedious process to start business in Bhutan. Right from expression of interest to establish a business until actual construction begins, it has 13 steps which takes at least 363 days for promoters to complete if every process is completed smoothly but, in many cases, it takes much longer (MoEA, 2020). It indicates that such lengthy processes are associated with regulatory compliance required by the National Environment Commission (NEC), Department of Forest and Park Services (DoFPS) under Ministry of Agriculture and Forest (MoAF), Bhutan Agriculture and Food Regulatory Authority (BAFRA)

and Drug Regulatory Authority (DRA) who take no less than 100 days to provide clearances to business promoters intending to establish business in industrial parks (MoEA, 2020).

*Table 1: Bhutan's Ease of Doing Business Ranking by Region and Income Group*

| Sl. No | Indicators | Ease of Doing Business | South Asia | Lower Middle Income |
|---|---|---|---|---|
| 1 | Starting a Business | 103 | 2 | 13 |
| 2 | Dealing with construction permits | 91 | 5 | 16 |
| 3 | Getting electricity | 78 | 4 | 15 |
| 4 | Registering property | 53 | 2 | 10 |
| 5 | Getting credits | 94 | 1 | 4 |
| 6 | Protecting minority investors | 111 | 3 | 25 |
| 7 | Paying Taxes | 15 | 1 | 21 |
| 8 | Trading across borders | 30 | 1 | 1 |
| 9 | Enforcing contracts | 29 | 1 | 1 |
| 10 | Resolving insolvency | 168 | 1 | 2 |
| 11 | Labor market regulation | | | |
| | Overall Ranking | 89/190 | 2/8 | 13/47 |

Source: World Bank, 2020

### 3.3 Entrepreneurship Ecosystem

The entrepreneurship ecosystem model was used to assess the current situation of entrepreneurship and its future potential role to strengthen the manufacturing sector in Bhutan. The pandemic has caused a significant adverse impact on progress toward entrepreneurship and exposed and deepened pre-pandemic fragilities (UN, 2020). The integration of entrepreneurship ecosystem domains like policy and regulatory system; access to finance and incentives;

entrepreneurship culture; infrastructure; human capital; and market access are critical to facilitate entrepreneurship growth. Any shortcoming in these six domains [See Figure 1] will stop Cottage and Small Industries (CSIs) from reaching their full potential (MoEA, 2020).

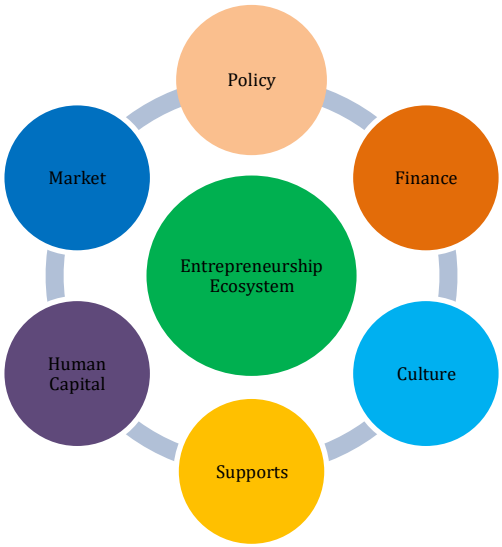


*Figure 1: Entrepreneurship Ecosystem Assessment Framework*

Bhutan still has a weak entrepreneurship *culture* due to poor and limited facilities and low levels of skills. The Bhutan Startup Centre, currently managed by the Ministry of Economic Affairs, plans to establish regional startup centers in the country. The Incubation Center and FabLab are under construction in colleges and TVET institutes to promote innovation and business startups. Besides infrastructure developments, measures like capacity development, entrepreneurship education, hackathon challenge, business idea competition, startup acceleration and mentorship services are provided (MoEA, 2020) to entrepreneurs. The major dots appear to be getting connected, but the entrepreneurship culture is still emerging and needs a lot of investment in infrastructure, capacity development and facilitation services.

The integration of *policies and regulations* will be essential to support the growth of startups. The EDP 2016 has identified Cottage and Small Industries (CSIs) and Agriculture as key

priority sectors that directly support the food processing industry (MoEA, 2020). Likewise, strengthening the entrepreneurship ecosystem at the core of CSI policy does not show clear growth pathways. The broader economic policies support entrepreneurship, but synergy in regulatory policies will be more critical to support the growth and development of CSIs. The International Trade Centre (ITC) COVID-19 Business Impact Survey revealed that the Micro Small and Medium Enterprises (MSMEs) find it difficult to access policy packages. At least 47 to 55 percent of enterprises reported difficulties in accessing the information on government benefits compared with 38 percent of large firms (UN, 2020).

*Limited access to finance* is one of the top constraints for startups. It will be a severe post-pandemic challenge as capital flows out of the financial sector in developing countries (UN, 2020). Presently, National CSI Bank Limited has dedicated loan schemes for CSIs while other banks continue to provide priority sector lending to small businesses. Besides, NGOs such as the *Loden* Foundation, *Druk* Holding and Investment, and the Royal Monetary Authority of Bhutan also provides entrepreneurs with micro finance to scale up businesses. During the pandemic, credit guarantee schemes, working loans, and interest waivers and deferment were provided to CSIs, but studies elsewhere shows that MSMEs were not able to receive and gainfully utilize financial aid due to limited access to information, and lack of financial literacy of enterprises and other skills (UN, 2020). Further, the CSI flagship program, strategic document does not have a concrete plan to improve access to finance.

*Poor human capital* is a common issue in most developing countries as small businesses have limited finance to invest in capacity development. Poor human capital has resulted in low innovation, low productivity, and poor growth of the sector (MoEA, 2020). Lack of innovation due to poor human capital coupled with poor technology exchange caused innovative

entrepreneurship to remain remarkably low even during the pre-pandemic period, with less than 5% of entrepreneurs introducing new products or services in their new business in 2019 (UN, 2020). Within the 12th FYP, the CSI flagship hopes to train at least 112 CSIs and at least 150 entrepreneurs in various areas to enhance human capital (MoEA, 2020).

*Limited access to the markets* is another challenge for most entrepreneurs. The study shows that over 60% of early-stage entrepreneurs across developing countries depend on the local market as the majority cannot participate in the national or international market. Further, a study shows that over 30% of large firms export directly compared with only 10% of small firms, but over 35% of MSMEs have started digitalizing business during pandemic (UN, 2020). Bhutan has noted the lack of product standards and certification as a common challenge for exporting products. Bhutan Standard Bureau and Bhutan Agriculture and Food Regulatory Authority could expedite approval for accreditation from third-party regional accreditors, which will benefit the entire manufacturing industries, particularly exporters (MoEA, 2020).

Besides capacity building support initiatives, the *business development support* in the form of Industrial Development Grants (IDG) was started to provide technical support to the CSI sector. IDG, a cost sharing grant program, provides grants for the purchase of core machines and equipment – packaging and value addition equipment for initial set up or expansion of the manufacturing units with a ratio of 90:10 (90 percent grant and 10 percent contribution from beneficiary) for new firms and 80:20 for existing firms. Other support includes fiscal incentives and capacity development while access to the startup center and its common facilities and marketplace (showroom) are limited to entrepreneurs based in Thimphu.

### 3.4 Pandemic Impact on Industries

Ever since the declaration of COVID-19 as a pandemic, governments worldwide started to impose movement restrictions to protect the lives of the people. But this measure has affected many sectors of economies around the world, from production to service sectors but the aggressive spread of the pandemic has had a particularly strong effect on developing countries mostly due to limited resources and economic slowdown.

The pandemic has affected industries of all sizes, but SMEs were particularly vulnerable to the high prevalence of Covid, and were sensitive to demand shocks, with few avenues to respond. SMEs are 8% more likely to have temporarily shut due to the pandemic than large firms across all countries and sectors, and those large industries that shut down temporarily during lockdown tended to reopen earlier on average (Adian et al., 2020). However, compared to other industries, the food processing sector was less affected by the COVID-19 crisis because food products are essential goods, and there was no significant drop in demand (Szczepaniak, Ambroziak and Drozidz, 2020).

The study suggests that about 25% of the small businesses in developing countries would permanently shut down due to pandemic (UN, 2020). The evidence from China indicates that a decline in short-term revenues and inability to resume production have been common problems. Failure to restart work is primarily due to lack of employees, as most people remained confined due to social distancing and movement restrictions policies and reduced market demand (Pen, Wu, and Lu, 2020 and Adian et al., 2020). The manufacturing industries were more affected by increased operating costs but less by restricted cash flow. It suggests that low work resumption rates and transportation restrictions during the pandemic significantly disrupted supply chain management of the manufacturing industries. It has put them in the difficult position of not meeting

demand as they cannot procure raw materials and other inputs, which sets production on hold (Pen, Wu, and Lu, 2020). SMEs are expected to face more financial constraints compared to large industries (Adian, 2020) even during normal times and the pandemic is expected to have widened it. The pandemic and measures to address it has created significant new challenges for the transportation system. The challenges are delays, logistics issues in export supply chains, and sporadic and exceptional demand, pickup, and delivery services, so policymakers were pressured to get regularly involved with the industry to anticipate, identify, and address new issues as they arise (Gray, 2020). In Bangladesh, a study reported expiry of food products and a shortage of working capital caused difficulty in meeting operational expenses and closure of distributor's operation as common short-term issues. These challenges are projected to continue, causing a medium-term reduction in return on investments, reduced jobs in industries, affecting trading relationships, forcing the restructuring of supply chains, and decreasing industries' contribution to the GDP (Chowdhury, Sarkar, Paul, Moktadir, 2020).

In response to the pandemic impact, SMEs were forced to adopt near-term operational adjustments such as remote working, online delivery, reducing the workforce, reducing working hours, and reducing pay. The formal firms reduced their payroll at most in proportion to the revenue shock, but some firms remain unprofitable following the lockdown forcing them to exit (Bachas, Brockmeyer and Semlet, 2020). Likewise, firms also adopted the utilization of payment facilities on credit (Adian et al., 2020) but SMEs reportedly preferred tax rebates, tax subsidies or tax reductions, and financial support such as loan interest subsidies or reductions (Adian et al., 2020). During the pandemic, governments around the world supported SMEs through various monetary and fiscal measures, including debt finance, employment support, tax waiver, business cost, creating demand, business climate and advisory services (UN, 2020 & Adian et al., 2020). In

China, the government granted value added tax exemptions, tax reductions for SMEs, and reduction in social security fees and rents for enterprises to reduce their operating costs. However, these measures are limited to resuming work and income being generated, so industries prefer work resumption to expedite recovery. Despite a high rate of work resumptions and various support measures taken by the government to assist SMEs recovery, the effects of the pandemic have not yet been eliminated, largely because the pandemic has not yet been brought under control in most parts of the world (Lu, Pen, and Wu, 2020). European countries focused on supporting SMEs with various financial supports to prevent a liquidity crunch and lower employment loss during the pandemic (Juergensen, Guimon and Narula, 2020). At the same time, some suggest that countries keep measures flexible in responding to the changing situation of the pandemic crisis (Aday and Aday, 2020).

The food processing firms have taken measures to adapt to the new environment during the pandemic crisis coupled with various government protective measures. However, enterprises themselves should build resilience in the long run by planning, risk management, digitalization, automation, and integrating production management and distribution systems (Szczepaniak, Ambroziak and Drozidz, 2020).

The literature suggests that the pandemic has affected MSMEs in developing countries due to low resilience and limited resources. But the literature also reported that the food processing sector was less affected as there was no substantial reduction in food demand as food is an essential commodity. In Bhutan, even before the pandemic, the food production sector was experiencing a decline in growth rate, and the pandemic could have caused a deterioration in the situation of firms. Further, the entrepreneurship ecosystem assessment shows that MSMEs had difficulties in

accessing support packages during the pandemic largely due to financial illiteracy of enterprises and limited access to information.

## 4. Methodology

In addition to the literature review, the paper also used quantitative analysis to examine the impact of the pandemic on the food processing industry.

### 4.1 Data Collection

The paper used the micro data from the census on COVID-19 impacts on large and medium (L&M) production and manufacturing industries collected by the National Statistical Bureau in collaboration with the Economic Contingency Unit under the Office of the Prime Minister of Bhutan (PMO). The census, which covered the entire range of L&M industries, was intended to develop economic policy interventions to help firms withstand pandemic shocks. The enumerators were composed of the government officials from the Department of Industry, Ministry of Economic Affairs; the Department of Macroeconomic Affairs, Ministry of Finance; and the Economic Contingency Unit, Office of the Prime Minister of Bhutan; and the National Statistical Bureau. Given the pandemic situation, data were collected online, and incomplete responses were collected through telephone interviews.

### 4.2 Data Analysis

As of December 2020, the Ministry of Economic Affairs has issued 176 licenses for large and medium (L&M) industries of which 116 were classified as medium, and 60 were large firms (MoEA, 2020). However, to rationalize number of business establishments, the census has clubbed business units with the parent company if the units maintain books of account together with the parent company. Likewise, units under parent company with same activities are also clubbed together to form a single business unit irrespective of where they maintain books of account. Using this criterion, the number of firms has been reduced to 139 establishments of which 13 L&M firms are food processors. This paper has used the same standards to analyze the pandemic impact on food processing firms.

Descriptive statistics and visual representations in charts were used to describe the situation and draw conclusions. For example, to assess the impact on revenue, income differences between *'during-pandemic'* and *'pre-pandemic'* periods were calculated. The *'pre-pandemic'* period was considered from January-June 2019 and *'during-pandemic'* period was defined between January-June 2020. Further, the responses for open-ended questions were coded, arranged into common themes, and ranked based on frequencies.

## 5. Findings and Discussions

The census conducted by National Statistical Bureau and the Office of the Prime Minister of Bhutan has covered entire large and medium (L&M) production and manufacturing industries to formulate and implement economic contingency plans for the manufacturing sector. From 176 L&M production and manufacturing firms excluding four hydropower plants, non-operational

industries, and non-respondents, the census included responses from 139 firms. However, given the scope of this paper, the findings and discussions are confined to 13 food processing firms.

### 5.1 Pre-pandemic challenges

*Doing business difficulties:* The EDB ranking indicates doing business has become relatively difficult despite reforms taking place. The detailed analysis of the project approval process in the industrial park presents a classic example of the difficulty in starting a business. For promoters to start a business in the Industrial Parks, it must go through 13 different steps, which takes at least 682 days, including time taken by promoters themselves. However, there are opportunities to enhance services by cutting the process and reducing service delivery turnaround time (TAT) [See Table 3]. It would be necessary to amend specific laws and policies, sectoral coordination, and improve existing operating procedures for this to happen. For example, 113 promoters have expressed an intention to start a business in three Industrial Parks - *Dhamdum* Industrial Estate in *Samtse*, *Motanga* Industrial Estate in *Samdrup Jongkhar* and *Jigmeling* Industrial Estate in *Sarpang*. Of them, 27 promoters are awaiting Land Use Certificate (LUC) from National Land Commission (NLC), 10 are awaiting project approval from MoEA and nine promoters are awaiting Environmental Clearance from the National Environment Commission (NEC). The reports show only seven out of 113 promoters could start a business in industrial parks (MoEA, 2020) [ See Table 2].

*Table 2: The status of business clearance in three industrial parks*

| Sl. No | Business Clearance Status | No. of Promoters |
|---|---|---|
| 1 | Awaiting Environmental Clearance from NEC | 9 |
| 2 | Awaiting Land Use Certificate from NLCS | 27 |
| 3 | Business Operational in Industrial Parks | 7 |
| 4 | Promoters undertaking construction works | 3 |
| 5 | Land Lease Agreement under process with Dzongkhag | 6 |
| 6 | Land Lease Agreement signed | 28 |
| 7 | Project approval under process | 10 |
| 8 | Provisional Letter of Intent issued by IIDD, DoI, MoEA | 23 |
| | Grand Total | 113 |

Source: MoEA, 2020

*Table 3: Assessment turnaround time for approval of projects in industrial parks*

| Sl. No. | Process/Services | Lead Agency | Turnaround Time (TAT) |
|---|---|---|---|
| 1 | Announcement of vacant plot in Industrial Park through media for submission of application | IIDD, DoI, MoEA | 30 days as per LLRR, 2018. |
| 2 | Assessment and evaluation of the application and approval for Letter of Interest (LoI) by Committee | IIDD, DoI, MoEA | 30 days |

| | | | |
|---|---|---|---|
| 3 | Submission of Business Plan to Department of Industry, Ministry of Economic Affairs after receipt of LoI | Promoter | No TAT but Promoter is required to complete project for approval within 6 months |
| 4 | Appraisal of the Business Plan and seek sectoral clearances | IIDD, DoI, MoEA | 10 working days |
| 5 | Agencies review and issue sectoral clearances (In general, for P&M the key agencies are as specified in the next column) | BPC<br>NECS<br>BAFRA<br>DoFPS, MoAF<br>DRA | BPC-7.5 days<br>NECS-142 days<br>BAFRA-105 days<br>DoFPS, MoAF-104 days<br>DRA-173 days |
| 6 | After receiving complete set of documents, IIDD appraise and seek approval of:<br>• Department Project Approval Committee for Priority Projects.<br>• Ministry's Project Approval Committee for Other Activities. | FDID & IIDD, DoI, MoEA | 5 working days for Priority Projects<br>10 working days for Other Activities |
| 7 | Obtains industrial license from RTIO | Promoter | 3 working days |
| 8 | After receipt of Project Approval and Industrial License, IIDD forwards the | IIDD, DoI, MoEA | 5 working days |

| | | | |
|---|---|---|---|
| | LoI to NLC for issuance of Land Lease Certificate (LLC) | | |
| 9 | Reviewing and Issuance of Land Lease Certificate (LLC) | NLC | 71 days (TAT as per LLRR 2018 is 15 working days) |
| 10 | Executes Land Lease Agreement and demarcate the plots | Dzongkhags | 21 days |
| 11 | Submission of drawing of plant to IIDD, DoI for construction permit | Promoter | 180 days |
| 12 | Reviewing and issuance of construction permit | IIDD, DoI, MoEA | 7 working days |
| 13 | Promoters initiate construction of plant | Promoter | 180 days |
| | Total TAT (days) | | 682 days |
| | Time (days) for MoEA | | 85 days |
| | Time (days) for Promoter | | 363 days |
| | Time (days) for Land Lease Certificate and Land Lease Agreement (Current TAT based on average time taken to issue NLC and lease agreement since July 2019 after adoption of LLRR 2018) | | 92 |
| | TAT (days) for clearances | BPC | 7.5 days |

| | | | |
|---|---|---|---|
| | (Current TAT based on average time taken to issue clearances in the last 1 year) | NECS | 142 days |
| | | BAFRA | 105 days |
| | | DoFPS, MoAF | 104 days |
| | | DRA | 173 days |

Source: MoEA, 2020

***General Challenges:*** The challenges reported by industries are ranked based on the frequency of issues reported. During the census, firms were asked to specify the top three constraints or challenges faced before COVID 19. However, four out of 13 food processing firms raised 20 different challenges while the majority, 9 firms, have not raised any issues during the census [See Table 4].

*Table 4: Pre-pandemic challenges faced by food processing industries*

| Rank | Challenges | Frequency | Percentage |
|---|---|---|---|
| 1 | Competition from cheap imports | 5 | 25% |
| 2 | Limited domestic market | 4 | 20% |
| 3 | Labor shortage | 3 | 15% |
| 4 | Limited access to foreign exchange | 2 | 10% |
| 5 | Shortages of raw materials | 2 | 10% |
| 6 | Impact of tax | 2 | 10% |
| 7 | Limited access to finance | 1 | 5% |
| 8 | Unproduction | 1 | 5% |
| | Grand Total | 20 | 100% |

*The competition from cheap imports:* The fierce competition from cheap imports is reportedly a common challenge faced by food processing companies. Of 20 different issues, 5 are related to competition from cheap imports which are all reported by food processing firms.

Products like n*oodles, himgold, animal feeds,* and *processed cheese* are a few of those facing threats from cheap imports. The competition from cheap imports is at the core of issues faced by food processing industry and reportedly remained so during the pandemic.

*Limited domestic market:* The food processing industry reported finding a limited domestic market to be a challenge, and about 4 issues are related to the limited domestic market largely due to competition from cheap imports and consumer preference towards low price products. Likewise, lack of product regulation has encouraged an influx of cheap and inferior imported products. Products like *rice, soya chunks, cup yogurt,* and *flour mills* have significantly lost domestic market share to imported items. For example, a flour mill processor has lost local market share to imported products due to duty free imports from India.

*Lack of skilled workers:* 3 issues are related to shortages, particularly a lack of skilled national workers. Although the labor issue is one of the most critical for many firms, only a few have reported the issue because the food processing companies are mostly located across the southern border with easy access to cheap Indian day workers, so firms do not necessarily feel the pinch of skilled workers shortages.

*Limited access to foreign exchange:* Limited access to foreign exchange is reported by firms who supply the products to the domestic market but require importing inputs from countries other than India. For example, Karma Feeds produces animal feed, caters to the domestic market, and doesn't have hard currency earnings, so businesses alike do not have any hard currency earnings but still need to buy inputs (amino acids in this case) from countries other than India. The absence of access to foreign exchange has become a factor causing a shortage of input materials for industries.

## 5.2 During-pandemic challenges

### *5.2.1 Market and Revenue*

Of 130 firms, 58 cater to the domestic market only, 26 are export oriented and 46 cater to both markets. Of 13 food processing firms, four supply only to the domestic market, one supply to the export market only, and eight supply to both markets [See Table A-4].

Except for coke and refined petroleum products firms, the income of large and medium production and manufacturing firms in general fell by -28% on average. But medium enterprises were slightly hit harder compared to large ones. On average, income of medium enterprises dropped by 23%, while large ones experienced a -20% drop in revenue on an average [See Table A-5].

The food processing firms were severely affected, as indicated by the average drop in income of -42%. The income of medium food processing firms recorded an average -80% drop compared to a 53% drop for large firms [See Table A-5]. Falls in demand were reported as a common challenge during the pandemic. It directly contributed to a drop in revenue of the industries. The huge drop in income could be due to stocking of raw materials as import became

difficult. However, the expenditure by food processing firms on imported raw materials dropped by only -1% [See Table A-11] as opposed to a -3% drop in spending on domestic raw materials from January to June 2019 [See Table A-12].

*Domestic Market Challenges:* The main markets for the food processing firms are the private sector, government institutions, and individual consumers. Of 12 food processing firms that cater to the domestic market, four supply at least 11 products to government institutions, 11 of them supply 33 different products to private entities. At the same time 10 of them also supply 19 different types of products to individual consumers. However, seven firms reportedly faced challenges related to domestic production during the pandemic, while five did not report any constraint related to the domestic market. Nineteen food products reportedly suffered domestic market challenges during the pandemic, while 15 products did not report any domestic market constraints.

*Fall In Sales:* Out of 78 different issues, 8% were directly related to a fall in demand in the domestic market [See Table A-2], which is ranked fourth. The food processing firms reported closure of international tourist visits as the primary reason for the decrease in demand from tourist hotels, which are the primary customers of the food products. Equally, the closure of small restaurants during lockdowns and restricted movement of people affected the demand. Additionally, with strict health protocols and social distancing policies of the government, hotels and restaurants could only operate half the actual capacity, leading to a fall in demand for food products from the local market.

*Export Market Challenges:* Of 13 food processing firms, 9 export their products, and the census indicates that they have not explored markets beyond India and Bangladesh. The findings show that 8 out of the 9 food exporting firms export about 17 products to India while 4 food processing firms export 6 products to Bangladesh. All firms faced one or the other constraints related to the export of their products, but only 1 out of 18 export items reportedly did not face any challenges.

*Fall in Exports:* India and Bangladesh are two main markets for food industries of Bhutan. India is a major market for the food industries, but nationwide lockdowns for quite extended periods have affected exports of food products severely. Further, due to the closure of international borders and movement restrictions within the country, industries could not export as much as they normally do because logistic issues were reportedly the main issues during the pandemic. Also, the strict health protocols caused disturbances in logistics and supply chains which worsened the problem of exporting challenges.

### *5.2.2 Raw Materials and Energy*

Of 130 firms, 38 source 100% of raw materials from the local market, while 37 depend entirely on imported raw materials. There are about 44 who source raw materials from both domestic and import markets. Amongst the food producing firms, 8 entirely depend on imported raw materials. Likewise, 5 also depend on both domestic and imported raw materials [See Table A-8].

The overall expenditure by industries on raw materials has dropped by -17% on an average [See Table A-9], and similarly, average electricity consumption has dropped by -10% [See Table

A-13]. The average expenditure on raw materials by food processing industry fallen by -2% [See Table A-9], and electricity consumption decreased by -25% [See Table A-12]. Further, expenditure on imported raw materials by food processing industry fell only by -1% [See Table A-4] compared to a decline in spending on domestic raw materials of -3% on average [See Table A-9].

The electricity consumption by large food processing firms fell by -26% [See Table A-13] but electricity consumption by medium food firms got reduced by -23% on average [See Table A-14]. The findings suggest that with almost the same level of expenditure on raw materials and a huge decline in electricity consumption, there was a huge drop in production. It is due to reduced production capacity, closure of firms during the lockdown and a fall in demand caused by the significant reduction in income of -42% on average [See Table A-4], which indicates actual fall sales.

*Source of domestic raw materials:* Out of 17 different raw materials which are sourced from domestic markets, 10 (48%) are sourced from registered firms, 6 (29%) from cooperatives and 3 (14%) sources from farmers and 2 (9%) from other sources [See Figure 2]. From nine food processing firms that source raw materials from the domestic market, two firms encountered challenges related to the supply of *fruits, vegetables, and milk*, but three firms did not report any issues related to raw materials supply.

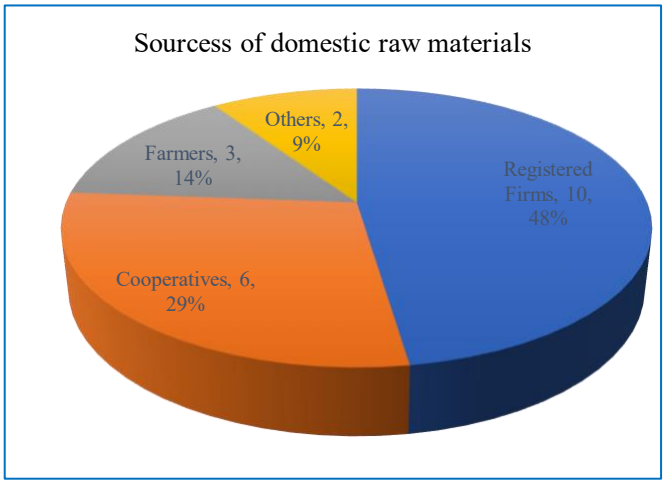


*Figure 2: Sources of domestic raw materials*

*Sources of imported raw materials:* Food processing firms import 52 raw materials, of which 50 are imported from India. Other sources include *Betal Nuts* from Malaysia, *Palmolein Oil* from Indonesia, and *fruit pulps and milk powder* from China, Germany, and New Zealand.

*Raw materials substitution:* Out of 51 raw materials imported by L&M food processing firms, its reported that at least seven raw materials like *fruits, vegetables, betel nuts, fresh milk, maize (dried distiller grains), wheat (floor), mastered (oil cake)* and four other input materials like *carton, can, rice polish, limestone power* and *essential ingredients* can be substituted with local products, but food processing firms continue to import these raw materials for various reasons. The firms reported that 50% of the substitutable raw materials/inputs are *unreliable* and *inconsistent*, followed by 35% of the substitutable raw materials/inputs being *expensive* and 15% of the substitutable raw materials/inputs are *poor quality* in nature [See Figure 3]. *Fruits, vegetables,* and *milk* are important raw materials for large firms, which forms a backbone of food processing industry in the country. Likewise, *maize* is important raw material to keep only animal feed production firm in the country running, and *wheat* (*flour*) is used as raw materials for noodles production, one of the top 10 imported food items and it's also being exported.

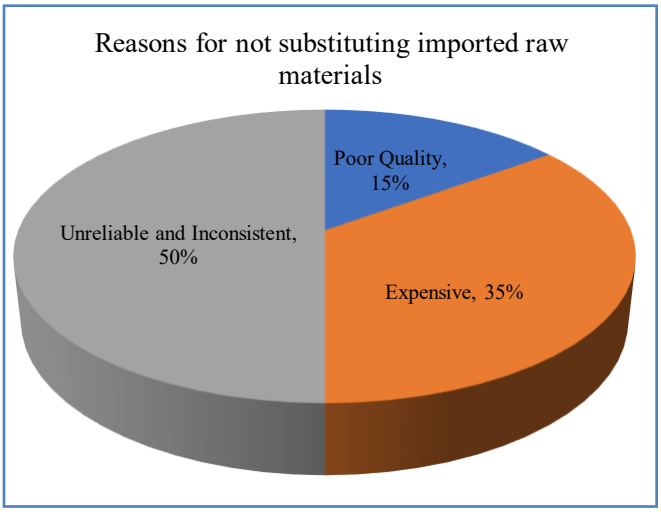


*Figure 3: Reasons for not substituting imported raw materials*

*Raw materials shortage:* The domestic raw materials shortage could be largely attributed to subsistence farming, but it would have become severe due to import difficulty during the pandemic. However, access to the market is a common challenge for farmers to sell their products due to remote location, poor road connectivity, and lack of storage facilities. Unfortunately, the pandemic has intensified the existing weak aggregation and supply chain, leading to cost escalation, further reducing the demand for farm products.

The census reported that 13 out of 78 issues [ranked 2] are directly linked to raw materials shortages during this pandemic. The census suggests that raw materials shortage is mainly due to the closure of supplier's businesses, particularly in India, as suppliers have been affected by a series of nationwide lockdowns. Bhutan also imposed import restrictions to contain viruses.

*Raw materials mismatch:* With the closure of international borders and the risk of virus spread associated with movement of goods, suddenly, when every export had to route through a formal customs process, many agricultural products couldn't export since the products were not on the export list. Until special arrangements were made between India and Bhutan, farmers faced export challenges while, on the other hand domestic industries reportedly faced raw materials shortages. Besides pandemic challenges, pre-existing issues of poor innovation, lack of product diversification and low scale would have further reduced the market of agriculture products during the pandemic. It implies an inevitable mismatch between available farm produce and industrial requirements.

### *5.2.3 Labor and Employment*

The overall industrial workforce decreased, particularly casual employees, from 3565 persons in June 2019 to 3015 persons in June 2020. There was a decrease in total employment by -5%, which is close to 548 persons. The reasons are restriction in import of day workers from across the borders, restricted mobility of local casual workers during the pandemic, and reduced hiring due to reduced demand for products.

But the overall workforce within the food processing industry increased by 2%, close to 22 persons, probably due to hiring of regular national workers to replace expatriate workers who couldn't return to work due to the closure of borders [See Table 5]. The regular workers of food processors increased from 614 in June 2019 to 664 in June 2020. It spiked by 8.1%, which is the highest of all manufacturing sectors which experience growth in the size of workers [See Table 5], but the food processing industry also reduced its casual workers to 399 in 2020 from 427 in 2019, about a 7% decline on average [See Table 5].

Out of a total of 11,137 workers, as the business got affected, 1,114 workers in these sectors received reduced pay, 192 workers were on leave with payment, 44 were on leave without pay, 85 were permanently laid off, and 100 workers resigned from their jobs. Food processing firms did not lay off any workers, while 11 workers are on leave with pay and 36 workers are on reduced remunerations [See Table 7].

*Table 5: Total workforce of large and medium industries by industry classification*

| Industry classification | 2020 | | | 2019 | | | Difference | |
|---|---|---|---|---|---|---|---|---|
| | Regular | Casual | Total | Regular | Casual | Total | Number | Percent |
| Manufacture of food and related products | 664 | 399 | 1063 | 614 | 427 | 1041 | 22 | 2% |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Manufacture of beverages | 1083 | 519 | 1602 | 1061 | 635 | 1696 | -94 | -6% |
| Manufacture of wood and wood products | 605 | 88 | 693 | 627 | 124 | 751 | -58 | -8% |
| Manufacture of coke and refined petroleum products | 49 | 11 | 60 | 50 | 11 | 61 | -1 | -2% |
| Manufacture of chemicals, plastics, and rubbers products | 675 | 190 | 865 | 626 | 161 | 787 | 78 | 10% |
| Manufacture of cement and other concrete products | 1373 | 425 | 1798 | 1384 | 463 | 1847 | -49 | -3% |
| Manufacture of basic metals | 1939 | 649 | 2588 | 1968 | 1028 | 2996 | -408 | -14% |
| Manufacture of electrical and other machinery equipment | 93 | 8 | 101 | 92 | 3 | 95 | 6 | 6% |
| Mining and quarrying | 1152 | 384 | 1536 | 1219 | 316 | 1535 | 1 | 0% |
| Other | 489 | 342 | 831 | 479 | 397 | 876 | -45 | -5% |
| Total | 8122 | 3015 | 11137 | 8120 | 3565 | 11685 | -548 | -5% |

*Shortage of workers:* The lack of a skilled national workforce remains a challenge for firms, and the pandemic has intensified the problem. During the pandemic, three firms that supposedly faced labor-related issues have submitted concerns, such as restricted movement of foreign workers and non-availability of domestic workers. Most of the firms are located across borders. Usually, they depend on imported laborer, but with the closure of international borders, the import of foreign daily workers has been restricted, which cuts the labor supply. Further, as viruses continue to spread too quickly, and fewer local people are available for work with nationwide lockdown and movement restrictions. Likewise, mandatory quarantine of industrial workers for those involved in supply and delivery across borders intensified labor shortage issues.

The food processing firms also faced skills shortages. This worsened during the pandemic due to a lack of skilled national workers and restricted entries of foreign workers. The government approved foreign workers on a case-by-case basis, but 21 days strict quarantine discouraged workers and had to pay for quarantine expenses. Both workers and employers were helpless with already unstable financial conditions. The skills shortage areas include technical skills in food production, mechanical and electrical, and food safety and quality controls skills. Likewise, firms also faced managerial skills shortages in finance, accountancy, and industrial management skills.

### *5.2.4 Logistics and Distribution*

With the international border closure, new regulations were put in place. For example, both incoming and outgoing vehicles had to obtain vehicle entry permits from the authorities on both sides, which took time and caused logistics disturbances. Likewise, logistic coordination became even more difficult due to movement restrictions, especially during the lockdown, and it took much longer to deliver consignments. Furthermore, the limited and poor infrastructures like dry port got congested, which took longer transition time, and discourages the suppliers by such problems.

The highest number of issues reported by food industry were related to logistics and transportation challenges - 25 out of 78 different issues reported by 13 food firms are connected to logistics and transportation. Unavoidable movement restrictions during lockdowns have disrupted the logistics and distribution of products to the market. The food processing firms reported that limited vehicle movement and complicated movement procedures during lockdown had affected their sales expansion and distribution. Further, access to Indian roads was limited by international borders' closure except for essential carriers since the beginning of 2020. Due to limited internal road networks, transportation of goods from industrial hubs in the southwest to

central and eastern parts of the country took much longer than usual, leading to increased transportation and product damages. However, to lessen the burden on business and people, the government has lifted certain restrictions on movements.

Further, closure of international borders and frequent lockdowns during the widespread community transmission of COVID -19 is a common challenge that affected logistics and supply chains, particularly those for exports. Bhutan and India, guided by long-standing relationships, have agreed to mechanisms to facilitate smooth transactions of goods. But having to follow specific State Government regulations in India and vehicle movement interruption on highways has reportedly delayed the delivery consignments.

*Unfriendly custom regulations*: The firms reported that the pandemic worsened India's unfriendly customs regulations, which intensified the logistics and supply chain problems. Tedious processes harassed food exporters in the clearing of export goods. Besides following a long, complex custom process to obtain an export certificate from India, the exporters had to follow different state government regulations. Of 78 different issues cited by firms in this area, nine are directly related to unfriendly custom regulations of India.

Besides, exporters also had difficulty dealing with excessive regulations at home as COVID-19 health protocols have worsened the tedious custom process - facilitation of documentation became extremely difficult with lockdown and movement restrictions.

*Increased cost of production:* In Bhutan, the industrial sector is still dominated by labor intensive production coupled with limited and poor technological adoption, which increases the cost of production with labor becoming scarce during the pandemic. Further, breakdowns in

logistics and supply chains during the pandemic have increased the cost of transportation, resulting in increased costs of raw materials and input prices.

*Low product shelf-life: Koufuku* International Limited (KIL) is the only company that reported low product shelf-life issues, but this paper assumed that other food processing industries could also have suffered the same challenges, particularly when using perishable raw materials. KIL faced logistics challenges for products, particularly *curd* and *cheese*. Besides limited domestic market consumption, low product shelf life has been the biggest issue for KIL during the pandemic. This issue may be specific to KIL but has a huge potential to substitute dairy imports, so issues need to be addressed given its economic contribution.

#### *5.2.5 Finance and Foreign Exchange*

Limited working capital and the impact of foreign exchange fluctuation comprise 5% of the total challenges submitted by industries. Food processing firms reported a shortage of working capital as a challenge. It could be due to advance payment for raw materials as some reportedly require advance payment as early as three months before delivery, increased costs of production, reduced revenue, and wages to employees leave, amongst others.

### 5.3 Pandemic impact on firms

The census has captured the challenges of food processing firms during the pandemic on critical components like markets, raw materials, and labor supply, which essentially impact revenue. However, out of 13 food processing firms, only 3 large and 3 medium firms have reported

complete revenue figures for 2019 and 2020, representing at least 46% of the food processing firms.

*Revenue Impact:* An income differences by firm size were calculated to compare the pandemic impact on the revenue of food processing industry. Before the pandemic, the average difference in revenue between the large and medium food processing industries was about Nu.69.7 million. The revenue difference dropped to Nu.65.2 million during the pandemic. Possibly had it not been for various fiscal and monetary policy interventions, the revenue difference could have been even more significant. However, a deeper analysis shows that on average, revenue of large food processing firms dropped by 18% but revenue of medium food processing firms dropped by 38% on an average, which is 20% higher. It indicates that the pandemic has further widened the average revenue gap between L&M food processing industries [See Table 6]. It also implies that medium industries are more vulnerable to external shocks like the current pandemic as they are financially unstable, have less market share, and have fewer partners. However, the revenue share of food processing industry in overall industrial revenue has increased to 5.4% during pandemic from 3% during pre-pandemic period relatively due to fall in revenue of mining and quarrying, and cement and concrete production industries [See Table 17].

*Table 6: Pre-pandemic and during-pandemic revenue differences*

| Industry | Revenue in (Nu. in millions) | | | |
|---|---|---|---|---|
| | Pre-pandemic (2019) | During-pandemic (2020) | During-Pre (Absolute) | During-Pre (%) |
| Large | 110.2 | 90.3 | -19.9 | -18% |

| | | | | |
|---|---|---|---|---|
| Medium | 40.5 | 25.1 | -15.4 | -38% |
| Difference | 69.7 | 65.2 | -4.5 | 20% |

## 5.4 Response to the pandemic

The sudden widespread pandemic gave industries no time to prepare and respond to possible impacts. However, with a huge decline in demand and the subsequent impact on revenue, firms were forced to take internal measures to adapt to the new and challenging business environment during the pandemic for the sustainability of the business.

### *5.4.1 Firms' Responses to Pandemic*

*Workforce, Employment and Remuneration*: With the huge revenue fall, the firms are forced to respond to the pandemic's impact through internal adjustments. To adjust to the fall in demand, increasing cost of productions, and revenue decline, firms have quickly responded by adjusting their workforce. Only 85 employees have been permanently laid off in the manufacturing sector, 44 sent on leave without pay, 192 on leave with pay, and 1,114 workers were on reduced remuneration. Despite a -42% drop in revenue of food processing firms, of the total of 1063 employees, only 11 employees were sent on leave with pay and reduced pay for 36 employees but did not lay off any employees [See Table 7].

*Table 7: Workforce adjustment by industries during pandemic*

| Industry classification | Employment Situation | | | | | |
|---|---|---|---|---|---|---|
| | Leave with pay | Leave without pay | Permanently laid off | Resigned | Other | Reduced remuneration |
| Manufacture of food and related products | 11 | 0 | 0 | 0 | 0 | 36 |
| Manufacture of beverages | 0 | 2 | 10 | 33 | 0 | 54 |
| Manufacture of coke and refined petroleum products | 0 | 0 | 9 | 0 | 0 | 9 |
| Manufacture of chemicals, plastics, and rubbers products | 48 | 10 | 9 | 16 | 8 | 96 |
| Manufacture of cement and other concrete products | 0 | 0 | 45 | 0 | 0 | 692 |
| Manufacture of basic metals | 105 | 3 | 0 | 25 | 3 | 153 |
| Mining and quarrying | 28 | 29 | 12 | 26 | 43 | 74 |
| Total | 192 | 44 | 85 | 100 | 54 | 1114 |

*Stocking up of Raw Materials:* Besides labor adjustments in response to the pandemic, the firms have also started to stock up raw materials as it has become difficult to import or source them domestically. But the analysis of the value of the stock of raw materials is confined to 3 large and 6 medium food processing firms with complete information. On average, the value of raw materials of large industries during-pandemic is Nu.12 million more than the pre-pandemic period. Further, it shows large industries are more resilient to the effects of the pandemic, and the value of stock of raw materials during the pandemic increased by 36% on average. It's safe to assume

that large industries have started to pile up raw materials, but other reasons could be due to the fall in production, where raw materials remained unconsumed. Likewise, the value of the stock of raw materials of medium industries got reduced by - 63% on average, which shows they are less resilient to external shocks such as the current pandemic [See Table 8].

*Table 8: Pre-pandemic and during-pandemic value of raw material in stock differences*

| Industry | Value of stock of raw materials (Nu. in million) | | | |
|---|---|---|---|---|
| | Pre-pandemic (2019) | During-pandemic (2020) | During-Pre (Absolute) | During-Pre (%) |
| Large | 75 | 102 | 27 | 36% |
| Medium | 24 | 9 | -15 | -63% |
| Total | 99 | 111 | 12 | 13% |

*Self-Containment of Business Operations*: Bhutan has no option but to implement an inevitable lockdown, but it has been harsh for many sectors, particularly for construction and manufacturing industries where remote working is not feasible. The government has allowed industries to operate in self-containment mode to minimize the risk of virus spread while keeping business operational. But the census shows that 79 firms have completely shut down business during lockdown while 58 were fully operational or partially operational. But only 6 out of 13 food processing companies were shut down while 7 continued to be operational during lockdowns. The finding suggests that despite a lot of easing strategies, it has been difficult for businesses to remain operational during lockdowns, and it continues to be very harsh on business - 111 out 137 firms wanted to operate in self-containment mode, but only 79 of them could operate their business during the lockdown.

### *5.4.2 Government Responses to Pandemic*

In response to the pandemic, protecting the health and livelihood of the people became the utmost priority but fostering economic security became even more important to safeguarding livelihood. To respond to this compelling priority, the Royal Government of Bhutan established the National Resilience Fund (NRF) of Nu. thirty thousand (30,000) million in April 2020 (RGoB, 2020).

His Majesty The King's Relief Fund (HMRF) provided a full(partial) interest waiver of loans contracted before April 10, 2020. HMRF also provides unemployment benefits to individuals affected by pandemic- overseas returnees, laid off employees and employees on reduced remuneration from various sectors of the economy including those workforces from food processing industry.

*Monthly Interest Waiver:* With HMRF, as with the interest waiver for individual loans, all businesses fully received an interest waiver for July to September 2020 and a 50% interest waiver for all businesses from October 2020 to March 2021 (RGoB, 2020). Likewise, the significant relief for manufacturers was the deferment of loan payments until June 2021, and 10 out of 13 food processing firms have taken advantage of this and deferred loans. After the pandemic, the banks started to provide soft loans for business continuity to business entities at a 5% interest rate to battle against COVID-19. The census record shows that four out of 13 food firms have availed themselves of these soft loans. Additionally, National Cottage and Small Industry Development Bank Limited (NCSIDBL) also introduced microloans up to Nu.500,000 for the agriculture sector at 2% and soft loans to CSI at a 4% interest rate.

*Income Tax Deferment:* Along with relief funds and loan interest waivers, the government also deferred all Corporate Income Tax (CIT) and Business Income Tax (BIT) for the income year 2019 till June 30, 2020, while tourism and allied sectors were deferred until December 31, 2020 (RGoB, 2020). Further, firms were given the option to settle their CIT and BIT on an instalment basis. But the record shows only 1 out of 13 firms have deferred tax payments [See Figure 4].

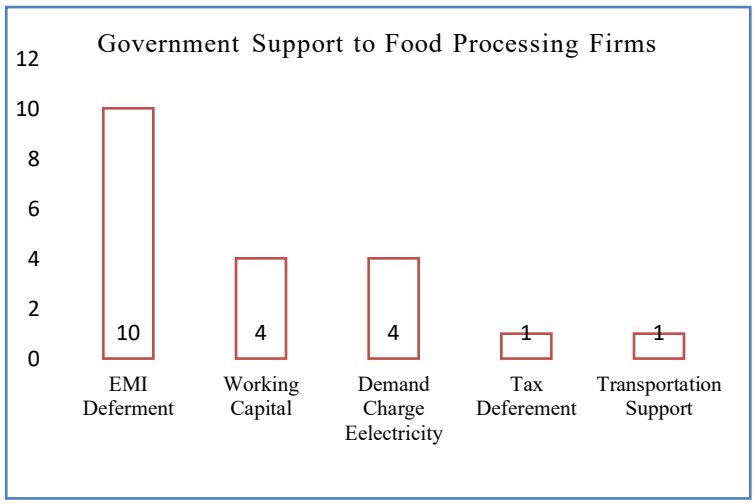


*Figure 4: No. of industries who availed different government supports*

Besides, the manufacturing sector benefited through demand charge electricity and transportation facilities supported by the government. The findings show that 4 out of 13 firms have availed themselves of charge electricity charge while only one firm has availed itself of transportation facilities [See Figure 4].

*Public Sector Led Demand Creation:* To create demand for the local industries, the government has amended public procurement rules in favor of domestic products. Such reforms in the procurement system allowed suppliers to procure local products to supply in government institutions.

*National Credit Guarantee Scheme:* To foster new economic activities during the pandemic, diversify and enhance exports, reduce imports, and generate employment opportunities,

the government has introduced the National Credit Guarantee Scheme (NCGS). Under this scheme, the government guarantees loans if a new business or business scale up contributes to the above objectives. It is expected to ease access to finance, one of the main challenges reported by industries during the census.

*Investment in Agricultural Production:* In response to the pandemic and difficulty in importing essential food items, through Economic Contingency Plan the government has invested Nu. 247 million in agricultural products such as cereals - *maize, buckwheat, wheat;* vegetables-*chilli, onion, tomatoes, brinjal, cauliflower, beans; oil seeds-mustard; lentils;* meat-*chicken* and *pork; fish* and *milk*. The contingency plan has focused on farm road granular sub-base laying, setting up integrated cold storage, marketing facilities, and building post-harvest facilities to improve aggregation and marketing. laying, setting up integrated cold storages, marketing facilities, and building post-harvest facilities. However, the strategy has overlooked the short-term marketing of excess products and farm products such as *onions, ginger, cabbage,* and *carrot* had difficulty finding a market as reported in the mainstream media.

*National CSI Development Bank Limited:* The government converted the former Rural Economy Development Corporation Limited to the NCSIDBL. It is expected to narrow the access to finance gap for CSIs and startups (NCSIDBL, 2020). It has not only enhanced access to finance for CSIs but would have allowed other banks to devote themselves to both large and medium firms during the pandemic crisis. From February 2020 to July 2021, National CSI Development Bank supported 5944 projects worth Nu.1,531.52 million [See Table A-1].

*Table 9: Sectors supported by NCSIBL by project and amount*

| Sl. No | Sectors | Nu.in Million | No. of Projects |
|---|---|---|---|
| 1 | Agriculture | 560.73 | 2,550 |
| 2 | Livestock | 588.96 | 2261 |
| 3 | Production and manufacturing | 234.47 | 677 |
| 4 | Seasonal Export | 3.5 | 2 |
| 5 | Services | 109.49 | 395 |
| 6 | Working Capital | 34.37 | 59 |
| | Grand Total | 1,531.52 | 5,944 |

*Economic Recovery Strategies:* Having vaccinated 90% of its eligible adult population with COVID-19 shots, MoEA and MoF have proposed Economic Recovery Strategies- measures such as reduced quarantine periods, allowing labor imports, enhancing import/export, opening the business. Fiscal and monetary measures will be implemented to help businesses to recover from the pandemic crisis. For example, to meet quarantine facilities requirements, 1000 bed temporary quarantine facilities and 2500 bed permanent quarantine facilities constructions are at an advanced stage of completion, which could accommodate quarantine requirements of 100s of labor at a reasonable cost. For those fully vaccinated, the quarantine period has been reduced to 14 days from 21 days and business hours from 9 pm to 10 pm in low-risk areas and 8 pm to 9 pm in high-risk areas. Further, the government is in discussion with the Royal Monetary Authority of Bhutan (RMA) to support economic sectors with monetary measures, including e-commerce payment platforms (The Bhutanese, 2021).

## 5.5 Post-pandemic challenges

The post pandemic challenges described here are limited to findings from the data analysis and literature reviews.

### *5.5.1 Slow business recovery*

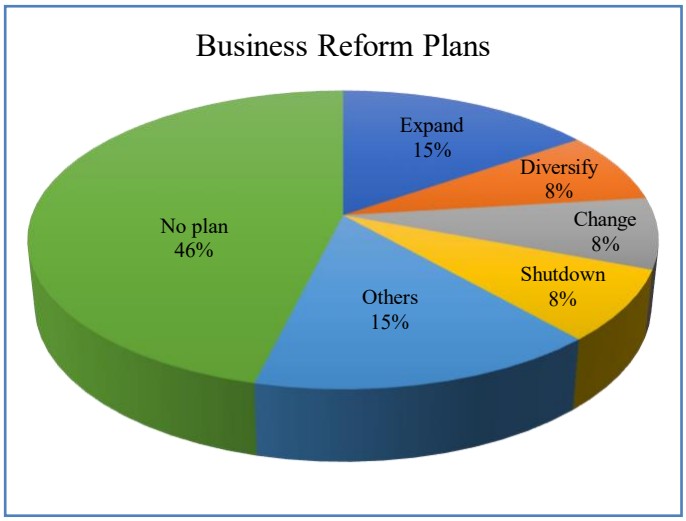


*Figure 5: Industries with different business reform plans*

Globally, the pandemic has shaped the way businesses are conducted, and the post pandemic reforms will determine its recovery and sustainability. The pandemic has affected businesses in many ways, from raw materials sourcing to selling of final products, yet the census shows that a majority of the business (46%) do not have any specific business reform plans [See Figure 5]. It indicates poor innovation culture within the industrial sectors. Businesses are simply waiting for pandemic to end and expect business operations to fall back to pre-pandemic status quo. Moreover, 15% of the businesses who indicated to have some form of business plans have no unique reform plans other than the aspiration to go for online transactions and focus on the domestic market as the export market has increasingly become uncertain. The findings suggest that food processing firms will take slow recovery path as there are no innovative plans to reform the business.

### *5.5.2 Competition from cheap imports*

For an import-dependent economy like Bhutan, the food processing industry will continue to face significant competition from cheap imports essentially. The above is due to high costs of

production owing to inefficient technologies, high transportation costs, increased raw materials, and input prices, which make domestic products relatively expensive. Additionally, while upholding consumer rights and preferences and serving the obligation of the free trade agreement with trading partners, it will be difficult to impose any restriction policies to counter competition from imports. Unless the government initiates policy interventions to solve root problems and industries reform themselves to improve efficiency, the competition from cheap imports will continue.

## 6. Recommendations

The recommendations are derived from the literature review and findings from the data analysis. The generic recommendations under policy reforms and infrastructure development will apply to the entire manufacturing sector.

### 6.1 Broad Policy Reforms

*Ease of Doing Business reforms:* Despite many ongoing reforms, systems and processes continue to be barriers to doing business in Bhutan. Of 11 major EDB indicators, the paper did a process analysis of starting a business in Industrial Parks in Bhutan. It shows a burdensome process that takes about 682 days to start a business, provided that every process is completed smoothly. Unexpectedly, 363 days out of 682 days are taken by promoters themselves to complete various tasks. Analysis shows a lot of processes can be streamlined, and service delivery time can be reduced to bring efficiency to ease the process for starting a business.

Process analysis shows that screening of most of the business applications are stuck at processing land certificates at National Land Commission (NLC) for various reasons. The land is scarce, and authorities need to take cautious steps in allocating land for business, but the current practice appears to be burdensome without any value addition. Having designated and approved the government land for an Industrial Park, there is no rationale for forwarding a Letter of Intent (LoI) to NLC for a Land Use Certificate (LUC). Therefore, it may be recommended for NLC to delegate the award of the LUC mandate to DoI, MoEA like it has authorized *Dratshang Lhentshog*, the Council for Religious Affairs, to lease land owned by the institution. If this mandate is delegated to MoEA, it can substantially reduce service delivery time as there is no need to wait for 92 days to issue a LUC. Likewise, other regulators could also review their regulation requirements and delegate to MoEA particularly those enterprises located within the Industrial Parks.

*Enhance G2B services:* The process for starting a business looks still clumsy and tedious despite attempts to improve government to business services, so the concept of one-stop shops is yet to be realized. The current attempts are limited to the digitalization of license applications. The preceding process like application for environmental clearances, land-use certificates, and product standards and certification remain standalone processes.

The process analysis of sectoral clearances shows that it takes between 104-173 days or more, so there is no systematic way to follow through. This has led promoters to taking on burdens to swim through bureaucratic processes. This paper recommends digitizing and integrating all process related business approval, to provide efficient G2B services. Further, this paper suggests that the Startup Center in Thimphu set up a one-stop shop to support and guide potential

entrepreneurs by supporting capacity development programs, disseminating information, policy, and regulatory advisory services.

*Skilling programs for food processing industry:* The shortage of skilled labor has become a common issue for firms with restrictions on importing foreign workers during the pandemic. On the other hand, youth unemployment is rising, particularly amongst high school leavers and university graduates. Youth unemployment rose to 22.6% in 2020 (NSB, 2021). This indicates a severe skills mismatch, and it has become a chronic labor market challenge, and unless we close this gap, economic sectors will continue to face skills shortages, forcing firms to depend on expatriate workers. To meet the immediate shortage of skilled workers, the government could facilitate the entry of foreign workers to meet immediate labor requirements, but TVET institutes could provide courses such as food production, food safety and quality management, and machine operation to meet long-term demand. Likewise, firms could also collaborate with the colleges to train employees on special courses in food processing and extend internships to meet the skills shortages.

*Targeted support for commercial farming:* Even during the pre-pandemic period, access to raw materials has been one of the biggest challenges confronting food processing industry. With supply disruption during the pandemic, raw materials shortages have become major issues for industries dependent on imported raw materials. For firms to acquire these imported raw materials more easily, the government could consider improving access to convertible currency for industries dependent on such imported inputs. Further, in the long run, enhancing domestic production of raw materials could benefit both industries and cultivators as it has potential to

minimize dependency, cut income outflow and create farm related jobs. Therefore, given existing market demand from food processing firms and future potential diversification, it has become critical to move away from subsistence farming to commercial cultivation. In this effort, the government could provide technical and capacity development for farmers groups and youth groups for commercial cultivation of fruits, crops, and vegetables as per industrial demand.

*Direct contract award for institutional supply involving local products:* Given the competition from cheap imports, the limited domestic market has always been a challenge for manufacturers. But there are domestic markets especially in government institutions such as schools and hospitals. The *Kuensel*, a public newspaper, reported that about 500 students were suffering from glossitis affecting at least 11 schools, and there were cases of peripheral neuropathy, a disease related to nutrient deficiency. An expert investigation team has reported nutrient deficiency as the cause of disease in these affected school children and recommended improving the school feeding program. But this situation presents an opportunity for firms and the government to collaborate for larger interests. The firms could diversify products for local market needs such as schools and hospitals, while the government must bring necessary policy changes to facilitate them. The government already amended procurement rules to favor domestic products for institutional supply, but this paper recommends considering direct awards of contracts to suppliers involving local food products and processed items to be supplied to these institutions. This will not only support the growth of industries but also support nutritional improvement in feeding programs in schools.

### 6.2 Industrial Infrastructural Development

Industrial infrastructure development will be critical for the quick recovery of firms from pandemic shock. During the pandemic, the lack of well-developed industrial infrastructures such as dry ports, cold storage and internal roads network were common infrastructure issues. There is a desperate need for new infrastructures, upgrading existing facilities, and fast-tracking ongoing infrastructure development activities.

*Fast-track industrial parks development:* The idea of industrial infrastructures, particularly industrial parks, received attention during the 5th FYP (1981-1986). By 1988, Pasakha Industrial Estate became the first and biggest industrial estate in Bhutan. However, similar mega projects like *Dhamdhum* Industrial Park, *Motanga* Industrial Park and *Jigmeling* Industrial Park, conceptualized during the 9th Five Year Plan (2003-2008), are still being developed. The well-built infrastructures in three mega industrial parks will determine the success of 113 business promoters, of which 21 businesses are agro-based industries according to the list maintained with DoI, MoEA. Therefore, the government could fast-track the development of basic infrastructures like power, water, and internal road connections at the earliest possible time. This will facilitate early business operation and reduce initial investment costs for firms awaiting to start the business.

*Fast-track dry port construction:* Additionally, the only mini dry port located in *Phuntsholing* is overwhelmed with many goods transactions, particularly during the pandemic, despite the best attempts to manage the volume. Since the *Pasakha* dry port, which is under construction, has immense potential to ease pressure on the mini dry port and benefit industries located within the industrial estate, expediting project implementation could be helpful. It should be a high priority infrastructure project to facilitate industries quick early recovery from pandemic

shocks. Likewise, the construction of *Gelephu* and *Nganglam* dry port also has immense potential to benefit industries located within *Jigmeling* IP and *Motanga* IP respectively.

### 6.3 Enhance Agro-Logistics and Food Value Chain

*Improve internal road networks:* Up until now, Bhutan has been mostly relying on Indian highways for delivery of goods, particularly from the industrial hub of *Phuentsholing* to the east, south-east, south and south-west parts of the country as well as raw materials imports from India and export items. During the pandemic, with no access to Indian roads and lack of proper internal road connections, particularly the absence of a fully connected southern east-west highway, increased transportation costs. In addition, the low carrying capacity of roads and bridges was also a problem. Thus, a well-built internal road connection between industrial parks, distribution centers and collection points will be most critical to the growth of manufacturing industries.

*Set-up cold stores facilities:* Limited facilities such as cold storage have further intensified the low product shelf life of processed food products. Likewise, due to weak aggregation and supply chain issues, raw materials shortage is a common challenge. Presently, there are very few private investments in cold storage facilities. Given the scattered location of farms, existing facilities are insufficient to cater to current aggregation challenges, so the government must intervene to set up cold storage in strategic locations. Additionally, the government could also explore public-private partnership opportunities to invest in cold storage and warehouse facilities.

*Support for high impact value added production:* Bhutan's entrepreneurship ecosystem is at an early stage of development, and access to finance is one of the common issues faced by

startups. Business development grants and capacity development for startups are implemented by multiple organizations, leading to a lot of duplication and coordination issues. But the government could harmonize the startup initiatives and provide targeted interventions for high impact value added production. This paper suggests the government could waive taxes, improve access to land, and share upfront investment costs while providing credit guarantee to support high end-agriculture startups that involve value addition by substituting import, enhancing export, and creating employment opportunities.

### 6.4 Internal Industrial Reforms

*Product diversification:* The L&M processing industries are major players in agro-based industries; however, they only produce about 21 different products of which 13 are exported. The products range from fruit juices, packed water, flour items, edible oil to dairy products. Hence, product diversification is critical not just for the sustainability of industry but also to absorb excess agriculture products. The capacity development support provided by the government should be diverted towards innovation in products in the manufacturing sector.

*Innovation, digitalization, and technological adoption:* The findings of this paper suggest that firms in Bhutan have weak research and innovation and poor technological adoption. The firms around are looking for innovation and digitalization of business. For firms to build future resilience, improve productivity and enhance sustainability, industries could invest in research, innovation, and up-gradation of technologies. The banks could support them with loans to finance innovation, digitalization, and technological up-gradation but since access to finance is expected

worsen, the government could also provide fiscal incentives for such initiatives by the industries to minimize the financial burden.

*Export market expansion:* Besides the limited domestic market, the export market remains very narrowly concentrated on India with minimal exports to Bangladesh, so firms need to expand export markets. Bangladesh has huge market potential, and it's not only a source of foreign exchange, but the expansion of the export market will also minimize the risk associated with a narrow export market. The L&M food processing firms have immense potential to digitize business to improve business efficiency and productivity.

## 7. Conclusion

The findings and discussions concluded that food processing industries suffered significant revenue loss due to supply chain disruption - labor and raw materials shortages and declines in demand are major challenges. Unlike in other countries, the food processing industry suffered significant reduction in its revenue. For the quick recovery of food processing industries, the government must take the pandemic as an opportunity to improve the policy and regulatory environment. Likewise, enhancing agro-logistics to ensure raw materials supply will remain critical. Additionally, to build long-term resilience of the entire manufacturing sector, the government could expedite industrial infrastructure development projects to link industrial parks and major towns.

This paper has focused on policy roles in recovering food industries from the pandemic shocks. Likewise, the role of finance deserves independent research on its own as the government

has initiated many financial measures like loan interest waiver and deferment, working capital loans, and providing credit guarantees to keep the financial position of firms strong.

## 8. Limitations

The pandemic impact on revenue is calculated based on a revenue comparison over six months for both pre- and post-pandemic periods, which may not accurately represent the pandemic impact on revenue of the industries. Additionally, since not all industries responded to open-ended questions, the common issues compiled from open-ended responses may be biased toward those industries that submitted issues.

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## 10. Annexes

*Table A-1: Types of challenges faced by L&M food processing industries during the pandemic*

| Rank | Challenges | Frequency | Percent |
|---|---|---|---|
| 1 | **Logistics and transportation** | **25** | **32%** |
| | Delivery delay due to lockdown in India | 6 | 8% |
| | International border closure | 4 | 5% |
| | Product damages due to low product shelf life | 3 | 4% |
| | Restricted in-country vehicle movement during lockdown | 2 | 3% |
| | Longer distance in-country transportation | 2 | 3% |
| | Difficult to get vehicle entry permit to enter Bhutan | 2 | 3% |
| | Long transition at entry dry port | 2 | 3% |
| | Strict COVID health protocols | 1 | 1% |
| | Factory location in COVID Red Zone | 1 | 1% |
| | Others | 2 | 3% |
| 2 | **Raw materials shortage** | **13** | **17%** |
| | Closure of supplier's business | 3 | 4% |
| | Import restriction during lockdown | 2 | 3% |
| | Inconsistent supply of raw materials | 2 | 3% |
| | Increase prices of raw materials | 1 | 1% |
| | Non-availability of domestic raw materials | 1 | 1% |
| | Poor quality of raw materials | 1 | 1% |
| | Limited suppliers | 1 | 1% |
| | Others | 2 | 3% |
| 3 | **Unfriendly custom regulations** | **9** | **12%** |
| | Lengthy custom process | 6 | 8% |
| | Difficulty to get export certificate | 3 | 4% |
| 4 | **Fall in demand** | **6** | **8%** |
| | Reduced demand from tourism sector | 4 | 5% |
| | Reduced demand due to increased prices | 2 | 3% |
| 5 | **Increased cost of production** | **9** | **12%** |
| | Increased price of raw materials | 5 | 6% |
| | Increased cost of transportation | 3 | 4% |
| | Increased wages for labor | 1 | 1% |
| 6 | **Fall in export** | **6** | **8%** |
| | Closure of export markets due to lockdown | 3 | 4% |

| | | | |
|---|---|---|---|
| | Reduced demand from partner importers | 3 | 4% |
| 7 | **Labor shortage** | **4** | **5%** |
| | Non-availability of domestic workers | 2 | 3% |
| | Restricted import of foreign workers | 2 | 3% |
| 8 | **Limited working capital** | **3** | **4%** |
| | Did not get working capital from government | 1 | 1% |
| | Limited working capital due to advance payment | 1 | 1% |
| | Others | 1 | 1% |
| 9 | **Payment challenges** | **2** | **3%** |
| | Risk of deception for advance payment | 1 | 1% |
| | Untimely payment | 1 | 1% |
| 10 | **Impact of foreign exchange fluctuation on price** | **1** | **1%** |
| | Impact of foreign exchange fluctuation on price | 1 | 1% |
| | **Grand Total** | **78** | **100%** |

*Table A-2: Products sold in different market by L&M food producing industries*

| Products sold in domestic market | | Products sold in export market | |
|---|---|---|---|
| 1. | Jams & pickles | 1. | Fruit squashes & juices |
| 2. | Packaged drinking water | 2. | Sauce & vinegar |
| 3. | Fruit juices/drinks/squashes | 3. | Jam & pickle |
| 4. | Sauce & vinegar | 4. | Supari (betel nuts) |
| 5. | Rice (gaki chhum) | 5. | *Druksoy* soya chunks (45 gm) |
| 6. | *Druksoy* soya chunks (45gm) | 6. | Atta/maid |
| 7. | Animal feeds | 7. | Sooji |
| 8. | Atta/Maida | 8. | Bran |
| 9. | Sooji | 9. | Curd (Premium/Sweet) |
| 10. | Bran | 10. | Gouda cheese (300gms) |
| 11. | Refined Oil (Soyabean/Palmolein) | 11. | *Zimtak* chicken 30gm |
| 12. | Processed cheese (Gouda/Local) | 12. | *Zimtak* veg 30gm |
| 13. | Unsalted butter | 13. | Fruit juices |
| 14. | Set curd (400 ml) | | |
| 15. | Cup yogurt (90 ml) | | |
| 16. | Him gold | | |
| 17. | *Zimtak* veg (30/65 gm) | | |
| 18. | *Zimtak* chicken (30/65 gm) | | |
| 19. | Chicken hot oriental (60gm) | | |
| 20. | *Zimtak* tasty bhujia | | |

| | |
|---|---|
| 21. | UHT milk |

*Table A-3: No. of L&M industries by industry classification and their products markets, 2020*

| Industry classification | Market | | | Total |
|---|---|---|---|---|
| | Export only | Domestic only | Both | |
| Manufacture of food and related products | 1 | 4 | 8 | 13 |
| Manufacture of beverages | 0 | 5 | 9 | 14 |
| Manufacture of wood and wood products | 0 | 6 | 3 | 9 |
| Manufacture of coke and refined petroleum products | 0 | 2 | 1 | 3 |
| Manufacture of chemicals, plastics, and rubbers products | 6 | 6 | 5 | 17 |
| Manufacture of cement and other concrete products | 1 | 6 | 3 | 10 |
| Manufacture of basic metals | 8 | 4 | 5 | 17 |
| Manufacture of electrical and other machinery equipment | 0 | 3 | 0 | 3 |
| Mining and quarrying | 9 | 20 | 12 | 41 |
| Other | 1 | 2 | 0 | 3 |
| Total | 26 | 58 | 46 | 130 |

*Table A-4: Average income of L&M industries from January to June by Industry classification*

| Industry classification | 2020 | 2019 | Difference | % Difference |
|---|---|---|---|---|
| Manufacture of food and related products | 49,043,480 | 84,097,176 | (35,053,696) | -42% |
| Manufacture of beverages | 120,343,016 | 163,657,088 | (43,314,072) | -26% |
| Manufacture of wood and wood products | 23,103,200 | 29,140,218 | (6,037,018) | -21% |
| Manufacture of coke and refined petroleum products | 58,904,504 | 40,085,968 | 18,818,536 | 47% |
| Manufacture of chemicals, plastics, and rubbers products | 39,370,336 | 52,602,452 | (13,232,116) | -25% |
| Manufacture of cement and other concrete products | 286,604,544 | 407,917,632 | (121,313,088) | -30% |
| Manufacture of basic metals | 357,092,736 | 527,993,408 | (170,900,672) | -32% |
| Manufacture of electrical and other machinery equipment | 35,993,504 | 39,760,128 | (3,766,624) | -9% |
| Mining and quarrying | 42,993,184 | 59,509,444 | (16,516,260) | -28% |
| Other | 9,014,083 | 9,614,665 | (600,582) | -6% |
| Total Average Income | 110,735,056 | 152,583,552 | (41,848,496) | -27% |

*Table A-5: Average income of large industries from January to June by Industry classification*

| Industry classification | Large Industries | | | |
|---|---|---|---|---|
| | 2020 | 2019 | Difference | Difference (%) |
| Manufacture of food and related products | 109,896,216 | 71,810,776 | 38,085,440 | 53% |
| Manufacture of beverages | 265,386,240 | 303,707,936 | (38,321,696) | -13% |
| Manufacture of wood and wood products | 37,633,028 | 48,445,168 | (10,812,140) | -22% |
| Manufacture of coke and refined petroleum products | 74,000,000 | 68,000,000 | 6,000,000 | 9% |

| | | | | |
|---|---|---|---|---|
| Manufacture of chemicals, plastics, and rubbers products | 46,422,460 | 49,709,580 | (3,287,120) | -7% |
| Manufacture of cement and other concrete products | 641,845,312 | 851,017,856 | (209,172,544) | -25% |
| Manufacture of basic metals | 493,446,368 | 643,348,096 | (149,901,728) | -23% |
| Manufacture of electrical and other machinery equipment | 58,312,660 | 85,519,656 | (27,206,996) | -32% |
| Mining and quarrying | 96,391,008 | 106,911,720 | (10,520,712) | -10% |
| Other | 13,312,540 | 18,720,000 | (5,407,460) | -29% |
| Total | 260,900,112 | 320,123,968 | (59,223,856) | -19% |

*Table A-6: Average income of medium industries from January to June by Industry classification*

| Industry classification | Medium Industries | | | |
|---|---|---|---|---|
| | 2020 | 2019 | Difference | Difference (%) |
| Manufacture of food and related products | 18,617,116 | 92,873,176 | (74,256,060) | -80% |
| Manufacture of beverages | 11,560,595 | 23,606,214 | (12,045,619) | -51% |
| Manufacture of wood and wood products | 11,479,336 | 13,696,257 | (2,216,921) | -16% |
| Manufacture of coke and refined petroleum products | 43,809,004 | 26,128,956 | 17,680,048 | 68% |
| Manufacture of chemicals, plastics, and rubbers products | 37,742,920 | 53,492,564 | (15,749,644) | -29% |
| Manufacture of cement and other concrete products | 49,777,352 | 112,517,496 | (62,740,144) | -56% |
| Manufacture of basic metals | 29,843,972 | 66,574,688 | (36,730,716) | -55% |
| Manufacture of electrical and other machinery equipment | 24,833,928 | 16,880,360 | 7,953,568 | 47% |
| Mining and quarrying | 30,048,258 | 47,658,872 | (17,610,614) | -37% |
| Other | 417,170 | 509,330 | (92,160) | -18% |
| Total | 28,327,400 | 52,494,480 | (24,167,080) | -46% |

*Table A-7: Revenue share of L&M industries from January to June by Industry classification*

| Industry classification | No. of Firms | Total Revenue | | % Share | |
|---|---|---|---|---|---|
| | | 2019 | 2020 | 2019 | 2020 |
| Manufacture of food and related products | 13 | 933,540,088 | 1,428,650,808 | 3% | 6% |
| Manufacture of beverages | 14 | 4,251,911,104 | 3,715,407,360 | 14% | 15% |
| Manufacture of wood and wood products | 9 | 436,006,512 | 338,697,252 | 1% | 1% |
| Manufacture of coke and refined petroleum products | 3 | 204,000,000 | 222,000,000 | 1% | 1% |
| Manufacture of chemicals, plastics, and rubbers products | 17 | 845,062,860 | 789,181,820 | 3% | 3% |
| Manufacture of cement and other concrete products | 10 | 8,510,178,560 | 6,418,453,120 | 28% | 25% |
| Manufacture of basic metals | 17 | 10,936,917,632 | 8,388,588,256 | 35% | 33% |
| Manufacture of electrical and other machinery equipment | 3 | 256,558,968 | 174,937,980 | 1% | 1% |
| Mining and quarrying | 41 | 4,383,380,520 | 3,952,031,328 | 14% | 16% |
| Other | 3 | 56,160,000 | 39,937,620 | 0% | 0% |

| | | | | | |
|---|---|---|---|---|---|
| | 130 | 30,813,716,244 | 25,467,885,544 | 100% | 100% |

*Table A-8: No. of L&M industries by industry classification and source of raw materials*

| Industry classification | Source of Raw material | | |
|---|---|---|---|
| | Import only | Domestic only | Both |
| Manufacture of food and related products | 8 | 0 | 5 |
| Manufacture of beverages | 7 | 0 | 7 |
| Manufacture of wood and wood products | 1 | 2 | 6 |
| Manufacture of coke and refined petroleum products | 3 | 0 | 0 |
| Manufacture of chemicals, plastics, and rubbers products | 9 | 3 | 4 |
| Manufacture of cement and other concrete products | 1 | 3 | 6 |
| Manufacture of basic metals | 3 | 1 | 13 |
| Manufacture of electrical and other machinery equipment | 2 | 0 | 1 |
| Mining and quarrying | 1 | 29 | 1 |
| Other | 2 | 0 | 1 |
| Total | 37 | 38 | 44 |

*Table A-9: Average expenditure by L&M industries on raw materials by industry classification from January-June*

| Industry classification | 2020 | 2019 | Difference | Difference (%) |
|---|---|---|---|---|
| Manufacture of food and related products | 32,641,715 | 33,174,972 | (533,257) | -2% |
| Manufacture of beverages | 63,863,066 | 82,883,806 | (19,020,740) | -23% |
| Manufacture of wood and wood products | 13,290,192 | 14,974,171 | (1,683,979) | -11% |
| Manufacture of coke and refined petroleum products | 8,515,458 | 5,546,163 | 2,969,295 | 54% |
| Manufacture of chemicals, plastics, and rubbers products | 44,247,499 | 48,320,407 | (4,072,908) | -8% |
| Manufacture of cement and other concrete products | 171,802,082 | 254,755,965 | (82,953,883) | -33% |
| Manufacture of basic metals | 287,184,909 | 398,253,584 | (111,068,675) | -28% |
| Manufacture of electrical and other machinery equipment | 14,262,031 | 13,572,681 | 689,350 | 5% |
| Mining and quarrying | 8,396,703 | 10,308,887 | (1,912,184) | -19% |
| Other | 36,643,187 | 17,861,443 | 18,781,744 | 105% |
| Total | 104,981,251 | 125,781,567 | (20,800,316) | -17% |

*Table A-10: Average expenditure by L&M industries on imported raw materials by industry classification from January-June*

| Industry classification | Import (Nu.) | | | |
|---|---|---|---|---|
| | 2020 | 2019 | Difference | Difference (%) |
| Manufacture of food and related products | 30,210,303 | 30,663,460 | (453,157) | -1% |
| Manufacture of beverages | 54,552,182 | 69,444,574 | (14,892,392) | -21% |
| Manufacture of wood and wood products | 6,473,856 | 9,431,244 | (2,957,388) | -31% |
| Manufacture of coke and refined petroleum products | 8,515,458 | 5,546,163 | 2,969,295 | 54% |
| Manufacture of chemicals, plastics, and rubbers products | 41,189,194 | 44,267,619 | (3,078,425) | -7% |

| | | | | |
|---|---|---|---|---|
| Manufacture of cement and other concrete products | 88,537,755 | 133,440,914 | (44,903,159) | -34% |
| Manufacture of basic metals | 271,648,966 | 383,254,728 | (111,605,762) | -29% |
| Manufacture of electrical and other machinery equipment | 14,262,031 | 13,572,681 | 689,350 | 5% |
| Mining and quarrying | 720,000 | 1,085,204 | (365,204) | -34% |
| Other | 4,776,687 | 5,365,913 | (589,226) | -11% |
| Total | 86,542,295 | 102,000,217 | (15,457,922) | -15% |

*Table A-11: Average expenditure by L&M industries on domestic raw materials by industry classification from January-June*

| Industry classification | Domestic (Nu.) | | | |
|---|---|---|---|---|
| | 2020 | 2019 | Difference | Difference (%) |
| Manufacture of food and related products | 2,431,412 | 2,511,512 | (80,100) | -3% |
| Manufacture of beverages | 9,310,884 | 13,439,232 | (4,128,348) | -31% |
| Manufacture of wood and wood products | 6,816,336 | 5,542,927 | 1,273,409 | 23% |
| Manufacture of coke and refined petroleum products | | | | |
| Manufacture of chemicals, plastics, and rubbers products | 3,058,305 | 4,052,788 | (994,483) | -25% |
| Manufacture of cement and other concrete products | 83,264,327 | 121,315,051 | (38,050,724) | -31% |
| Manufacture of basic metals | 15,535,943 | 14,998,856 | 537,087 | 4% |
| Manufacture of electrical and other machinery equipment | | | | |
| Mining and quarrying | 7,676,703 | 9,223,683 | (1,546,980) | -17% |
| Other | 31,866,500 | 12,495,530 | 19,370,970 | 155% |
| Total | 18,438,956 | 23,781,350 | (5,342,394) | -22% |

*Table A-12: Average value of electricity consumption of L&M industries by industry classification from January-June*

| Industry classification | 2020 | 2019 | Difference | Difference (%) |
|---|---|---|---|---|
| Manufacture of food and related products | 2,482,368 | 3,306,612 | (824,244) | -25% |
| Manufacture of beverages | 4,579,490 | 5,150,209 | (570,719) | -11% |
| Manufacture of wood and wood products | 2,071,708 | 2,576,854 | (505,146) | -20% |
| Manufacture of coke and refined petroleum products | 335,807 | 321,226 | 14,581 | 5% |
| Manufacture of chemicals, plastics, and rubbers products | 2,047,712 | 2,374,424 | (326,712) | -14% |
| Manufacture of cement and other concrete products | 53,823,375 | 65,058,257 | (11,234,882) | -17% |
| Manufacture of basic metals | 118,767,191 | 135,643,306 | (16,876,115) | -12% |
| Manufacture of electrical and other machinery equipment | 1,389,694 | 1,509,672 | (119,978) | -8% |
| Mining and quarrying | 1,127,141 | 1,160,525 | (33,384) | -3% |
| Other | 658,830 | 1,777,657 | (1,118,827) | -63% |
| Total | 37,865,110 | 41,856,977 | (3,991,867) | -10% |

*Table A-13: Average value of electricity consumption by large industries by industry classification from January-June*

| Industry classification | 2019 | 2020 | Difference | % Difference |
|---|---|---|---|---|
| Manufacture of food and related products | 2,302,793 | 1,713,728 | (589,065) | -26% |
| Manufacture of beverages | 4,678,628 | 4,137,487 | (541,141) | -12% |
| Manufacture of wood and wood products | 2,411,617 | 1,953,747 | (457,870) | -19% |
| Manufacture of coke and refined petroleum products | 300,000 | 300,000 | - | 0% |
| Manufacture of chemicals, plastics, and rubbers products | 1,067,064 | 847,053 | (220,011) | -21% |
| Manufacture of cement and other concrete products | 64,581,710 | 53,394,768 | (11,186,942) | -17% |
| Manufacture of basic metals | 126,594,015 | 117,659,500 | (8,934,515) | -7% |
| Manufacture of electrical and other machinery equipment | 1,460,000 | 1,280,000 | (180,000) | -12% |
| Mining and quarrying | 496,934 | 532,680 | 35,746 | 7% |
| Other | 816,151 | 422,133 | (394,018) | -48% |
| Total | 40,789,412 | 37,211,758 | (3,577,654) | -9% |

*Table A-14: Average value of electricity consumption by medium industries by industry classification from January-June*

| Industry classification | 2019 | 2020 | Difference | % Difference |
|---|---|---|---|---|
| Manufacture of food and related products | 1,003,819 | 768,640 | (235,179) | -23% |
| Manufacture of beverages | 471,581 | 442,003 | (29,578) | -6% |
| Manufacture of wood and wood products | 165,237 | 117,961 | (47,276) | -29% |
| Manufacture of coke and refined petroleum products | 21,226 | 35,807 | 14,581 | 69% |
| Manufacture of chemicals, plastics, and rubbers products | 1,307,360 | 1,200,659 | (106,701) | -8% |
| Manufacture of cement and other concrete products | 476,547 | 428,607 | (47,940) | -10% |
| Manufacture of basic metals | 9,049,291 | 1,107,691 | (7,941,600) | -88% |
| Manufacture of electrical and other machinery equipment | 49,672 | 109,694 | 60,022 | 121% |
| Mining and quarrying | 663,591 | 594,461 | (69,130) | -10% |
| Other | 961,506 | 236,697 | (724,809) | -75% |
| Total | 1,067,565 | 653,352 | (414,213) | -39% |