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Analysis of Constraints Faced by Startups in the Food Processing Industries in Tamilnadu, India

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Authors' contributions

This work was carried out in collaboration among all authors. All authors read and approved the final manuscript.

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ABSTRACT

Food processing sector is the transformation of raw agricultural products into food or one form of food into other forms. Food processing comprises many forms of processing foods starting from grinding grain to make raw flour to home cooking to complex industrial methods of food processing and it is used to make convenience foods. The Indian Food and Beverage Industry is evolving as a high-profit sector and contributes about 3 % of India's GDP with the value of two-thirds of the total retail market in India. The projected revenue in the food and beverage business segment is estimated to show a CAGR growth rate of 14.2 percent from the year 2020 to 2024. The study was carried out in June 2022 with the objective is to analyze the constraints faced by startups in the food processing industries, for this study 30 key informants were selected from each start-up food processing industry in three districts namely Trichy, Dindugal, and Coimbatore and all the three districts, the Key Informants was asked collectively to list the constraints faced by the start-up food processing industry through the participatory method. The Rank Based Quotient (RBQ) value for the insufficient connection between production and processing is 84.67 and ranked first among the infrastructure constraint which implies that lack of infrastructure godowns for storage and linkages with the traders. The delay in sanction of loans was the major constraint with RBQ of 76.67 and ranked first among the policy constraint. The delay in sanction of loans makes the new startups

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innovate the new products in the market, which bags their product diversification in the market. The tedious channels for financial transactions with an RBQ value of 59.33 and a high rate of interest for loans with an RBQ of 57.33. The lack of knowledge on Post-harvest technologies with an RBQ value of 70.67, shows the lack of training on the handling of new and improved post-harvest equipment for product diversification. In the marketing constraint, the challenges in identifying the specific market for the product was ranked first among the marketing constraint with an RBQ value of 77.33. The hindrance in the identification of specific market for their produce bags their profit, they forced to sale their produce in markets in which they will not able to get better remunerative for their produce. The Policy would seek to create a favorable environment for the Agri-preneurs to start Food Processing sectors through fiscal initiatives/interventions, which will facilitate the establishment of low-cost pre-cooling and cold chain units proximal to the agricultural farms. It also facilitates the establishment of cold storage units and sorting grading, and hi-tech packing facilities to reduce post-harvest wastages and improve the quality of products and the shelf life.

Keywords: Food processing; constraints; infrastructure; startups; supply chain management.

1. INTRODUCTION

Food processing sector is the transformation of raw agricultural products into food or one form of food into other forms. Food processing comprises many forms of processing foods starting from grinding grain to make raw flour to home cooking to complex industrial methods of food processing and it is used to make convenience foods. The Indian Food and Beverage Industry is evolving as a high-profit sector and contributes about 3 % of India's GDP with the value of two-thirds of the total retail market in India. The projected revenue in the food and beverage business segment is estimated to show a CAGR growth rate of 14.2 percent from the year 2020 to 2024 [1].

During the last five years ending 2019-20, The Food Processing Industries sector has grown at an annual rate of around 11.18 percent on average. As per the Annual Survey of Industries (ASI) 2018-19, food processing was ranked 1st in total persons engaged in the manufacturing sector. An increasing global population will have a greater demand for food in 2030 [1]. At the same time, greater differentiation will be required due to an aging population and individualization. Innovation is needed to meet this demand. Good behavior in the form of sustainability is also an important aspect of food. The Food Safety and Standards Authority of India requires all food manufacturing businesses to obtain FSSAI registration. As a result, allspice or curry powder manufacturers must be FSSAI registered as small food manufacturers.

The scheme uses the One District One Product (ODOP) approach to reap the benefits of scale in terms of input procurement, common services, and product marketing. The scheme's ODOP will provide a framework for supply chain development and support infrastructure orientation. In one district, there may be more than one cluster of ODOP products. A cluster of ODOP products in a State may consist of more than one adjacent district. The states would identify the food product for a district, keeping in mind the scheme's emphasis on perishables [2,3]. The State Government would conduct a baseline study. The ODOP product could be a perishable agricultural product, a cereal-based product, or a food product that is widely produced in a district and its associated sectors. Mango, potato, litchi, tomato, tapioca, papad, pickle, millet-based products, fisheries, poultry, meat, and animal feed are examples of such products. Besides, certain other traditional and innovative products including waste-to-wealth products could be supported under the Scheme [4,5]. For example, honey, minor forest products in tribal areas, traditional Indian herbal edible items like turmeric, amla, Haldi, etc. Support for agricultural products would be for their processing along with efforts to reduce wastage, proper assaying, and storage and marketing.

India has made a strong name for itself in the global startup community. India ranks among the top five countries in the world in terms of the number of startups founded [6]. It is estimated that India houses around 4200 start-ups, creating more than 85,000 employment opportunities. Numerous Government initiatives and incentives apart from private investment ecosystems development are also playing a vital role in boosting the Startup community in the sector [7]. For nurturing innovations in the country, the Startup India Action Plan was launched in January 2016 by the Government of

India under the flagship Invest India initiative of DIPP.

Through this initiative, the government hopes to empower startups to grow through innovation and design, as well as to accelerate the spread of the startup movement on a large scale. Food processing, as a sector, is uniquely situated at the crossroads of agriculture, manufacturing, and services, and thus has the potential to become a significant growth engine for the Indian economy. What is remarkable is that many of the innovations that may spark this growth come from enterprising young and innovative Startups rather than large corporates or organized players in the food value chain. As a result, there is a strong case to be made for appropriately nurturing Startup innovations through a scalable enterprise model of the organized sector, via institutionalized collaborative mechanisms, which has the potential to drastically transform the Indian food processing economy and associated ecosystem. The main objective of this study is to analyze the constraints faced by startups in the food processing industries.

2. MATERIALS AND METHODS

The study was undertaken in three purposively selected districts of Tamil Nadu viz. Trichy, Dindugal and Coimbatore in June, 2022. Considering the number of start-up food processing industries in the three districts, 10 food processing industries were selected from each district making the total sample size 30 food processing industries. A total of 30 key informants were selected from each start-up food processing industry in three districts of Trichy, Dindugal, and Coimbatore, and in all three districts, the key informants were asked collectively to list the constraints faced by the start-up food processing industry through the participatory method. The most common constraints were jotted down. After that, a participatory discussion was held where all the 30 Industries in each district were present who again collectively listed the constraints in their respective district. A final list of the constraints was prepared by comparing the list prepared by the Key Informants as well as the respondents separately. Later on, both the Key Informants and Respondents were asked to rank the constraints individually. These were compiled together and the RBQ technique was used to quantify the data collected by the Preferential Ranking Technique. The following formula is given by Sabarathnam [8].

$$R.B.Q = \frac{\sum fi\ (n+1-i)\times 100}{N\times n} \quad \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots (1)$$

Where in,

fi = Number of respondents reporting a particular problem under i^{th} rank
N = Number of Respondents
i = Number of rank
n = Number of constraints identified

After calculating the RBQ values for Key Informants and Respondents separately the ranks of all the constraints were accessed. Finally, Spearman's Rank Correlation Coefficient was calculated between the ranks of constraints assigned by KI and respondents in all three districts.

2.1 Statistical Analysis

The 10 key informants in the Trichy district were asked to rank all the five categories of constraints in order to assign 1st to 5th rank in each category i.e Infrastructural constraints, Policy constraints, financial constraints, technological constraints, and marketing constraints, as per their perception. The ranks so assigned were plotted in a table against each constraint and the RBQ values were worked out. Similarly, all the 30 start-up food processing industries were also asked to rank the constraints and the RBQ values were calculated. Based on these RBQ values, ranks were finally assigned to each of the constraints separately calculated between the ranks of constraints assigned by the respondents to assess their association. The entire process was repeated in Dindugal and Coimbatore districts. The mean RBQ values were calculated to assess the preferential ranking of each constraint as depicted in the Trichy district. Similarly, the mean RBQ values were calculated for Dindugal and Coimbatore districts.

3. FINDINGS AND DISCUSSION

The constraints faced by startups in the food processing industries were assessed by five types viz., Infrastructure, Policy, Financial, Technology, and marketing. The results of RBQ value and ranks are given in Table 1.

Table 1. Constraints - RBQ value, ranking

I	Infrastructure Constraints	RBQ Value	Rank
1	**The insufficient connection between production and processing**	**84.67**	**I**
2	Lack of warehouse, cold storage for handling large quantities	75.33	II
3	Non-availability of lands at an affordable cost	70.00	III
4	Institutional gaps in the supply chain	60.00	IV
5	Inadequate road connectivity	52.67	V
II	**Policy Constraints**		
1	**Delay in sanction of loans**	**76.67**	**I**
2	Delay in getting subsidies	72.67	II
3	Complexity in licensing process	72.00	III
4	Tedious regulations in operational procedures	70.67	IV
5	Red tapism in availing approvals	69.33	V
III	**Financial Constraints**		
1	**Lack of capital for the start-up initiative**	**76.67**	**I**
2	High cost involved in the development of basic infrastructure	67.33	II
3	Tedious channels for financial transactions	59.33	III
4	High rate of interest for loans	57.33	IV
5	Poor return of investment witnessed in existing ventures	55.33	V
IV	**Technology Constraints**		
1	**Delay in the absorption of new technologies**	**78.67**	**I**
2	Lack of focus on quality and safety standards	74.67	II
3	Lack of knowledge of Post-harvest technologies	70.67	III
4	Lack of single product cold storage	65.33	IV
5	Absence of cold chain systems	63.33	V
V	**Marketing Constraints**		
1	**Challenges in identifying the specific market for the produce**	**77.33**	**I**
2	Delay in payment from distributors	75.33	II
3	Fragmented logistics	71.33	III
4	Lack of media space for branding	70.67	IV
5	Challenges in gaining the trust of traders	69.33	V

3.1 Infrastructure Constraints

The RBQ value for the insufficient connection between production and processing is 84.67 and ranked first among the infrastructure constraint which implies that lack of infrastructure godowns for storage and linkages with the traders, followed by a lack of warehouse, cold storage for handling large quantities with RBQ value of 75.33 and ranked second, non-availability of lands at an affordable cost is 70.00 and ranked third. This is due to the lack of cold storage facilities for handling the voluminous quantity of produce during harvest and the increased cost of land, which will hinder the agripreuners to buy the land for the setting of cold storage units.

The institutional gaps in the supply chain were the fourth constraint with an RBQ of 60.00, which shows the lack of infrastructure for the institutional building for dissemination of timely market information to the new startups and lack of infrastructure which hindrance the market intelligence for the new startups. The inadequate road connectivity was ranked last among the infrastructure constraint with an RBQ of 52.67.

3.2 Policy Constraints

The policy constraint was measured with five statements, the delay in sanction of loans was the major constraint with an RBQ of 76.67 and ranked first among the policy constraint. The delay in sanction of loans makes the new startups innovate the new products in the market, which bags their product diversification in the market. The delay in getting subsidies was second among the policy constraint with an RBQ value of 72.67. The complexity of licensing process with an RBQ value of 72.00 followed by tedious regulations in operational procedures with RBQ of 70.67 and red tapism in availing

approvals was ranked last among the policy constraint with RBQ of 69.33. The results show that the complexity and tedious process of starting up new initiatives hinder the respondents from setting up new startups.

3.3 Financial Constraints

Among the financial constraints, lack of capital for the startup initiative was ranked first among the financial constraint with an RBQ of 76.67, followed by the poor return of investment witnessed in existing ventures with RBQ of 55.33 and the high cost involved in the development of basic infrastructure was ranked third among the financial constraint with RBQ of 67.33. This shows that the nonavailability of timely disbursement of loans and poor return on investment was major constraint for them.

The tedious channels for financial transactions with RBQ value of 59.33 and a high rate of interest for loans with RBQ of 57.33.

3.4 Technology Constraints

Delay in the absorption of new technologies was ranked first among technology constraints with RBQ value of 78.67 followed by lack of focus on quality and safety standards with RBQ value of 74.67. The absorption of new technologies for the startups results in them a lack of focus on the new safety and quality standards. The lack of knowledge on Post-harvest technologies with RBQ value of 70.67, shows the lack of training on the handling of new and improved post-harvest equipment for product diversification. The lack of single product cold storage with RBQ of 65.33, followed by an absence of cold chain systems with RBQ value of 63.33. The presence of single product cold storage units is not available in that many numbers, which makes them stored in the common cold storage units.

3.5 Marketing Constraints

In the marketing constraint, the challenges in identifying the specific market for the product was ranked first among the marketing constraint with an RBQ value of 77.33. The hindrance in the identification of specific market for their produce bags their profit, they forced to sale their produce in markets in which they will not able to get better remunerative for their produce. The delay in payment from distributors with an RBQ value of 75.33 and fragmented logistics ranked third among the marketing constraints with RBQ value of 71.33. The lack of media space for branding was the fourth constraint among marketing with RBQ value of 70.67, and challenges in gaining the trust of traders with RBQ value of 69.33. The results show that the respondents are not easily accessible to the market and lack market intelligence.

4. CONCLUSION

The key challenges faced by the food processing sector are gaps in supply chain infrastructure, which means inadequate primary processing facilities, storage, and distribution facilities, and insufficient connection between production and processing. Seasonality of operations and low capacity utilization, institutional gaps in the supply chain are the major constraints. The RBQ value for the insufficient connection between production and processing is 84.67 which implies that lack of infrastructure godowns for storage and linkages with the traders, followed by a lack of warehouse, and cold storage for handling large quantities with RBQ value of 75.33. The delay in getting subsidies was second among the policy constraint with RBQ value of 72.67, lack of capital for the start-up initiative was ranked first among the financial constraint with RBQ of 76.67 and the challenges in identifying the specific market for the product was ranked first among the marketing constraint with RBQ value of 77.33. These are the major constraints among the respondents. The implementation of green business practices - from production to packaging and supply chain management - is a critical solution to addressing current food industry issues. The Policy would seek to create a favorable environment for agripreneurs to establish Food Processing sectors through fiscal initiatives/interventions such as rationalization of tax structures on fresh foods, processed foods, and machinery used in the production of processed foods. Also, to encourage the establishment of agro-processing facilities close to agricultural production areas in order to avoid waste and reduce transportation costs. The Policy will make it easier to set up low-cost pre-cooling and cold chain units near agricultural farms. It also provides cold storage units and grading, packing, and sorting facilities to reduce waste and improve product quality and shelf life.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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