Reverse Logistics in Small Scale Food Processing Industries with Practices and Efficiency in India

Vishnupriya T[1], Saravanan S[2]
[1,2] *Department of Management Studies, Anna University (BIT Campus), Tiruchirappalli, Tamilnadu, India*

***Abstract*- This study is demonstrated Reverse Logistics in small scale food processing Industries. Reverse Logistics (RL) is the process of recessive flow of moving goods for the persistence of taking value, proper discarding, remanufacturing and refurbishing activities. Reverse Logistics (RL) is evolving trend in Supply Chain Management to gain more competitive advantage in terms of their value, viability, sustainability and provide supplementary advantage in small scale industry. The Reverse Logistics (RL) practices modified in manufacturing industries to reduce wastage and reclaim. Food Processing sector possess high growth for the past 15 years. As well as Food Processing industries is going to concern, food loss is high. By applying the Reverse Logistics Practices in Food Processing Industries will help to manage the future mandate as well as save the environment. In Food Processing Industries mainly practices reverse logistics and also efficiency for increase the rate of return and wastages practices in industries.**

***Index Terms*- Reverse Logistics, Food Processing Industries, Food loss, efficiency, rate of return, wastages.**

INTRODUCTION

In the post-independence period, India witnessed rapid growth in food- processing sector specifically during 1980s. It followed the first phase of the Green Revolution that had resulted in increased agricultural production and the need for its post harvest management. The importance of the sector was realized by the business community leading to diversification from grain trading to processing . Initially it was, rice processing which was followed closely by wheat milling, paper and pulp industry, milk processing sector, jute industry, sugarcane processing and oils extraction through solvent plants. In some areas like the solvent extraction industry, the growth in installed processing capacity has been far higher than the supply of the raw materials. However, in other areas like fruits and vegetable processing, the growth has not been encouraging due to poor demand for processed products by the consumers. In such cases, the industry has also not been able to develop the demand adequately. The low levels of processing are driven primarily by the food habits of the population. Fresh fruits and vegetables are preferred compared to processed fruits and vegetables.

The term Reverse Logistics (RL) is first published by James R. Stock by the Council of Logistics Management in 1992. The concept further redefined in Reverse Logistics Programs by Reverse Logistics Association (1999). From the year 2005, Reverse Logistics can be applied in the industrial practice under logistics management. Reverse Logistics mainly emphasis to recovery of the product through 3R (Reuse, Remanufacturing and Recycle) concepts. In India, the National Environmental Policy, established in 2006 distinguishes the familiar sector and encourages the collection and recycling of waste.

Food waste or food loss is the uneaten food or not consumed by the consumers. The food loss occurs at every stage of supply chain with different quantities. In developing countries like India, 25% loss occurs at harvest stage, 35% of loss occurs at post-harvest stage and remaining 40% of loss occurs at retail and consumer stage (Food and Agriculture Organization of the United Nations, 2018). The recessive flow of food products necessary to reduce the food waste and smooth flow of logistics.

The issue of food losses is of high importance in the efforts to combat hunger, raise income and improve food security in the world's poorest countries. Food losses have an impact on food security for poor people, on food quality and safety, on economic development and on the environment. The exact causes of food losses vary throughout the world and are very much dependent on the specific conditions and local situation in a given country. In broad terms, food losses will be influenced by crop production

choices and patterns, internal infrastructure and capacity, marketing chains and channels for distribution, and consumer purchasing and food use practices. Irrespective of the level of economic development and maturity of systems in a country, food losses should be kept to a minimum.

Food losses represent a waste of resources used in production such as land, water, energy and inputs. Producing food that will not be consumed leads to unnecessary CO2 emissions in addition to loss of economic value of the food produced.

Economically avoidable food losses have a direct and negative impact on the income of both farmers and consumers. Given that many smallholders live on the margins of food insecurity, a reduction in food losses could have an immediate and significant impact on their livelihoods. For poor consumers (food insecure or at-risk households), the priority is clearly to have access to food products that are nutritious, safe and affordable. It is important to note that food insecurity is often more a question of access (purchasing power and prices of food) than a supply problem. Improving the efficiency of the food supply chain could help to bring down the cost of food to the consumer and thus increase access. Given the magnitude of food losses, making profitable investments in reducing losses could be one way of reducing the cost of food. But that would, of course, require that financial gains from reduced losses are not outweighed by their costs.

LITERATURE REVIEW

The performance of reverse logistics is affect by many factors, which we found useful to review them under five research streams: food specific features, cost, competitive advantage, regulation and legislation, and information management.

Vaidyanathan and Yadong (2007) classified the key reverse logistic drivers in financial elements related to costs, revenues and assets and non-financial drivers compiled in competitive pressure from liberalized return policies, environmental regulation and corporate citizenship as strategy to improve corporate image and gain market-share.

Hoek (1999), provided the resolution of Reverse Logistics (RL) from environmental damage. The framework to support Reverse Logistics (RL) was advanced and the contests were discussed.

P. de Brito et al (2002) discussed six case studies in United Nations and they recognized the critical factors of reverse logistics. They established their plan for inventory, network structure, relationships, information technology, planning and control of retrieval activities.

Erdogmus et al (2011) described the reverse logistics concepts and standing of reverse logistics. The model for reverse logistics was developed with the steps and unique features of reverse logistics are discussed.

Skapa (2012) focused the study on Czech market and expressed tactical plans for the reverse logistics field. The forces for reverse logistics were recognized by the author and the plan for operations was created.

R. N. Mahapatra et al (2013) proposed a model for mandate and found a procedure to minimize the consumption of raw material by the adapting the reverse logistics.

I. P. Vlachos (2014) aimed at investigative the reverse logistics across the food product life cycle. In that paper, he identified variables for actual supply chain by reviewing five research rivulet: food specific features, cost, competitive advantage, directive and legislature and information management. From that the upcoming of the product was strongminded and quality problems were accomplished.

Vijayan et al (2014) absorbed on their study at food retail industry as grocery stores, convenience stores, supermarkets and hypermarkets. They established the conceptual framework based on the variables under the environmental concern, barriers and adoption level of reverse logistics. In their study they also included the quality, reduction of repaid goods and better waste management method.

Sowmyiwa et al (2014) conducted the empirical survey targeting reverse logistics management in the food and beverages corporations carrying on business. They have taken framework from the author De Brito (2003) and they applied and analyzed their data to reduce total logistics cost, improved customer satisfaction, enhance competitive advantage and diminishing environmental impacts.

M. Anne et al (2015) clarified about reverse logistics and the effect of competitiveness among the food processing industries. They projected a framework for reverse logistics practices. From the examination, they found that there is a optimistic relationship between reverse logistics and proper

operation of material and also decreases cost and enhance competitiveness of the firm.

N.B. Ngadiman et al (2016) established the reverse logistics in the food and beverage industries in Malaysia. They have formed the framework based on five dimensions and calm the feedback. From that the feedback they highlight the present scenario and explored the internal and external barriers of the industries.

REVERSE LOGISTICS

The term Reverse Logistics (RL) is first published by James R. Stock by the Council of Logistics Management in 1992. Reverse logistics is defined as "all actions associated with a product/ service after the point of sale, the ultimate goal to optimize or make more efficient after market activity, thus redeemable money and environment resources" (Reverse Logistics Association, 2009). Reverse logistics is the process of recovering the product from the end customer for the purposes of capturing value or proper disposal. Events include collection, combined inspection/ selection/ soring, re-processing/ direct recovery, rearrangement and disposal (Mwaura Anne, Letting Nicholas, Ithinji Gicuru and Orwa Bula, 2016). Reverse logistics systems have some basic characteristics related to the organization requirement of two markets, supply uncertainty, returns disposition decisions, rescheduling and assumption (Amemba et al., 2013). Reverse logistics are hard to prediction, need more distribution points and particular equipment, packaging is often incapacitated, pricing is vague, product life cycle is not determined and slide and traceability are low (Vaidyanathan and Yadong, 2007; Pokharel and Mutha, 2009).

Reverse Logistics in small scale Food Processing Industries

ASI 2015 compiled that there are 19 sub-sectors of food processing industry. In this industry, on an average, the fixed capital per registered factory is Rs. 4.65 crore representative the most of the factories in this sector are micro and small initiatives under the definition of Micro, Small and Medium Enterprises Development (MSMED) act 2006. The different stages of losses are harvesting, collection, whipping, grouping/ sorting, inspecting/ cleaning, drying, packaging, transportation and storage depending upon the product (FAO 2016-"17). The study has estimated that harvest and post-harvest losses of major agricultural produces at national level was of the order of Rs. 44,753 crore per annum at 2017 wholesale prices.

Reverse Logistics practices based on types of food waste

Five system boundaries were distinguished in the food supply chains (FSC) of vegetable and animal commodities. Food loss/ waste were estimated for each of these segments of the FSC. The following aspects were considered:

Vegetable commodities and products:

Agricultural production: losses due to mechanical damage and/or spillage during harvest operation (e.g. threshing or fruit picking), crops sorted out post-harvest, etc.

Post-harvest handling and storage: including losses due to spillage and degradation during handling, storage and transportation between farm and distribution.

Processing: including losses due to spillage and degradation during industrial or domestic processing, e.g. juice production, canning and bread baking. Losses may occur when crops are sorted out if not suitable to process or during washing, peeling, slicing and boiling or during process interruptions and accidental spillage.

Distribution: including losses and waste in the market system, at e.g. wholesale markets, supermarkets, retailers and wet markets.

Consumption: including losses and waste during consumption at the household level.

Animal commodities and products:

Agricultural production: for bovine, pork and poultry meat, losses refer to animal death during breeding. For fish, losses refer to discards during fishing. For milk, losses refer to decreased milk production due to dairy cow sickness (mastitis).

post-harvest handling and storage: for bovine, pork and poultry meat, losses refer to death during

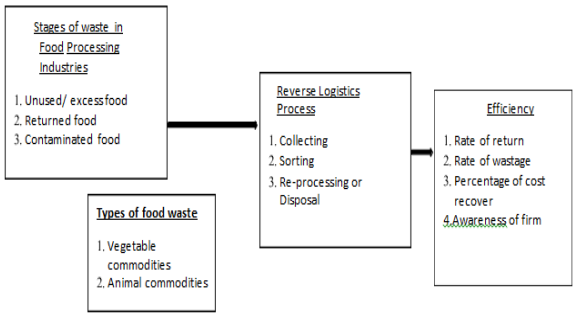
transport to slaughter and condemnation at slaughterhouse. For fish, losses refer to spillage and degradation during icing, packaging, storage and transportation after landing. For milk, losses refer to spillage and degradation during transportation between farm and distribution.

Processing: for bovine, pork and poultry meat, losses refer to trimming spillage during slaughtering and additional industrial processing, e.g. sausage production. For fish, losses refer to industrial processing such as canning or smoking. For milk, losses refer to spillage during industrial milk treatment (e.g. pasteurization) and milk processing to, e.g., cheese and yoghurt.

Distribution: includes losses and waste in the market system, at e.g. wholesale markets, supermarkets, retailers and wet markets.

Consumption: includes losses and waste at the household level.

From these types of food waste reverse logistics practices under the existing model for Reverse Logistics for Food Processing in small scale industries.



IMPROVING EFFICIENCY IN REVERSE LOGISTICS ON FOOD PROCESSING INDUSTRIES

There are three R's of reverse logistics in small scale food industries such as Restock, Repair or Refurbish and Recycle. The basic points mainly focus on 3"R"s of reverse logistics.

Restock the food when the substance contain some harmfull effects then there is a replacement. If there is nothing wrong with the product itself,the most logical solution is to replace or repackage the food item and prepare to sell it elsewhere.

Repair or Refurbish indicates some food products are not interested by the customers then it is prepared to another food with different categorize receipes.

Recycle is not only the wasted foods its also indicates in the same scenario, it takes to recycle for another products.

CONCLUSION

In this paper we are explaining the Reverse Logistics and their different types of food wastes proceed the Reverse Logistics practices in food processing industries. Here the model discussed already existing model based on the literature and practical implications of Reverse Logistics in Foreign Countries. It will create more attention towards Reverse Logistics in food processing Industries to be sustainable long-run and the food loss can be reduced. The future research leads to best practical application in food processing Industries and make it best improvement in their practices and efficiency .

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