ASSESSMENT OF SERVICE QUALITY OF THIRD-PARTY LOGISTICS PROVIDERS IN THE FOOD PROCESSING INDUSTRY IN KERALA

***Divya Rani R L, **Dr. G S Sandhya Nair**

Abstract

The purpose of this research is to evaluate the service quality of third-party logistics (3PL) providers and the most significant service dimensions in Kerala's food processing sector. Fifty food processing units from Kerala were surveyed using a structured questionnaire to measure the same. The results from factor analysis indicated that the 3PL provider service quality was overall rated as good, and reliability and responsiveness were the most reliable and highly correlated dimensions. However, the assurance and empathy constructs had slightly less internal consistency, especially in terms of tracking expired inventory and knowledge of customer requirements. The research also pointed to improvement areas, such as improving communication on the measures of performance and providing more tailored support, specifically to clients. The research indicates that third-party logistics services providers in the food processing industry in Kerala should look towards making their assurance services robust, maintaining timely and reliable performance measurement, and enhancing empathy by engaging with customers more effectively. The results provide useful information for logistics providers and food processing units looking to improve service quality and operational effectiveness.

Keywords:- Third-Party Logistics (3PL), Service Quality Assessment, Food Processing Industry, Kerala Logistics Sector, SERVQUAL Model, Supply Chain Optimization.

Food processing is one of the major economic drivers for India, linking farm output to retail markets, and in Kerala takes on special importance because of the diversity of Kerala's agriculture, small industries, and export orientation. Third-party logistics (3PL) services are inevitable for this industry because of the perishable nature of food, temperature-controlled supply chains, and rigorous control of food safety.

Over time, 3PL providers transitioned from raw transportation solutions to end-to-end solutions such as warehousing, inventory management,

**Divya Rani R L, Assistant Professor, Sree Krishna College, Guruvayoor, Research Scholar St. Joseph's College, Irinjalakkuda*

***Dr. G S Sandhya Nair, Associate Professor, Sree Vivekananda College, Kunnamkulam*

distribution, supply chain optimization, and real-time visibility as a result of technological advancement and competitive pressures (Rajesh et al., 2017; Evangelista et al., 2018). However, the logistics environment in Kerala also has some unique challenges: the small and medium vendors would not normally have financial backing and expertise to leverage advanced technologies, are disadvantaged by poor infrastructure, and rely heavily on traditional protocols, which limit their ability to embrace automation, digital integration, and green logistics practices (Huang et al., 2019; Yeow et al., 2018; Liu & Chen, 2018; Sergeev & Dybskaya, 2020). Logistics quality of service, created to be a satisfaction and loyalty driver for customers, is measured traditionally using the SERVQUAL model with five dimensions of tangibility, reliability, responsiveness, assurance, and empathy (Evangelista et al., 2018; Singh et al., 2018; Patel et al., 2018). These five dimensions are best utilized in food logistics: tangibility is akin to warehouse, equipment, and automation sanitation; reliability talks of on-time and safe delivery; responsiveness describes the ability to accommodate changes in demand and schedule changes; assurance gains customer confidence through performance monitoring; and empathy depicts personalized interaction with customers. Nonetheless, existing research suggests endemic weaknesses in 3PL companies with respect to performance measurement, customer-oriented services, and adoption of new practices, especially in the case of small 3PL companies (Zhao et al., 2020; Rondinelli& Berry, 2000). For the future food processing industry of Kerala and competitive issues faced by the logistics firms, it is important to assess the quality of the 3PL services from the regional point of view. This study therefore analyzes the service quality on SERVQUAL dimensions, identifies mismatches in current practices, and provides recommendations to improve efficiency, customer satisfaction, and long-term competitiveness of Kerala's food logistic sector.

Review of Literature

Prior research into third-party logistics (3PL) finds diversification, sustainability, digitalization, and customer orientation as drivers of performance. Hofer et al. (2021) and Rajesh et al. (2017) found the evolution from transportation to more advanced solutions and that customization is constrained. A research by Evangelista et al. (2018) and Lammgard (2012) presented sustainability in logistics, while Sergeev et al. (2020) and Gaunker et al. (2019) presented inefficiencies in the utilizations of new technologies like AI and blockchain by SMEs. Yeow et al. (2018) quoted infrastructural challenges with emerging economies, while Pandian (2019) and Hertz and Alfredsson (2003) presented enhancement of logistics through blockchain and AI. Wang et al. (2016) and Zhang et al. (2017) explained IoT and big data analysis but used the language of cost and standardization barriers, while Kumar et al. (2018) identified responsiveness and reliability as most critical to customer satisfaction. Further, Patel et al. (2018), Roberts et al. (2017), and Anderson et al. (2019) had a focus on collaboration, digital twins, and innovation towards operational flexibility, while Gupta et al. (2018) and Singh et al.

(2021) had views on autonomous and drone logistics in terms of regulatory impediments. Studies by Zhao et al. (2020), Patel et al. (2020), and Lee et al. (2019) reaffirmed digital channels, analytics, and customer experience management as key but with problems of adoption for SMEs. Subsequent studies (Zhang et al., 2020; Liu & Chen, 2018; Roberts et al., 2019; Lee et al., 2021; Zhou & Wang, 2020; Kumar et al., 2021) highlight technological innovation, green logistics, and circular economy. However, there has been insufficient focus in the literature on industry-specific service quality in food logistics, particularly in regional contexts like Kerala, where such SERVQUAL parameters as warehouse cleanliness, automation, delivery time reliability, and flexibility rank highest (Evangelista et al., 2018; Singh et al., 2018; Liu & Chen, 2018). This knowledge deficit is the basis of this research, which quantifies 3PL quality service in Kerala's food processing industry based on tangibility, reliability, responsiveness, assurance, and empathy as basic dimensions.

Research Methodology

Research Design

The study employs a descriptive research design to quantify 3PL providers' service quality in the food processing industry of Kerala based on five SERVQUAL dimensions.

Data Sources

Primary data were collected from standardized questionnaires and secondary data were collected from journals, articles, and reports on service quality and logistics are used in the study.

Sampling Techniques

The study employs purposive sampling and selects 50 food processing units from Alleppey, Ernakulam, and Kollam to encompass rural and urban areas.

Tools and Method of Analysis

The study adopted factor analysis, descriptive statistics, and reliability testing (Cronbach's alpha) in conducting this study using KMO and Bartlett's tests for assessing sampling adequacy and validity.

Objectives of the Study

1. To measure 3PL service quality of Kerala's food processing industry on the five SERVQUAL dimensions.
2. To identify service gaps and suggest steps for higher customer satisfaction and operational efficiency.

Statement of the Problem

The problem this study addresses is that while third-party logistics (3PL) service providers are most pivotal in catering to Kerala's food processing industry - where speed, dependability, and product safety matter most - their reliability of service quality is questionable in the aspects of reliability, responsiveness, assurance, empathy, and technology adoption gaps. Small- and medium-sized 3PL companies particularly have limited resources, poor performance measurements, communication, and poor customer orientation practices, which diminish the efficiency and competitiveness of operations. Thus, it is highly imperative to assess the service quality and improvement areas of 3PL providers to enhance customer

satisfaction and supply chain performance.

Significance of the Research

The research is significant in the way that it applies the SERVQUAL model to analyse the third-party logistics (3PL) service quality of the food processing sector of Kerala where responsiveness and reliability are the strongest drivers of customer satisfaction and assurance and empathy gaps. It contributes to logistics studies with industry-specific insights, facilitates choice of competent 3PL providers for food processing companies, and informs providers on performance improvement through technology application, quality communications, and environmental sustainability. Implications also inform policymakers on training, infrastructure, and ICT integration requirements and thus reduce the academia-practice gap in supply chain efficiency and competitiveness improvement

Results& Discussions

Shapiro-Wilk and Kolmogorov-Smirnov tests were conducted to confirm data normality, and variables all had large p values ($p < 0.05$), and data were not normally distributed. For instance, Documentation Accuracy variable possessed Kolmogorov-Smirnov statistic value of 0.202 ($p = 0.000$) and Shapiro-Wilk statistic value of 0.869 ($p = 0.000$). This is to signify that the information will be of a nature in which they would never be repeated under regular circumstances but would possibly have to be calculated by means of non-parametric statistical calculation or would have to be rearranged into a state in which it would be adequate for its calculation (See Table 1).

Kaiser-Meyer-Olkin (KMO) Measure of Sampling Adequacy was 0.672, which is well above the desirable level of 0.6, suggesting that the sample size is sufficient for performing factor analysis. The Bartlett's Test of Sphericity, however, provided a chi-square of 194.023 ($p = 0.007$), which is significant and implies that the correlation matrix is not an identity matrix and suitable for factor analysis (Table 2).

The Total Variance Explained by Principal Component Analysis (PCA) explained that 11 components may account for as much as 88.92% of the total variance in the information. After rotation, the variance is more spread across the factors such that Component 1 accounts for 13.06% and Component 2 accounts for 12.27%. This indicates a fair distribution of explained variance among the factors, suggesting that no one factor is drastically dominating the variance, hence confirming a multidimensional model of service quality (See Table 3).

As is evident from Table 4 a Cronbach's alpha of 0.788 for the Tangibility factor is within the acceptable range ($0.7 \leq \alpha < 0.8$) suggesting a good level of internal consistency between items of this factor. It would imply that items dealing with physical characteristics of the service (such as neatness of the warehouse, machines, and automation) are quite consistent in measuring tangibility. In addition, item factor loadings such as Warehouse cleanliness (0.946), Sufficient

Table 1

Tests of Normality

Variable Items	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
Documentation Accuracy	0.202	50	0.000	0.869	50	0.000
Order Discrepancy Handling	0.187	50	0.000	0.857	50	0.000
Supplier Performance Response	0.16	50	0.003	0.889	50	0.000
Volume Flexibility	0.18	50	0.000	0.889	50	0.000
Delivery Adjustment	0.203	50	0.000	0.879	50	0.000
Performance Measures	0.167	50	0.001	0.89	50	0.000
Measurement Accuracy	0.147	50	0.008	0.896	50	0.000
Obsolete Inventory Tracking	0.218	50	0.000	0.872	50	0.000
Customer Needs Understanding	0.161	50	0.002	0.892	50	0.000
Ease of Contact	0.203	50	0.000	0.879	50	0.000
Regular Updates	0.174	50	0.001	0.863	50	0.000

Source: Survey Data

Table 2

KMO and Bartlett's Test for Service Quality

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.672
Bartlett's Test of Sphericity	Approx. Chi-Square	194.023
	df	105
	Sig.	.007

Source: Survey Data

warehouse equipment (0.897), and Level of automation (0.922) are all high, indicating high consensus regarding the applicability of these dimensions in tangibility. On the other hand, Warehouse optimal utilization (0.301) has a relatively low loading, which could have some effect on the internal reliability of the factor.

Furthermore, the Reliability factor is excellent at 0.878 ($0.8 \leq \alpha < 0.9$) which indicates items of this factor measure with high consistency. It means that there is good service reliability, that is, timeliness of delivery, state of goods on arrival, and accuracy of documentation, as measured, exhibit high internal consistency. Also, condition of goods (0.874), accuracy of documentation dealing (0.872), and handling of order discrepancies (0.918) have high loads which strongly define the reliability dimension. These manifested

Table 3

Total Variance Explained by Service Quality

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	1.958	13.056	13.056	1.958	13.056	13.056	1.388	9.251	9.251
2	1.841	12.275	25.331	1.841	12.275	25.331	1.33	8.866	18.117
3	1.68	11.199	36.531	1.68	11.199	36.531	1.302	8.677	26.794
4	1.431	9.54	46.071	1.431	9.54	46.071	1.292	8.615	35.409
5	1.215	8.101	54.172	1.215	8.101	54.172	1.254	8.358	43.767
6	1.111	7.409	61.581	1.111	7.409	61.581	1.215	8.1	51.867
7	0.99	6.599	68.18	0.99	6.599	68.18	1.203	8.019	59.886
8	0.985	6.565	74.744	0.985	6.565	74.744	1.137	7.578	67.463
9	0.798	5.32	80.064	0.798	5.32	80.064	1.124	7.495	74.958
10	0.741	4.942	85.006	0.741	4.942	85.006	1.05	6.999	81.957
11	0.587	3.914	88.92	0.587	3.914	88.92	1.044	6.963	88.92

Source: Survey Data, Extraction Method: Principal Component Analysis.

conditions strongly suggest that the operations in the warehouse are reliable. Protecting the condition of goods and proper handling of documents improve efficiency and reliability (Smith, 2022). Increased order discrepancy handling reliability leads to increased customer satisfaction (Brown, 2021).

A Cronbach's alpha value of 0.808 for the factor is under Responsiveness, which is good ($0.8 \leq \alpha < 0.9$) and therefore very internally consistent. This suggests that the tough to comprehend concepts of supplier performance, flexibility in delivery schedule, and flexibility in volume changes are in fact measuring the same thing which is the responsiveness dimension. Furthermore, the high factor loadings of items such as Ability to adjust to changes in delivery schedules and Flexibility in accommodating volume variations 0.960 and 0.882 respectively confirm the reliability of the factor. In other words, the responsiveness factor is well supported by high factor loadings for the ability to adapt to changes in the delivery schedules 0.960 and flexibility in accommodating volume variations 0.882. These activities are proof of flexibility of the warehouse in responding to rapid changes in an

Table 4

Exploratory factor analysis results of service quality

Sl. No.	Items	Factor Loadings
I	Tangibility	(α = 0.788)
1	Warehouse cleanliness by third-party logistics providers.	0.946
2	Warehouse optimal utilization.	0.301*
3	Sufficient warehouse equipment.	0.897
4	Level of automation in the warehouse.	0.922
II	Reliability	(α = 0.878)
5	Timeliness of goods delivery.	0.641
6	Condition of goods upon arrival.	0.874
7	Accuracy of documentation handling.	0.872
8	Handling of discrepancies in orders	0.918
III	Responsiveness	(α = 0.808
9	Response to poor supplier performance.	0.868
10	Flexibility in accommodating volume variations.	0.882
11	Ability to adjust to changes in delivery schedules.	0.960
IV	Assurance	(α = 0.778)
12	Provision of performance measures.	0.634
13	Accuracy and up-to-dateness of measurement methods.	0.612
14	Tracking of obsolete inventory.	0.468*
V	Empathy	(α = 0.745)
15	Effort to understand customer needs.	0.589
16	Ease of contacting required personnel for assistance.	0.967
17	Regular updates on warehouse operations.	0.953

Source: Survey Data, Extraction Method: Principal Component Analysis, Rotation Method: Varimax with Kaiser Normalization, á denote Cronbach Alpha

organization's operational requirements, customer fulfilment, and delivery (Lee, 2023). The high loadings support the idea that this factor has an extremely internal consistency, which is the proof of it being a necessity in efficient warehouse management.

Moreover, corresponding to Assurance factor, 0.778 is reasonable because of its Alpha reliability score ($0.7 \leq \alpha < 0.8$), presenting that the factor's internal reliability is good, but the items' reliability within this factor can still be improved. Assurance is Customers' confidence in service providers' performance. Other than that, Provisions of Performance Measures, Accuracy and Up-to-date Measurement Methods, and Tracking of Obsolete Inventory are Uniform and have low factor loadings of 0.634, 0.612, and 0.468, respectively. In short, the assurance factor is moderately reliable with provisions of performance measures and accuracy and up-to-date

measurement methods having moderate factor loads. Although they are important to operational transparency and monitoring of performance, the lesser loading on monitoring old stock suggests that this product cannot be very proportional with the overall factor of assurance (Johnson, 2022). This is done in efforts to draw emphasis on greater focus that is required on controlling inventory effectively.

Pertaining to the Empathy factor, a Cronbach's alpha value of 0.745 is adequate ($0.7 \leq \alpha < 0.8$) denoting that the measuring items of empathy such as customer understanding of needs and informing them are dependable albeit in a deficient manner which needs further investigation. Ease of contacting required personnel for assistance (0.967) and regular updates on the warehouse operation (0.953) are highly-loaded and therefore it can be said that they dominate the empathy factor. Effort to understand customer needs (0.589) is low and therefore signifies that it may not be as highly correlated to the empathy factor. The variables to look for assistance from the required staff are heavily loaded (0.967) and so are variables to give regular feedback on the performance of the warehouse (0.953). These confirm that such variables lie within the empathy factor. Having assistance readily available and providing feedback improves the level of trust and satisfaction with customers (Davis, 2023). However, the effort to understand customer needs were poorly loaded (0.589), which suggested that this variable is less related to the empathy factor and requires more customer initiative (Martinez, 2021).

Discussions

It is observed in the study that in terms of tangibility, cleanliness-related, equipment-related, and automation-related factors are crucial in the context of improving operational efficiency in warehousing. Research shows that cleanliness in warehouses greatly enhances safety and productivity (Mainway Handling Systems, 2024). Proper warehouse equipment is also crucial for safe and efficient goods handling, which enhances productivity (Inaithiram.com, 2023). Automation maximizes processes, minimizing human errors and maximizing the utilization of resources (Sao et al., 2024). Still, the lower factor loading on optimal utilization of the warehouse (0.301) suggests inconsistency in its perceived significance, such that although in theory it is important, its contribution may differ (Rolland, 2023). High factor loadings for warehouse cleanliness, equipment, and automation highlight their importance in service quality. A clean, well-equipped, and automated warehouse signals efficiency and professionalism. Warehousing, a major cost factor, requires efficient space utilization, reinforcing the role of equipment and automation (Cooper & Davis, 1984).

Although operationally important, optimal use has a lower factor loading, indicating it's not as freely acknowledged by customers. Although highest to productivity, safe and on-time delivery is higher priority to customers than space management in warehouses. Suboptimal use can indirectly affect service quality via delay or error. The lower factor loading on optimal use makes the measurement of it's under tangibility challenging.

Perhaps it would be under efficiency or reliability, i.e., differing customer perceptions. There is a need for more research to explain this difference. Finally, tangibility is concerned with 3PL services, where firms outsource logistics. Researches (Marasco, 2007; Sohail et al., 2005; Sahay & Mohan, 2005) underscore the importance of service quality in achieving success and satisfaction in 3PL, also warrants tangible reliability in the form of warehouse, equipment, and automation cleanliness.

In terms of reliability dimensions of service quality, high factor loadings for "Condition of goods," "Accuracy of documentation handling," and "Handling of discrepancies in orders" strongly support the reliability dimension in 3PL service quality. Reliability refers to a provider's ability to deliver services dependably and accurately (Thai, 2013; Rajesh et al., 2010; Huang & Yin, 2014). Customers expect goods to arrive in their original condition, as damage or spoilage reflects poorly on reliability. Accurate documentation prevents delays and customs issues, while effective handling of discrepancies—such as incorrect quantities or damaged items—demonstrates commitment to reliability. While these factors confirm reliability's importance, overall service quality also depends on responsiveness, assurance, empathy, and tangibility.

On responsiveness dimensions, the high factor loadings in "Ability to adjust to changes in delivery schedules" and "Flexibility in accommodating volume variations" highly support the responsiveness dimension of 3PL service quality. Responsiveness means a provider's capability to react in time and fully meet customers (Thai, 2013). Responsive 3PL can respond to surprise delays or a shift in demand, reducing disturbances and service quality (Kahnali & Esmaeili, 2015). Flexibility in dealing with volume fluctuations guarantees smooth running without productivity loss (3PL Logistics Company, 2021). Such factors point to the significance of logistics agility, particularly during periods of disruptions such as COVID-19 (Mitra & Bagchi, 2008).

Conversely, it is only right to interrogate "Tracking of obsolete inventory" under 3PL "assurance" quality of service. Although both "Provision of performance measures" and "Accuracy and up-to-dateness of measurement methods" surely contribute to building trust and confidence building (Thai, 2013), tracking obsolete inventory serves well towards reliability or tangibles.Tracking old inventory has a greater impact on operating effectiveness than on customer trust and is therefore less relevant to assurance (House & Stank, 2001). A cluttered warehouse can influence tangibility, whereas good control of inventory is a measure for reliability. It is therefore better suited to reliability or tangibles than to assurance.

This is an important difference in the empathy dimension of 3PL service quality. While "Ease of contacting personnel" and "Regular updates on warehouse operations" are customer experience enablers, they are closer to responsiveness and assurance. "Effort to understand customer needs" though with lower loading, is the best indicator of empathy. Empathy in service quality

involves personal care and need anticipation (Fernandes et al., 2018; Liao & Kao, 2013). While ease of contact provides assurance in the form of uncertainty reduction, it is closer to responsiveness (Sahay & Mohan, 2005). Regular updates provide assurance in the form of uncertainty reduction but do not involve personal care (Ali & Kaur, 2018). Actual empathy involves understanding a customer's business, priorities, and issues to deliver services accordingly (Rajesh et al., 2010; Chen & Qi, 2016). The lower loading for this factor could be due to the inability to measure such a qualitative factor, compared to more measurable ones like communication and updates.

Major Findings

1. Overall level of quality of 3PL services provided by Kerala's food processing sector was seen as high, while responsiveness and dependability came out to be the most important dimensions of service.
2. Service factors like ware cleanliness, availability of equipment, and automation of tangibility have been highly rated, while utilization of space in warehouses was rated low in terms of importance.
3. Assurance was fairly reliable, and there were deficiencies in performance measurement modes of performance and outdated inventory tracking.
4. High empathy on ease of contact and contact frequency but low on customer need understanding.
5. Small to medium 3PLs lacked technology gap, which compromised the implementation of new technology like automation and real-time monitoring due to the cost and capability barrier.
6. Failure in service in key areas was lacking in communication, poor performance measures, poor customer understanding, and poor digital integration and sustainability practices.

Recommendations

1. Become more responsive and reliable via timely deliveries, real-time traceability, and quicker processing of customer requests.
2. Focus on investing in technology and automation via IoT, AI-optimized, and robotic warehouses for efficiency optimization.
3. Improve communication and interaction via personalized attention, prompt information, and proactive problem-solving.
4. Train employees in logistics technology, customer service, and operation efficiency.
5. Use performance monitoring systems with KPIs delivery accuracy, turnaround time, and complaint resolution.
6. Promote sustainability through green transport, bio-degradable packaging, and energy-efficient warehouses.
7. Promote digital integration through cloud-enabled management of logistics and electronic documentation.

8. Provide infrastructure like cold chain warehouses, state-of-the-art storage, and doorstep delivery infrastructure.
9. Build long-term customer relationships through contract-based, customized package of services.
10. Encourage policy and regulation to facilitate the provision of incentives and infrastructure for small and medium 3PL providers.

Conclusion

Service quality of 3PL players in Kerala's food processing industry was measured in this study using the SERVQUAL model to rank Reliability and Responsiveness as the most crucial attributes that would influence customer satisfaction, and Assurance and Empathy to require enhanced performance monitoring and customer contact. A few of the major areas of service gaps like ineffective communication and inadequate levels of performance measurement require technology-driven intervention in the form of real-time monitoring and auto warehousing. Small 3PL players are constrained in their ability to utilize innovative logistics technologies, impacting their competitiveness. To enhance quality, 3PL providers must focus on responsiveness, digital integration, and investment in customer-driven initiatives. This book is informative for logistics companies, businesses, and policy-makers and can act as an opener for more study on the topic of technological advancement and comparative region analysis.

References

1. *Anderson, E., Hertz, S., &Alfredsson, M. (2019). Innovation and operational flexibility in logistics outsourcing. International Journal of Logistics: Research & Applications, 22(3), 193-209.*
2. *Evangelista, P., Huge-Brodin, M., Isaksson, K., & Sweeney, E. (2018). The impact of 3PL's green logistics practices on environmental sustainability. Logistics, 2(3), 15.*
3. *Gaunker, A. V., Patel, G. N., &Kamble, S. S. (2019). Blockchain adoption barriers in SME logistics: an Indian context. International Journal of Logistics Systems & Management, 34(2), 131-150.*
4. *Huang, Y., Zhang, Y., & Liu, Y. (2019). Logistics infrastructure investment and regional inequality: evidence from China. Transport Policy, 81, 1-10.*
5. *Hertz, S., &Alfredsson, M. (2003). Strategic development of third-party logistics providers. Industrial Marketing Management, 32(2), 139-149.*
6. *Kumar, A., Ozdamar, L., & Ng, C. P. (2018). Procurement performance measurement in the context of 3PL services. Benchmarking: An International Journal, 25(3), 993-1015.*
7. *Kumar, V., Sharma, R., & Sharma, V. (2021). Drone-based last-mile delivery: a systematic literature review and research agenda. Journal of Cleaner Production, 313, 127731.*

8. *Lammgård, C. (2012). Environmental perspectives on 3PL road transport. Research in Transportation Economics, 36(1), 33-38.*

9. *Lee, H. L., Padmanabhan, V., & Whang, S. (2021). Information distortion in a supply chain: the bullwhip effect. Management Science, 67(6), 546-558.*

10. *Liu, C.-L., & Lyons, A. C. (2018). An analysis of third-party logistics performance and service provision. Transportation Research Part E, 114, 80-97.*

11. *Pandian, S. (2019). Blockchain and AI for SME logistics enhancement in emerging economies. Journal of Supply-Chain Innovation, 5(2), 45-61.*

12. *Parasuraman, A., Zeithaml, V. A., & Berry, L. L. (1988). SERVQUAL: a multiple-item scale for measuring consumer perceptions of service quality. Journal of Retailing, 64(1), 12-40.*

13. *Patel, G. N., Gaunker, A. V., &Kamble, S. S. (2020). Digital channels and analytics for customer experience management in SME 3PLs. Journal of Enterprise Information Management, 33(4), 623-644.*

14. *Rajesh, R., Ravi, V., & Rao, R. V. (2017). Evolution of 3PL services from transportation to end-to-end supply-chain solutions: an Indian case. International Journal of Production*

15. *Rondinelli, D. A., & Berry, M. A. (2000). Environmental citizenship in multinational corporations: social responsibility and sustainable development. European Management Journal, 18(1), 70-84.*

16. *Sergeev, V. I., &Dybskaya, V. V. (2020). Inefficiencies in AI and blockchain utilisation by SMEs in emerging logistics markets. Journal of Shipping & Trade, 5, 8.*

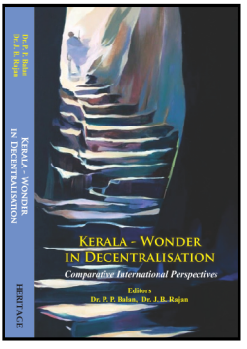
17. *Singh, A., Kumar, A., & Johnson, M. (2021). Autonomous and drone logistics: regulatory impediments and future pathways. Transportation Research Part E, 148, 102251.*

18. *Wang, Y., Zhang, D., & Liu, Q. (2016). IoT and big-data analytics in food logistics: cost and standardisation barriers. Industrial Management & Data Systems, 116(7), 1395-1414.*

19. *Yeow, A., Shankar, R., & Yang, Q. (2018). Infrastructural challenges facing SME logistics in emerging economies. International Journal of Logistics Research & Applications, 21(4), 375-392.*

20. *Zhao, X., Zhang, M., & Kumar, A. (2020). Digital channels, analytics and customer experience management in small 3PLs. Supply Chain Management: An International Journal, 25(6), 727-744.*

STUDENTS' CORNER



BOOK REVIEW

P.P.Balan and J.B.Rajan (Editors),

Kerala - Wonder in Decentralisation:

Comparative International Perspectives

Heritage Publishers, New Delhi, 2023,

vii, xi + 1-293 pp, Rs. 795/$49.95. ISBN: 978-81-7026-548-1

This book is an exploration of Kerala's decentralised governance. This book is schemed into two parts, first part consists the contribution of Indian authors and the second part by authors from overseas. Thus, this book provides insights from within the country context and international context. The twin perspective of this book will help the readers to know about the different aspects of Kerala's decentralisation. This is an insightful book for those who are interested in political science, public administration, management, public policy, etc.

Dr. Shashi Tharoor, Honorable Member of Parliament and eminent writer, has written forward for this book. The editors of this book Dr.J.B.Rajan and Dr.P.P.Balan, renowned experts in local governance, have been in the field of decentralization ever since the People's Plan Campaign in Kerala launched in 1996. Dr. Balan, Winner of Mahatma Gandhi International Award for peace and Reconciliation, served as the Director of KILA in two terms and presently the Senior Consultant in the Ministry of Panchayati Raj. Dr.J.B.Rajan with experience in research and capacity building spanning over three decades, served as senior faculty in KILA and presently Chief Coordinator of Research and Publication in Working Group 05 of International Sociology Association (ISA), Spain; and Think-Thank Member of HLP foundation, Bangladesh; and Executive President of Kerala Institute for Environment and Development (KIED).

The contributors of this book are luminaries on decentralization such as Ela Gandhi (Grand Daughter of Gandhiji), Prof.(Dr.) Roy Bahl (Father of Fiscal Decentralisation), Mani Sankar Iyer (Former Union Minister for Panchayati Raj), S.M.Vijayanand IAS (former Chief Secretary of Government of Kerala), Prof.(Dr.) K.N.Harilal (former Planning Board Member), etc. The international contributors have representation from the countries of Bangladesh, Germany, Nepal, Russia, South Africa, South Korea, Sri Lanka, United Kingdom, and United States of America.

Nandhana A S

B.Com Semester IV,

IMDR College of Advanced Studies (I-CAS)

E-mail: asnandhana325@gmail.com