

An Early Supply Chain Model with Sustainable Manufacturing Perspective to Empower Farmers as Post-harvest Small and Mid-size Enterprises in Indonesia: A Case Study

Muhammad Hisjam, Cucuk Nur Rosyidi, Eko Pujiyanto and Eko Liquiddanu
Dept. of Industrial Engineering, Faculty of Engineering, Universitas Sebelas Maret
Jalan Ir. Sutami 36A, Surakarta, Indonesia
hisjam@staff.uns.ac.id

Abstract

In Indonesia, farmers often become parties with a weak bargaining position, and usually, they can only get a small margin because they often sell their commodity in a raw condition without further process. It is necessary to empower the farmers to become also as post-harvest Small and Mid-size Enterprises (SMEs) using new appropriate technology to make them enjoy a better margin. Because the appropriate technology is a new one especially for farmers, the supply chain for this is still nascent. This paper proposes an early supply chain model with a sustainable manufacturing perspective to empower them. The case study was conducted on a community-based farmer of *amorphophallus oncophyllus sp.*, (in Bahasa Indonesia called as porang), located in Sukoharjo, Indonesia. Using an appropriate technology with a sustainable manufacturing perspective makes a more efficient and sustainable way to process the commodity for further products and resulting in cost reduction with better quality. Using this model hopefully will make farmers enjoy a proper margin and have better bargaining positions.

Keywords

Sustainable Manufacturing, Farmer, SME, Appropriate Technology and Early Supply Chain Model.

Acknowledgements

Authors would like to thanks to Sahabat Petani Porang Sukoharjo for supporting data. This work was supported by MR-UNS PNB Grant with contract number: 254/UN27.22/PT.01.03/2022.

Biographies

Muhammad Hisjam is a Lecturer at the Department of Industrial Engineering, Faculty of Engineering, Universitas Sebelas Maret since 1998. He earned Bachelor's in Agro-industrial Technology from Universitas Gadjah Mada, a Master in Industrial Engineering & Management from Institut Teknologi Bandung, and Ph. D in Environmental Science from Universitas Gadjah Mada. His research interests are supply chain, logistics, business, and sustainable development. He published some papers in journals and proceeding his research area. He and his team have won some research grants from Government institutions and private companies. He holds an Accredited Supply Chain Analyst from the American Academy of Project Management. He is the Head of the Logistics System and Business Laboratory, Faculty of Engineering, Universitas Sebelas Maret. He is a member of IISE, AAPM and IEOM.

Cucuk Nur Rosyidi is a Professor in the Department of Industrial Engineering, Faculty of Engineering, Universitas Sebelas Maret. He earned a Bachelor Degree from the Industrial Engineering Department of Institut Teknologi Sepuluh Nopember Surabaya. He finished the Master and Doctoral Degree in Industrial Engineering Department of Institut Teknologi Bandung. His research interests include product design and development, make or buy decisions, quality engineering, and mathematical model. Currently, he is the Head of Production System Laboratory, Faculty of Engineering, Universitas Sebelas Maret.

Eko Pujiyanto received the B.S. degree in Mathematics in 1993 and the M.Eng. degree in Industrial Engineering in 1998, both from Bandung Institute of Technology, Bandung and Ph.D. degree in Mechanical Engineering in 2012 from Gadjah Mada University, Yogyakarta, Indonesia. He is also received Professional Engineer from Sebelas Maret

University, Surakarta Indonesia. He is currently as an Associate Professor and Head of Master of Industrial Engineering Program. He is a member of The Center for Research in Manufacturing System at Sebelas Maret University, Surakarta Indonesia. His main research is the modeling and experimentation of manufacturing processes. His research interests include modeling and optimization of sustainable manufacturing process using statistical and computational, and data analysis and optimization using heuristics. In addition to research in the field of sustainable manufacturing modeling, he is also experimental-based research related to biomaterials using the Taguchi Method. The results of the multi-response experiment using the Taguchi method were optimized simultaneously with the multi-objective optimization tool. He has authored and coauthored several papers on these subjects. He has published more than 40 papers in journals and international conferences and owned h-index 6. He has been involved as a reviewer in several journals, such as the International Journal of Production Research, Production & Manufacturing Research, International Journal of Management Science and Engineering Management, International Journal of Applied Science and Engineering and Safety and Health at Work. He has completed the supervision of 15 Master Students and over 50 Undergraduate Students.