

energy, and utilizing efficient material. Agro industry sustainability results from interaction technology, land suitability, environment, and management practices [28].

IV. CONCLUSION

The Covid-19 pandemic had a major impact on Indonesia's briquette industry, which is predominantly export-oriented. In general, 82% of the respondents' businesses have problems with production, SC, business networks, and 26.5% experienced a lack of working capital to maintain or restart a business. This problem occurs not because of a decline in global demand, but 97% of respondents said due to scarcity of raw materials in domestic. This scarcity is due to the ripple effects of the global pandemic: increased demand in developed countries, shortages of supply due to lockdown policies in the Philippines and India, increased coconut prices and CSC in international markets, in addition to the government policies which targeting increasing exports of coconut commodities in 2019-2024. These four factors encourage farmers to sell coconut and CSC to the global market instead of selling to the processing industry in Indonesia. To reduce the impact of the pandemic, the authors recommend several actions taken by all coconut industry stakeholders in the short, medium, and long term.

REFERENCES

- [1] Directorate General of Estate Ministry of Agriculture, "Tree Crop Estate Statistics of Indonesia 2018-2020 (Coconuts)," Jakarta, Indonesia, December 2020, [Online] Available: <https://drive.google.com/file/d/19wDhqBN7ypGwtDx7PkQVpumUI3cqGjZl/view>.
- [2] S. Sankararaman, T. Sferra, "Are we going nuts on coconut oil?," *Current nutrition reports*, 7.3: 107-115, 2018.
- [3] S. Wu, et al., High-strength charcoal briquette preparation from hydrothermal pretreated biomass wastes," *Fuel Processing Technology*, 171: 293-300, 2018.
- [4] Suttibak, S., & Loengbudnark, W., "Production of charcoal briquettes from biomass for community use," in IOP Conference Series: Materials Science and Engineering, Bangkok, Thailand ,2018, Vol. 297 p. 012001.
- [5] D. Ivanov, A. Dolgui. "OR-methods for coping with the ripple effect in supply chains during COVID-19 pandemic: Managerial insights and research implications," *International Journal of Production Economics*, 232: 107921, 2021.
- [6] S. Boccaletti, W. Ditto, G. Mindlin, A. Atangana, "Modeling and forecasting of epidemic spreading: The case of Covid-19 and beyond," *Chaos, Solitons & Fractals*, 135, 109794, 2020.
- [7] D. Ivanov, D., "Predicting the impacts of epidemic outbreaks on global supply chains: A simulation-based analysis on the coronavirus outbreak," *Transportation Research*, Part E, 136(March), 101922, 2020.
- [8] D. Chenneveau et al., Coronavirus and technology supply chains: How to restart and rebuild," McKinsey & Company, April. 1, 2020. [Online]. Available: <https://www.mckinsey.com/business-functions/operations/our-insights/coronavirus-and-technology-supply-chains-how-to-restart-and-rebuild>.
- [9] M. M. Queiroz et al., Impacts of epidemic outbreaks on supply chains: mapping a research agenda amid the COVID-19 pandemic through a structured literature review," *Annals of Operations Research*, 1-38, 2020.
- [10] A. Dolgui, D. Ivanov, M. Rozhkov, "Does the ripple effect influence the bullwhip effect? An integrated analysis of structural and operational dynamics in the supply chain," *International Journal of Production Research*, 58(5), 1285-1301, 2020.
- [11] PERPAKI, "An internal phone survey of Covid-19 pandemic impact". Jakarta, Indonesia, June.2020.
- [12] P. Kimani, et al., Actors' perceptions of government performance in support of value chain development in marine small-scale fisheries in Kenya," *Marine Policy*, 122: 104221, 2020.
- [13] S. Shinozaki, "Dampak Covid-19 pada Usaha Mikro, Kecil dan Menengah di Indonesia: Hasil Survei Cepat," *Asian Development Bank*, Jakarta, Indonesia, June. 2020.
- [14] L. Eberle et al., "New services development: a study in the context of a health organization," *International Journal of Quality and Service Sciences*, 2018.
- [15] Wikipedia, "COVID-19 community quarantines in the Philippines," 2020, [Online]. Available: https://en.wikipedia.org/wiki/COVID-19_community_quarantines_in_the_Philippines.
- [16] Wikipedia, "COVID-19 pandemic lockdown in India," 2020, [Online]. Available: https://en.wikipedia.org/wiki/COVID19_pandemic_lockdown_in_India.
- [17] Statista, "Global leading producers of coconuts 2018," 2020, [Online] Available: <https://www.statista.com/statistics/1040499/world-coconut-production-by-leading-producers/>.
- [18] International Coconut Community, "Weekly Price Updated," 2020, [Online], Available: https://coconutcommunity.org/statistics/weekly_price_update.
- [19] CBI, "High demand for processed fruit and vegetables due to COVID-19," 2020, [Online], Available: <https://www.cbi.eu/news/high-demand-processed-fruit-vegetables-due-covid-19>.
- [20] CNN, "The pandemic's newest shortage? Coconut water," 2020, [Online] Available: <https://edition.cnn.com/2020/03/18/business/coconut-water-vita-coco-sales-coronavirus/index.html>.
- [21] Katadata, "Encouraging Production, Ministry of Agriculture Aims Exports of Estate Products to Increase 3 Times", 2020, [Online], Available: <https://katadata.co.id/marthathertina/berita/5e9a4c3b0d21b/dorong-produksi-kementan-bidik-ekspor-hasil-kebun-naik-3-kali-lipat>.
- [22] I. Gunawan, et al., Typical traceability barriers in the Indonesian vegetable oil industry," *British Food Journal*, 2020.
- [23] C. Chen, et al., A Cross-Country Comparison of Fiscal Policy Responses to the COVID-19 Global Pandemic," *Journal of Comparative Policy Analysis: Research and Practice*, 23.2: 262-273, 2021.
- [24] C. Limpianchob, "Integrated of harvesting and production planning in aromatic coconut supply chain using mixed-integer linear programming," *International Journal of Operational Research*, 30.3: 360-374, 2017.
- [25] F. Egea, et al., An efficient agro-industrial complex in Almería (Spain): Towards an integrated and sustainable bioeconomy model," *New biotechnology*, 40: 103-112, 2018.
- [26] O. A. Kosareva, et al., Global trends of digitalization of agriculture as the basis of innovative development of the agro-industrial complex of Russia," *Eurasian Journal of biosciences*, 13.2: 1675-1681, 2019.
- [27] L.A. Kasiri, et al., Integration of standardization and customization: Impact on service quality, customer satisfaction, and loyalty," *Journal of Retailing and Consumer Services*, 35: 91-97, 2017.
- [28] D.D. Dong, et al., Restructuring toward a modernized agro-food value chain through vertical integration and contract farming: the swine-to-pork industry in Vietnam," *Journal of Agribusiness in Developing and Emerging Economies*, 2020.