

REFERENCES

- [1] N. Springle, B. Li, T. Soma, and T. Shulman, “The complex role of single-use compostable bioplastic food packaging and foodservice ware in a circular economy: Findings from a social innovation lab,” *Sustain. Prod. Consum.*, vol. 33, pp. 664–673, 2022, doi: 10.1016/j.spc.2022.08.006.
- [2] M. Kan and S. A. Miller, “Environmental impacts of plastic packaging of food products,” *Resour. Conserv. Recycl.*, vol. 180, no. November 2021, p. 106156, 2022, doi: 10.1016/j.resconrec.2022.106156.
- [3] R. Geyer, J. R. Jambeck, and K. L. Law, “Production, use, and fate of all plastics ever made - Supplementary Information,” *Sci. Adv.*, vol. 3, no. 7, pp. 19–24, 2017, doi: 10.1126/sciadv.1700782.
- [4] M. Eriksen *et al.*, “Plastic Pollution in the World’s Oceans: More than 5 Trillion Plastic Pieces Weighing over 250,000 Tons Afloat at Sea,” *PLoS One*, vol. 9, no. 12, pp. 1–15, 2014, doi: 10.1371/journal.pone.0111913.
- [5] R. Stefanini, G. Borghesi, A. Ronzano, and G. Vignali, “Plastic or glass: a new environmental assessment with a marine litter indicator for the comparison of pasteurized milk bottles,” *Int. J. Life Cycle Assess.*, vol. 26, no. 4, pp. 767–784, 2021, doi: 10.1007/s11367-020-01804-x.
- [6] N. Ayrimis, Z. Candan, and S. Hiziroglu, “Physical and mechanical properties of cardboard panels made from used beverage carton with veneer overlay,” *Mater. Des.*, vol. 29, no. 10, pp. 1897–1903, Dec. 2008, doi: 10.1016/j.matdes.2008.04.030.
- [7] G. Song, H. Zhang, H. Duan, and M. Xu, “Packaging waste from food delivery in China’s mega cities,” *Resour. Conserv. Recycl.*, vol. 130, no. November 2017, pp. 226–227, 2018, doi: 10.1016/j.resconrec.2017.12.007.
- [8] R. Sharma, V. Koushal, M. Sharma, R. Sharma, and V. Sharma, “Plastics: Issues Challenges and Remediation,” *Int. J. Waste Resour.*, vol. 04, no. 01, pp. 1–6, 2014, doi: 10.4172/2252-5211.1000134.
- [9] E. Watkins, J.-P. Schweitzer, E. Leinala, and P. Börkey, “Policy Approaches to Incentivise

- Sustainable Plastic Design,” Paris, 2019. doi: 10.1787/233ac351-en.
- [10] “Eco Spindles Sri Lanka | Polyester Yarn and Filament Manufacturer | Plastic Recycler.” <https://www.ecospindles.com/> (accessed Oct. 04, 2022).
- [11] S. Edirisinghe, “Microplastics – The silent killer,” *The Morning*, Colombo, pp. 1–10, Jun. 14, 2020. [Online]. Available: <https://www.themorning.lk/microplastics-the-silent-killer/>
- [12] J. Bimali Koongolla, A. L. Andrady, P. B. Terney Pradeep Kumara, and C. S. Gangabadage, “Evidence of microplastics pollution in coastal beaches and waters in southern Sri Lanka,” *Mar. Pollut. Bull.*, vol. 137, no. June, pp. 277–284, 2018, doi: 10.1016/j.marpolbul.2018.10.031.
- [13] B. Nemat, M. Razzaghi, K. Bolton, and K. Rousta, “The Potential of Food Packaging Attributes to Influence Consumers ’ Decisions to Sort Waste,” *Sustain.*, vol. 12, no. 6, pp. 1–22, 2020.
- [14] “Food Packaging Market Size, Growth and Industry Trends [2028].” <https://www.fortunebusinessinsights.com/industry-reports/food-packaging-market-101941> (accessed Feb. 06, 2023).
- [15] F. Licciardello, “Packaging, blessing in disguise. Review on its diverse contribution to food sustainability,” *Trends Food Sci. Technol.*, vol. 65, pp. 32–39, 2017, doi: 10.1016/j.tifs.2017.05.003.
- [16] M. Brozovic, D. Kova Č E V I, and J. Bota, “Consumer Satisfaction With Packaging Materials: Kano Model Analysis Approach,” *Teh. Vjesn. - Tech. Gaz.*, vol. 28, no. 4, pp. 1203–1210, Aug. 2021, doi: 10.17559/TV-20200831093518.
- [17] F. Wikström, H. Williams, J. Trischler, and Z. Rowe, “The Importance of Packaging Functions for Food Waste of Different Products in Households,” *Sustainability*, vol. 11, no. 9, p. 2641, May 2019, doi: 10.3390/su11092641.
- [18] A. Azapagic, D. Amienyo, and C. Camilleri, “Environmental impacts of consumption of Australian red wine in the UK,” *J. Clean. Prod.*, vol. 72, pp. 110–119, 2014, doi: 10.1016/j.jclepro.2014.02.044.
- [19] T. H. T. Anh, “The value of rib design in food packaging : from packaging company and

- consumer perspectives,” Lund University, 2015.
- [20] O. J. Hanssen, H. Meiler, E. Svanes, and V. Schakenda, “Life Cycle Assessment as a Tool in Food Waste Reduction and Packaging Optimization-Packaging Innovation and Optimization in a Life Cycle Perspective,” in *Life Cycle Assessment Handbook: A Guide for Environmentally Sustainable Products*, M. A. Curran, Ed. Wiley Online Library, 2012, pp. 345–367. doi: 10.1002/9781118528372.ch16.
- [21] C. S. Harshath, R. Chandan, N. Shashikantha, and V. Reddy, “Buckling Evaluation of a Plastic Bottle Design,” *Int. Res. J. Eng. Technol.*, vol. 5, no. 10, pp. 549–553, 2018.
- [22] M. D. P. Noriega, O. Estrada, and I. López, “Computational model to design plastic multi-layer films for food packaging to assure a shelf life at the best cost,” *J. Plast. Film Sheeting*, vol. 30, no. 1, pp. 48–76, 2014, doi: 10.1177/8756087913484920.
- [23] C. Y. Barlow and D. C. Morgan, “Polymer film packaging for food: An environmental assessment,” *Resour. Conserv. Recycl.*, vol. 78, pp. 74–80, 2013, doi: 10.1016/j.resconrec.2013.07.003.
- [24] B. Simon, M. Ben Amor, and R. Földényi, “Life cycle impact assessment of beverage packaging systems: focus on the collection of post-consumer bottles,” *J. Clean. Prod.*, vol. 112, pp. 238–248, Jan. 2016, doi: 10.1016/j.jclepro.2015.06.008.
- [25] J. Schmidt, L. Grau, M. Auer, and R. Maletz, “Multilayer Packaging in a Circular Economy,” *Polymers (Basel)*, vol. 14, 2022, doi: 10.3390/polym14091825 Academic.
- [26] C. Allione, C. De Giorgi, B. Lerma, and L. Petrucelli, “Sustainable food packaging : a case study of chocolate products,” *Life Cycle Manag. Conf. LCM*, 2011.
- [27] K. Marsh and B. Bugusu, “Food packaging - Roles, materials, and environmental issues: Scientific status summary,” *J. Food Sci.*, vol. 72, no. 3, 2007, doi: 10.1111/j.1750-3841.2007.00301.x.
- [28] S. Kakadellis and Z. M. Harris, “Don’t scrap the waste: The need for broader system boundaries in bioplastic food packaging life-cycle assessment – A critical review,” *J. Clean. Prod.*, vol. 274, p. 122831, 2020, doi: 10.1016/j.jclepro.2020.122831.
- [29] World Commission on Environment and Development, “Report of the World Commission

- on Environment and Development: Our Common Future Acronyms and Note on Terminology Chairman's Foreword," 1987.
- [30] M. A. Rosen and H. A. Kishawy, "Sustainable Manufacturing and Design: Concepts, Practices and Needs," *Sustainability*, vol. 4, no. 2, pp. 154–174, 2012, doi: 10.3390/su4020154.
- [31] L. A. Ocampo and E. Estanislao-Clark, "Developing a framework for sustainable manufacturing strategies selection," *DLSU Bus. Econ. Rev.*, vol. 23, no. 2, pp. 115–131, 2014.
- [32] Sustainable Packaging Coalition, "Definition of Sustainable Packaging," 2011.
- [33] K. Sonneveld, K. James, L. Fitzpatrick, and H. Lewis, "Sustainable Packaging: How do we Define and Measure It?," no. April, pp. 1–9, 2005.
- [34] P. Scarborough, C. Arambepola, A. Kaur, P. Bhatnagar, and M. Rayner, "Should nutrient profile models be category specific or across-the-board A comparison of the two systems using diets of British adults," *Eur. J. Clin. Nutr.*, vol. 64, no. 6, pp. 553–560, 2010, doi: 10.1038/ejcn.2010.31.
- [35] N. A. Mohamed, "Environmental Vision for the Egyptian Dry Food Packaging Case Study of Cocoa packaging," *Arts Des. Stud.*, vol. 49, pp. 47–56, 2016.
- [36] S. Clark, "Food Processing: Principles and Applications," pp. 249–273, 2014.
- [37] J. W. Han, L. Ruiz-Garcia, J. P. Qian, and X. T. Yang, "Food Packaging: A Comprehensive Review and Future Trends," *Compr. Rev. Food Sci. Food Saf.*, vol. 17, no. 4, pp. 860–877, 2018, doi: 10.1111/1541-4337.12343.
- [38] G. Bertoluci, Y. Leroy, and A. Olsson, "Exploring the environmental impacts of olive packaging solutions for the European food market," *J. Clean. Prod.*, vol. 64, pp. 234–243, 2014, doi: 10.1016/j.jclepro.2013.09.029.
- [39] E. Svanes, M. Vold, H. Moller, M. Pettersen, H. Larsen, and O. Hanssen, "Sustainable Packaging Design: a Holistic Methodology for Packaging Design," *Packag. Technol. Sci.*, vol. 23, no. February, pp. 161–175, 2010, doi: 10.1002/pts.

- [40] “Packaging-Vocabulary- Part 1: General terms, ISO 21067-1,” in *ISO (International Organization for Standardization)*, 2016.
- [41] “Your guide to food packaging.” <https://www.newfoodmagazine.com/article/90810/food-packaging-types-importance-trends/> (accessed Feb. 08, 2023).
- [42] Rexam PLC, “Packaging unwrapped,” 2012. doi: 10.1016/S0262-4079(07)60869-0.
- [43] J. P. Kerry, *New Packaging Technologies, Materials and Formats for Fast-Moving Consumer Products*. Elsevier Ltd, 2013. doi: 10.1016/B978-0-12-394601-0.00023-0.
- [44] F. Wikström and H. Williams, “Potential environmental gains from reducing food losses through development of new packaging - a life-cycle model,” *Packag. Technol. Sci.*, vol. 23, no. 7, pp. 403–411, Nov. 2010, doi: 10.1002/pts.906.
- [45] G. L. Robertson, *Food packaging, principle and practices*, no. 3. Taylor & Francis Group, LLC, 2013.
- [46] “Which Type of Flexible Packaging is Best for Which Type of Food? - CRAZY SPEED TECH.” <https://www.crazyspeedtech.com/type-flexible-packaging-best-type-food/> (accessed Feb. 08, 2023).
- [47] Sustainable Packaging Coalition, “Case Studies : How Companies Use LCA Tools to Meet Packaging Goals,” 2021.
- [48] “Home | For People + The Planet.” <https://sustainablepackaging.org/> (accessed Feb. 10, 2023).
- [49] “The Australian Packaging Covenant - APCO.” <https://apco.org.au/the-australian-packaging-covenant> (accessed Jul. 19, 2022).
- [50] Australian Packaging Covenant, “Food Services Packaging Sustainability Guidelines,” 2019.
- [51] K. Verghese, S. Lockrey, S. Clune, and D. Sivaraman, “Life cycle assessment (LCA) of food and beverage packaging,” in *Emerging Food Packaging Technologies*, Elsevier, 2012, pp. 380–408. doi: 10.1533/9780857095664.4.380.
- [52] K. L. Verghese, R. Horne, and A. Carre, “PIQET: The design and development of an

- online streamlined LCA tool for sustainable packaging design decision support,” *Int. J. Life Cycle Assess.*, vol. 15, no. 6, pp. 608–620, 2010, doi: 10.1007/s11367-010-0193-2.
- [53] S. Kumara, “Sri Lanka to Ban a Range of Single Use Plastic Products by 2021 | The Sri Lankan Scientist,” *The Sri Lankan Scientist*, 2020. <http://scientist.lk/2020/10/27/sri-lanka-to-ban-a-range-of-single-use-plastic-products-by-2021/> (accessed May 13, 2021).
- [54] “Sri Lanka’s ban on polythene, styrofoam comes into effect – NewsIn.Asia.” <https://newsin.asia/sri-lankas-ban-polythene-styrofoam-comes-effect/> (accessed May 13, 2021).
- [55] S. L. National Audit Office, “The Environmental Audit Report on the Plastic Importing, Management of Usage and Post Usage in Sri Lanka.,” Colombo, 2019.
- [56] P. Ghisellini, C. Cialani, and S. Ulgiati, “A review on circular economy: The expected transition to a balanced interplay of environmental and economic systems,” *J. Clean. Prod.*, vol. 114, no. February, pp. 11–32, 2016, doi: 10.1016/j.jclepro.2015.09.007.
- [57] “Directive 2008/122/EC of the European Parliament and of the Council,” 2008. doi: 10.5040/9781782258674.0028.
- [58] C. Mooren, “Transforming package into package; A case study into the drivers and barriers to a circular economy in the Dutch plastic food packaging industry,” Utrecht University, 2015.
- [59] C. Kalliopi, “Food Packaging and Circular Economy in the Netherlands : Challenges and Policy Solutions,” University of Twente, 2020.
- [60] G. Cappiello, C. Aversa, A. Genovesi, and M. Barletta, “Life cycle assessment (LCA) of bio - based packaging solutions for extended shelf - life (ESL) milk,” *Environ. Sci. Pollut. Res.*, no. 0123456789, 2021, doi: 10.1007/s11356-021-17094-1.
- [61] S. Humbert, V. Rossi, M. Margni, O. Jolliet, and Y. Loerincik, “Life cycle assessment of two baby food packaging alternatives: Glass jars vs. plastic pots,” *Int. J. Life Cycle Assess.*, vol. 14, no. 2, pp. 95–106, 2009, doi: 10.1007/s11367-008-0052-6.
- [62] P. R. Jayatilaka, A. K. Kulatunga, and E. A. R. S. Ekanayake, “Incorporating Sustainable Concepts for Product Design, Development and Manufacturing,” no. May, pp. 1–14, 2016,

[Online].

Available:

<https://www.researchgate.net/publication/301787966%0AINCORPORATING>

- [63] A. Del Borghi, M. Gallo, and F. Magrassi, “Glass Packaging Design and Life Cycle Assessment: Deep Review and Guideline for Future Developments,” in *Reference Module in Food Science*, Elsevier Inc., 2016, pp. 1–9. doi: 10.1016/b978-0-08-100596-5.21008-1.
- [64] R. Vaidya, “Structural Analysis of Polyethylene Terephthalate Bottles using the Finite Element Method,” Jawahar lal Nehru Technological University, 2009.
- [65] S. Otto, M. Strenger, A. Maier-Nöth, and M. Schmid, “Food packaging and sustainability – Consumer perception vs. correlated scientific facts: A review,” *J. Clean. Prod.*, vol. 298, 2021, doi: 10.1016/j.jclepro.2021.126733.
- [66] M. Vellini and M. Savioli, “Energy and environmental analysis of glass container production and recycling,” *Energy*, vol. 34, no. 12, pp. 2137–2143, 2009, doi: <https://doi.org/10.1016/j.energy.2008.09.017>.
- [67] C. B. MacKerron and D. Hoover, “Waste and Opportunity 2015: Environmental Progress and Challenges in Food, Beverage, and Consumer Goods Packaging,” 2015. [Online]. Available: <https://www.nrdc.org/sites/default/files/consumer-goods-packaging-report.pdf>
- [68] C. M. V. B. Almeida, A. J. M. Rodrigues, S. H. Bonilla, and B. F. Giannetti, “Emergy as a tool for Ecodesign: evaluating materials selection for beverage packages in Brazil,” *J. Clean. Prod.*, vol. 18, no. 1, pp. 32–43, 2010, doi: 10.1016/j.jclepro.2009.03.019.
- [69] M. Bertolini, E. Bottani, G. Vignali, and A. Volpi, “Comparative Life Cycle Assessment of Packaging Systems for Extended Shelf Life Milk,” *Packag. Technol. Sci.*, vol. 29, no. 10, pp. 525–546, Oct. 2016, doi: 10.1002/pts.2235.
- [70] B. Notarnicola, G. Tassielli, P. A. Renzulli, V. Castellani, and S. Sala, “Environmental impacts of food consumption in Europe,” *J. Clean. Prod.*, vol. 140, no. July, pp. 753–765, 2017, doi: 10.1016/j.jclepro.2016.06.080.
- [71] H. Williams, G. Venkatesh, and F. Wikstrom, “The influence of packaging attributes on recycling and food waste behaviour - An environmental comparison of two packaging

- alternatives,” *J. Clean. Prod.*, vol. 137, pp. 895–902, 2014, doi: 10.1016/j.jclepro.2016.07.097.
- [72] J. Jörissen, C. Priefer, and K.-R. Bräutigam, “Food Waste Generation at Household Level: Results of a Survey among Employees of Two European Research Centers in Italy and Germany,” *Sustainability*, vol. 7, no. 3, pp. 2695–2715, Mar. 2015, doi: 10.3390/su7032695.
- [73] H. Williams, F. Wikström, T. Otterbring, M. Löfgren, and A. Gustafsson, “Reasons for household food waste with special attention to packaging,” *J. Clean. Prod.*, vol. 24, pp. 141–148, 2012, doi: 10.1016/j.jclepro.2011.11.044.
- [74] J. Langley *et al.*, “Food for Thought? — A UK pilot study testing a methodology for compositional domestic food waste analysis,” *Waste Manag. Res. J. a Sustain. Circ. Econ.*, vol. 28, no. 3, pp. 220–227, Mar. 2010, doi: 10.1177/0734242X08095348.
- [75] P. Müller and M. Schmid, “Intelligent packaging in the food sector: A brief overview,” *Foods*, vol. 8, no. 1, 2019, doi: 10.3390/foods8010016.
- [76] F. Wikström, H. Williams, K. Verghese, and S. Clune, “The influence of packaging attributes on consumer behaviour in food-packaging life cycle assessment studies - a neglected topic,” *J. Clean. Prod.*, vol. 73, pp. 100–108, Jun. 2014, doi: 10.1016/j.jclepro.2013.10.042.
- [77] H. Williams and F. Wikström, “Environmental impact of packaging and food losses in a life cycle perspective: A comparative analysis of five food items,” *J. Clean. Prod.*, vol. 19, no. 1, pp. 43–48, 2011, doi: 10.1016/j.jclepro.2010.08.008.
- [78] J. Wang, H. Zhuang, and P.-C. Lin, “The environmental impact of distribution to retail channels: A case study on packaged beverages,” *Transp. Res. Part D Transp. Environ.*, vol. 43, pp. 17–27, 2016, doi: <https://doi.org/10.1016/j.trd.2015.11.008>.
- [79] M. C. Heller, S. E. M. Selke, and G. A. Keoleian, “Mapping the Influence of Food Waste in Food Packaging Environmental Performance Assessments,” *J. Ind. Ecol.*, vol. 23, no. 2, pp. 480–495, 2019, doi: 10.1111/jiec.12743.
- [80] R. Wever and J. Vogtländer, “Eco-efficient Value Creation: An Alternative Perspective

- on Packaging and Sustainability,” *Packag. Technol. Sci.*, vol. 29, no. January, pp. 229–248, 2012, doi: 10.1002/pts.1978.
- [81] M. Frida Hermansson, F. Hermansson, M. Janssen, and F. Gellerstedt, “Environmental evaluation of Durapulp bio-composite using LCA - Comparison of two different applications,” *J-for-Journal Sci. Technol. For. Prod. Process.*, vol. 5, no. 2, pp. 68–76, 2016, doi: 10.13140/RG.2.1.3604.9447.
- [82] B. Choi, S. Yoo, and S. Il Park, “Carbon footprint of packaging films made from LDPE, PLA, and PLA/PBAT blends in South Korea,” *Sustain.*, vol. 10, no. 7, 2018, doi: 10.3390/su10072369.
- [83] “Prerequisite programmes on food safety — Part 4: Food packaging manufacturing, ISO/TS 22002-4,” in *ISO (International Organization for Standardization)*, 2013.
- [84] R. Rijk and R. Veraart, *Global Legislation for Food Packaging Materials*. Wiley-VCH, 2010.
- [85] N. Theobald, “Tamper-evident food and beverage packaging,” in *Emerging Food Packaging Technologies*, Woodhead Publishing Limited, 2012, pp. 220–235. doi: 10.1533/9780857095664.2.220.
- [86] G. Ares and R. Deliza, “Studying the influence of package shape and colour on consumer expectations of milk desserts using word association and conjoint analysis,” *Food Qual. Prefer.*, vol. 21, no. 8, pp. 930–937, 2010, doi: 10.1016/j.foodqual.2010.03.006.
- [87] V. Puyares, G. Ares, and F. Carrau, “Searching a specific bottle for Tannat wine using a check-all-that apply question and conjoint analysis,” *Food Qual. Prefer.*, vol. 21, no. 7, pp. 684–691, 2010, doi: 10.1016/j.foodqual.2010.05.008.
- [88] A. Eldesouky and F. Mesias, “An insight into the influence of packaging and presentation format on consumer purchasing attitudes towards cheese: A qualitative study,” *Spanish J. Agric. Res.*, vol. 12, no. 2, pp. 305–312, 2014, doi: 10.5424/sjar/2014122-5520.
- [89] D. L. Widaningrum, “The Importance of Take-Out Food Packaging Attributes: Conjoint Analysis and Quality Function Deployment Approach,” in *EPJ Web of Conferences*, Mar. 2014, vol. 68, p. 7. doi: 10.1051/epjconf/20146800036.

- [90] S. K. Dash, “Identifying and classifying attributes of packaging for customer satisfaction - A Kano Model approach,” *Int. J. Prod. Manag. Eng.*, vol. 9, pp. 57–64, 2021, doi: 10.4995/ijpme.2021.13683.
- [91] G. Vignali and G. Vitale, “Life Cycle Assessment of Food Packaging,” in *Reference Module in Food Science*, Parma: Elsevier, 2017, pp. 1–12. doi: 10.1016/B978-0-08-100596-5.21427-3.
- [92] B. H. Lindh, A. Olsson, and H. Williams, “Consumer Perceptions of Food Packaging : Contributing to or Counteracting Environmentally Sustainable Development?,” *Packag. Technol. Sci.*, vol. 29, no. November 2015, pp. 3–23, 2016, doi: 10.1002/pts.
- [93] J. Rokka and L. Uusitalo, “Preference for green packaging in consumer product choices – Do consumers care?,” *Int. J. Consum. Stud.*, vol. 32, no. 5, pp. 516–525, 2008, doi: 10.1111/j.1470-6431.2008.00710.x.
- [94] Department of Economic and Social Affairs, “THE 17 GOALS | Sustainable Development.” <https://sdgs.un.org/goals> (accessed May 13, 2023).
- [95] K. S. Marsh, “Plastic Food Containers,” in *Reference Module in Food Science*, Elsevier, 2016, pp. 1–4. doi: 10.1016/B978-0-08-100596-5.03196-6.
- [96] M. A. Cerqueira, A. A. Vicente, and L. M. Pastrana, “Nanotechnology in Food Packaging: Opportunities and Challenges,” *Nanomater. Food Packag. Mater. Process. Technol. Saf. Issues*, pp. 1–11, 2018, doi: 10.1016/B978-0-323-51271-8.00001-2.
- [97] J. Rezaei, A. Papakonstantinou, L. Tavasszy, U. Pesch, and A. Kana, “Sustainable product-package design in a food supply chain: A multi-criteria life cycle approach,” *Packag. Technol. Sci.*, vol. 32, no. 2, pp. 85–101, Feb. 2019, doi: 10.1002/pts.2418.
- [98] B. Mohebbi, “The art of packaging: An investigation into the role of color in packaging, marketing, and branding,” *Int. J. Organ. Leadersh.*, vol. 3, no. 2, pp. 92–102, 2014, doi: 10.33844/ijol.2014.60248.
- [99] N. Yokokawa, Y. Masuda, E. Amasawa, H. Sugiyama, and M. Hirao, “Systematic packaging design tools integrating functional and environmental consequences on product life cycle: Case studies on laundry detergent and milk,” *Packag. Technol. Sci.*, vol. 33, no.

- 11, pp. 445–459, 2020, doi: 10.1002/pts.2526.
- [100] M. F. B. Harahap, A. Mubarak, and A. Suzianti, “Designing a Green Food Delivery Packaging with QFD for Environment (QFDE) and TRIZ,” in *IOP Conference Series: Earth and Environmental Science*, 2020, vol. 464, no. 1. doi: 10.1088/1755-1315/464/1/012004.
- [101] X. C. Schmidt Rivera, C. Leadley, L. Potter, and A. Azapagic, “Aiding the Design of Innovative and Sustainable Food Packaging: Integrating Techno-Environmental and Circular Economy Criteria,” *Energy Procedia*, vol. 161, no. 2018, pp. 190–197, Mar. 2019, doi: 10.1016/j.egypro.2019.02.081.
- [102] L. Zampori and G. Dotelli, “Design of a sustainable packaging in the food sector by applying LCA,” *Int. J. Life Cycle Assess.*, vol. 19, no. 1, pp. 206–217, Jan. 2014, doi: 10.1007/s11367-013-0618-9.
- [103] Y. Qin and A. Horvath, “What contributes more to life-cycle greenhouse gas emissions of farm produce: Production, transportation, packaging, or food loss?,” *Resour. Conserv. Recycl.*, vol. 176, no. May 2021, p. 105945, 2022, doi: 10.1016/j.resconrec.2021.105945.
- [104] N. Yokokawa, E. Amasawa, and M. Hirao, “Design assessment framework for food packaging integrating consumer preferences and environmental impact,” *Sustain. Prod. Consum.*, vol. 27, pp. 1514–1525, 2021, doi: 10.1016/j.spc.2021.03.027.
- [105] N. Yokokawa, E. Kikuchi-Uehara, E. Amasawa, H. Sugiyama, and M. Hirao, “Environmental analysis of packaging-derived changes in food production and consumer behavior,” *J. Ind. Ecol.*, vol. 23, no. 5, pp. 1253–1263, 2019, doi: 10.1111/jiec.12918.
- [106] E. Pauer, B. Wohner, V. Heinrich, and M. Tacker, “Assessing the environmental sustainability of food packaging: An extended life cycle assessment including packaging-related food losses and waste and circularity assessment,” *Sustain.*, vol. 11, no. 3, 2019, doi: 10.3390/su11030925.
- [107] R. B. Y. Chan, “Packaging solutions for household food waste in the context of the food/beverage–packaging industry: A comparative review of empirical literature and industry press releases,” *Resour. Conserv. Recycl.*, vol. 185, p. 106479, Oct. 2022, doi: 10.1016/j.resconrec.2022.106479.

- [108] M. Dahlström and J. Peterson, “Developing a cost estimation model for packaging material Based on a multiple-case study within the food packaging industry,” Lund University, 2013. [Online]. Available: <http://lup.lub.lu.se/luur/download?func=downloadFile&recordOId=3802976&fileOId=3803117>
- [109] S. Park, D. S. Lee, and J. H. Han, “Eco-Design for Food Packaging Innovations,” in *Innovations in Food Packaging*, Elsevier Ltd, 2014, pp. 537–547. doi: 10.1016/B978-0-12-394601-0.00022-9.
- [110] Z. Naukowe and P. A. Nauk, “Challenges for the packaging industry in the Circular Economy,” no. 109, pp. 0–1, 2019, doi: 10.24425/znigsme.2019.2019.130173.
- [111] T. Groves, “Reduce, reuse, recycle,” *Bmj Clin. Res.*, vol. 336, no. 7650, 2008, doi: 10.1136/bmj.39559.679155.47.
- [112] D. R. Cooper and T. G. Gutowski, “The Environmental Impacts of Reuse: A Review,” *J. Ind. Ecol.*, vol. 21, no. 1, pp. 38–56, 2017, doi: 10.1111/jiec.12388.
- [113] A. Del Borghi, S. Parodi, L. Moreschi, and M. Gallo, “Sustainable packaging: an evaluation of crates for food through a life cycle approach,” *Int. J. Life Cycle Assess.*, 2020, doi: doi.org/10.1007/s11367-020-01813-w.
- [114] I. Asuquo, “Plastic Waste in the Aquatic Environment: Impacts and Management,” *Environment*, vol. 2, no. 1, p. 1, 2018, doi: 10.31058/j.envi.2018.21001.
- [115] H. Dahlbo, V. Poliakova, V. Mylläri, O. Sahimaa, and R. Anderson, “Recycling potential of post-consumer plastic packaging waste in Finland,” *Waste Manag.*, vol. 71, pp. 52–61, 2018, doi: 10.1016/j.wasman.2017.10.033.
- [116] M. K. Eriksen, J. D. Christiansen, A. E. Daugaard, and T. F. Astrup, “Closing the loop for PET, PE and PP waste from households: Influence of material properties and product design for plastic recycling,” *Waste Manag.*, vol. 96, pp. 75–85, 2019, doi: 10.1016/j.wasman.2019.07.005.
- [117] J. Hopewell, R. Dvorak, and E. Kosior, “Plastics recycling: Challenges and opportunities,” *Philos. Trans. R. Soc. B Biol. Sci.*, vol. 364, no. 1526, pp. 2115–2126, 2009, doi:

10.1098/rstb.2008.0311.

- [118] R. K. Foolmaun and T. Ramjeawon, “Life Cycle Assessment (LCA) of PET bottles and comparative LCA of three disposal options in Mauritius,” *Int. J. Environ. Waste Manag.*, vol. 2, no. 1–2, pp. 125–138, 2008, doi: 10.1504/IJEW.2008.016997.
- [119] B. Wohner, E. Pauer, V. Heinrich, and M. Tacker, “Packaging-related food losses and waste: An overview of drivers and issues,” *Sustain.*, vol. 11, no. 1, 2019, doi: 10.3390/su11010264.
- [120] M. Aheeyar, M. Reitemeier, A. Bandara, F. Thiel, and N. Jayathilake, “Food waste in Sri Lanka : an analysis of the applicable urban regulatory framework,” *The State of the World.*, no. December, 2020.
- [121] K. Östergren *et al.*, “FUSIONS definitional framework for food waste,” 2014. [Online]. Available: [http://www.eu-fusions.org/phocadownload/Publications/FUSIONS Definitional Framework for Food Waste 2014.pdf](http://www.eu-fusions.org/phocadownload/Publications/FUSIONS_Definitional_Framework_for_Food_Waste_2014.pdf)
- [122] M. M. Starke, “Material and structural modelling of corrugated paperboard packaging,” Stellenbosch University, 2020.
- [123] IGI Global, *Handbook of Research on Future Opportunities for Technology Management Education*. IGI Global, 2021. doi: 10.4018/978-1-7998-8327-2.
- [124] S. Umaroh and A. D. Kartika, “A framework for an IT use policy development,” *EEA - Electroteh. Electron. Autom.*, vol. 66, no. 1, pp. 159–165, 2018.
- [125] M. Ayamga, B. Tekinerdogan, A. Kassahun, and G. Rambaldi, “Developing a policy framework for adoption and management of drones for agriculture in Africa,” *Technol. Anal. Strateg. Manag.*, vol. 33, no. 8, pp. 970–987, 2021, doi: 10.1080/09537325.2020.1858047.
- [126] J. Naous, A. Seehra, M. Walfish, D. Mazi, A. Nicolosi, and S. Shenker, “The design and implementation of a policy framework for the future Internet,” in *ACM Workshop on Hot Topics in Networks*, 2009.
- [127] L. Milios, “Policy Framework for Material Resource Efficiency: Pathway Towards a Circular Economy,” Lund University, 2020.

- [128] M. J. Maullo and S. B. Calo, "Policy management: An architecture and approach," *Proc. 1993 IEEE 1st Int. Work. Syst. Manag. IWSM 1993*, no. May 2014, pp. 13–26, 1993, doi: 10.1109/IWSM.1993.315293.
- [129] René Wies, "Policy Definition and Classification : Aspects , Criteria , and Examples," *Proceeding IFIP/IEEE Int. Distrib. Syst. Oper. Manag.*, no. September, pp. 1–12, 1996, [Online]. Available: https://www.researchgate.net/profile/Rene_Wies/publication/2784392_Policy_Definition_and_Classification_Aspects_Criteria_and_Examples/links/00b4952eb61a7acb04000000.pdf
- [130] B. R. A. Hurley, A. Ouzts, J. Fischer, and T. Gomes, "Framework for Sustainable Food Packaging Design," *Packag. Technol. Sci.*, vol. 29, no. January, pp. 399–412, 2013, doi: 10.1002/pts.
- [131] D. Kang, N. Sgriccia, S. Selke, and R. Auras, "Comparison of bacon packaging on a life cycle basis: a case study," *J. Clean. Prod.*, vol. 54, pp. 142–149, 2013, doi: <https://doi.org/10.1016/j.jclepro.2013.05.008>.
- [132] J. Muller, C. González-Martínez, and A. Chiralt, "Combination Of Poly(lactic) acid and starch for biodegradable food packaging," *Materials (Basel)*., vol. 10, no. 8, 2017, doi: 10.3390/ma10080952.
- [133] H. Lindh, H. Williams, O. Annika, and F. Wikstrom, "Elucidating the Indirect Contributions of Packaging to Sustainable Development: A Terminology of Packaging Functions and Features," *Packag. Technol. Sci.*, vol. 29, no. January, pp. 225–246, 2016, doi: 10.1002/pts.
- [134] H. Williams, F. Wikström, and M. Löfgren, "A life cycle perspective on environmental effects of customer focused packaging development," *J. Clean. Prod.*, vol. 16, no. 7, pp. 853–859, May 2008, doi: 10.1016/j.jclepro.2007.05.006.
- [135] M. Löfgren and L. Witell, "Kano's Theory of Attractive Quality and Packaging," *Qual. Manag. J.*, vol. 12, no. 3, pp. 7–20, 2005, doi: 10.1080/10686967.2005.11919257.
- [136] S. Otani and S. Yamada, "Application of QFDE on greenhouse gas reduction strategy," *Int. J. Qual. Serv. Sci.*, vol. 3, no. 3, pp. 285–303, Oct. 2011, doi:

10.1108/17566691111182843.

- [137] L.-H. Chen and W.-C. Ko, “Fuzzy approaches to quality function deployment for new product design,” *Fuzzy Sets Syst.*, vol. 160, no. 18, pp. 2620–2639, Sep. 2009, doi: 10.1016/j.fss.2008.12.003.
- [138] M. Benner, A. R. Linnemann, W. M. F. Jongen, and P. Folstar, “Quality Function Deployment (QFD) - Can it be used to develop food products?,” *Food Qual. Prefer.*, vol. 14, no. 4, pp. 327–339, 2003, doi: 10.1016/S0950-3293(02)00129-5.
- [139] V. Siracusa, C. Ingrao, A. Lo, C. Mbohwa, and M. Dalla, “Environmental assessment of a multilayer polymer bag for food packaging and preservation : An LCA approach,” *Food Res. Int.*, vol. 62, pp. 151–161, 2014, doi: 10.1016/j.foodres.2014.02.010.
- [140] S. U. M. Jagoda, J. R. Gamage, and H. Karunathilake, “A Comparative Analysis of the Environmental and Structural Performance of PET Bottle Designs in Sri Lanka,” in *2021 Moratuwa Engineering Research Conference (MERCon)*, Jul. 2021, pp. 214–219. doi: 10.1109/MERCon52712.2021.9525802.
- [141] A. Meybeck, C. Cederberg, J. Gustavsson, R. van Otterdijk, and U. Sonesson, “Food Loss and Food Waste,” FAO, Rome, 2011. doi: 10.4337/9781788975391.
- [142] N. Yokokawa, E. Kikuchi-Uehara, H. Sugiyama, and M. Hirao, “Framework for analyzing the effects of packaging on food loss reduction by considering consumer behavior,” *J. Clean. Prod.*, vol. 174, pp. 26–34, 2018, doi: 10.1016/j.jclepro.2017.10.242.
- [143] A. Konstantas, “Towards eco-efficient food supply chains: Environmental and economic life cycle sustainability of confectionary and frozen desserts,” School of Chemical Engineering and Analytical Science, 2019. [Online]. Available: https://www.research.manchester.ac.uk/portal/files/85712251/FULL_TEXT.PDF
- [144] A. Dobon *et al.*, “The sustainability of communicative packaging concepts in the food supply chain. A case study: Part 1. Life cycle assessment,” *Int. J. Life Cycle Assess.*, vol. 16, no. 2, pp. 168–177, 2011, doi: 10.1007/s11367-011-0257-y.
- [145] H. K. Jeswani, R. Burkinshaw, and A. Azapagic, “Environmental sustainability issues in the food-energy-water nexus: Breakfast cereals and snacks,” *Sustain. Prod. Consum.*, vol.

- 2, no. January, pp. 17–28, 2015, doi: 10.1016/j.spc.2015.08.001.
- [146] I. Arzoumanidis, M. D. Eusanio, A. Raggi, and L. Petti, “Functional Unit Definition Criteria in Life Cycle Assessment and Social Life Cycle Assessment : A Discussion,” in *Perspectives on Social LCA*, M. Traverso, L. Petti, and A. Zamagni, Eds. 2019. doi: 10.1007/978-3-030-01508-4.
- [147] E. Pauer, M. Tacker, V. Gabriel, and V. Krauter, “Sustainability of flexible multilayer packaging: Environmental impacts and recyclability of packaging for bacon in block,” *Clean. Environ. Syst.*, vol. 1, no. October, p. 100001, 2020, doi: 10.1016/j.cesys.2020.100001.
- [148] B. S. P. Singh, V. Chonhenchob, and J. Singh, “Life Cycle Inventory and Analysis of Re-usable Plastic Containers and Display-ready Corrugated Containers Used for Packaging and Science,” no. April, pp. 279–293, 2006.
- [149] Y. Dong and S. A. Miller, “Assessing the lifecycle greenhouse gas (GHG) emissions of perishable food products delivered by the cold chain in China,” *J. Clean. Prod.*, vol. 303, p. 126982, 2021, doi: 10.1016/j.jclepro.2021.126982.
- [150] C. Guo, Y. Ma, B. Yang, C. S. Jensen, and M. Kaul, “EcoMark: Evaluating models of vehicular environmental impact,” *GIS Proc. ACM Int. Symp. Adv. Geogr. Inf. Syst.*, pp. 269–278, 2012, doi: 10.1145/2424321.2424356.
- [151] M. Eriksson, I. Strid, and P. A. Hansson, “Carbon footprint of food waste management options in the waste hierarchy - A Swedish case study,” *J. Clean. Prod.*, vol. 93, pp. 115–125, 2015, doi: 10.1016/j.jclepro.2015.01.026.
- [152] Y. Xing *et al.*, “The Characteristics of Greenhouse Gas Emissions from Heavy-Duty Trucks in the Beijing-Tianjin-Hebei (BTH) Region in China,” *Atmosphere (Basel)*, vol. 7, no. 9, p. 121, 2016, doi: 10.3390/atmos7090121.
- [153] F. Silvenius, K. Grönman, J.-M. Katajajuuri, R. Soukka, H.-K. Koivupuro, and Y. Virtanen, “The Role of Household Food Waste in Comparing Environmental Impacts of Packaging Alternatives,” *Packag. Technol. Sci.*, vol. 27, no. 4, pp. 277–292, Apr. 2014, doi: 10.1002/pts.2032.

- [154] K. S. Sangwan, M. Sodhi, T. Spengler, and C. Thies, “Exploring the three dimensions of sustainability related to clay cups,” *Procedia CIRP*, vol. 98, no. 8, pp. 139–144, 2021, doi: 10.1016/j.procir.2021.01.019.
- [155] G. Vignali, “Life-Cycle Assessment of Food-Packaging Systems,” in *Environmental Footprint of Packaging*, S. S. Muthu, Ed. Singapore: Springer Singapore, 2016, pp. 1–22. doi: 10.1007/978-981-287-913-4_1.
- [156] A. Konstantas, L. Stamford, and A. Azapagic, “Environmental impacts of ice cream,” *J. Clean. Prod.*, vol. 209, pp. 259–272, 2019, doi: 10.1016/j.jclepro.2018.10.237.
- [157] J. G. Persson, “Eco-indicators in product development,” *Proc. Inst. Mech. Eng. Part B J. Eng. Manuf.*, vol. 215, no. 5, pp. 627–635, 2001, doi: 10.1243/0954405011518566.
- [158] G. Bošnjaković and G. Vladić, “Research methodologies for assessing the ergonomics of packaging products-a review,” *Int. Symp. Graph. Eng. Des.*, no. Figure 1, pp. 335–345, 2020, doi: 10.24867/GRID-2020-p37.
- [159] F. X. Aguilar and Z. Cai, “Conjoint effect of environmental labeling , disclosure of forest of origin and price on consumer preferences for wood products in the US and UK,” *Ecol. Econ.*, vol. 70, no. 2, pp. 308–316, 2010, doi: 10.1016/j.ecolecon.2010.09.002.
- [160] H. Uchida, Y. Onozaka, T. Morita, and S. Managi, “Demand for ecolabeled seafood in the Japanese market : A conjoint analysis of the impact of information and interaction with other labels,” *J. FOOD POLICY*, vol. 44, pp. 68–76, 2014, doi: 10.1016/j.foodpol.2013.10.002.
- [161] A. Niazi, J. S. Dai, S. Balabani, and L. Seneviratne, “Product Cost Estimation: Technique Classification and Methodology Review,” *J. Manuf. Sci. Eng.*, vol. 128, no. 2, pp. 563–575, May 2006, doi: 10.1115/1.2137750.
- [162] H. Palsson, C. Finnsgard, and C. Wanstrom, “Selection of Packaging Systems in Supply Chains from a Sustainability Perspective: The Case of Volvo,” *Packag. Technol. Sci.*, vol. 29, no. January, pp. 399–412, 2012, doi: 10.1002/pts.1979.
- [163] Y. A. Alamerew, M. L. Kambanou, T. Sakao, and D. Brissaud, “A multi-criteria evaluation method of product-level circularity strategies,” *Sustain.*, vol. 12, no. 12, pp. 1–

- 19, 2020, doi: 10.3390/su12125129.
- [164] Y. Shiau, T. Tsai, W. Wang, and M. Huang, “Use Questionnaire and AHP Techniques to Develop Subcontractor Selection System,” *Proc. 19th Int. Symp. Autom. Robot. Constr.*, 2017, doi: 10.22260/isarc2002/0006.
- [165] L. A. Ocampo, J. J. T. Labrador, A. M. B. Jumao-as, and A. M. O. Rama, “Integrated multiphase sustainable product design with a hybrid quality function deployment – multi-attribute decision-making (QFD-MADM) framework,” *Sustain. Prod. Consum.*, vol. 24, pp. 62–78, 2020, doi: 10.1016/j.spc.2020.06.013.
- [166] E. Triantaphyllou, *Multi-criteria Decision Making Methods: A Comparative Study*, vol. 44. Boston, MA: Springer US, 2000. doi: 10.1007/978-1-4757-3157-6.
- [167] K. Zhü, “Fuzzy analytic hierarchy process: Fallacy of the popular methods,” *Eur. J. Oper. Res.*, vol. 236, no. 1, pp. 209–217, 2014, doi: 10.1016/j.ejor.2013.10.034.
- [168] D. Kannan, R. Khodaverdi, L. Olfat, A. Jafarian, and A. Diabat, “Integrated fuzzy multi criteria decision making method and multi- objective programming approach for supplier selection and order allocation in a green supply chain,” *J. Clean. Prod.*, vol. 47, pp. 355–367, 2013, doi: 10.1016/j.jclepro.2013.02.010.
- [169] M. B. Ayhan, “A fuzzy AHP approach for supplier selection problem: A case study in a gearmotor company,” *Int. J. Manag. Value Supply Chain.*, vol. 3, no. September, pp. 11–23, 2013, doi: 10.5121/ijmvsc.2013.4302.
- [170] J. Rees, S. Bandyopadhyay, and E. H. Spafford, “PFIREs: A policy framework for information security,” *Commun. ACM*, vol. 46, no. 7, pp. 101–106, 2003, doi: 10.1145/792704.792706.
- [171] A. Hevner and S. Chatterjee, *Design Research in Information Systems*, vol. 22. Boston, MA: Springer US, 2010. doi: 10.1007/978-1-4419-5653-8.
- [172] K. Burton, P. O’Raghallaigh, and T. Nagle, “Developing a Green IS to support the move to eco-effective packaging: A Design Science Research study.,” *Proc. Annu. Hawaii Int. Conf. Syst. Sci.*, vol. 2020-Janua, pp. 896–905, 2021, doi: 10.24251/hicss.2021.110.
- [173] A. R. Hevner, S. T. March, J. Park, and S. Ram, “Design science in information systems

- research,” *MIS Q. Manag. Inf. Syst.*, vol. 28, no. 1, pp. 75–105, 2004, doi: 10.2307/25148625.
- [174] P. Hayashi, G. Abib, and N. Hoppen, “Validity in qualitative research: A processual approach,” *Qual. Rep.*, vol. 24, no. 1, pp. 98–112, 2019, doi: 10.46743/2160-3715/2019.3443.
- [175] L. A. Kihn and E. M. Ihantola, “Approaches to validation and evaluation in qualitative studies of management accounting,” *Qual. Res. Account. Manag.*, vol. 12, no. 3, pp. 230–255, 2015, doi: 10.1108/QRAM-03-2013-0012.
- [176] A. Inglis, “Approaches to the validation of quality frameworks for e-learning,” *Qual. Assur. Educ.*, vol. 16, no. 4, pp. 347–362, Sep. 2008, doi: 10.1108/09684880810906490.
- [177] R. W. Graham, “Illustrating triangulation in mixed-methods nursing research,” *Nurse Res.*, vol. 12, no. 4, pp. 7–18, Apr. 2005, doi: 10.7748/nr2005.04.12.4.7.c5955.
- [178] A. K. Shenton, “Strategies for ensuring trustworthiness in qualitative research projects,” *Educ. Inf.*, vol. 22, no. 2, pp. 63–75, 2004, doi: 10.3233/EFI-2004-22201.
- [179] R. Heale and D. Forbes, “Understanding triangulation in research,” *Evid. Based. Nurs.*, vol. 16, no. 4, p. 98, 2013, doi: 10.1136/eb-2013-101494.
- [180] H. Noble and R. Heale, “Triangulation in research, with examples,” *Evid. Based. Nurs.*, vol. 22, no. 3, pp. 67–68, 2019, doi: 10.1136/ebnurs-2019-103145.
- [181] T. Grisham, “The Delphi technique: a method for testing complex and multifaceted topics,” no. January 2009, 2014, doi: 10.1108/17538370910930545.
- [182] N. Norani, “Validation of Lean Manufacturing Implementation Framework Using Delphi Technique,” *J. Teknol.*, no. October, 2012, doi: 10.11113/jt.v59.1596.
- [183] G. J. Skulmoski and F. T. Hartman, “The Delphi Method for Graduate Research,” *J. Inf. Technol. Educ.*, vol. 6, 2007, doi: 10.28945/199.
- [184] C. R. Mure, “Rigid Packaging Applications,” in *Handbook of Industrial Polyethylene and Technology*, Hoboken, NJ, USA: John Wiley & Sons, Inc., 2017, pp. 1091–1107. doi: 10.1002/9781119159797.ch41.

- [185] P. A. Popescu, E. E. Popa, A. C. Mitelut, and M. E. Popa, “Development of Recyclable and Biodegradable Food Packaging Materials – Opportunities and Risks,” *Curr. Trends Nat. Sci.*, vol. 9, no. 17, pp. 142–146, 2020, doi: 10.47068/ctns.2020.v9i17.016.
- [186] N. C. Damianou, “A Policy Framework for Management of Distributed Systems,” no. February, p. 233, 2002.