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Abstract	:	Empty and partially filled grain (EPFG) from rice milling factories is usually discarded to landfill. Converting EPFG to valuable products could increase the waste value, improve Malaysia's rice milling waste management, and prevent environmental problems. Utilising the existing and accessible technology in rice mills factories, the optimal waste management practices involving EPFG were investigated. The options were option 1 as biochar, option 2 as compost, and option 3 as bioethanol. Data was obtained from a previous study based on the current Malaysian scenario. A methodology integrating MFA and LCA was applied to observe the environmental performance of these options, which was performed using STAN2 and SimaPro 9.0 software. The best environmental performance was found for the conversion of EPFG to compost (option 2) since less input was used and fewer emissions were released. A total of 3,550 kg CO₂ eq. per ton of EPFG used was obtained while avoiding fertiliser products. Therefore, converting EPFG to compost as an easily applied technology can be suggested to rice mill factories to improve their waste management. When deployed in agricultural waste management systems, the integration MFA-LCA model could be referred to as a useful source when implementing policies and industrial uptake.