

ABSTRACT

The Indian wood processing sector and scientific community, over the past few years, have been exploring several emerging technologies to produce more durable and environment friendly wood products. The concept of wood modification in the country has moved from the development phase to reality of late as many wood modification methods have been adopted and successful trials have been completed in the laboratories. In the wood industries pan India, the demand of modified and refurbished wood is increasing as there is a ban imposed by the government on felling of natural trees from forests. Hence, the technologies developed, were found suitable for adaptation at the industrial level to add value to the commercial products through modification, enhancing various wood properties, resulting in an increased service life of the product (Ganguly, 2018; Poonia *et al.*, 2016). Wood modification is a holistic term to describe the application of any chemical, physical, biological, or mechanical methods to alter the properties of the lignocellulosic material including almost everything that takes place within the wood microstructure once felling is completed. The modified wood should itself be nontoxic under service conditions and, furthermore, there should be no release of any toxic substances during service, or at end of life following disposal or recycling of the modified wood. A recent review of the Scopus database returned with the results that the domain of wood modification is gaining an unprecedented popularity in the scientific community (Sandberg *et al.*, 2017). This trend is mainly driven by environmental policies adopted globally and a rapid surge in use of wood replacing other fossil based materials. Among the wood modification technologies, microwave treatment is found to be highly effective and henceforth is gaining popularity in the Indian sub-continent because of having many advantages over other conventional modification techniques in practice (Samani *et al.*, 2019). If implemented successfully, this technique may subsequently result in significantly lesser energy consumption for woodprocessing, thus creating a positive impact on the environment. However, it is important that environmental impact assessments are made part of new treatments, wood-based materials, and products to provide a complete picture, which may aid in establishing governmental policies concerning environment and climate protection. There are established methods to assess the impact, such as life cycle assessments (LCAs) of wood products and modification processes in the developed countries but the same is not followed in India and other such developing nations. Each LCA comprises a multi-step procedure that estimates the lifetime environmental impact of a product. The complete process of LCA includes goal and scope definition, inventory analysis, impact assessment, and interpretation. The process is naturally iterative as the quality and completeness of information and its plausibility is constantly being tested. Reliable and transparent inventory data are the backbone of every good LCA. The data collection portion of LCA to prepare a repository is known as LCI. It consists of detailed tracking of all the flows in and out of the product system, including raw resources or materials, energy by type, water, and emissions to air, water and land by specific substance. The LCI resulting from a properly conducted LCA can then be utilized by governments and NGOs to create an Environmental Product Declaration (EPD). Thereby, the scientific methods make it possible to implement environment and climate protection policies in a controllable and measurable manner. Furthermore, the EPD allows to make the results available, visible, and useful for the general public. The processes of LCA and LCIA and EDP are not in practice in the Indian wood sector at all till date. Hence in this context the outcome of the visit may be helpful for the Indian wood industries who in return may prepare a LCI for global acceptability of their products and focus more on EDP as it is the need of the hour.