

## **ABSTRACT**

*Rapid population growth and limited urban land availability have forced people to live in limited space such as apartments. This issue creates challenges in achieving comfort and functionality in limited residential areas. This research aims to design a 3 – in – 1 multifunctional modular furniture that functions as chairs, storage, and tables by utilizing mahogany wood waste from a local MSME (Micro, Small, and Medium Enterprises) called INPI House to optimize limited living spaces while supporting environmental sustainability. This research methodology applies a qualitative approach through literature review, observation, interviews, and questionnaires to apartment residents. The design process implements Design for Disassembly (DfD) principles to support sustainability, ease of assembly, and material recyclability. The design results produce furniture with a modular system and multifunctional features that fulfils three different functions with configurations that can be adjusted by users based on space requirements. Thus, this design is able to answer the challenge of optimizing limited residential spaces while contributing to waste management at INPI House MSME and promoting the use of sustainable materials in the furniture industry.*

**Keywords:** *Modular furniture, Multifunction, Mahogany wood waste, Limited Housing, Sustainable Design*