

## Maurine ANDANJE

Jomo Kenyatta University of Agriculture and Technology, Kenya

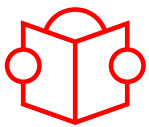


Research field

**Advanced manufacturing**

PhD title

**Bioplastic Development,  
Characterization and Optimization  
of 3D Printing Process Parameters**



### Keywords

- bioplastics
- recycling
- additive manufacturing
- 3D printing

### Summary

To reduce the environmental impacts of conventional plastics, bioplastics have recently emerged as a possible alternative. Starch has been used in the production of bioplastics, but the competition posed to food security is a challenge. Therefore, producing bioplastics from agricultural waste and recycled plastics is a promising alternative.

A bioplastic developed from agricultural wastes will have variations in flowability and be temperature sensitive, which can negatively impact the manufacture



process. Additive manufacturing (AM) is proposed to manufacture parts from the bioplastics since it offers flexibility in material usage. We will develop a bioplastic from agricultural wastes and recycled plastics, and then optimize the 3D printing process parameters. Different ratios of the biomaterial to plastic will be investigated and tested for biodegradability and printability, to develop a bioplastic that is printable at optimized conditions. This will widen the application of bioplastics in AM to effectively manufacture high quality consumer products with complex designs.



**Supervisor**  
**Prof. James Wamai  
MWANGI**  
JKUAT, Kenya



**Co-supervisor**  
**Prof. Sandro  
CARRARA**  
EPFL