Greenhouse with Automated Farming Technology: Structural Design and Development (GrAFT: SSD)

Jermaine S. Magboo
https://orcid.org/0000-0001-8686-0025
jermaine.magboo@g.batstate-u.edu.ph
College of Industrial Technology, Batangas State University
Batangas City, Philippines

Abstract

The fast-growing technology occupies a vital role in Philippine Agriculture, from agricultural structures like greenhouses to the timely availability of cultivars with good vigor. Furthermore, one of the most pressing concerns of the agricultural sector is the development plan for sustainable agriculture, smart farming, and the environment. The current partnership of the Department of Agriculture – Bureau of Plant Industry (DA-BPI) with the Korea International Cooperation Agency (KOICA), proves that greenhouse farming is strongly supported and encouraged by the Philippine government. Furthermore, it is one of Batangas State University's identified priority research under Agriculture, Environment, and Technology. The study used a developmental research approach with the focal aim of designing and developing a greenhouse structure specifically for the aeroponic type of crop cultivation. Hence, the study seeks to attain the following: create an efficient structural design for GrAFT in relation to temperature, humidity, orientation, and location; conduct structural analysis using simulation software concerning wind velocity and static load; construct a greenhouse taking into consideration the material properties, structure and standard, and availability and cost of materials; and to design planters for tomatoes in terms of material properties, measurements and spacing, and availability and cost of materials. Every aspect of the design process in this study conformed to the requirements set by the Philippine Agricultural and Engineering Standards.

Keywords: Aeroponics, Agriculture, Greenhouse, Green Technology, Wind Load Analysis