



UNIVERSITI
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IIIDBEE X 2023
20 JANUARY 2023
*International Invention, Innovation & Design Exposition
for Built Environment and Engineering 2023*

**College of Built Environment
UiTM Puncak Alam**
20 January 2023 | Friday

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ABOVE-GROUND BIOMASS AND CARBON STOCK ESTIMATION OF HARUMANIS USING ARTIFICIAL NEURAL NETWORK AND RANDOM FOREST



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INTRODUCTION

The Artificial Neural Network and Random Forest are the popular machine learning algorithms to estimate above-ground biomass and carbon stock. This algorithms will be used to estimate the carbon stock for Harumanis

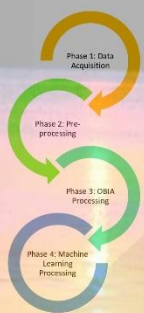
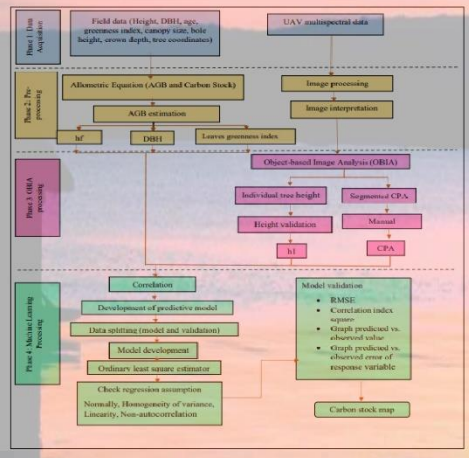
ISSUES/ PROBLEM STATEMENT

In the beginning of the 21st century, climate change starts to be a new challenge a priority concern of various stake holders. Climate change has now influenced significantly numerous sectors, including food security. Subsequently, food industries, farming communities and researchers connected with the agriculture sector ought to convey modern processes or adapt reasonably the existing ones in arrange to address the challenges presented by climate change. Agriculture sector must adopt the rising technology such as usage of drone UAVs can provide valuable data concerning the vegetation and chemical traits, in this manner influencing significant choices and approaches

OBJECTIVES

The objectives for this research are as follows: (1) To determine the relationship between tree parameter with weather variable, and multispectral data for Harumanis tree plantation for above-ground biomass and carbon estimation, (2) to classify tree crown delineation using Object Based Image Analysis and (3) to develop model for above-ground biomass and carbon stock estimation using artificial neural network and random forest

METHODOLOGY



NOVELTY

- Provide the model of above-ground biomass and carbon stock of Harumanis
- Provide basic knowledge about the usage of UAVs in agriculture sector
- Predict the future above-ground biomass and carbon stock for Harumanis
- As a reference for future study as not many research related to Harumanis

CONCLUSION

Artificial Neural Network and Random Forest can be used to estimate above-ground biomass and carbon stock and this algorithms are very handy for future agriculture sector as they can handle large amounts of data, improving accuracy and can make predictions about the future above-ground biomass and carbon stock

COMMERCIALIZATION

- Provide knowledge to farmers, researchers and also public users about the usage of UAVs in agriculture sector which can help to develop a bigger sector
- Via Machine Learning algorithms, the accuracy for estimation of above-ground biomass and carbon stock can be improved and help to predict the future carbon stock for Harumanis

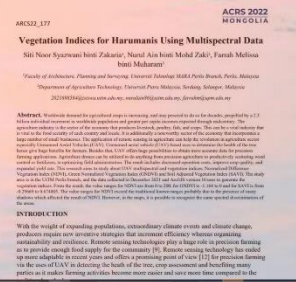
INSTRUMENT

| Detail | Ardupilot Quadcopter |
|--------------------|-----------------------------|
| Sensor | MicaSense RedEdge |
| Overlap | 75% horizontal and vertical |
| Altitude | 75m |
| Spatial resolution | 5cm/gsd |

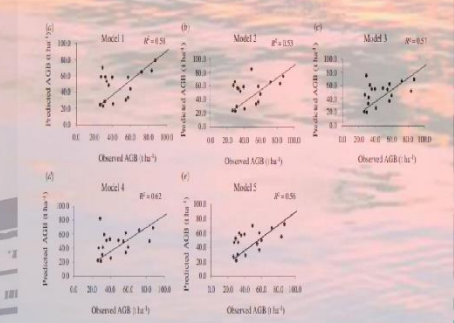
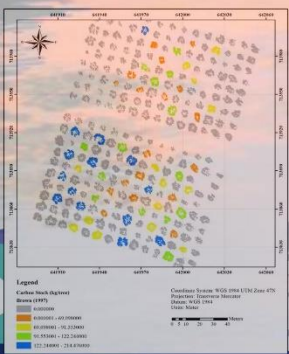


CONFERENCE & PUBLICATION

The 43rd Asian Conference on Remote Sensing (ACRS) 2022- Mongolia 3-5 October 2022



FINDINGS (EXPECTED OUTCOMES)



(Shahidan, 2022)

(Mohd Zaki et al, 2018)