ESTIMATION AND MAPPING OF SOIL ORGANIC CARBON STOCKS OF DIFFERENT LAND USES IN SCIENCE CITY OF MUÑOZ, NUEVA ECIJA

ALDRIN BUALAN GERONIMO

An undergraduate thesis manuscript presented to the faculty of the Department of Soil Science, College of Agriculture in partial fulfillment of the requirements for the degree

BACHELOR OF SCIENCE IN AGRICULTURE (SOIL SCIENCE)

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BIOGRAPHICAL SKETCH

The author is the grandson of Leonardo Geronimo, a veteran of the Filipino-Japanese war, and Benigno Bualan, a farmer from Zamboanga in Mindanao. He was born on the 27th of June and raised in Sta. Maria, Bulacan by Alejandro and Sulpriza Geronimo.

He graduated as valedictorian from Sta. Maria Elementary School. He finished secondary education at Pulong Buhangin National High School. During elementary and high school, the author was a campus journalist and competed almost annually to journalism contests. In 2007, he was able to participate in a national level journalism competition held at Koronadal City.

The author entered the University, under the BS Agriculture program in 2012, and then transferred to the University of the Philippines – Diliman in 2014. He studied geology in the latter for one semester. He returned to CLSU in 2015.

The author served as Dr. Fred Perez' personal research and office assistant. He was involved to several projects under different institutes such as the Commission on Higher Education (CHED), National Economic Development Authority (NEDA), Department of Environment and Natural Resources (DENR), Philex Mining Corporation, and Deutsche Gesellschaft für Internationale de Zusammenarbeit (GIZ) GmbH.

In 2013, he became a member of the Philippine Society of Soil Science and Technology Inc. (PSSST). The author participated in the 2nd Asian Irrigation Forum in 2016 held at the Asian Development Bank (ADB) Headquarters, Manila.

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ALDRIN BUALAN GERONIMO

LIST OF TABLES

LIST OF FIGURES

LIST OF APPENDICES

LIST OF APPENDIX TABLES

TABLE OF CONTENTS

ESTIMATION AND MAPPING OF SOIL ORGANIC CARBON STOCKS OF DIFFERENT LAND USES IN SCIENCE CITY OF MUÑOZ, NUEVA ECIJA[1/]

by

ALDRIN B. GERONIMO

ABSTRACT

A total of 106 composite soil samples representing 9,691 ha were collected from different land uses of the Science City of Muñoz in order to determine and map the distribution of organic carbon and identify factors affecting its storage in soil. It was revealed that grasslands store about 8.32 (± 4.01) t C ha^{-1} which does not statistically differ from the amount stored by rice multiculture and rice monoculture with 7.46 (± 2.54) t C ha^{-1} and 7.99 (± 3.06) t C ha^{-1}, respectively. The comparable levels of carbon stock was attributed to the low bulk density measured in grasslands despite their higher soil organic carbon content (SOC), and high bulk density in rice land uses despite their lower SOC.

Soil properties that were found to be negatively correlated ($p < 0.05$) with SOC are silt content and bulk density, i.e. as silt content and bulk density increased, SOC decreased. Positive correlation was established with clay content, i.e. as clay content increased, SOC also increased.

The same negative correlation was found between carbon stock and silt content, while positive correlation appeared between carbon stock, bulk density and clay content.

As for farm management practices in rice, no significant differences in terms of carbon storage were found among different sources of irrigation and different levels of nitrogen fertilizer application. On the other hand, incorporation of rice straw was found to be advantageous over crop stubble removal in terms of sequestering carbon. Yield was found to be correlated ($p < 0.05$) with % SOC but not with carbon stock.

Using the Inverse Distance Weighted (IDW) method of interpolation, the soil organic carbon stock of the first 5 cm of the soil of the study area was mapped and estimated at 75,263.38 tons.

[1/]An undergraduate thesis manuscript presented to the faculty of the Department of Soil Science, College of Agriculture in partial fulfilment of the requirements for the degree Bachelor of Science in Agriculture major in Soil Science with Research Contribution No. **CA-05-17-0006**

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