ECONOMIC EVALUATION OF WATER HYACINTH AND SAWDUST AS ALTERNATIVE SUBTRATES FOR OYSTER MUSHROOM PRODUCTION IN VIHIGA COUNTY, KENYA

BY

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DECLARATION

This thesis is my original work and has not been presented in any other University in its present form and manner for the fulfillment of the requirement for the award of a degree.

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DEDICATION

To my wife Hellen and my children, Eric, Asher, Miriam and Joash.

ABSTRACT

Mushrooms are valued for their nutrition, medicine and culinary uses. They can grow on agricultural and forestry wastes, but the sources are affected by declining agricultural productivity and seasonality. Bagasse is the best substrate for mushroom production. However, its availability is fast diminishing from the sugar industry. Mushroom production is an economic activity in Vihiga County, largely promoted by Vihiga Mushroom Project. The project is faced with imminent collapse due to suspension of bagasse supply from sugar factories. As a result, production declined from 73370kg in 2009 to 1782kg by 2011.In an attempt to promote mushroom production, there has been need to identify alternative materials to replace bagasse. A potential substrate identified was water hyacinth. The plant is able to produce 10m tons of dry biomass annually from L.Victoria. Studies showed that it can be used for mushroom production. However, issues of concern including possible use as a replacement to bagasse, the effect of water hyacinth mixed with sawdust and economic profit on production of oyster mushroom are unknown. Therefore, the purpose of this study was to conduct an economic evaluation of water hyacinth and sawdust as alternative substrates for oyster mushroom production in Vihiga County.The objectives were to; evaluate the possible use of water hyacinth as a replacement to bagasse for production of oyster mushroom, evaluate the possible use of water hyacinth mixed with sawdust as a substitute to bagasse for production of oyster mushroom and determine the effect of water hyacinth alone and when mixed with sawdust on economic profit of oyster mushroom production. The study was anchored on the Discovery and a Creation theory of Entreprenuership.It was guided by a conceptual framework showing interrelationships of water hyacinth, sawdust, bagasse and oyster mushroom production. Completely Randomized Design was used. Primary data was collected from experiment while secondary data was through review of records. The data was analyzed using ANOVA and BCA techniques. The results of mushroom yield using water hyacinth was 1861g implying low yield,4049g from water hyacinth mixed with sawdust meaning high yield compared to 4350g of bagasse. There was a significant difference in mushroom yield between water hyacinth and bagasse (39.11) meaning water hyacinth was inferior to bagasse. Water hyacinth mixed with sawdust compared to bagasse was insignificant (0.51) at p=0.05.This implied that yields are the same at P=0.05.All the substrates had positive Economic net present value and economic benefit-cost ratio meaning there was no significant difference.Conclusions are that water hyacinth alone cannot replace bagasse but water hyacinth mixed with sawdust can be a substitute to bagasse. ENPV and EBCR for economic profits were low and high respectively. The study recommended use of water hyacinth and water hyacinth mixed with sawdust to replace bagasse. From an economic front, both types were recommended.These results are useful to Vimpro, Vihiga County and scholars.

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LIST OF ACRONYMS AND ABBREVIATIONS

AME	Africa and Middle East
ANOVA	Analysis of variance
BE	Biological efficiency
BCA	Benefit cost analysis
BS	Bagasse substrate
CBK	Central Bank of Kenya
CDF	Constituency Development Fund
Ed.	Edition
FAO	Food Agricultural Organization
GDP	Gross Domestic Product
Ha	Hectare
1DRC	International Development Research Centre
KFS	Kenya Forest Services
KNBS	Kenya National Bureau of Statistics
KORCE	Kenya Organic Research Centre for Excellence
n.d	No date
MDG	Millennium Development Goals
PRSP	Poverty Reduction Strategy Paper
PPS	Presidential Press Service
US	United States
USDA	United States Department of Agriculture
MMUST	MasindeMuliro University of Science and Technology
Vimpro	Vihiga Mushroom Project
WMS	Welfare Monitoring Survey
WHS	Water hyacinth substrate
WHSDS	Water hyacinth and sawdust substrate

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OPERATIONAL DEFINITION OF TERMS

Bagasse	A by-product from sugarcane after sugar has been extracted
Briquette	Form of charcoal made from bagasse used for cooking
Farming	The practice of cultivating the land or raising stock/products
Flush	Maturity period of mushroom before harvesting, it determines yield
Mushroom	A common name for the fruiting body of fungi. Some are edible, others are highly poisonous
Poverty	The inability of people to meet their basic needs such as food, shelter and clothing
Riparian	People who are living next to lakes and rivers
Saprophytes	An organism which grows on and derives its nutrients from dead or decaying organic matter
Substrate	The material used in mushroom growing (Medium of growth)
Spores	Reproducing bodies containing one or more cells
Water hyacinth	A floating weed/plant in fresh water bodies
Sawdust	A by-product from the timber Industry