

BUSITEMA UNIVERSITY

TOPIC OF STUDY

ASSESSING THE IMPACT OF RICE GROWING ON PEOPLE'S LIVELIHOOD

A CASE STUDY OF NAMASAGALI SUBCOUNTY KAMULI DISTRICT

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AWARD OF A DEGREE OF BACHELOR OF SCIENCE IN NATURAL
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DECLARATION


I **BARONGO COLLIN** do here by declare that this research proposal has been through my own efforts and never has it been submitted to Busitema University or any other institution of higher learning for the award of a degree or any other qualification.

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Date 12th/07/2021

APPROVAL

This research has been done under the guidance of:

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MRS. NYANGOMA IMMELDAH

Supervisor

DEDICATION

I dedicate this work to whoever is ready to address the natural resource and environmental challenges using sustainable and economic ways for caring for the present and future generations. Thank you, change begins with you

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ACROYMNS/ABBREVIATIONS

1. NAEZ	Northern Agro-Ecological Zone
2. USD	United States Dollar
3. FAO	Food Agricultural Organization
4. GOU	Government of Uganda
5. UBOS	Uganda Bureau of Statistics
6. &	And
7. MAAIF	Ministry of Agriculture, Animal Industry and Fisheries
8. NAADS	National Agricultural Advisory Services
9. NaCRRI	National Crop Resources Research Institute
10. NARO	National Agricultural Research Organization
11. NERICA	New Rice for Africa
12. VOL	Volume
13. NO.	Number
14. SRI	System of Rice Intensification
15. Fe	iron
16. IPM	Integrated Pest Management
17. EDF	Environmental Defense Fund
18. e.g.	for example
19. Kg	kilogram
20. Mn	manganese
21. i.e.	that's to say
22. N	Nitrogen
23. C	Carbon
24. GHGs	greenhouse gases
25. CH ₄	methane
26. CO ₂	carbon dioxide

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ABSTRACT

People have continuously underestimated the impact of rice growing on their livelihood. This is attributed to the fact that most people only consider the worthiness of rice growing by rice yields ignoring the activities associated with rice growing and can affect people's livelihood. For example, continuous flooding of rice plants through precipitation and irrigation leads to high water consumption, and eventually to pronounced water scarcity in water scarce areas (Van Dis et al, 2015).

The study was carried out in Bwiiza, Kasozi, Kisaikye and Namasagali parishes of Namasagali sub county of Kamuli district. The aim of the study was to generate information on the impact of rice growing on people's livelihood in Namasagali sub county. This was important in suggesting ways to appreciate rice growing so as to ensure that people grow rice extensively with in the lowlands and uplands using environmentally friendly technologies. This was done by finding out the benefits people get from rice growing, problems people face during rice growing, the costs of rice growing to the people plus environment and the possible measures undertaken to solve the problems faced during rice growing as well as costs that have come up as a result of rice growing.

Data was collected using two methods that is; interviewing and questionnaire. Systematic random sampling technique was used to come up with a sample of 60 respondents. Data collected was analyzed using Microsoft excel_2010 and results were presented by use of pie charts, frequency tables, line graphs and bar graphs.

The study revealed that men mainly the youth were more involved in rice growing than women and rice growing is mainly carried out for commercial purpose. The study also found out that rice growing has increased income and improved standards of living of rice growers and rice growing has greatly led to climate change, loss of bio diversity and wetland degradation.

It is recommended from the study that farmers should transfer from paddy rice growing to upland rice varieties with special focus on NERICA 4 and NERICA 3 that have the ability yielding than other rice varieties, this will make farmers to continually harness the benefits accruing from the wetlands such as raw material for making mats, animal watering and

grazing, fire wood and reduce on loss of wetland animals, grass and trees. Farmers should organize themselves into groups such that they are able to devise means how to strengthen their production ability and bargaining power on market. Also government and non-government organizations should advocate and sensitize farmers about better rice production technologies that are environmentally friendly, better rice seed varieties, importance of growing rice, how best to overcome problems faced during rice growing as well as effects or costs that come up as result of rice growing.

CHAPTER ONE: INTRODUCTION

1.1. Background of the study

According to <https://www.veetee.com/us/what-is-rice/>, Rice is a grain. It is the seed of grass species *oryza sativa* (Asian rice) or *oryza glaberrima* (African rice). As part of our diet, it is considered a carbohydrate. 100g of rice will contain 80g of carbohydrates, 7.13g of protein, 11.61g of water and 0.66g of fat. Rice is also a great source for a number of essential vitamins and minerals such as vitamins B1 (thiamine), B3 (niacin), B5 (pantothenic acid), folate, iron, copper, manganese and selenium.

Rice growing in Uganda started as early as 1904 but became noticeable as food crop during the 1950s mainly to feed the Second World War veterans and government institutions such as schools, prisons and hospitals (Odogola, 2006; Bua & Ojirot, 2014).

However, rice production gained importance as cash crop after the establishment of Kibimba rice irrigation scheme in the 1960s followed by Doho and Olweny irrigation scheme in the 1970s (Odogola, 2006; GoU, 2009).

Rice, paddy production for Uganda was 260,786 tones. Rice, paddy production of Uganda increased from 4767 tons in 1969 to 260786 tons in 2018 growing at an average annual rate of 12.04% (Knoema.com, 2018).

Rice farming today is faced with several agronomic and environmental challenges related to the intensification of crop production. Deceleration in the growth of rice yields, soil depletion, growing water use, increasing water and air pollution as well as climate change are some of the biggest areas of concern. Tackling them at the same time is likely to require negotiating tradeoffs, and making management decisions that need to be weighted carefully in order to reduce environmental impact, on the one hand, while maintaining or increasing yields and contributions to food security on the other hand (Van Dis et al, 2015).

In Namasagali sub county, Kamuli district, most people are below the poverty line and are vulnerable (that is to say the rural poor that comprises of the rural women, rural men and their children), these largely depend on farming particularly rice growing to improve on their livelihood since rice is the major food and cash crop grown and it has calculated risks compared

REFERENCES

1. Searchinger, T., Adhya, T., Linquist, B., Wassmann, R. & Yan, X. 2014. Wetting and Drying: Reducing Greenhouse Gas Emissions and Saving Water from Rice Production. World Resources Report, WRI.
2. Characterization of Rice Production Systems in Northern Agro-Ecological Zone, Uganda by G. O. Akongo, W. Gombya-Ssembajjwe, M. Buyinza1 & J. J. Namaalwa or Journal of Agricultural Science; Vol. 10, No. 1; 2018 ISSN 1916-9752 E-ISSN 1916-9760 Published by Canadian Center of Science and Education.
3. Uganda National Rice Development Strategy (NRDS) 2008-2018, Ministry of Agriculture, Animal Industry and Fisheries.
4. Journal of Biology, Agriculture and Healthcare
www.iiste.org ISSN 2224-3208 (Paper) ISSN 2225-093X (Online) Vol.3, No.16, 2013.
5. Chen, Y., & Ni, X. 2011. Nitrogen Modulation on Plant Direct and Indirect Defenses. In T. Liu, & L. Kang, eds. Recent Advances in Entomological Research, pp 86-102. Berlin, Springer Links. 500 pp.
6. (<http://www.theguardian.com/science/2012/jan/24/japan-farming-technique-duckpesticide>).
7. Van Dis, R., Attwood, S., Bogdanski, A., DeClerck, F., DeClerck, R., Gemmill-Herren, B., Hadi, B., Horgan, F., Rutsaert, P., Turmel, M.-S., Garibaldi, L. (2015), Counting the costs and benefits of rice farming, A trade-off analysis among different types of agricultural management, FAO, unpublished project report for The Economics of Ecosystems and Biodiversity (TEEB) global initiative for Agriculture and Food.
8. Truc, N.T.T., Sumalde, Z.M., Espaldon, M.V.O., Pacardo, E.P., Rapera, C.L., & Palis, F.G. 2012. Farmers' Awareness and Factors Affecting Adoption of Rapid Composting in Mekong Delta, Vietnam and Central Luzon, Philippines. J. Environ. Sci. Manage., 15(2).
9. Griffith, D. 2015. Economic value of ecosystem services provided by aquatic organisms in flooded-rice production: a literature review. Unpublished report for the FAO TEEB Rice study.
10. De Silva, S., Johnstone, R. & Try, T. 2013. Rice and Fish: Impacts of Intensification of Rice Cultivation. IWMI - ACIAR Investing in Water Management to Improve



Productivity of Rice-Based Farming Systems in Cambodia Project. Issue brief #4, June 2013.

11. Hortle, K., Troeung, R., Lieng, S. 2008. Yield and value of the wild fishery of rice fields in Battambang Province, near the Tonle Sap Lake, Cambodia. MRC Technical Paper No. 18, Mekong River Commission.
12. Heong, K.L., Escalada, M.M., Van Chien, H., Reyes, J.H.D. 2015. Are there productivity gains from insecticide applications in rice production? In K.L. Heong, M.M. Escalada, J. Cheng, eds. Rice Planthoppers, pp. 179-189. Beijing, Springer. 231 pp.
13. Spangenberg, J.H., Douguet, J.M., Settele, J., Heong, K.L. 2015. Escaping the lock-in of continuous insecticide spraying in rice: Developing an integrated ecological and socio-political DPSIR analysis. *Ecol. Modell.*, 295: 188-195.
14. Horgan, F. G., & Crisol, E. 2013. Hybrid rice and insect herbivores in Asia. *Entomologia Experimentalis Et Applicata*, 148(1): 1-19.
15. Pitelkow, C. M., Fischer, A. J., Moechnig, M. J., Hill, J. E., Koffler, K. B., Mutters, R. G., & Linquist, B. A. 2012. Agronomic productivity and nitrogen requirements of alternative tillage and crop establishment systems for improved weed control in direct-seeded rice. *Field Crop. Res.*, 130: 128-137.
16. Odogola, R. W. (2006). Survey report on the status of rice production, processing and marketing in Uganda. Submitted to the Embassy of Japan in Uganda through JICA and Sasakawa Africa Association-Uganda.
17. Bua, B., & Ojirot, M. (2014). Assessing the Importance of Rice as Food and Income Security Crop in Puti-puti Sub-county, Pallisa District, Uganda.
18. Government of Uganda (GoU). (2009). The Uganda National Rice Development strategy (NRDS) lays out Uganda's strategy for promotion of rice production between 2009/10-2017/18. Retrieved from <http://www.agriculture.go.ug>
19. Knoema .com
20. Ahmed, A. & Akhtar, M. (2011, July 15). Weeds of rice crop and their control. *Zaraat Nama*, pp. 6-9.
21. Govt. of Pakistan. 2012-13. Economic Survey of Pakistan. Ministry of Food, Agriculture and Livestock, Islamabad.
22. <https://www.vectee.com/us/what-is-rice/>

23. Halwart, M., Gupta, M.V. 2004. Culture of fish in rice fields. FAO and World Fish Centre, Rome and Penang. pp 77.
24. FAO. n.d. Plant Production and Protection Division; Integrated Production and Pest Management Programme in West Africa. Retrieved 27.01.2015, from <http://www.fao.org/agriculture/crops/thematicsite/tema/pests/ipm/ipmwestafrica/en/>
25. FAO. 2015. AGP – Integrated Pest Management. Retrieved 19.8.2015, from <http://www.fao.org/agriculture/crops/thematic-site/tema/pests/ipm/en/>
26. <http://www.fao.org/agriculture/crops/thematic-site/tema/pests/ipm/en/>
27. Kreye, C., Bouman, B.A.M., Castañeda, A.R., Lampayan, R.M., Faronilo, J.E., Lactaen, A.T., & Fernandez, L. 2009. Possible causes of yield failure in tropical aerobic rice. *Field Crops Res.*, 111: 197-206.
28. Kato, Y., & Katsura, K. 2014. Rice adaptation to aerobic soils: physiological considerations and implications for agronomy. *Plant Prod. Sci.*, 17(1): 1-12.
29. Van Buyten, E., Banaay, C.G.B., Vera Cruz, C. & Háfte, M. 2013. Identity and variability of *Pythium* species associated with yield decline in aerobic rice cultivation in the Philippines. *Plant Pathol.*, 62: 139-153.
30. Jongdee, B., Pantuwan, G., Fukai, S., & Fischer, K. 2006. Improving drought tolerance in rainfed lowland rice: an example from Thailand. *Agricul. Water Manage.*, 80(1): 225-240.
31. Wassmann, R., Buendia, L. V., Lantin, R. S., Bueno, C. S., Lubigan, L. A., Umali, A., Nocon, N., Javellana, A. & Neue, H. U. 2000a. Mechanisms of crop management impact on methane emissions from rice fields in Los Baños, Philippines. *Nutr. Cycl. Agroecosys.*, 58(1-3): 107-119.
32. Wassmann, R., Lantin, R. S., Neue, H. U., Buendia, L. V., Corton, T. M., & Lu, Y. 2000b. Characterization of methane emissions from rice fields in Asia. III. Mitigation options and future research needs. *Nutr. Cycl. Agroecosys.*, 58(1-3): 23-36.
33. Minasny, B., McBratney, A. B., Hong, S. Y., Sulaeman, Y., Kim, M. S., Zhang, Y. S., & Han, K. H. 2012. Continuous rice cropping has been sequestering carbon in soils in Java and South Korea for the past 30 years. *Global Biogeochem. Cycles*, 26(3).

34. Krupnik, T. J., Shennan, C., Settle, W. H., Demont, M., Ndiaye, A. B., & Rodenburg, J. 2012. Improving irrigated rice production in the Senegal River Valley through experiential learning and innovation. *Agricul. Sys.*, 109: 101– 112.
35. Makara, O., Sarom, M., Nesbitt, H. J., Fukai, S., & Basnayake, J. 2001. Rice production systems in Cambodia. In *Increased lowland rice production in the Mekong Region: Proceedings of an International Workshop held in Vientiane, Laos, 30 October-2 November 2000*. pp. 43-51. Australian Centre for International Agricultural Research (ACIAR).
36. Bernier, J., Atlin, G. N., Serraj, R., Kumar, A., & Spaner, D. 2008. Breeding upland rice for drought resistance. *J. Sci. Food Agric.*, 88(6): 927-939.
37. Mohanty, M., Probert, M.E., Reddy, K.S., Dalal, R.C., Rao, A.S., & Menzies, N.W. 2010. Modelling N mineralization from high C: N rice and wheat crop residues. In *19th World Congress of Soil Science*.
38. Sander, B. O., Samson, M., & Buresh, R. J. 2014. Methane and nitrous oxide emissions from flooded rice fields as affected by water and straw management between rice crops. *Geoderma*, 235: 355-362
39. Huynh viet kai and Mitsuyasu Yabe (2011), technical efficiency analysis of rice production in Vietnam, *J. ISSAAS VOL, 17, NO, 1:135-146*.
40. *African crop science journal*, vol. 15, No.4, pp.243-253.
41. www.kamuli.go.ug
42. weather spark