EFFECT OF LAND OWNERSHIP ON THE TECHNICAL EFFICIENCY OF CROP FARMERS

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ABSTRACT. The essence of this study was to examine the land ownership pattern in Osun State, Nigeria, with a view to assessing its effect on the technical efficiency of the farms. Precisely, the farm efficiency level was estimated; factors that determine farm efficiency were identified, and the impact of land ownership on-farm efficiency was also assessed. A three-stage random sampling was used to select 144 respondents. Data collected using a pretested interview schedule was subjected to descriptive statistics, stochastic production frontier function, and average treatment effect. The results show that land ownership by absolute interest accounted for about 65% of the farmers. The mean technical efficiency level of the farms was 47%. Farm size and labour are necessary factors to be increased to have increased output. The non-access to credit and land ownership by absolute interest constituted to technical inefficiency of the farms. Similarly, ownership of farmland by absolute interest reduced efficiency by 24% among sampled farmers and 25.5% among owners of farmland. The study, therefore, suggested that farm size should be increased, and credit facilities are made available to farmers to facilitate the acquisition of necessary inputs to increase output given the existing technology. This can be by way of making accessible to food crop farmers, lands belonging to the government, which are currently not in use.

Keywords: absolute interest; derivative interest; land acquisition; land use system; food crops.

RICE FARMERS' PERCEPTION AND KNOWLEDGE OF INTEGRATED RICE AND FISH FARMING IN SELECTED LOCAL GOVERNMENT AREAS OF KWARA STATE

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ABSTRACT. In spite of the numerous advantages associated with integrated rice and fish farming, deliberate adoption of this technique is still insignificant. This study examined rice farmers' perception and knowledge of integrated rice and fish farming practice in Kwara State. A three-stage sampling procedure was used to select 149 rice farmers, while data was obtained through the use of a well-structured structured interview schedule. Data were analysed using descriptive statistics and the Pearson's Product Moment Correlation (PPMC). The results show that 81.9% of the respondents were male with mean age of 38 years and an average of 14 years farming experience. Given the average mean score of 3.04 respondents had a positive perception of integrated rice and fish farming, while 63.8% of the respondents had moderate knowledge. Farmers' identified high cost of irrigation materials (M.S.=2.59), poaching (M.S.=2.59), flooding (M.S.= 2.55) as major constraints to the practice of integrated rice and fish farming. Farmers' perception had a significant relationship with knowledge of integrated rice and fish farming at $p<0.05$ level. Also, farmers' age (r=0.300, $p<0.000$), level of education (r=0.287, $p<0.000$), farming

experience (r=0.220, p<0.007), membership of cooperative society (r=0.176, p<0.032) and extension contact (r=0.204, p<0.013) had significant relationship with the knowledge level. The study concluded that the rice farmers had moderate knowledge and positive perception of integrated rice and fish farming. There is a need to provide incentives, such as irrigation facilities to farmers and provision of adequate training on integrated rice and fish farming in order to fully maximize the potentials therein.

Keywords: perception; knowledge; integrated farming; rice; fish.

YOUTHS' INVOLVEMENT IN OIL PALM (*ELAEIS GUINEENSIS*) FRUIT PROCESSING ACTIVITIES

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ABSTRACT. This study assessed the youths' involvement in oil palm fruit processing activities in Ondo State, Nigeria. It described the socio-economic characteristics of youths involved in oil palm fruit processing activities, determined their level of involvement, examined their perception and identified constraints associated with their involvement. Multistage sampling procedure was employed to select 120 respondents from the study area. Interview schedule was employed to collect relevant data, which was analysed with SPSS software package. Descriptive statistics were used to summarise the data while inferential statistics were used to draw inference on hypothesis. The results show that majority (63.3%) were male, 95.8% had formal education with a mean age of 27.2 ± 2.7 years. Picking of fresh fruit bunches ($\bar{x}$= 2.71), packaging ($\bar{x}$= 2.60) and gathering of bunches ($\bar{x}$= 2.50) were the major activities youth involved in. Higher percentage (57.9%) of the youth had favourable perception towards involvement in oil palm fruit processing activities. Lack of modern processing facilities ($\bar{x}$=3.65) and funds/inadequate credit facilities ($\bar{x}$ = 3.65) were the prime constraints to their involvement. Number of labour (r = 0.7460; p≤0.01) and income (r = 0.601; p≤0.01) of the respondents were significantly related to youth involvement. The study concluded that youth had moderate involvement in oil palm processing activities. However, agricultural development stakeholders like government should provide adequate and functional credits facilities to these youths to encourage their involvement.

Keywords: constraints; participation; processing; perception, socio-economic.

RURAL HOUSEHOLDS' PERCEPTION OF VITAMIN A BIOFORTIFIED CASSAVA AND ITS PRODUCTS: IMPLICATIONS FOR FOOD SECURITY

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ABSTRACT. The paper examined the perception of rural households about vitamin A biofortified cassava and its products in Osun State, Nigeria. Multistage sampling procedure was used to select 50 households' members. Quantitative data were collected on the respondents' personal and socio-economic characteristics, their awareness on

vitamin A biofortified cassava, their perception about the crop and its products, as well as the constraints affecting its acceptability in the study area. Data were described using frequency counts, percentages, means and standard deviation and inferential statistics, like Pearson Product Moment Correlation and Chi-square analyses. Results showed that the respondents had a mean age of 52.62 ± 14.30, while 82% of them were married. 74% of the respondents had heard of Vitamin A bio fortified cassava, 64% had seen it while 44% had planted it with 54% having positive perception towards the crop and its products. Poor transport facilities (mean = 3.16) and difficulties in getting planting materials (mean = 2.36) ranked highest among the constraints affecting acceptability of the crop in the study area. There exist significant association between the respondents' marital status and their perception about vitamin A biofortified cassava. It was concluded that majority of the respondents have positive perception towards vitamin A biofortified cassava and its products. It was recommended that extension personnel should create more awareness about the nutritional value of the crop and its products to enhance better food security status among rural households.

Keywords: socio-economic; acceptability; awareness; constraints.

FOOD SECURITY STATUS: ITS DRIVERS AND COPING STRATEGIES AMONG VEGETABLE FARMING HOUSEHOLDS

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ABSTRACT. Food insecurity remains a major challenge worldwide, especially among the rural areas of developing nation. Women and children are most vulnerable to this phenomenon. However, while many studies have assessed farming households' food security status in general, there is dearth of information on vegetable farmers', who are mostly women, food security status in particular. This study, therefore, investigated the food security status of vegetable farming households, its drivers and coping strategies in Kwara State, Nigeria. Descriptive statistics, food insecurity index and logistic regression were used to analysed data collected from 180 respondents. The findings showed that food insecurity remains a major challenge in rural areas as only 45.55% were food secure. The food secure group surpassed the food security line by 17%. Food insecure group fell below the food security line by 36% with a daily average calorie intake of 1581.35 kcal. Annual income ($p< 0.1$), cooperative membership ($p< 0.1$), vegetable production ($p< 0.05$) and access to credit ($p< 0.05$) were the significant factors enhancing their food security status, while household size ($p< 0.01$) negatively influenced it. The widely used food insecurity coping mechanisms by the households were eating less expensive food, eating wild fruits, reducing rational consumption, allowing children to eat first, borrowing money to buy food, buying food on credit and skipping meal within a day. The study recommends encouragement of vegetable production through provision of credit facilities to the farmers as this would enhance their food security status.

Keywords: food insecurity; calorie intake; rural women; coping strategies; vegetable production.

ECONOMIC ANALYSIS OF CONTRACT FARMING AND TECHNICAL EFFICIENCY OF BROILER FARMERS

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ABSTRACT. The study assessed the effect of contract farming on broiler production in Osun State, Nigeria. 120 farmers comprising of broiler farmers participating and not participating in contract farming were selected using multistage sampling technique. Information was elicited from the farmers with the aid of a structured questionnaire. The data were analyzed using descriptive statistics, Stochastic Production Frontier and Ordinary least square regression model. The findings of this study revealed that majority (75%) of the farmers rated the activities of contracting farming to be good and favorable, as the contract farmers earn more from broiler production than their counterparts. Average technical efficiency of the contract and non contract farmers were 0.8209 and 0.6803, respectively. The results also revealed that years of experience in broiler production, education of farmer, off-farm income, membership in farmers association, access to credit, access to veterinary services and participation in contract farming significantly affected technical efficiency of broiler farmers in the study area. Therefore, the study recommends that there should be increase in the awareness of the benefits associated with contract farming in agrarian communities, so that more farmers are encouraged to participate, as this will improve their production efficiency.

Keywords: poultry; income; regression; household.

DOES CREDIT ACCESS IMPROVE ADOPTION INTENSITY OF IMPROVED MAIZE SEED VARIETIES?

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ABSTRACT. This study investigated the effect of credit access on the adoption intensity of improved maize varieties in Osun State. A number of 150 maize farmers were selected through a multistage sampling procedure from using a structured questionnaire. Descriptive statistics, adoption index, and Tobit regression model were used to analyse the data collected. The results showed that Majority of maize farmers were over 40 years (52.6%), male (87%), and married (87%). The result also showed that majority of the farmers did not adopt improved maize varieties (55%) in the state. Swan 1 improved variety was majorly adopted (87.1%), while DMR-ESR-W variety was less adopted (62.9%) in the State. Just a few of maize farmers had access to credit in the State (20%). The mean adoption intensity in the State was observed to 62%. Based on adoption intensity of improved maize varieties, adopters were classified as partial adopters (65%) and full adopters (35%). Tobit regression estimates showed that credit access, household size, secondary occupation, years of education and extension contact have significant effect on the adoption intensity of improved maize varieties. In accordance with the findings, we therefore recommend that microfinance institutions should look attentively at scaling up their credit services to enhancing adoption intensity of improved maize varieties.

Keywords: microfinance; Swan I; DMR-ESR-W; Tobit model; maize farmers, Osun State.

EFFECTS OF DIFFERENT STAGES OF MATURITY AND POSTHARVEST TREATMENTS ON THE EXTENSION OF SHELF LIFE AND QUALITY OF BANANA

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ABSTRACT. An experiment was carried out in the Laboratories of the Departments of Horticulture and Biochemistry and Molecular Biology, Bangladesh Agricultural University, Mymensingh, during the period from 23rd April to 10th May 2015. The two factors experiment was conducted for extension of shelf life and quality of banana under different postharvest treatments. The first factor was stages of maturity which had three maturity stages, *viz*.: 1) hard green (S_1), 2) pale green (S_2) and optimum maturity stage (S_3). The second factor was postharvest treatments, which had five treatments, *viz*.: 1) control (room temperature), 2) keeping fruits in perforated plastic bag, 3) keeping fruits in perforated plastic bag containing $KMnO_4$, 4) fruits treated with hot water for 5 min at 50°C and then kept in plastic bag containing $KMnO_4$, and 5) fruits pre-cooling for 30 min at 5°C and then kept in plastic bag containing $KMnO_4$. The pulp to peel ratio, total soluble solids, total sugar, reducing sugar, titratable acidity, were greater when fruits were harvested at optimum maturity stage than hard green stage. Total soluble solids, total sugar, reducing sugar were increased with storage duration, but increasing trend was slower when fruits were pre-cooling at 5°C for 30 min and kept in plastic bag containing $KMnO_4$. The longest shelf life of banana fruits (19 days) was observed when hard green stages fruits pre-cooling at 5°C for 30 min and kept in plastic bag containing $KMnO_4$ and the minimum shelf life (5.87 days) was observed in the combination of optimum maturity stage + control. So, it may be concluded that pre-cooling for 30 min at 5°C and then kept in plastic bag containing $KMnO_4$ treatment should be used for extending shelf life and quality of banana.

Keywords: maturity; banana; KMnO4; postharvest; storage.

THE EFFECT OF *PANGIUM* SP. AND *TITHONIA DIVERSIFOLIA* LEAVES EXTRACT AS VEGETABLE PESTICIDES TO *CROCIDOLOMIA PAVONANA* (LEPIDOPTERA; PYRALIDAE) LARVA MORTALITY

Eva BAIDENG, Ventje MEMAH, Hanny PONTORORING, Hendronoto LENGKEY

ABSTRACT. *Pangium* sp. and *Tithonia diversifolia* have the potential to become vegetable pesticides due to the content of secondary metabolites, such as alkaloids, tannins, flavonoids, terpenoids and saponins in their leaves, which are plant protection agents. This study aims to determine the mortality of *Crocidolomia pavonana* larvae after application of *Pangium* sp. and *Tithonia diversifolia*. *C. pavonana* is one of the main pests affecting cabbage production in North Sulawesi, Indonesia. *Pangium* sp. and *T. diversifolia* leaf extraction separately were carried out by immersion method using methanol (CH_3OH) solvent and followed by current-current distribution method. The result of crude extract was partitioned in a 95% mixture of hexane methanol (C_6H_{14} - CH_3OH). Then, the 95%

methanol fraction (CH_3OH) was further partitioned with a mixture of ethyl acetate and water (EtOAc - H_2O), and the extract from the ethyl acetate fraction (EtOAc) was then used in testing as a vegetable pesticide. This study used a completely randomized design (CRD) with six treatments, namely 0% (control), 0.1%, 0.2%, 0.3%, 0.4%, 0.5% and carried out three replications, where each treatment used 10 larvae. Larval mortality observations were carried out at 24, 48, 72, 96, 120 HAA (hours after application). The results indicated that there was a mortality rate of *C. pavonana* larvae, so that the *Pangium* sp. and *T. diversifolia* have the ability to act as botanical insecticides, although *T. diversifolia* extract treatment showed a higher mortality rate, compared to *Pangium* sp. Larval mortality above 50% (LC 50) was found in P3 (0.3%) treatment after 72 HAA, is of 53.33% (*Pangium* sp. extract) and 63.33% (*T. diversifolia* extract), successively. Then, at 120 HAA, the same larval mortality rate from both extractions in P3 treatment, increased to 76.67% using *Pangium* sp. extract, while the same mortality rate (76.67%) using *T. diversifolia* extract occurred in 96 HAA observations. ANOVA test showed significantly different results for the two extraction uses of *Pangium* sp. and *T. diversifolia*. LC 50 in *Pangium* sp. extract, at a concentration of 0.136% or 1360 ppm and in *T. diversifolia* extract of 0.1103% or 1103 ppm.

Keywords: extraction; vegetable pesticides; *Pangium* sp.; *Tithonia diversifolia*; *Crocidolomia pavonana.*

SUSTAINABLE MANAGEMENT OF MANGO NUTRITION FOR BETTER YIELD AND QUALITY

Muhammad KHAN, Niaz AHMED

ABSTRACT Optimum supply of macro and micronutrients is of critical importance in improving the yield and quality of horticultural crops. Alike, the quality and yield of mango plants significantly increase by balanced application and uptake of macro and micronutrients. However, soil type and characteristics are important factors that directly influence the bio-availability of these nutrients to the plants. In addition, variability in climate has an impact on mango yield in the current scenario. Many scientists have found that mango cultivation in saline soils is a major obstacle to achieving the desired yield and improving quality. Overdose of fertilization is the major factor for the development of saline soils, furthermore, rise in climate temperatures is also a major factor. Therefore, to overcome this problem, nutrient management and the use of balanced fertilizer are the important factors to be controlled. Thus, this review focuses on the performance and importance of essential macro and micronutrients to improve the yield and quality of mango fruits. To understand the effective use of macro and micronutrients, the positive and negative impacts of the nutrients are explained. It is suggested that analyzing the soil, mango fruits, and mango plant leaves for their nutrient status can be useful to formulate fertilization strategies for higher fruit production and quality. Research and development, along with agricultural extension, should focus more on introducing genetically effective mango varieties to improve nutrient and water utilization efficiency.

Keywords: nutrient management; fruit quality; mango production; yield.