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UTILISATION OF INDIGENOUS KNOWLEDGE SYSTEMS FOR SUSTAINABLE VEGETABLE PRODUCTION IN EKITI STATE: IMPLICATIONS FOR SUSTAINABLE AGRICULTURAL DEVELOPMENT IN NIGERIA

SUMMARY

Vegetable production is often faced with some challenges that borders on pests and diseases infestation and low yield. Therefore, this study explores indigenous knowledge system (IKS) approaches in vegetable production under tropical conditions. The following were examined: personal attributes of vegetable farmers, identification of various vegetables production stages with their corresponding IKS approaches, presentation of procedures used in developing some of the IKS amongst farmers, identification of reasons for using IKS in vegetable production and examination of benefits and problems associated with IKS utilization in vegetable production. Frequency distribution, percentages, mean and standard deviation were used to describe the data. Inferential statistics such as correlation was used in analysis. There was a relationship between IKS approaches used in vegetable production and personal attributes age, farm size, household size, and income. Reasons for using IKS included: hazards involved in utilisation of synthetic fertilizers, less financial commitment in processing of material, and it is environmental friendly. Benefits and problems associated with IKS were: 'it is profitable', 'it is cheaper than modern method', and 'it increases farm revenue'. Some IKS used in vegetable production include: bush fallow, trash burning, bed and heap making, soil incorporated with weathered poultry manure used to control nematode in tomatoes, extracts of occimum to control damping off. Others include application with lotion from black local soap and dusting with wood ash from Iroko tree (*Chlorophora excels*) to control insects. Constraints to production and IKS must be improved and to forestall IKS being supplanted for use in sustainable agricultural development in Nigeria.

Keywords: farmer, hazard, pests and diseases and agricultural development

INTRODUCTION

Vegetable production has always been an integral part of traditional farming systems in developing countries. (Awujoola, 2007). Vegetables are

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needed in households in the tropics to enhance, or improve, intake of balanced diets and they serves as a source of income to small producers (Rubsihayo, 1994). Demand for vegetables has increased as a result of urbanization, industrialization, growth in population and diversification of eating habits (Rubaihayo. 1992).

Vegetable gardening practices promote variety in diets and improve household nutrition of rural populations. In spite of vegetable improvement programs which produce high yielding, early maturing, disease resistant varieties and extension services to boost production in developing nations, there is reluctance by producers to adopt scientific knowledge.

Atteh(1990) and Bamigboye & Kuponiyi (2009) noted that most scientific knowledge failed because of assumed superiority of western technologies and the body of knowledge by small scale producers. Kolawole (2002) claimed that rural people, to whom all research development efforts are directed, have their own body of knowledge that enables them to arrive at decision which would help better their lots. Brokensha et al. (1980) stated "to ignore rural peoples knowledge is to ensure failure in development". This is because local people respects the expertise of indigenous people which is regarded as a major contribution to development (Osunade 1996). The development and use of local knowledge including agricultural practices is generally believed to conform to ecologically sound land management systems.

The study was undertaken to investigate utilisation of indigenous knowledge systems for sustainable vegetable production in Ekiti State, Nigeria. Specifically it was undertaken to:

a) describe personal attributes of vegetable farmers in the study area,
b) identify various vegetable production stages and their corresponding IKS approaches,
c) present procedures used in developing and utilising some of the IKS among farmers,
d) identify reasons for using IKS in vegetable production and examine benefits and problems associated with IKS utilization in vegetable production.

MATERIAL AND METHODS

The study area was Ekiti state in south-western Nigeria located between 40o 20' and 5o 40' east longitude and between 6o20'and 80 10' north latitude. Ekiti state is comprised of 16 Local Government Areas (LGA). Farming is a widespread occupation

A multistage sampling technique was used to select respondents. The first step involved purposive selection of 5 LGAs from the 16 LGAs in the state based on the concentration of vegetable farmers. Two communities were then randomly selected from each of the LGA, making ten communities. Using simple random sampling technique, 10 respondents were sampled all 100 vegetable farmers were

sampled Validated and pretested structured interview schedule was used to elicit requisite information from the respondents between April and May, 2014.

Data analysis procedure

The simple descriptive statistics frequency, percentage, mean and standard deviation were used to describe the data while Pearson Correlation was used to make inferential deductions on the relationship between IKS utilization and personal characteristics of the vegetable farmers

RESULTS AND DISCUSSION

Personal characteristics of respondents (Table 1) varied. The majority of respondents are in the active years of life. There are more female vegetable farmers than males, and (corroborate) findings of (Rubaihajo, 1994). The average family size varied but suggested it was made up of husband, wife, children and dependant relatives, Most respondents had a below average family income. Almost all respondents had some education.

Table 1. Frequency and percentage distribution of socio-economic characteristics of sampled vegetable farmers in Ekiti state, Nigeria

Socio-economic characteristics	Frequency	Percentage n=100
Age		
Below 35	20	20
Between 49 and 59	64	64
64+	16	16
Total	100	100
Gender		
Male	30	30
Female	70	70
Total	100	100
Household size		
1 to 5	60	60
6 to 10	25	25
11+	15	15
Total	100	100
Income (Naira)		
93,580	58	58
58,966.5	19	19
24,351	15	15
> 100, 000	8	8
Total	100	100
Education		
Primary education	36	36
Post secondary	25	25
Secondary	29	29
None	10	10
Total	100	100

The IKS utilized in vegetable production varied (Table 2). The great majority utilized slashing and trash burning for land clearing. The [assumption] was that during burning most soil dwelling insects would have been destroyed and the refuse would add potash to the soil. Other methods were employed for soil fertility management. A minority used ogirisoko lotion to treat seed before planting to protect against soil dwelling insects.

Control of nematodes and pest of okra and tomato (*Solanum lycopersicum* L) were used, and other methods were used for above ground insects. Methods were used to control damping off a fungal disease of tomatoes and pepper (*Capsicum annuum* L.) The IKS are highly utilized in vegetable production in the study area. The finding support the report of Kolawole (2002) that no matter the degree of modernity, people will still use what is known to them.

Table 2. Distribution of respondents by the types of IKS utilize in vegetable production (2013)

Stages of production	Corresponding IKs	Frequency	Percentage
Land preparation Slashing without burning Slashing and trash burning Heap and bed making	Cutlass Hoe and shovel	25 80 65 35	25 80 65 35
Sowing Seed	Treated seeds with ogirisoko portion to guide against soil dwelling insects	40	40
Soil fertility management	Organic manuring Bush fallow Cover cropping Crop rotation	60 72 40 5	60 72 40 5
Weed control	Manual (using hoe)	100	100
Pest and nematode control	Soil incorporated with weathered poultry manure Extract of siam weed and neem	59 15	59 15
Defoliating insect Control	Dusting from iroko wood ash	50	50
Disease control Damping off tomatoe and pepper	Black local soap Spray with occimum portion	45 48	45 48

The majority of respondents indicated that IKS was less hazardous had less financial commitment are available as reasons for using it in vegetable production (Table 3). A smaller subset use IK it is environmentally friendly.

Table 3. Reasons for using IKS

Reasons for using IKS	Frequency	Percent
Less hazardous	80	80
Less financial commitment in processing of material involved	62	62
It is environmental friendly	40	40
It is readily available	65	65

Better than half of respondents indicated that energy is dissipated during preparation and utilization of most IKS causing a problem to its utilization (Table 4). A smaller subset indicated that elders who are the major custodians of the IKS are not willing to divulge the knowledge. The serious implication is that most of the IKS are not being documented and can be lost. A little better than half felt that the odor is disagreeable, this may be curtailed through proper standardization.

Table 4. Problems associated with the use of IKS

Reason	Frequency	Percent
The odor could be offensive at times e.g. neem during extraction	55	55
A great of energy consumed during preparation and utilization	60	60
Custodians of indigenous knowledge are not willing to knowledge	45	45

Multiple responses
Source: Field survey, 2014

Four personal characteristics of vegetable farmers had positive and significant relationships with IKS utilization (Table 5). The positive correlation of age, household size, income and farm size indicated that the greater the variation in these variables, the more IKS producers utilized in vegetable production.

Table 5. Correlation analysis showing relationships between IKS utilization and socio-economic characteristics of vegetable farmers

Socio-economic characteristic of vegetable farmers	Correlation coefficient	Coefficient of determination r^2 (COD)	%Contribution
Age	0.359	0.1288*	12.8
Household size	0.118	0.0139**	1.39
Income	0.322	0.159**	15.9
Farm size	0.380	0.144*	14.44
Education level	-0.076	0.0057NS	0.58

*Significant at 0.05 ** significant at 0.01

The implications are: since experience is a product of age, the older the farmer is the more experience he had in farming and the more local methods were used. Also, the larger the household size (which may serve as farm support) the more IKSs were used. The large with a tendency of variation of crops. The higher the income generated the more IKS practiced indicating that if something works it would be adapted. The negative correlation between education and IKS utilization would tends towards western methods of farming (Deji et al., 2005; Bamigboye, 2008).

CONCLUSIONS

The types of IKS utilized in the vegetable production in the study area were: soil incorporated with weathered poultry manure, extracts of occimum to control damping off and dusting with wood ash from Chlorophora excels. Some of the principal problems militating against the use of IKS in vegetable production were: custodian of indigenous knowledge are not willing to diverge their knowledge and the odor could offensive during preparation and usage It is therefore recommended that scientists should mainstream indigenous people into research cycle for holistic rural development.

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