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Farmers' Attitude about Organic Pest Management Practices and Soil Biodiversity Conservation in Budondo Sub County, Jinja District

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ABSTRACT

Farmers' attitudes have determined the choice of pest management method in Uganda. As a result of increased demand for food to cater for the increasing population, agricultural production has developed. Apparently, most of Ugandan farmers use inorganic pesticides and herbicides as the most effective and quick method of pest control. However these synthetic chemicals heavily contribute to soil biodiversity loss. A study of 340 households in Budondo Sub-County farming community, Jinja District revealed that pests affected crops and caused significant yield losses. This was manifested in their score of responses viz. strongly agreed (1175) and strongly agreed (1075) respectively. Farmers therefore sprayed their gardens with inorganic pesticides (81.8%) in order to eliminate pests quickly (86.5%). The study also revealed that organic pest management practices have not been adopted because of inadequate training, inadequate knowledge which was found significant at (χ^2 (77, n=340) =180.441, $p< .001$) and attitude significant at (χ^2 (99, n=340) =161.511, $p< .001$). The researcher therefore recommended the government of Uganda to make and adopt a policy and action plan on organic pest management for sustainable soil biodiversity conservation. Farmers in Budondo be actively involved, sensitized and trained about organic pest management practices if any conservation measures were to be attained.

Key words: Soil, biodiversity, conservation, organic, inorganic, pesticides, households, attitude.
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INTRODUCTION

Farmers' attitudes affect the choice of pest management method (Escalada & Heong, 2012). Many consumers today are considering the effects of organic agricultural practices as compared to conventional agricultural methods that use pesticides, herbicides and synthetic fertilizers in crop production. Some wonder whether organic products are worth the extra cost, while others question whether environmental or health-related issues are really much better in organic production and consumption.

Several approaches to the intervention of pest management include cultural, biological, physical and chemical pest control measures. In Budondo Sub County, farmers have very little exposure to integrated pest management (Sebastian, Joshi, Gergon, Catudan, & Desamero, 2003). Each household depends on a single piece of land usually less than two acres for their food and income on multispecies agricultural systems, i.e. the cultivation of a variety of crops (Mal et al., 2009).

Despite the existence of some organic farmers, majority of Ugandan farmers mistakenly believe that all insects are pests and should be killed (Escalada & Heong, 2012). Due to this, most farmers in Budondo Sub County apply inorganic pesticides because they believe that the pesticides used increase yield and effectively eradicate pests (Lutap & Atis, 2013) yet they are broad spectrum rather than target oriented (Gurr, Snyder, Wratten, & Read, 2012). Farmers' awareness of the existence of natural enemies of pests was low. Henceforth, soil biodiversity is declining at a speeding rate attributed to this agriculture development

Pesticides affect biological diversity, along with habitat loss and climate change. They have toxic effects in the short term on directly exposed organisms or long-term effects by causing changes in habitat and the food chain (Isenring, 2010). For example insecticides kill insect pest, herbicides kill weeds, fungicides kill fungi, nematicides kill nematodes and termiticides kill termites (Manual, 2013). However, Communities of different animal and plant species perform vital functions within ecosystems and are more stable (Eisenhauer et al., 2009)

In the recent decades, knowledge and information have intensively determined agricultural production decisions (Escalada & Heong, 2012). Most of small scale farmers in Budondo Sub County lack access to appropriate information due to financial inabilities and inadequate extension services. Many of the problems in conserving biodiversity are associated with the lack of recognition of the importance it plays in agricultural production. Although many farmers and the farming community have a profound knowledge of their agriculture, training and education is often needed to highlight the roles of the soil biota at various levels of the ecosystem/landscape (Tukamushaba, Mugonola, Otieno, Bugenyi, & Kibikyo, 2016)

Farmers' awareness, labour supply by household members, the effectiveness for pest control and motivation have significant effect on the choice of pest management method (Impact, 2016; Segura, Barrera, & Morales, 2004).

Knowledge on the pesticidal residues of crops among farmers is essential because of their hazardous effect not only on humans but on the environment as well (Lutap & Atis, 2013). Labor supplied by household members was most frequent for pest control; only organic farmers exchanged labor for this purpose. However, a low effectiveness for pest control was commonly perceived, probably due to a feeling among the organic farmers of a low impact of their pest management extension service, whereas a lack of motivation and laziness were prevalent among the nonorganic farmers, shown by a concern with their low crop yields and the emigration of youth (Segura et al., 2004).

Organic pest control is a very slow process and it will take good amount of time for you to witness its benefits. Organic farmers believe that Organic pest control methods are non-hazardous to the health of both human and animal population will not pollute the environment; will not help in bringing down the fertility of the soil. Using chemical pest control products like weed killers, acids, pest control sprayers etc. are highly toxic and especially the pest control aerosols will cause lungs disorders, cancer, etc. Chemical pest control products are more expensive than organic pest control methods. The amount a farmer spends for

buying neem oil, onions, pepper, urine, ash etc. would really be very cheap.

Well planned communication strategies could correct such misperceptions hence improved skills and decisions on pest management (Escalada & Heong, 2012). Incentives and investment could also promote biodiversity conservation (Gudka et al., 2014)

The researchers' specific objectives to this study were:

- To assess the impact of crop pests in Budondo Sub County
- To determine the pest management practices used by farmers for soil biodiversity conservation in Budondo Sub county
- To assess the attitude of farmers towards the use of organic pest management practices in Budondo Sub county

Description of study area: Budondo is one of the 12 sub counties (6 rural and 6 urban) in Jinja District in Busoga region and in Uganda. It has five (5) parishes and a total of thirty eight (38) villages. It is located in Kagoma County along River Nile west of Jinja Town. It is about 10 Km from Jinja town. Budondo Sub County community has a total population of 45,035 male and female who live in 8502 households (Statistics, 2005). The average household is 5.3 with an average land holding of 1.5 acre per household (Statistics, 2005).

MATERIALS AND METHODS

This was a case study conducted through a descriptive survey research design. It was concerned with establishing farmers' attitudes about organic pest management practices and conservation of soil biodiversity in Budondo Sub County, Jinja District.

Descriptive approach was used in order to gather information about the present existing condition and utilize observations in the study (Creswell, 2003). The research study partially based its findings through both quantitative research methods in order to permit a flexible and iterative approach. It also employed qualitative research method in order to find and build theories that would explain the relationship of one variable with another variable through qualitative elements in research (Atomica, 2010). A total of 340 respondents was randomly determined using a probabilistic sampling design specifically simple random sampling from 8502 household in Budondo Sub County chosen in line with Strydom and De Vos sample determination table (De Vos & Strydom, 1998).

Researchers used both administered questionnaire, interviews, observations and documentary analysis as the main tools for collecting data. They were concerned with views, perceptions, opinions, attitudes and behaviours of the respondents (Otieno, Buyinza, Kapiyo, & Oindo, 2013). Questionnaires were administered by the interviewer especially where concepts were difficult to interpret by farmer respondents. The data obtained through a questionnaire was similar to that obtained through an interview because of the open ended questions (Burns & Grove, 1993). Descriptive statistics for the survey items was summarized in the text and reported in tabular and chart forms. Frequencies analyses were conducted to identify valid percent for responses to all the questions in the survey. To determine the effects of experience, knowledge and attitude on soil biodiversity conservation, Chi Square was run using statistical package for social sciences (SPSS) version 21.0 to test specific hypothesis to determine their significance levels. The Phi and Cramer's V yielded the Chi-Square values to show the degree of association. Attitude of farmers in Budondo Sub County was also tested with the help of Likert test. Scores were ranked 5 for strongly agree, 4 for agree, 3 for not sure, 2 disagree and 1 for strongly disagree.

RESULTS AND DISCUSSIONS

Socio- demographic characteristics of respondents

The socio-demographic characteristics of respondents were tabulated from questionnaires describing bio-data, education background and occupation of respondents in the five parishes of Budondo Sub-County (Table 1).

The mean age of 37.6 of household respondents authenticated the responses given the Ugandan age of consent of 18 years. This supports Segura et al (2004) who suggested that the youth emigrate from their farming communities and perhaps are less motivated to carry out farming. It also implies that pest management was carried out by the mature farmers who had knowledge and made farming decisions on the choice of farm inputs used (Lutap & Atis, 2013).

Table 1: Socio-demographic Characteristics of Respondents in Budondo Sub-County (N=340)

Characteristics	Frequency	Percentage
Age		
10-19	27	7.9
20-29	77	22.6
30-39	83	24
40-49	88	25.9
50-59	34	10.0
≥ 60	31	9.1
Mean	37.6	-
Sex		
Male	154	45.3
Female	186	57
Marital status		
Single	62	18.2
Married	199	58.5
Divorced	9	2.6
Widowed	51	15
Separated	19	5.6
Dependants		
1-5	145	42.6
6-10	140	41.2
11-15	40	11.8
≥ 16	15	4
Highest education level		
Primary	151	44
O' level	88	25.9
A' level	20	5.9
College/ University	12	3.5
Never to school	69	20.3
Occupation		
Farming	300	88.2
Trading	34	10
Civil servant	6	1.8
Working experience		
1-2 years	48	11
3-4 years	61	17.9
5-6 years	46	13.5
≥ 7 years	185	54
Parish		
Ivunamba	83	24
Namizi	73	21.5
Kibibi	74	21.8
Buwaji	63	18.5
Nawangoma	47	13.8

More than a half of respondents were female (57%) indicating gender sensitivity and farming dominance by female. Over a half of respondents were married (58.5%) and had over six dependants (57.4%) (Table 1). This indicates that the most of households practiced farming to produce food to survive their household members and generate income to help them fulfill their needs and responsibilities (Mal et al., 2009).

Over three quarters of household respondents (79.7%) attended formal education. This shows that they had the capacity to be sensitized about organic pest management practices and implement them effectively. The major economic activity in rural communities was farming (Mal et al., 2009).

This is manifested by the majority of household respondents (88.2%) whose occupation was farming with over 5 years' experience (70.5%) (Table 1). The respondents (an average of 20%) were randomly selected from each of the five parishes that constitute Budondo Sub-County. This intended to ensure an equal representation of the study area.

From table 1, farming was the major occupation (88.2%) for the mature (mean age= 37.6) and married (58.5%) in Budondo Sub County. It was practiced to provide a source of food for survival and to sustain their families given a large number of household dependents of six and above. All the respondents were from parishes of Budondo Sub

County and therefore were key stakeholders of the study.

Impact of crop pests in Budondo Sub County

Over a half of respondents grew most of vegetables i.e. Cabbage (67.4%), Tomatoes (74%), Pumpkins (50.3%) and greens like dodo, sukuma etc. (87.1%) (Table 2). This was due to Budondo's conducive ecology for vegetable growing enhanced by her location near River Nile and proximity to Jinja town. Respondents revealed that Ginger farming (27.1%) had just been introduced in the area whereas Onions (38.8%) and Carrots (40.6%) were progressing due to increasing demand in and neighboring markets (Table 2). This was in line with Pophiwa who urged that there was a growing demand for food globally most especially organically produced (Pophiwa, 2012).

Table 2: Crops Grown in Budondo Sub-County (N=340)

Crops	Yes (%)	No (%)
Vegetables		
Cabbage	229 (67.4)	111 (32.6)
Carrots	138 (40.6)	202 (59.4)
Tomatoes	253 (74)	87 (25.6)
Onions	132 (38.8)	208 (61.2)
Pumpkins	171 (50.3)	169 (49.7)
Ginger	92 (27.1)	248 (72.9)
Greens	296 (87.1)	44 (12.9)
Other vegetables	23 (6.8)	317 (93.2)
Cereals		
Maize	332 (97.6)	8 (2.4)
Rice,	124 (36.5)	216 (63.5)
Millet	83 (24)	257 (75.6)
Sorghum	25 (7.4)	315 (92.6)
Other cereals	0 (0.0)	340 (100)
Root tubers		
Cassava	291 (85.6)	49 (14)
Sweet potatoes	319 (93.8)	21 (6.2)
Yams	264 (77.6)	76 (22.4)
Other root tubers	8 (2.4)	332 (97.6)
Fruits		
Banana	317 (93.2)	23 (6.8)
Pawpaw	215 (63.2)	125 (36.8)
Oranges	135 (39.7)	205 (60.3)
Jack fruit	287 (84)	53 (15.6)
Mangoes	251 (73.8)	89 (26.2)
Passion fruits	175 (51.5)	165 (48.5)
Pineapples	48 (11)	292 (85.9)
Other fruits	16 (7)	324 (95.3)
Legumes		
Ground nuts	304 (89.4)	36 (10.6)
Beans	329 (96.8)	11 (3.2)
Soya	259 (76.2)	81 (23.8)
Peas	36 (10.6)	304 (89.4)
Other legumes	19 (5.6)	321 (94)

Maize was the dominant cereal crop grown in Budondo Sub-County as agreed by (97.6%) (Table 2). This was because maize is the traditional food and cash crop in the study area and promotes food security. There was also a high demand of maize by schools, prisons and neighborhood countries. Rice growing was represented by (36.5%), millet (24%) and Sorghum 7.4% possibly due to their unfavourable ecological environment in the study area. More than three quarters of respondents agreed that cassava (85.6%), sweet potatoes (93.8%) and yams (77.6%) were grown by the majority households. This indicated that farmers in Budondo value the traditional staple foods.

Most households grow banana (93.2%), jack fruit (84%), mangoes (73.8%), pawpaw (63.2%) and passion fruits (51.5%) (Table 2). This was possibly due to high demand of fruits by urban dwellers around the study area. However, orange growing (39.7%) was still low while pineapple growing (11%) was left to isolated farmers possibly due to little awareness about their growing methods. Most of respondents agreed that legumes grown were beans (96.8%) followed by ground nuts (89.4%), and soya (76.2%). This is because they were consumed in different forms. Peas (10.6%) are grown by isolated farmers (Table 2) possibly due to little awareness about the value and growing methods of it.

It was found out that (85.9%) of household respondents were aware of pests (Table 3), very few could identify aphids (15.6%), whiteflies

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(7.6%), mealy bugs (10.6%), cut worms (15%), stem borers (25.9%), hoppers and locusts (22.9%), african boll worm (7.1%), african army worm (7.1), thrips (10.9%), leaf minors (17.6%) and white grabs (12.4%). Little knowledge about pests implies that farmers were unable to establish the growing habits and behaviours of the pests. This probably limited farmers' ability to choose the appropriate method of control and possibly adopt to pesticides as the only solution. This contradicts the IPM approach which relies on knowledge and experience. To minimize losses to pests, farmers should have awareness about the types of pests which attack crops as well as their biology which is not the case in Budondo (Lutap & Atis, 2013)

Almost a half of respondents identified termites (45.6%) as pests. This indicates that some of the farmers in Budondo Sub County knew little about other functions of termites. Most farmers in Budondo knew pests by local names (53.5%), others saw pests' symptoms on their crops while others saw them physically but were not aware of their names. This indicated that pests were common in the study area.

Table 3: Knowledge about Pests in Budondo Sub-County (N=340)

Variables	Yes (%)	No (%)
Are you aware of pests	292 (85.9)	48 (11)
Pests		
Aphids	53 (15.6)	287 (84)
White flies	26 (7.6)	314 (92.4)
Mealy bugs	36 (10.6)	304 (89.4)
Termites	155 (45.6)	185 (54)
Cut worms	51 (15.0)	289 (85.0)
Stem borers	88 (25.9)	252 (71)
Hoppers and locusts	78 (22.9)	262 (77.1)
African boll worm	24 (7.1)	316 (92.9)
African army worm	24 (7.1)	316 (92.9)
Thrips	37 (10.9)	303 (89.1)
Leaf miners	60 (17.6)	280 (82.4)
White grubs	42 (12.4)	298 (87.6)
Others	182 (53.5)	158 (46.5)
Pest management practice		
Spray them using pesticides	278 (81.8)	62 (18.2)
Pick them by hands	48 (11)	292 (85.9)
Weed crops to prevent pests	113 (33.2)	227 (66.8)
Crop rotation	142 (41.8)	198 (58.2)
Intercropping	110 (32.4)	230 (67.6)
Spray using a mixture of any of urine, red pepper, neem, onions etc.	103 (30.3)	237 (69.7)
Use ash mixed with pepper and urine	112 (32.9)	228 (67.1)
Leave them	38 (11.2)	302 (88.8)
Any other	10 (2.9)	330 (97.1)

Table 3 also portrays that spraying with pesticides (81.8%) was the common method used towards managing pests in Budondo Sub-County. This justifies that crops in Budondo Sub-County were largely affected by pests and farmers tried to prevent crop losses to insects and other pests by spraying with pesticides (Seymour, 2004).

As discussed by Lutap and Atis (2013) about organic methods of controlling pests, less than a half of households agreed that farming practices reduce on pest infestation for example picking pests by protected hands (11%), weeding crops to prevent pests (33.2%), rotating crops (41.8%), intercropping (32.4%), spraying with a mixture of any of urine, red pepper, neem or onions (30.3%), using a mixture of pepper and urine (32.9%) while others left them (11.2%) (Table 3). This little awareness could perhaps be due to little exposure to organic pest control measures (Sebastian et al., 2003)

The knowledge of households about the effects of pests and the use of pesticides to manage pests was tested using a 5 score point Likert scale as shown in Table 4.

Table 4: Likert Scale for the Effect of Pests in Budondo Sub-County (N=340)

Variables	Strongly agree (x5)	Agree (x4)	Not sure (x3)	Disagree (x2)	Strongly disagree (x1)
Pests attack crops	235 (1175)	99 (396)	6 (18)	0 (0)	0(0)
Pests cause significant yield loss	215 (1075)	112 (448)	13 (39)	0 (0)	0(0)
Pesticides and herbicides kill every insect pest and weed they come across	38 (190)	152 (608)	109 (327)	30 (60)	11 (11)
Pesticides kill bees,	12 (60)	74 (296)	157 (471)	60 (120)	37 (37)
Pesticides kill wasps	10 (50)	72 (288)	164 (492)	60 (120)	34 (34)
Pesticides kill earth worms	16 (80)	69 (276)	159 (477)	61 (122)	35 (35)
Pesticides kill ants	34 (170)	88 (352)	145 (435)	49 (98)	24 (24)
Skin itches when use pesticides	97 (485)	123 (492)	92 (276)	22 (44)	6 (6)

As manifested in the respondents' scores of response, the people of Budondo Sub County strongly agreed that pests attacked their crops (1175) and caused significant yield loss (1075) killed every insect pest and weed they came across (608). This could perhaps be the reason why they sprayed with pesticides (Kellogg, Nehring, Grube, Goss, & Plotkin, 2000). They agreed that the skin itches with use of pesticides (492) but were not sure whether pesticides killed bees (471), wasps (492), earthworms (477) and ants (435) as shown on Table 4. This implied that households in Budondo Sub-County used inorganic pesticides to minimize crop losses by pests with little knowledge of their negative effects on other non-target beneficial organisms. They also agreed that pesticides and herbicide

Table 5: Likert Scale for the Effect of Inorganic Pesticides on Soil Macro Fauna in Budondo Sub-County (N=340)

Statement	Strongly agree (x5)	Agree (x4)	Not sure (x3)	Disagree (x2)	Strongly disagree (x1)
Herbicides decrease organic matter from weeds	71 (355)	130 (520)	124 (372)	11 (22)	4 (4)
Pesticides and herbicides once sprayed on crops will further kill termites and earthworms	48 (240)	104 (416)	143 (429)	32 (64)	13 (13)

The knowledge of households about the effects of inorganic pesticides on soil macro fauna was tested using a 5 score point Likert scale as shown in Table 5. As manifested in the scores of response, farmer respondents in Budondo Sub County agreed that herbicides decreased organic matter from weed (355 for strongly agree) and (520 for agree). This meant that herbicides once sprayed, not only cleared weed but also killed macro fauna that lived in and under weeds as stressed by Seymour (2004).

They were not sure whether once pesticides and herbicides were sprayed on crops, would further kill termites and termites (429). This indicated little awareness about the effects of inorganic pesticides on soil biodiversity. It also indicated that farmers sprayed crops with chemical pesticides that they had little knowledge about.

Farmers' attitude on organic pest management practices

Household farmers in Budondo Sub-County had a negative attitude towards organic pest management practices. This was clearly shown in Table 6 where more than a half of respondents could not agree that; good seed bed preparation could expose pests to external enemies (70.9%), use of pest and disease free seeds (65%), crop rotation (55.3%), inter-planting (76.5%), early planting(79.1%), hand weeding (72.9%), hand picking of pests (82.1%), pruning infected parts (71.2%), use of ash and urine (70.6%) and use of neem, pepper and onion mixtures (81%)

effectively eliminate pests. They believe that organic pest control practices are slow as compared to pesticides eliminating pests quickly and effectively (Lutap & Atis, 2013).

Table 6: Farmers' Attitude on Organic Pest Management Practices in Budondo Sub-County (N=340)

Variables	Yes (%)	No (%)
In your opinion, can the following farming practices effectively eliminate pests?		
Good seed bed preparation to expose pests to external natural enemies	99 (29.1)	241 (70.9)
Use of pest and disease free seeds	119 (35.0)	221 (65.0)
Crop rotation	152 (47)	188 (55.3)
Inter-planting with crops that repel pests like onions and garlic	80 (23.5)	260 (76.5)
Early planting at onset of rains	71 (20.9)	269 (79.1)
Hand weeding limits the host range of different pests that like weedy areas	92 (27.1)	248 (72.9)
Hand picking of pests	61 (17.9)	279 (82.1)
Pruning infected plant parts controls pests	98 (28.8)	242 (71.2)
Use ash and urine	100 (29.4)	240 (70.6)
Use neem, pepper and onion mixtures	54 (15.9)	286 (81)
Any other	22 (6.5)	318 (93.5)
Are you aware of plant extracts that can be mixed to make organic pesticides?	174 (51.2)	166 (48.8)
Plant extracts that be mixed to form organic pesticides		
Neem tree	128 (37.6)	212 (62.4)
Onions	129 (37.9)	211 (62.1)
Garlic	94 (27.6)	246 (72.4)
Mexican marigold	100 (29.4)	240 (70.6)
Pepper	126 (37.1)	214 (62.9)
Ash	129 (37.9)	211 (62.1)
Any other plant	6 (1.8)	334 (98.2)

Even though more than half of farmers were aware of plant extracts that could be mixed to make organic pesticides (51.2%), a few of them could identify neem tree (37.6%), onions (37.9%), garlic (27.6%), Mexican marigold (29.4%), pepper (37.1%) and ash (37.9%) as ingredients. This was possibly due to lack of motivation and exposure about the procedure and process of mixing them (Sebastian et al., 2003; Segura et al., 2004).

Table 7: Likert Scale for the Farmers' Attitude on Organic Pest Management and Conservation of Soil Biodiversity in Budondo Sub-County (N=340)

Statement	Strongly agree (x5)	Agree (x4)	Not sure (x3)	Disagree (x2)	Strongly disagree (x1)
Organic pest management practices can eliminate pests without the use of pesticides	32 (160)	98 (392)	128 (384)	58 (116)	24 (24)
Termites are a nuisance so should be poisoned by termiticide to completely eliminate them	142 (710)	133 (532)	42 (126)	19 (38)	4 (4)
Pests can only be eliminated by pesticides	135 (675)	104 (416)	64 (192)	34 (68)	3 (3)

Farmers' attitude on organic pest management practices and conservation of soil biodiversity was tested using a 5 score point Likert scale as shown in Table 7.

As manifested in the scores of response, farmer respondents agreed that organic pest management practices could eliminate pests without the using artificial pesticides (392), not sure (384). This implied that the farmers in Budondo Sub County had hope in organic pest control methods. Most of them strongly agreed that termites were a nuisance so should be eliminated by termiticide (710). This means that termites are enemies of farmers and could not be spared. Most of farmers strongly agreed that pests can only be eliminated by pesticides (675). This clearly indicates that attitude of farmers towards pest control is skewed to the

effectiveness and easily use of inorganic pesticides.

Chi square results indicated that farming experience, knowledge for use of pesticides and attitude significantly affected conservation of biodiversity.

At χ^2 (33, n=340) =33.208, p = .46 experience shows a statistically significant association with soil biodiversity conservation since it is less than 0.5. Phi and Cramer's V tests revealed the strength of the association between the variables being very strong (Table 8). The association of farmers' knowledge of use of inorganic pesticides and soil biodiversity conservation at χ^2 (77, n=340) =180.441, p< .001 was strongly significant. The association of farmers' attitude on organic pest management practices and soil biodiversity conservation at χ^2 (99, n=340) =161.511, p< .001 was strongly significant.

Table 8: Chi-Square Statistic Value of Experience, Knowledge and Attitude on Soil Biodiversity Conservation in Budondo Sub-County (N=340)

Independent Variables	Value	Degree of freedom (df)	Chi-Square(χ^2) calculated	Phi and Cramer's V
Experience in farming	33.208[a]	33	.457	.457
Farmers knowledge of use of inorganic pesticides	180.441[b]	77	.000	.000
Farmers attitude on organic pest management	161.511[c]	99	.000	.000

Note. a. 33 cells (68.8%) have expected count less than 5. The minimum expected count is .10.
b. 76 cells (79.2%) have expected count less than 5. The minimum expected count is .02.
c. 100 cells (83.3%) have expected count less than 5. The minimum expected count is .02.

CONCLUSION

Most of household in Budondo Sub County who practice farming have faced the problem of crop pests. The pests have reportedly attacked farmers' crops and caused significant losses. Soil macro fauna especially termites and earthworms have also been reported as pests by respondents there by disregarding their long term economic benefits of decomposing organic matter and nutrient recycling among others. Due to this pest problem farmers have resorted to use of inorganic pesticides as claimed by respondent (86.5%) because of their attitude that, they are easier to use and effective in eliminating pests. There could be other friendly ways of controlling pests which are organic but Farmers in Budondo have been under-looked due to inadequate knowledge which was found significant at (χ^2 (77, n=340) =180.441, p< .001) and attitude (χ^2 (99, n=340) =161.511, p< .001) as to whether they could control pests or not.

RECOMMENDATIONS

Based on findings, it is recommended that the Government of Uganda should make and adopt a policy and action plan on organic pest management for sustainable soil biodiversity conservation. Farmers in Budondo should be sensitized about attitude change for organic pest management practices and soil biodiversity conservation. Adoption to organic pest management practices should be implemented with several approaches and strategies which includes farmers' participation if any success is to be registered.

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