

**INDIGENOUS METHODS OF CONTROLLING PESTS AMONG RICE FARMERS  
IN PATIGI LOCAL GOVERNMENT AREA OF KWARA STATE, NIGERIA**

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**ABSTRACT**

*Considering the negative effects of the continuous dependence on chemical, it is therefore necessary to look into the potentials in local experiences and practices adopted by rice farmers to control pests. The objective of the study is to assess the indigenous methods used to control pests of rice by farmers in Patigi Local Government Area of Kwara State, Nigeria. Simple random technique was used to select one hundred and five (105) rice farmers. Data were collected using interview schedule and analyzed using frequencies, percentages and Pearson correlation. The finding showed that majority (82.9%) of the rice farmers were male, close to two-third (63.8%) fell above 40 years of age and almost all (97.1%) were married, more than half (59.1) had no formal education with farm size of not less than 5 acres. The results also showed that some of the indigenous methods of controlling pests of rice are: by use of raw fruits of pawpaw, wood ash, light trap, exudates substances, frightening sounds, torchlight batteries, cassette tape and use of wire-mesh. An overwhelming number (98.1%) of the respondents attested that the indigenous control methods were effective but very low percentage (1.9%) of the farmers often used it and majority (81.0%) of them obtained information about it from their parents, grand parents and relations. The results further showed that there were significant relationship between educational level and the use of indigenous control methods ( $r=-0.411$ ,  $P=0.000$ ) but there were no relationship between age ( $r=0.067$ ,  $P=0.496$ ), farm size ( $r=0.028$ ,  $P=0.773$ ) and the use of indigenous control methods. Few numbers of rice farmers employed indigenous control method but an overwhelming number of them attested to its effectiveness. Therefore, development agents need to recognize it, value it, appreciate it in their interaction with the local communities and also incorporate it in their approaches.*

**Key words:** Pests, measure, indigenous knowledge, Nigeria

**INTRODUCTION**

The Nigerian rice sector has seen some remarkable developments over the last quarter-century. Both rice production and consumption in Nigeria have vastly increased during this period. Notwithstanding, the production increase was insufficient to match the consumption increase -with rice imports making up the shortfall. With rice now being a structural component of the Nigerian diet and rice imports making up an important share of Nigerian agricultural imports, there is considerable political interest in increasing local rice production (Akpokodje, 2001). In spite of the concerted efforts by the Nigerian Government to achieve the status of 'self-sufficiency' in production, the challenges of post-harvest technology such as destoning, polishing, packaging as well as the problems of diseases and pests infestation have made the dream a mirage. Thus, massive importation of rice into the country has become a celebrated affair, to the extent that, a whopping sum of 50 billion naira was earmarked for rice importation towards the middle of year 2008 by the Federal Government of Nigeria (Akande, 2006).

According to the report given by International Rice Research Institute (IRRI, 1991), the 360 metric tons of rice production in the 1960s were not enough to meet the local demand in Nigeria for the commodity, although the quality of locally produced rice was poor when compared with the imported. One of the major causes of decline in the output is the problem of pests and disease infestation. The use of chemical control methods on rice pest and diseases has increasingly posed a lot of difficulty like environmental pollution and resistance to chemicals by pests and diseases. The use of chemical insecticides has been dominating the plant protection since 1950s. This parochial approach has led to neglect on the study of alternative pest and disease management methods and has increased pest outbreak and disease.

In the emerging global knowledge economy a country's ability to build and mobilize knowledge capital, is equally essential for sustainable development as the availability of physical and financial capital (World Bank, 1997). The basic component of any country's knowledge system is its indigenous knowledge. It encompasses the skills, experiences and insights of people, applied to maintain or improve their livelihood. Indigenous knowledge is also the social capital of the poor, their main asset to invest in the struggle for survival, to produce food, to provide for shelter or to achieve control of their own lives. Indigenous knowledge is the local knowledge that is unique to a given culture or society. Indigenous knowledge (IK) contrasts with the international knowledge system generated by universities, research institutions and private firms. It is the basis for local-level decision making in agriculture, health care, food preparation, education, natural-resource management, and a host of other activities in rural communities (Warren 1991). Indigenous Knowledge according to Flavier (1995) is the information base for a society, which facilitates communication and decision-making. Indigenous information systems are dynamic, and are continually influenced by internal creativity and experimentation as well as by contact with external systems.

Today, many indigenous knowledge systems are at risk of becoming extinct because of rapidly changing natural environments and fast pacing economic, political, and cultural changes on a global scale. Practices vanish, as they become inappropriate for new challenges or because they adapt too slowly. However, many practices disappear only because of the intrusion of foreign technologies or development concepts that promise short-term gains or solutions to problems without being capable of sustaining them. The tragedy of the impending disappearance of indigenous knowledge is most obvious to those who have developed it and make a living through it. But the implication for others can be detrimental as well, when skills, technologies, artifacts, problem solving strategies and expertise are lost (World Bank, 1998).

Indigenous knowledge is cheaper but not yet fully utilized in the development process and considering the negative effects of the continuous dependence on chemical such as increase in the rate of environmental pollution, resistance of pest and diseases to the chemicals as later offspring's develop resistant genes to the chemical and increase in the price of agricultural output due to expensive rate of agrochemicals. In view of this, this study looked into the potential in local experiences and practices adopted by rice farmers to control pests. The study gave answers to the following questions: What are the demographic characteristics of rice farmers in Patigi local government area of Kwara State, Nigeria?; What is the frequency of usage of indigenous pests control methods of rice?; How effective are these control methods?; What are the sources of information of these indigenous control methods?

### Objectives of the study

The general objective of the study is to assess the indigenous methods used to control pests of rice by farmers in Patigi Local Government Area of Kwara State, Nigeria. The specific objectives are to:

- determine the demographic characteristics of rice farmer in Patigi Local Government Area of Kwara State, Nigeria
- determine the frequency of usage of indigenous methods of controlling pests of rice used by these farmers
- investigate the effectiveness of these indigenous methods of controlling pests of rice
- identify the source of information of these control methods available to these farmers.

### Hypothesis of the study

There is no significant relationship between the selected demographic characteristics of the rice farmers and the use of indigenous methods of controlling pests of rice.

### METHODOLOGY

The study was carried out in Patigi Local Government Area of Kwara State, Nigeria. The study population is constitute of all rice farmers' in Kwara. Patigi Local Government was purposely selected as the study area because the farmers there are predominantly rice producers. The list of the villages under this Local Government was obtained from the head of department (Agriculture), Patigi Local Government, Patigi, Kwara state, Nigeria. Seven villages that were leading in rice production were purposively selected and these villages are Patigi, Rogun, Latayi, Yagbagi, Nankope, Tutugi and Ezhigiko. Fifteen rice farmers were randomly selected from each of the aforementioned villages and this gave a sample size of one hundred and five [105] respondents. Both primary and secondary data were used. The primary data was obtained from the field survey using interview schedule. The content of the interview schedule was validated by experts in the Department of Agricultural Extension and Rural Development of University of Ilorin, Ilorin, Nigeria. Descriptive statistics such as frequency, percentage, mean and inferential statistics such as spearman rho were employed in testing the hypothesis.

### RESULTS AND DISCUSSION

#### Demographic Characteristics of the Respondents

The results from Table 1 indicate that majority (63.8%) of the respondent were above 40 years of age, 27.8% were 30-40years old while 8.6% were below the age of 31years. Age is an important factor in the indigenous knowledge system. The implication of this age distribution among these respondents is that since majority of them are old, they would be good source of information on indigenous control methods because of their knowledge based due to their long involvement in farming activities. More than two-third of the respondents (82.9%) were males while the rest (17.1%) were females. A very high percentage (78.1%) of the respondents was Muslims while 21.9% were Christians.

The Table shows that almost all (97.1%) of the respondents were married, 1.9% were single while 1.0% were separated. The high percentage of the married could be attributed to the fact that majority of them were adults with strong cultural, traditional and religious believe where divorce is not encouraged or even allowed. Marriage is a respected institution in the rural area and it confers social responsibility on the people. The table also shows that majority (59.1) of the respondents were with no formal education, 12.4% had adult education, 17.1% primary education, 10.4% secondary education while 1.0% had tertiary education.

The Table further showed that almost half (48.6%) had farm size between 5 to 9 acres of land while 23.8% cultivated between 10 and 14 acres with 5.7% using between 15-19 acres and

about 2.9% of the respondents. This is in line with (Erenstein, Frederic, Akande, Titilola, Akpokodje & Ogundele, 2003) which stated that Rice producing farm households are primarily small-holders with limited capital resources.

Table 1: Distribution of respondents according to their demographic characteristics.

| <i>Characteristics</i>   | <i>Frequency</i> | <i>Percentages</i> |
|--------------------------|------------------|--------------------|
| <b>Age (years)</b>       |                  |                    |
| ≤30                      | 9                | 8.6                |
| 31-40                    | 29               | 27.6               |
| 41-50                    | 4                | 3.8                |
| >50                      | 63               | 60.0               |
| <b>Gender</b>            |                  |                    |
| Male                     | 87               | 82.9               |
| Female                   | 18               | 17.1               |
| <b>Marital Status</b>    |                  |                    |
| Single                   | 2                | 1.9                |
| Married                  | 102              | 97.1               |
| Divorced                 | -                | -                  |
| Widowed                  | 1                | 1.0                |
| Separated                | -                | -                  |
| <b>Religion</b>          |                  |                    |
| Islam                    | 82               | 78.1               |
| Christianity             | 23               | 21.9               |
| Traditional              | -                | -                  |
| <b>Educational Level</b> |                  |                    |
| No formal education      | 62               | 59.1               |
| Adult education          | 13               | 12.4               |
| Primary education        | 18               | 17.1               |
| Secondary education      | 11               | 10.4               |
| Tertiary education       | 1                | 1.0                |
| <b>Farm Size(Acres)</b>  |                  |                    |
| <5                       | 25               | 23.8               |
| 5-9                      | 51               | 48.6               |
| 10-14                    | 20               | 19                 |
| 15-19                    | 6                | 5.7                |
| >20                      | 3                | 2.9                |

Source: Field survey 2007

#### Frequency of Usage of Indigenous Control Methods

Table 2 revealed that an overwhelming number of the respondents indicated that they rarely use indigenous methods in controlling pests of rice. The table showed that all respondents (100.0%) seldom use light traps and touch light batteries. 99.0%, 98.1%, 95.2%, 93.3%, 92.4% and 88.6% indicated also that they seldom use wood ash, wire mesh, exudates substances, cassette tapes, raw fruits of pawpaw and frightening sounds respectively. The table also showed that the respondents did not indicate using wood ash, light trap and torchlight batteries occasionally at all while 8.6%, 5.7%, 5.7%, 4.8% and 1.9% occasionally used frightening sounds, raw fruits of pawpaw, cassette tapes, exudates substance and wire-mesh respectively. The table further showed that the only indigenous method that the respondents indicated that they used often is frightening sounds with a very low percentage of 2.8; this is followed by raw fruits of pawpaw (1.9%), cassette tapes (1.0%) and wood ash

(1.0%). The rarely usage of indigenous control methods among the rice farmers might be due to the availability and easy application of agrochemicals. This is a replacement of traditional methods by modern technology.

Table 2: Frequency Distribution of Usage of Indigenous Control Methods

| Indigenous methods used | Frequency of usage |       |              |     |           |     | Rank            |
|-------------------------|--------------------|-------|--------------|-----|-----------|-----|-----------------|
|                         | Seldom             |       | Occasionally |     | Often     |     |                 |
|                         | Frequency          | %     | Frequency    | %   | Frequency | %   |                 |
| Raw fruits of pawpaw    | 97                 | 92.4  | 6            | 5.7 | 2         | 1.9 | 2nd             |
| Wood ash                | 104                | 99.0  | -            | -   | 1         | 1.0 | 3rd             |
| Light trap              | 105                | 100.0 | -            | -   | -         | -   | 5th             |
| Exudates substances     | 100                | 95.2  | 5            | 4.8 | -         | -   | 5th             |
| Frightening sounds      | 93                 | 88.6  | 9            | 8.6 | 3         | 2.8 | 1 <sup>st</sup> |
| Torchlight batteries    | 105                | 100.0 | -            | -   | -         | -   | 5 <sup>th</sup> |
| Cassette tape           | 98                 | 93.3  | 6            | 5.7 | 1         | 1.0 | 3 <sup>rd</sup> |
| Wire-mesh               | 103                | 98.1  | 2            | 1.9 | -         | -   | 5th             |

Source: Field survey 2007

#### Effectiveness of Indigenous Methods of Controlling Pests of Rice

Results in table 3 indicates that an overwhelming number (98.1%) of respondents indicated indigenous methods of controlling pests of rice as effective while just 1.9% indicated that the indigenous methods of controlling pests of rice as not being effective.

Table 3: Frequency Distribution of Perceived Effectiveness of Indigenous Methods of Controlling Pests of Rice.

| Effectiveness | Frequency | Percentage |
|---------------|-----------|------------|
| Effective     | 103       | 98.1       |
| Not effective | 2         | 1.9        |
| Total         | 105       | 100.0      |

Source: Field survey 2007

#### Sources of Information of the Indigenous Control Methods available to Rice Farmers

Results in table 4 shows that a majority (62.9%) of the respondents indicated that they received information about indigenous control methods from their parents and grand parents, followed by relation (18.1%). This might be to the closeness and good rapport between parents and their children and also among the relative in the rural areas. The table also shows that very low percentage (5.7%) got their information from radio while 13.3% obtained theirs from friends.

**Table 4: Frequency distribution of sources of information of indigenous control methods available to rice farmers.**

| <i>Sources of information</i> | <i>Frequency</i> | <i>Percentage</i> |
|-------------------------------|------------------|-------------------|
| Friends                       | 14               | 13.3              |
| Relations                     | 19               | 18.1              |
| Parents and Grand Parents     | 66               | 62.9              |
| Radio                         | 6                | 5.7               |
| Total                         | 105              | 100.0             |

Source: Field survey 2007

**Results of Tests of Hypothesis**

The null hypothesis stated that "there is no significant relationship between the selected demographic characteristics of respondents and the use of the indigenous methods of controlling pests". From the result in Table 5, the Pearson correlation analysis of selected personal characteristics [age, educational level and farm size] and indigenous methods used to control pests of rice, the gender of the respondents is significant to the use of indigenous control methods ( $r=-0.411$ ,  $P=0.000$ ). The null hypothesis which held that there is no significant relationship between educational level and the use of indigenous control methods is rejected and the alternative hypothesis that there is significant relationship between educational level and the use of indigenous control methods is accepted. This means that the higher the level of education, the lower the indigenous methods used. However, there exist no significant relationship between the age ( $r=0.067$ ,  $P=0.496$ ), farm size ( $r=0.028$ ,  $P=0.773$ ) of respondents and the use of the indigenous control methods. The null hypothesis that there is no significant relationship between age, farm size and the use of indigenous control methods was therefore accepted. This means that age and farm size of respondents have nothing to do with the use of indigenous control methods.

**Table 5: Pearson correlation analysis of selected personal characteristics and indigenous methods used**

| <i>Variables</i> | <i>r-values</i> | <i>P</i> | <i>Decision</i> |
|------------------|-----------------|----------|-----------------|
| Age              | 0.067           | 0.496    | Not significant |
| Educ. Level      | -0.411          | 0.000    | Significant     |
| Farm size        | 0.028           | 0.773    | Not significant |

Source: Field survey 2007

**Indigenous Control Methods**

The various indigenous control methods indicated by the response are presented below

*Raw fruits of pawpaw:* The respondents reviewed that raw fruits of pawpaw could be used to control rats. They indicated that pawpaw would be grinded and the pieces are spread on the rice field. When rats find these and eat them, it will cause tissue. This will irritate their mouths and as a result, they will not be able to feed on the paddy.

*Wood Ash:*

The respondents indicated that wood ash is another indigenous pest control method. Ash is collected and put in bags and on trees within the rice field. Stick is then used to punch the bag so that ash will sprinkle on the rice. This, the farmer said would prevent some pests of rice.

*Light Trap*

Respondents revealed that a bright light could be used to attract pests in the right to a particular location where they could be caught. They explained that a spot in the field is dug and the farmers will fill this with water. Then an oil lamp is placed at the centre of this water. The insects attracted by the light get trapped in the lamp.

*Physical Disturbance*

Farmers indicated that they could use physical disturbances to chase pests of rice away from the field. They use brooms to brush the standing rice crops and this would chase the pests away.

*Exudates Substances*

Respondents revealed that there were some trees that have sticky substances which could be used to trip some pests of rice. They claimed that they apply these sticky substances on the winnowing fan and it is dragged along on the crop and then, pests get stuck into it.

*Frightening Sounds*

The farmers revealed that there were various devices that they used to generate frightening sounds that chase away pests of rice. They further said that they put two iron plates together which provide an intermittent beats that scare away pests like rats and birds.

*Torchlight batteries:* Insects are controlled using torchlight batteries. The contents of the torchlight's batteries are powdered and the dust is spread around the base of the crop when insects are noticed. The powder is mixed with water and the paste obtained is used to paint the floors of the paddy field. There is also the practice of breaking the used batteries into larger pieces which are buried in different part of the farm.

*Cassette tape:* Bad cassette tapes are used to control birds by fencing the rice plot to make a searing escrow to scare away birds. Broken bottle with empty tins could also be hanged on the rope to make a kind of sound that is strong enough to scare or chase away birds. Puppets dressed in human attires which appear like a man is also used to drive out birds from the rice

*Trapping and use of wire-mesh:* Trapping and wire-mesh are used in controlling grasscutters and rodents.

## CONCLUSION AND RECOMMENDATIONS

The indigenous knowledge systems of controlling pests of rice were gotten from many past generations and passed down from one generation to the other orally and was widely practiced before. It is now being neglected by many farmers despite the fact that they claimed that the methods were effective and it is being replaced nowadays by agrochemicals. These various indigenous control methods employed by very few rice farmers have not been scientifically verified but the farmers ascertained that the methods were effective. However, the long existence of the use of methods lends credent to its validity. Local participation of farmers in development projects should be encouraged because familiarity with indigenous knowledge would help the extension agents understanding of local peoples' problem and be able to communicate with them effectively. Development agents (CBOs, NGOs, governments, donors, local leaders, and private sector initiatives) need to recognize it, value it and appreciate it in their interaction with the local communities. Before incorporating it in their approaches, they need to understand it – and critically validate it against the usefulness for their intended objectives. It is also recommends that these indigenous control methods should be documented and incorporate with the use of agrochemicals.

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