Fish farmers’ usage of information on weather forecasts in Kwara state, Nigeria

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Abstract  
The study examined the fish farmers’ usage of Information on weather forecasts in Kwara State, Nigeria. 127 respondents were selected for the study. The data was analyzed using frequency count, percentage, mean and Binary Logistic Regression. The result showed that the mean age of the fish farmers was 32 years, about 682.5% of the fish farmers were male, about 36.2% has fishing as their primary occupation, about 98.45% of the respondents reared catfish and the mean annual income of the fish farmers was 1,191,181.10 Naira. Friends and Neighbors (x̅=3.40) are the highest ranked sources of weather forecast. The result revealed that about 74 % of the fish farmers have high usage level of weather forecast. The determinant factors of usage of weather forecast were years of experience in fish farming (0.809), income from fish farming (0.000) and cycle cultured per annum (-1.851). This study recommended that there should be provision of accurate, timely and continuous provision of information on the weather forecast to the fish farmers.

Key Words: Usage, Information, Weather Forecasts, Fish Farmers.

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Introduction

Agriculture remains the key sector that plays a vital role in the growth of most economies of the countries in sub-Saharan Africa. The Agricultural sector provides food for human consumption and raw materials for the industries and also serves as a source of foreign exchange earnings for Nigeria. The Agricultural sector in Nigeria is characterized by the low level of irrigation, low technology and productivity, land tenure problems, high production cost, limited financing, poor distribution of inputs and high labour intensity [1,2].

Fishing is one of the oldest means of livelihood for mankind [3]. Fish farming provides income and employment opportunities for several people in Nigeria. Fish has numerous nutritious advantages over meat as it has low cholesterol level [4]. Fish is a cheap and readily available source of protein for many people in Nigeria as about 3.2 million metric tonnes of fish are consumed per annum [4,5,6,7,8]. According to [9] fish consumers have a lower risk of having bowel cancer and also it helps in regulating the blood pressure of the consumers. Extension agents are expected to disseminate information on the health and nutritional benefits of fish to the consumers.

According to [10] Africa is one of the most susceptible continents to climate change. Annually, many parts of Africa suffered severe drought and floods [11]. Climate change is a major factor that is adversely affecting crops, fishes and livestock production. In agriculture, climate change negatively affects animal production due to impact of increasing temperature, feed grain unavailability and higher incidence of diseases outbreak [12]. Also, [13] stated that climate change has adversely affected agricultural output and food security of many farmers.

Fish production is an important source of livelihood that could help reduce high unemployment rate in Nigeria, reduce food insecurity and malnutrition as fish is an important source of protein. Hence, there is a need for quick research-based evidence on the usage of the provided information on the weather forecasting among the fish farmers so as to influence future government policy and intervention towards the fish farmers.

The importance of weather forecast in agricultural productivity cannot be over-emphasized as the climatic variables are changing and not predictable. Farmers rarely use information on weather forecast when made available [14]. Hence, there is a need for study on the usage of information on weather forecasts so as to determine the factors limiting the use of weather forecast among the fish farmers. The problem of climate change and inaccessibility to information on weather forecast are the main factors affecting culture fish farming in Kwara State, Nigeria. Although, several studies such as [15,16] have been carried out on use of Climate information for agricultural production. There seems to be paucity of information on the usage of weather forecasts among fish farmers in Kwara State, Nigeria. Therefore, there is a need to examine the fish farmers’ usage of information on weather forecasts in Kwara State, Nigeria.

The specific objectives were to:
1) To determine the socio-economic characteristics of the fish farmers in the study area.
2) To examine the fish farmers’ sources of information on weather forecast in Kwara State, Nigeria.
3) To assess the usage level of information on weather forecast by fish farmers in Kwara State, Nigeria.
4) To analyse the determinants of the usage of information on weather forecast.

Methodology

The research was carried out in Kwara State Nigeria. Kwara state is predominantly an agrarian State, people are into crop production and aquaculture in Kwara State, Nigeria. The population of the study comprised of all fish farmers in study area. The proportionate sampling of 56% of the total fish farmers (226) association members was used for the study. This gives a sample size of one hundred and thirty-seven (127) fish farmers as respondents. The data was collected through the use of questionnaires. The sources of
information on weather forecast was determined on a 4-point Likert typed scale of always=4, sometimes=3, rarely=2 and never=1. Usage of weather forecast by fish farmers was measured with the use of 2-point Likert typed scale where High Usage =1 and Low Usage =0. The socioeconomic factors influencing the use of weather forecast was measured with binary logistic regression. The data was analysed with the use of frequency counts, percentage, means and Binary logistic regression.

Results and Discussion
Socio-economic Characteristics of the Respondents
The result presented in Table 1 showed that mean age of the fish farmers was 32 years. This implies that the respondents were relatively young. This concurred with the findings of [17] which stated that most of fish farmers were still within their active years because fish farming needs energy and require activeness. The findings in Table 1 also revealed that about 68.5% of the respondents were males. This indicates that fishing activities are mainly practices by the males in Kwara State, Nigeria. This finding concurred with the findings of [18] who reported that majority of fish farmers in Kwara State, Nigeria were male. About 60.8% of the fish farmers were married. This implies that most of the fish farmers have families which they can use as source of labour in the farm. This corroborates the work of [19] which stated that most of the fish farmers were married and have children in which they use as source of labour. The mean household size of the fish farmers was 4 persons. The result in table 1 showed that fish farming was the primary occupation of about 36.2% of the respondents. About 50.4% of the fish farmers had tertiary education. This indicates that fish farmers were educated in the study area. this might be adduced to the technical skills that are required in fish farming. About 98.45% of the respondents cultured catfish. This shows that catfish is the main cultured fish. The mean years of experience in fishing activities was 4 years. The finding in Table 1 revealed that 1,191,181.10 Naira was the average annual income of the respondents. This implies that fish production is a profitable venture.

<table>
<thead>
<tr>
<th>Variables</th>
<th>Frequency (127)</th>
<th>Percentage (100%)</th>
<th>Mean</th>
<th>Standard Deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Age (years)</strong></td>
<td></td>
<td></td>
<td>32.0 Years</td>
<td>11.11</td>
</tr>
<tr>
<td>20 – 29</td>
<td>69</td>
<td>54.3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>30 – 39</td>
<td>31</td>
<td>24.4</td>
<td></td>
<td></td>
</tr>
<tr>
<td>40 – 49</td>
<td>12</td>
<td>9.4</td>
<td></td>
<td></td>
</tr>
<tr>
<td>50 and above</td>
<td>15</td>
<td>11.8</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Gender</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>87</td>
<td>68.5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td>40</td>
<td>31.5</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Marital Status</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Single</td>
<td>48</td>
<td>37.8</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Married</td>
<td>77</td>
<td>60.6</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Divorce</td>
<td>1</td>
<td>0.8</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Widow</td>
<td>1</td>
<td>0.8</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Household size</strong></td>
<td></td>
<td></td>
<td>4.0 Persons</td>
<td>2.3</td>
</tr>
<tr>
<td>1 – 5</td>
<td>112</td>
<td>88.2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6 – 10</td>
<td>11</td>
<td>8.7</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Above 10</td>
<td>4</td>
<td>3.1</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Educational Level</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

73
Non formal education 33 26.0
Primary education 2 1.6
Secondary education 28 22.0
Tertiary education 64 50.4

**Primary Occupation**
Arable Crops Farming 37 29.1
Hunting 7 5.5
Fishing 46 36.2
Trading 36 28.3
Artisan 1 0.8

**Types of fish cultured**
Catfish 125 98.4
Tilapia 2 1.6

**Fish farming experience** 4 Years 4.21
1 – 5 110 86.6
6 – 10 13 10.2
Above 10 4 3.1

**Annual Income**
\[
\begin{array}{|c|c|}
\hline
\text{Income Range} & \text{Number} \\
\hline
\leq 500,000 & 15 \\
500,001 – 1,000,000 & 54 \\
1,000,000 – 1,500,000 & 37 \\
\geq 1,500,000 & 21 \\
\hline
\end{array}
\]

Source: Field Survey 2022

**Fish Farmers’ Sources of Information on Weather Forecast**
The result table 2 showed that friends and Neighbours (\(\bar{x}=3.40\)) are the highest ranked sources of weather forecast. Internet (\(\bar{x}=2.78\)) and radio and Television (\(\bar{x}=2.30\)). This result indicated that friend and neighbours, internet and radio and Television are the main sources of information on weather forecast. This result is in agreement with the work of [16] which stated farmers get information about weather forecast through the use of internet and through the radio.

<table>
<thead>
<tr>
<th>Sources of Information On Weather Forecast</th>
<th>Always</th>
<th>Sometimes</th>
<th>Rarely</th>
<th>Never</th>
<th>Mean (SD)</th>
<th>Ranking</th>
</tr>
</thead>
<tbody>
<tr>
<td>Extension workers</td>
<td>21(16.5)</td>
<td>21(16.5)</td>
<td>18(14.2)</td>
<td>67(52.8)</td>
<td>1.96(1.167)</td>
<td>5th</td>
</tr>
<tr>
<td>Friends/neighbors</td>
<td>67(52.8)</td>
<td>50(39.4)</td>
<td>4(3.1)</td>
<td>6(4.7)</td>
<td>3.40(.769)</td>
<td>1st</td>
</tr>
<tr>
<td>Internet</td>
<td>37(29.1)</td>
<td>45(35.4)</td>
<td>26(20.5)</td>
<td>19(15.0)</td>
<td>2.78(1.028)</td>
<td>2nd</td>
</tr>
<tr>
<td>Newspapers</td>
<td>24(18.9)</td>
<td>21(16.5)</td>
<td>24(18.9)</td>
<td>58(45.7)</td>
<td>2.08(1.175)</td>
<td>4th</td>
</tr>
<tr>
<td>Radio/Television</td>
<td>16(12.6)</td>
<td>49(38.6)</td>
<td>20(15.7)</td>
<td>42(33.1)</td>
<td>2.30(1.065)</td>
<td>3rd</td>
</tr>
</tbody>
</table>

Sources: Field Survey 2022

**The Usage Level of Information on Weather Forecast by Fish Farmers**
The findings in Figure 1 revealed that about 74% of the fish farmers have high level of usage of information on weather forecasts while about 26% have low level of usage of information on weather forecast. This denotes that majority of the fish farmers utilize the information on weather forecasts in the study area. This further shows that the information received are reliable.
Determinants Factors influencing the Usage of Information on Weather Forecast

The result in Table 3 revealed that years of experience in fishing activities has a positive coefficient (0.809), annual income from fishing activities has a positive coefficient (0.000) and cycle cultured per year has a negative coefficient (-1.851). This result indicates that years of experience, income from fish activities and cycle cultured per year were the determinants factors of the usage of weather forecast. The increase in years of experience and income from fishing activities leads to an increase in the usage of weather forecasts information. However, there is an inverse relationship between the usage of information on weather forecast and the cycle cultured per annum. This is in line with the findings of [15] which stated that fish farmers who practice fish farming frequently and in large quantities make use of weather forecast better than the small-scale less frequent fish farmers.

<table>
<thead>
<tr>
<th>Variables</th>
<th>B</th>
<th>S.E.</th>
<th>Wald</th>
<th>Sig.</th>
<th>Exp(B)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>0.073</td>
<td>0.083</td>
<td>0.762</td>
<td>0.383</td>
<td>1.076</td>
</tr>
<tr>
<td>gender</td>
<td>0.790</td>
<td>0.680</td>
<td>1.349</td>
<td>0.245</td>
<td>2.204</td>
</tr>
<tr>
<td>Marital status</td>
<td>0.491</td>
<td>0.748</td>
<td>0.431</td>
<td>0.512</td>
<td>1.634</td>
</tr>
<tr>
<td>Household size</td>
<td>0.800</td>
<td>0.455</td>
<td>3.090</td>
<td>0.079</td>
<td>2.225</td>
</tr>
<tr>
<td>Education</td>
<td>0.173</td>
<td>0.110</td>
<td>2.444</td>
<td>0.118</td>
<td>1.188</td>
</tr>
<tr>
<td>Years of Experience</td>
<td>0.809</td>
<td>0.436</td>
<td>3.448</td>
<td>0.043*</td>
<td>2.245</td>
</tr>
<tr>
<td>Income from Fish farming</td>
<td>0.000</td>
<td>0.000</td>
<td>5.047</td>
<td>0.025*</td>
<td>1.000</td>
</tr>
<tr>
<td>Cycle Cultured per Annum</td>
<td>-1.851</td>
<td>0.759</td>
<td>5.950</td>
<td>0.015*</td>
<td>0.157</td>
</tr>
<tr>
<td>Income per cycle cultured</td>
<td>0.000</td>
<td>0.000</td>
<td>0.029</td>
<td>0.865</td>
<td>1.000</td>
</tr>
<tr>
<td>Constant</td>
<td>-18.246</td>
<td>40193.003</td>
<td>.000</td>
<td></td>
<td>1.000</td>
</tr>
</tbody>
</table>

Model
Summary-2 Loglikelihood = 84.982
Cox & Snell R Square = 0.369
Nagelkerke R Square = 0.528
** Significant at 0.01 level; *Significant at 0.05 level
Conclusion
This study examined the fish farmers’ usage of information on weather forecasts in Kwara State, Nigeria. In light of the results of the study, we can conclude the following:
1. Majority of the fish farmers were male, young and agile.
2. Catfish was the most reared fish in the study area was catfish.
3. Majority of the fishers have high level of usage of Information on weather forecast information.
4. Friends and neighbors, internet and radio and television are the main sources of information on weather forecast.
5. The determinant factors of usage of weather forecast were years of experience in fish farming, income from fish farming and cycle cultured per annum.

Recommendations
1. There should be accurate, timely and continuous provision of information on the weather forecasts to the fish farmers by the government agencies.
2. Government and Non-governmental agencies concerned with fisheries should work hard to ensure that the fish farmers have access to weather forecast through diverse sources so as to enhance their productivity and reduce climate related losses as a result of flooding, drought etc.
3. Government should provide financial incentives inform of loans and grants to the fish farmers so as to enhance their productivity.

References
[8] FAO (2016) Fisheries in the Drylands of Sub-Sahara Africa- “Fish comes with the rains”. Building the Resilience for fisheries-dependent livelihoods to enhance food security and nutrition in the drylands, by Jeppe Kolding, Paul van Zwieten, Felix Martin and Florence Poulain. FAO Fisheries and Aquaculture Circular No. 1118, Italy.


استخدام التنبؤات الجوية بين مزارعي الأسماك في ولاية كوارا، نيجيريا

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الملخص

تناولت الدراسة استخدام التنبؤات الجوية بين مزارعي الأسماك في ولاية كوارا، نيجيريا. تم اختيار 127 مشاركًا بشكل عشوائي للدراسة. تم تحليل البيانات باستخدام عدد التكرارات والنسبة المئوية والمتوسط والانحدار اللوجستي الثنائي. أظهرت النتيجة أن متوسط عمر مربي الأسماك كان 32 سنة، وأن حوالي 68.5% من مربي الأسماك ذكور، وحوالي 36.2% يمارسون صيد الأسماك أساسية، وأن حوالي 98.45% من أفراد العينة يقومون بتربيه سمك السلمون، وأن متوسط الدخل السنوي للمزارعين يبلغ 32 سنة. كان مزارعي الأسماك 1,191,181.10 نايرا. الأصدقاء والجيران (3.40) هم المصادر الأعلى تصنيفًا للتنبؤات الجوية. أظهرت النتائج أن حوالي 74% من مزارعي الأسماك لديهم مستوى استخدام عاالي للتنبؤات الجوية. وكانت العوامل المحددة لاستخدام التنبؤات الجوية هي سنوات الخبرة في تربية الأسماك (0.809)، والدخل من تربية الأسماك (0.000) ودورة الاستزراع سنويا (1.851). أوصت هذه الدراسة بضرورة توفير معلومات دقيقة وفي الوقت المناسب ومستمرة عن توقعات الطقس لمزارعي الأسماك.

الكلمات المفتاحية: الاستخدام، التنبؤات الجوية، مزارعي الأسماك، نيجيريا.