

EFFECTS OF WEATHER FORECAST INFORMATION BY FARMERS, IN ABIA STATE, NIGERIA.

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ABSTRACT

The study analyzed effect of weather forecast information by farmers in Abia state, Nigeria. Despite efforts by weather forecast in order to find solutions to the spiral food production, high prices and market prices fluctuates between dry and wet seasons. The specific objectives of the study were to; determine effect of weather forecast information on the agricultural income of the farmers, examined the sources of weather forecast information to the farmers and determined the level of utilization of weather forecast information by the farmers. The main instrument for data collection was a structured interview schedule administered to 135 farmers. Data obtained were analyzed using descriptive and linear regression analysis. Results indicate that effect of weather forecast information usage in agricultural income of the farmers had a coefficient of 0.837. This implies that weather forecast information use can increase or decrease agricultural income of the farmers. Result further show that majority (63.0%) of the farmers had low utilization of weather forecast information and 44.4% of the farmers had radio as their major source of weather information. The study therefore recommends that appropriate policies should be formulated and implemented to ensure that climatological and meteorological centres should be established. The study further recommends that extension education should be intensified on the effects of weather forecasts in conjunction with government owned agricultural agencies to ensure adequate funding.

Keywords: Weather forecast, use, sources, farmers' income

INTRODUCTION

Weather information is vital for increased production and marketing of agricultural products. Weather plays an important role in agricultural production and it has a great influence on the growth development of crops and livestock. Weather is certainly the most important factor determining the success or failure of any agricultural enterprise (Ejionueme, 2007). Agroclimatology and agrometeorology are two inseparable fields of study (Ufot, 2012). Both make use of the knowledge of the atmospheric characteristics and behavior to practice agriculture in order to ensure minimal negative effects due to climatic influence (Ufot, 2012). Meteorology is a systematic observation, recording and process of the climatic elements for a period of time. It is the science that studies the atmospheric principles particularly with forecasting the weather. The word meteorology is coined from the Greek word "meteo" meaning atmosphere. Weather is the climatic condition of an area with reference to temperature, rainfall, sunlight wind, humidity and cloud. (Ugochukwu, 2000).

Agro-climatology is an inter-disciplinary science which deals with the effect of environmental factors in agricultural production. Weather forecasting is the application of scientific and technological knowledge to weather warning (Oyanakin et al, 2009).

Forecasting refers to anticipating and predicting change. It is- the orderly, systematic analysis of trends projected from immediate and past conditions. It is an attempt to visualize the kind of future environment in which a farmer plans and actions likely to be implemented. It makes assumptions about known, unknown future conditions that are likely to determine the success of that plans and predict specific outcome from implementation (Inyanga, 1998).

Weather forecast is paramount for any meaningful agricultural productivity, planning, profitability and avoidance of unnecessary financial losses as reported by Ufot (2012). Weather information are those information that help in predicting decisions of the climate. Accurate and timely weather information facilitates weather decisions. Weather information are used when farmers are selecting from enterprise, changing products a plans, making investment and deciding when, how and where to produce and market their products. Weather affects output therefore, weather forecast help to make production seasonal and order the biological pattern of production because crops need rain to germinate and grow as well as dry weather for reproduction and maturity (Ejionueme, 2007). The sources of weather information include National weather service, State Forestry Agencies, local observations and private

weather forecasting services. Weather forecast are furnish via radio and television. Weather forecast are useful in protection of life and property. It tells us what to do in terms of agricultural policies, to make formal decisions and insurance of risks and uncertainties in agricultural as well as control of pest and disease incidences and suitable planning of the farm.

The effects of weather on crops production depends on solar radiation, air, temperature, rainfall relative humidity, wind movement. Agricultural crops can be long day and short day crops. In southern part of Nigeria most of the crops grown are short day for example root crops, tree crops and vegetable crops. Where as in the Northern part of Nigeria most of the crops grow are referred to as long day crops for examples are cereals, legumes. Ufot (2012) indicate that the effect of weather forecast on crop production are agronomic, planning decision making, profitability produce quality, consumer satisfaction, erosion and floor control and effective use in farm operations yield and danger of pest and diseases.

Fadiji (2000) has shown that the role played by weather information suggests the need for agricultural weather information for rural farmers who do not have access to the information that farmers need in regards to weather forecast, but such information can be supplemented with radio and television which are good medium for supplying information at the awareness stage. Extension agents have not award credit to the use of radio and television to disseminate weather information due to a number of obstacles such as forecasting time, lack of radio sets and television due to high cost and that weather forecasting may not give enough details about agricultural activities.

Farmers need to have specific information on when and how to obtain weather information mass media as one of the sources of information can be very helpful in creating awareness and attitude of farmers towards better utilization of weather information on research findings on weather and climate forecast. The mass media methods such as radio, television, extension newsletter on farm calendar are used to reach large number of people quickly.

Weather and climate are major threat to food production in Southern Nigeria, which are mainly dependent on rain fed agricultural production. The Negative effects of weather and climate change have been studied. Ibrahim et al (2009) lamented that the effect of climate and weather changes on food production but there is limited studies on the utilization and sources of weather forecast information by farmer in Imo State. Notwithstanding the impediments of excessive hotness and coldness of the weather and climate factors on food production, farmers are constrained by factors such

as cost, lack of knowledge on how to implement them belief and cultural practices limit the use of weather forecast information by farmers.

The provision of weather information advice or guidance and season weather forecast (Okezie and Okorie, 2009). Despite efforts of radio and television programmes on weather and climate forecast aired to farmers in Imo State in the area spiral food production is still high and market prices also fluctuates between dry and wet seasons. The researcher therefore attempt to analyze the effect of weather forecast information on agricultural yield of the farmers, examine the sources of weather forecast information to the farmers and determine level of utilization of weather forecast information by the farmers in the study area.

METHODOLOGY

This study was conducted in three agricultural zones of Abia State. The state is located between latitude $4^{\circ} 45'$ and $6^{\circ} 7'$ north and longitude $7^{\circ} 6'$ and $8^{\circ} 10'$ east. It is bordered by Imo, Anambra and River states in the west, north east and southeast. It also shared boundaries with Enugu, Ebonyi, Cross River, and Akwa-Ibom states respectively. It has a land mass of 5,833.77sq kilometer (NPC, 2006).

Multistage sampling technique was used in the study. The first stage involved a purposive selection of one local government area each from the three agricultural zones of the state. These are Ikwuano, Bende and Umuahia North Local Government Area (LGA). In the second stage three communities were randomly selected in the three LGAs, giving a total of three communities. In Ikwuano LGa Iyala, Umuariaga and Itunta were selected. In Bende Ndiwo, Ubibia and Okporoenyi were selected but in Umuahia North LGA, Okwoyi, Isieke and Azueke were selected. The third stage, involved a random selection of 15 farmers each from the nine selected communities. This gave a total of 135 respondents that summed up the sample size.

Primary data for the study were obtained with the aid of a structured interview schedule which was distributed to the farmers selected as respondents. The data collected were analyzed using descriptive and inferential statistics. The descriptive statistics such as percentages, mean, frequencies distribution were used to analyze objectives ii while iii was analyzed using regression analysis. Objective i was analyzed using regression analysis. The regression model was implicitly specified thus:

$$Y = F(X_1, X_2, e)$$

Where

Y = agricultural yield/income of farmers (kg)

X = weather forecast information use

e = error term.

RESULTS AND DISCUSSION

Table 1: Effect of Weather Forecast Information use on Farmers Income

| Explanatory variable | Linear function | Semi log function | Double function | log | Exponential |
|----------------------|--------------------|-------------------|--------------------|-----|-------------------|
| Constant | 289.443 | 175.088 | 149.118 | | 102.675* |
| r ² | 14.092 (1.903)* | 3.813 (1.844) | 0.069 (4.372)** | | 0.007 (2.541)* |
| F | 0.592 | 0.478 | 0.837 | | 0.649 |
| | 523.894* | 318.667** | 0.837 | | 0.649 |
| N | 135 | 135 | 135 | | 135 |

Source: Field data 2017. t.ratios are in parenthesis * Significant at 5 ** Significant at 1%

The result of the simple regression analysis on the effect of weather forecast information utilization on farmers agricultural yield is presented in table 1. The result shows that the double log form gave the best fit judging from the explanatory power and having the highest coefficient of determination (r^2) of 0.837. This implies that about 84% of the variation in weather forecast information utilization accounted for by the degree of effect or yield. The coefficient of effect yield was positive and significant at 1% which implies that the more the farmers use the weather forecast information, the more their income/output, therefore there is relationship between the farmers use of weather forecast information and income/output of the farmers. This is line with finding of Njoku (2016) that stated that increase in adoption of agricultural technologies result to increase agricultural income of the farmer.

Weather forecast information sources available to farmers.

Results of the study as presented in table 1 revealed that 44.4% of the respondents obtained their weather

forecast information from radio. This finding is in line with the view of Njoku (2016) who observed that radio communication was important source of information among rural farmers because of its availability and cost effective. Result further indicates that many of the respondents 26.6-% got their weather forecast information from television. The implication of this is that the farmers in the study area are relatively handy and that television set cost are relatively cheap and affordable. Result further shows that respondents (13.3%) got their weather forecast information from extension agents. This could be that extension agents in the study area are effective and committed to their extension function of diffusion of information. Private weather forecasts constituted the least source of weather forecast information for the respondents accounting for only 1.5%. This could be as a result of high level of ignorance on weather forecasting observed by among the farmers.

Table 2: Respondents based on Sources of Weather Information Available to Farmers

| Weather Information Source | Frequency | Percentage |
|----------------------------------|-----------|------------|
| Radio | 60 | 44.4 |
| Television | 35 | 26.0 |
| National weather service | 3 | 2.2 |
| State forestry agencies | 5 | 3.7 |
| Local observation | 12 | 8.9 |
| Private weather forecast service | 2 | 1.5 |
| Extension agents | 18 | 13.3 |
| Total | 135 | 100 |

Source: Field Survey, 2017

Level of Utilization of Weather Forecast Information

Results of the study as presented in table 2 revealed that there was low usage of weather forecast information among the farmer.

Table 3: Respondent based on Utilization of Weather Forecast information

| Scale of Use | Frequency | Percentage |
|------------------|-----------|------------|
| Low | 85 | 63.0 |
| Moderate | 30 | 27.0 |
| High | 20 | 15.0 |
| Extension agents | 18 | 13.0 |
| Total | 35 | 100 |

Source: Field Survey, 2017

Results of the study as presented in table 3 revealed that moderate (62.0%) of the respondents indicated that their level of utilization/use of the weather information forecasted by the weather forecasters was low. This implies that the level of use of weather forecast information by farmers was generally low. The reason could be due to inadequate and insufficient exposure of the farmers to weather forecast knowledge/skills advices disseminated by weather forecasters.

Result further indicates that a moderate proportion (22.2%) of the farmers utilized the information disseminated by weather forecasters. Results equally showed that level of utilization of weather forecast information was high. This is in line with Nwachukwu and Egwu (2008) observed that farmer's response to use of information was generally low because they were unaware of the weather information. Information is vital for increased production marketing and weather constitute the major threat in agricultural production Ukoha and Nzeakor (2016) lamented that farmers in accessibility to sources of information and in appropriate utilization of such channel needs to be enhanced in order to increase the level of utilization of new agricultural practice which will increase agricultural production.

CONCLUSION AND RECOMMENDATIONS

Conclusion

The study analyzed the use and sources of weather forecast information on agricultural yield/income of farmers in Abia State, Nigeria. Results obtained from the study showed that the coefficient of determination (r^2) was 0.837. This implies that increase age in weather forecast information by farmers will increase agricultural/income or yield of the farmers. Result further indicate that majority of the farmers had low utilization of weather forecast information. The major source of weather forecast information available to the farmers was through radio weather forecast. The study therefore conclude that the low agricultural income of the farmers was due to low utilization of the weather information.

Recommendations

Weather and climate constitute major threats to agricultural production and had contributed to the current food insecurity. Hence it is recommended that appropriate policies should be formulated to ensure that climatological and meteorological service locations set aside by governments for should be established.

Agricultural weather forecast programmes should be packaged in local languages for the farmers to enhance diffusion and usage. Extension agents should collaborate with the weather forecasters in conjunction with the government owned agricultural agencies to ensure adequate funding.

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