

Climate change information needs of agro-pastoralists in Southeast Nigeria

Abstract

All categories of farmers need information to be productive. Such information is on climatic change. This research work seeks to examine climatic change information needs of agro-pastoralists in Southeast, Nigeria. The specific objectives were to ascertain agro-pastoralists' awareness of climatic change, identify sources of information on climate change, examine areas climatic change information is needed, and to describe agro-pastoralists responses to climatic change information received. Questionnaire was used to elicit information from 120 agro-pastoralists purposively selected from their various camps in 3 Southeast States of Nigeria (Imo, Abia and Enugu). Data collected were analyzed descriptively using percentages and presented in frequency tables. Results showed that all the agro-pastoralists were aware of climate change as seen in their response such as occurrence of heavy, but erratic rainfall(95.5%), drought occurrence(81.68%), high temperature(64.2%), flooding(87.5%), water shortage(84.2%), crop failures(100%) among others. Sources of information on climatic change were personal experiences, (80%), fellow farmers(75.3%), Miyetti Allah(100%), Hausa radio program(100%) and many more. They need information on livestock diseases, pasture availability, safe places to go, livestock prices, passable/impassable roads, when to sell their animals. To cope, they sell their animals (90.8%), dig water holes/wells, take animals for vaccination, receive training on animal vaccination, buy veterinary drugs and many more.

Keywords: climate change, information, pastoralists, temperature, livestock

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Introduction

Pastoralist is a complex livelihood system seeking to maintain an optimal balance between so many forces and stakeholder such as pastures, livestock and people in uncertain and variable environments.¹ Despite the great role pastoralism plays in supporting local livelihood, its capacity to adapt to change is facing several challenges - climate change being the major one.² The world's climate is changing rapidly, model productions for this country alone is that there will be increase in global average surface temperature.³ These increases will have greater impact in the life of vulnerable groups, livestock farmers inclusive. This is because livestock are key assets held by poor people in pastoral systems, providing multiple economic, social and risk management functions. Livestock are a crucial coping mechanism in variable environments, and as variability increases they will become more important.¹ Climate induced shocks will affect general livestock development.

Climate change is associated with increase in very high temperature and heat stress, coupled with frequent droughts and intense flooding, windstorms and even disease and pests outbreaks.³ These hazards are projected to have greatest impact on the livelihoods of resource poor farmers living in sub-Saharan Africa.^{4,5} The vulnerability of livelihood to the impacts of climate change will depend to a larger extent on the level of exposure, sensitivity and adaptive capacity of the people affected.³ However, agriculture is the main livelihood activity of the people in Africa and is climate sensitive. Agricultural systems are highly responsive to climate sensitive. Agricultural systems are highly responsive to climate fluctuations, creating real potential for skillful climate forecasts and information to improve farm and resources managements and their welfare of rural farm populations.⁶ Therefore, since climate shocks can have devastating effects on resource poor farmers, attention is given to climate information/needs of farmers

to create opportunities for reducing poverty and vulnerability among these farmers.⁷

Climate information and support sources therefore play a crucial role in providing early warning systems as well as creating awareness for building poor farmers capacity and prepare them for disaster responses to climate change.⁵ Again, choice of climate information dissemination channel may affect access and uses of information on climate change. It is here that the climate information to be disseminated be adapted and relevant to the needs, interest and aspirations of the people. This is why in managing climate risk, information and information sources and its transmission to the target audience is very vital. This is because climate risk management information is central to providing answers to a range of questions relating to adaptation.⁸

The people (agro-pastoralists) in the study area are in need of access to climate information and support services. They are yet to experience the full benefits of climate research information and support services to enable them effectively cope and build adaptive capacity to the changing climate.⁹ This supports, Harvey et al.¹⁰ who expressed concern that information sharing among climate change actors in Africa is limited and may be worse in the semi-arid environments due to barriers of poverty, lack of infrastructures, illiteracy and many more.¹¹ There is also limitation in information mechanism in terms of reliability, timing, and even language. This gap will be closed by this study.

The specific objectives therefore includes to:

- Ascertain agro-pastoralists' awareness of climate change
- Identify sources of climate change awareness
- Identify climate change information needs of agro-pastoralists

- d) Determine agro-pastoralists responses to climate change information received.

Methodology

This study was conducted in Southeast agro-ecological zone of Nigeria. The zone is made up of five (5) states-Abia, Anambra, Ebonyi, Enugu and Imo (Figure 1). The zone occupies a total land mass of about 10, 952, 400 hectares with a population figure of about 35,381,729 persons in 2021 projected from 2006 National Population Commission Census figure (NPC, 2006). The 2-stage sampling technique was adopted in the process of sample selection. The first stage was the purposive selection of three states from the Southeast agro-ecological zone with heavy presence of agro-pastoralists (Abia, Enugu and Imo). The second stage involved the random selection of 120 agro-pastoralists from the list of 1200 agro-pastoralists in the three states. Both primary and secondary data sources were used. All the objectives were analyzed using percentages presented in tabular forms.

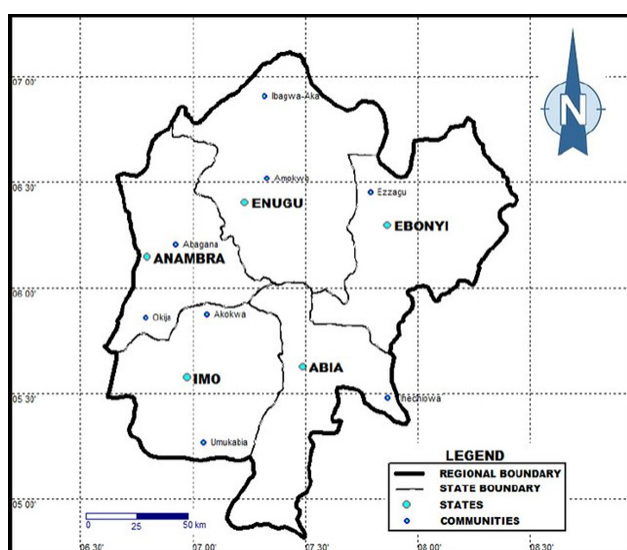


Figure 1 Map of Southeast, showing the sampled States of Imo, Abia and Enugu.

Results and discussion

Climate change awareness of agro-pastoralists

Table 1 showed that climate change is real. The indicators of climate change awareness includes high, but erratic rainfall (95.8%), drought occurrences (81.6%), occurrence of severe floods (87.5%), early cessation of rains (98.3%), occurrence of diseases/ pests (91.6%), late rainfall onset (72.5%), water shortage (84.2%), food shortage (69.2%), crop failure/ low crop yield (100%), constant unstable winds (72.5%), and pasture shortage (99.2%) were all observed and seen by the agro-pastoralists. These signs showed that climate is really changing. Too much dry spell is really threatening pastoral economy as grasses die early and water sources dry up leaving the animals at the mercy of artificial lakes.

In a study on climate risk management information in Kenya, Egeru,¹² observed that in order to cope and adapt to climate change, pastoralists must first perceive that there is a risk caused by changes taking place. Result of the study showed that pastoralists (99%) in the sub-region perceived that the climate has changed in the sub-region with increase in temperatures (72.2%) and high but erratic rainfall (94.0%). Further, 91%, 52% and 47% of the pastoralists noted that

drought, floods, and hailstorms were common in the subregion. He also noted that there has been a shift in the onset period of rainfall from the 'traditional' pattern (March to April) that was known to the community to unpredictable and reliable onset and cessation.

Table 1 Climate change awareness of pastoralists

Awareness indicator	Percentage
High but erratic rainfall	95.8
Drought occurrences	81.6
Temperatures too high	64.2
Occurrence of severe flood	87.5
Early cessation of rain	98.3
Constant unstable winds	72.5
Early rainfall onset	75.8
Occurrences of diseases/pests	91.6
Late rainfall onset	72.5
Water shortage	84.2
Food shortage	69.2
Crop failures/ low yield	100
Pasture shortage	99.2

Sources of climate change awareness

Table 2 revealed the various sources of information on climate change available to the pastoralists. These includes personal experiences (80%), fellow farmers/friends (75.3%), Miyetti Allah association (100%), Hausa radio program (100%), Arabic schools (75.8%), meetings (95.8%), mobile phones (98.3%) among many others. In a study by Egeru,¹² pastoralists agreed to have received information from radio, traditional rulers, healers/medicine men, indigenous knowledge through observations of animal movements, cloud formation, plant flowering process, sign/shapes of moon, sunset/dawn, and animal signs among many others. In a work by Kirui et al.,⁵ on access to climate information in Kenya, the results indicates that radio is the primary source of climate information in the study area. This is supported by the fact that the highest number of respondents own radios (70%, 72% and 43% in sub-humid, semi-arid and arid zones respectively) with a few respondents owning both radio and television. Inter-personal contacts turned out to be a valuable source of climate forecast information. Most farmers depend on what they hear from friends, relatives, neighbors, administration personnel (chiefs and sub-chiefs).⁶ The results suggest that extension agents are very effective in reaching the vulnerable people with climate information and support services that are necessary for building adaptation. Extension agents have regular contacts with rural farming communities.

Climate risk information needs

Information is vital for the farmer to be successful, productive and enterprising. Table 3 revealed the climatic risk information needed by the agro-pastoralists to keep business going. The information needed includes pasture availability (87.5%). Animals feed on grasses, its availability ensures the life and health of the animals, while its unavailability threatens both the pastoralists and the animal subsectors. So agro-pastoralists need vital/reliable information on pasture availability. Livestock diseases (97.5%), is another information

need of the respondents. The pastoralists need this vital information for the survival and existence of animals and family. They need information on markets for livestock and livestock products (98.3%). Livestock rearing is business and pastoralists would no doubt sell for consumption and other reasons. Sales may be to restock, enlarge or reinvestment of the farm. They need information on drought (99.2%), forecasts on floods (88.3%), water/watering locations (90%), forecast of rainfall onset (95%), livestock purees (98.3%), passable and impassable roads (99.2%), when to sell livestock (96.6%) among other climatic information needs.

Table 2 Sources of climate change awareness

Sources	Percentage
Personal experiences	80
Fellow farmers/friends	75.3
Miyetti-Allah Association	100
Hausa radio programme	100
Newspapers/printed papers	95.8
Mosque	85.8
Arabic schools	75.8
Television	86.6
Internet	41.6
Government extension agencies	41.6
Meetings	95.8
Mobile phones	98.3

Table 3 Climate risk information needs of agro-pastoralists

Areas of information needs	Percentage
Information on pasture availability	87.5
Livestock diseases	97.5
Markets for livestock /livestock product	98.3
Information on drought	99.2
Forecasts on floods	88.3
Water and watering location	90
Forecast of rainfall onset	95
Livestock purees	98.3
Passable /impassable roads	99.2
When to sell livestock	96.6
Veterinary services	95
Adaptation technologies	98.3
Financial/credit support	92.5
Safer places to relocate	90.8

As agro-pastoralists move, they see communities of people and observe whether they are welcomed or not, if peace exist in the community or not for them to stay or leave, where old hostilities exist, pastoralists move away immediately for fear of possible attacks. Other information needs are veterinary services (95%), adaptation technologies (98.3%), financial/ credit support (92.5%), and lastly

safer places to relocate (90.8%). All of this avenues of knowledge promote agro business, health, peaceful co-existence of both man and animals and survival of business. It is therefore not out of place for agro pastoralists to be in great need of such climate information for the growth of their business enterprise. Every member of the community is concerned about the nature of rainfall, drought and diseases during the up-coming season. Therefore, as the season approaches conjectures about the likely rainfall scenario (such as amount, on-set and distribution) constitute the most common topic in social encounters.

Responses to climate information needs

Whether agro-pastoralists got the information needed for survival or not, they elicit certain responses to different information types. It is natural to react to external stimuli immediately. Table 4 showed that the pastoralists sold some animals (90.8%), this was to prepare for future hardship and avoid total loss of revenue and major livelihood assets. Some also shifted animals rearing/stocking to dry seasons. The digging of water holes/ cisterns (86.6%), moving animals closer to water holes/points (98.3%), prepare to shift completely to another place (85%), moving animals to diseases/pest free areas (100%) were done to keep business/family live going. Pest and diseases alerts made agro pastoralists to purchase /buy veterinary drugs (91.6%), and perform livestock health protection rituals by shifting their animals to disease free areas as earlier said. Others train in animal vaccinations (90.8%), so they can treat their animals without trekking long distance to meet the veterinary doctors. They also burn surrounding bushes to curb disease/pest infestations.

Table 4 Pastoralists responses to climate risk information received

Responses/actions	Frequency	Percentage
Sell some animals	109	90.8
Shift animals to dry season	94	78.3
Dig water hole /cistern for water	104	86.6
Adjust income/expenditure	87	72.5
Prepare to shift another place	102	85
Move animals closer to water log	118	98.3
Take animals for vaccination	109	90.8
Buy veterinary drugs	110	91.6
Train in animal vaccination	120	90.8
Shift animals to disease free areas	120	100
Burn bushes to curb infestation	94	78.3

The above agrees with Egeru,¹² who opined that upon receiving drought early warning information, pastoralists typically respond by preparing and shifting their livestock to dry season grazing areas with pasture and water, performing ritual sacrifices to evoke protection against drought and storing food from their garden harvest, splitting and selling firewood and charcoal, informally sensitizing other community members, and preparing to shift to other places with food and water among other actions.

Some created waterways and embankments around the homesteads, informing other community members. Other response options taken included: staying alert and identification raised areas, moving away from areas adjacent to rivers and planting crops on higher grounds among other actions. In addition, pastoralists who received rainfall

onset information responded by preparing their gardens (49.9%), waiting for rainfall onset prior to cultivating (4.7%), early planting (4.7%), performing ritual sacrifices (4.7%) and borrowing seeds in preparation for planting (2.4%). Pastoralists who received information on pasture locations and dynamics responded by moving animals to such locations with pasture (74.9%), took initiative to identify and confirm pasture availability in such locations (19.2%), participated in grazing meetings arranged by the grazing management committees (2.9%), discussed where to locate kraals (1.9%) and informed neighbours and kinsmen.

This process of diversification represents a major adaptation not exclusively to climate change but to economic pressures as well as policy influences. These strategies include: building up herd size as insurance against times of hardship; splitting herds across different locations and movement; keeping different species and breeds to make use of different ecological niches; selecting animals for different traits that enable survival in prevalent conditions; loaning surplus animals to family and friends for their subsistence requirements; crop diversification; mixed crop livestock farming systems;^{13–15} using different crop varieties; changing planting and harvesting dates; and mixing less productive, drought-resistant varieties and high-yielding water sensitive crops; use of irrigation; exchanges and resource management. These strategies ensure the rational use of the natural resource base on which the pastoral livelihoods depend.

Conclusion

The study has shown that the agro pastoralists are fully aware of climate change menace. This is manifested through variable rainfall pattern with the occurrences of heavy flooding, droughts, hot weather, erratic rainfall, abrupt/sudden cessation of rains and wind blowing unsteadily among other evidences. They need information on pasture availability, livestock diseases rainfall pattern, veterinary services, passable and impassable roads, forecasts on drought from sources such as Hausa radio program, Miyetti Allah association, phone calls, fellow farmers and rest. To be in business and improve, they often act on the information received by selling off animals before bad times, digging water holes, and moving animals to safer spots among others.

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Conflicts of interest

Authors declare that there is no conflict of interest.

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