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CASUALTIES AND EFFECT OF PERTURBATIONS ON RURAL AGRICULTURAL SETTINGS IN BENUE AND NASARAWA STATES NIGERIA

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The study assessed casualties and effect of perturbations on rural Benue and Nasarawa States in North Central Nigerian agricultural settings. Three hundred and fifty (350) respondents were selected for sampled size using multi-stage sampling techniques. Primary data were collected using a structured questionnaire. Descriptive statistics such as frequency, percentages and mean were employed in data analysis. It was found that the major casualties of perturbations were decrease in quantity of annual farm yield ($\bar{x}$=2.69), loss of lives and properties ($\bar{x}$=2.63) and damage of rural infrastructure ($\bar{x}$=2.58).Others were fluctuation in prices of farm produce (x=2.46), low level of rural development ($\bar{x}$= 2.45), decrease in quality of farm produce ($\bar{x}$=2.43), low income generation ($\bar{x}$=2.43) and increase in cost of transportation ($\bar{x}$=2.38). Others included decrease in water supply ($\bar{x}$= 2.37), difficulty in accessing farm labor ($\bar{x}$=2.36) and reduction in the quality of housing pattern ($\bar{x}$=2.32). The major effects of perturbations on agricultural settings discovered included: low yield of major crops ($\bar{x}$=2.58), degrade of settlement pattern ($\bar{x}$=2.52), low income ($\bar{x}$=2.49) and low standard of living condition ($\bar{x}$=2.41).Others were degrade market activities ($\bar{x}$=2.38), degrade religion activities ($\bar{x}$=2.38), degrade health care services ($\bar{x}$=2.45) and degrade school facilities ($\bar{x}$=2.15). The study recommends that government should aid affected farmers to reduce the shock of perturbations, financial institution should increase credit facilities for farmers at very low interest rate and rural farmers should form cooperative associations to enhance solidarity in times of perturbations. This could help address perturbations in agricultural settings in the study area and improve livelihood of farmers in the study area and Nigeria in general.

Keywords: Casualties, effect, agricultural settings, perturbations

INTRODUCTION

Perturbation is defined as the disturbance due to external forces which cause change in the normal function of a system, thereby altering the activities or function in the system (Asthana, 2013).The disturbances could emanates from natural happenings or through interaction of man in the environment (Hyde and Reeve, 2011). Chen (2005) posited that human-beings currently face global perturbations which affect

the environment in the perspective of climate change, productivity, access to freshwater, eco-system degradation, soil erosion and biodiversity loss. According to Joseph (2009), perturbations in agricultural settings are classified into natural and artificial. Natural perturbations refer to disturbances in the environment that are naturally sudden, unexpected and consequently, cause severe damages to agricultural activities, infrastructure, destroy lives and properties in rural areas. Examples include: floods, drought, erosion, desertification, climate change, hailstorm, frost and land slide (Raufus, 2010).

Artificial perturbations are those disturbances and changes that are influenced or induced by man through some elements of human error, negligence or intent. Examples include deforestation, pollution of environment, poor land management, overgrazing, intensification of land utilization, wrong dosage of chemicals, fertilizers and pesticides application.

According to FAO (2013) the effect of perturbations on crops yield are not the same or uniform. However agricultural production suffers long and multi prong consequences involving loss in harvest and livestock, out break of pest and diseases, destruction of rural infrastructure and irrigation systems. For instance protracted crisis, conflicts and violence affect agriculture in the perspectives of devastation of agricultural activities and rural livelihood, causing significant economic loss, food insecurity and damages on all large scales.

According to IPCC (2012) flood effects among the main type of sectors of economic and social activity in the country reveals the special nature of perturbations in rural settings. Indeed, there occurred a significant concentration of total flood effects in the social sectors which include housing, education, and health and in the productive sectors including agriculture, oil production, manufacturing and commerce while the flood effects on infrastructure sectors were relatively minor. The prevalence of these types of damage and losses can be explained by the extensive destruction of traditional housing units, schools, clinics, and associated facilities that were located in rural areas that are highly exposed to flooding.

The flood affected several sectors of the economy in Nigeria. For instance its overall negative impact on real GDP growth in 2012 is estimated at 1.4 percent (N570 billion, in nominal terms). However, in view of the losses associated with the flood, the account surplus drop, improved by only about 0.6 percent instead of projected 1.2 percent of GDP (NBS, 2012).

The effect of climate change is that it change the pattern of vector, soil and water born diseases, introducing the people into a new areas. The combine effect of temperature fluctuation, humidity, heavy rainfall, flooding and drought can contribute to outbreak of cholera, malaria and diarrhea. The long run effect is that it cause sicknesses of serious concern to the people thereby causing set back in carrying out socio economic activities by the rural people (IPCC, 2012).

According to FMARD (2012) the effect of perturbation on rural agricultural settings varies. Disturbances due to conflicts and crisis in the rural areas led to the followings;

i. Poverty: Because the people displaced are peasant farmers they now depend on others to give them land to plant crops on a smaller scale than what they have cultivated before. This might lead to low agricultural yield mainly to support their existence at a subsistence level. Their economic well-being is thus tempered with because of this conflict.

ii. Reduced standard and levels of education has been noticed. Their unhealthy looks were also visually observed. The conflict has led their children to be out of school, as their parents cannot afford the school fees and low capital base leads affected people to poor health condition.

iii. Environmental degradation has been found to be high particularly in areas where the Internally Displaced Persons (IDPs) are staying. Refuse disposal heaps, human wastes and associated household wastes create environmental degradation as drainages are found to be blocked due to poor sanitary conditions and above all potable water is found to be lacking during the dry season.

iv. Many people were killed in the conflict both young , women and old. This affect farm labor because majority of rural people depend on family labor to carryout farm activities.

V. Some of the cattle Fulanis do not know their bearings. Because there are no cattle routes they graze without limit and in most cases they are not guided (or guided by children) and so they cause not just havoc on to the crops but the response by the farmer's results into violent conflicts, which lead to wanton destruction of lives and properties.

Objective of the Study

The broad objective of this study was to assess perturbations in rural Benue and Nasarawa States agricultural settings. The specific objectives of the study were to;

i. identify the casualties of perturbations on rural agricultural settings in the study area and

ii. determine the effects of perturbations on agricultural settings in the study area;

METHODOLOGY

Research Design

This study employed a community survey, using research questionnaire.

The Study Area

The study was carried out in Benue and Nasarawa States, Nigeria. The two states are located in the North Central Nigeria.

Benue State is one of the 36 states in Nigeria, created in 1976 with head quarter at Makurdi. It lies in the North-Central region of Nigeria and shares boundaries with five other states; Nasarawa to the North, Taraba to the East, Cross-River to the South, Enugu to the South-East and Kogi to the West. The state also shares a common boundary with the Republic of Cameroon in the south-east. The State is divided into three agricultural zones namely North East (zone A), Northern (zone B) and Southern zones (zone C) (BNARDA, 2012).

Benue State lies between longitude $7^0 25'$ and $10^0 8'$E of the Greenwich Meridian and Latitude $6^0 25'$ and $8^0 8'$ N. The State covers a landmass of $32,518km^2$ with a projected population of 5,454,521 people. The State experiences tropical climate with two distinct seasons, the rainy season which lasts from April to October with annual mean rainfall of 1500mm and the dry season which begins in November and ends in March with temperature fluctuating between $23^0 c$ and $38^0 c$ in the year. The state is made up of several ethnic groups including Tiv, Idoma, Igede, Jukun, Etulo, Abakpa, Akyeya, Hausa, Igbo and Igala, among others. The state drives its name from river Benue, river Benue is one of the longest rivers in the Nigeria, it has great potential for fishing and influence agricultural activities especially irrigation farming in the dry season. The over flow of river Benue in the raining season often caused flooding, it affects farms, houses and valuable properties are destroyed. The inhabitants of the riverside areas engage in fishing as their primary occupation. Farming is the major occupation of majority of the people in the State with an estimated 75% of her population engaged in subsistence farming that is rainfed. The soil texture is clay loam, silty loam, sandy loam and silty clay. The soil is dark grayish, brown yellow strongly acid to slightly acid and neutral when dried. Solid minerals found in Benue State include limestone, kaolinite. gypsum, barite, feldsoar and gemstone. Some cereal crops produced in the State include; maize, G/corn, millet and rice while legumes crops produced include melon, groundnut, cowpea and soybeans. Root and tubers crops produced include cassava, yam and potatoes. Tree crops produced include mangoes, citrus, oil palm and guava. Livestock kept by farmers include pigs, cattle, goats and poultry birds (BNARDA, 2012).

The study area

Figure 3: Map of Benue State Showing the Location of the Study Area
Source: Adapted from BNARDA (2012).

Nasarawa State was created in 1996 with its capital at Lafia, it has (13) thirteen Local Government Areas (LGAs). It has diverse ethnic groups such as Alago, Eggon, Kanuri, Gwandara, Egbira, Mada, Tiv, Basa, and Gbagi, among others. The State shares boundary in the North with Kaduna State, in the West with Federal Capital Territory, Abuja, in the South by Kogi and Benue States while in the East by Taraba and Plateau States. It has a landmass of 27,117km^2 of which 75 percent is arable land for agriculture. It lies between latitude $8^03'$ N and Longitude $8^037'$ NE. The State experiences two distinct seasons namely; dry

and rainy seasons. The dry season begins from late October to March while, the rainy season begins from April and ends in October. The estimated amount of annual rainfall is between 1100mm-2000mm, the temperature ranges from 15^0 to 38^0c. The State in divided into three agricultural zones namely the Central, Southern and Western zones (FMARD, 2010).

The State has a projected population of 2,479,231 (NPC, 2016), majority of the people are predominately subsistence farmers. The soil texture is clay, loamy, sandy and silt clay. Some crops produced in the area include; Maize, G/corn, millet, sugarcane, yam, cassava, groundnut and melon. Tree crops

produced include; citrus, mangoes, cashew and oil palm. Livestock kept by farmers include; cattle, sheep, goats, pigs, and poultry (NADP, 2010). The State is endowed with solid minerals deposits they include Salt, bauxite, columbite, granite, aquamarine, quartz, marble, tantalite and gemstone. The State is also known for dry season irrigation activities due to the unique weather experience in some parts of the state. Subsistence agriculture is the main activity in the area. Farms are generally small, usually less than five hectares and rely on the use of manual labour and crude implements such as hoes and machetes (Agada and Igbokwe, 2014
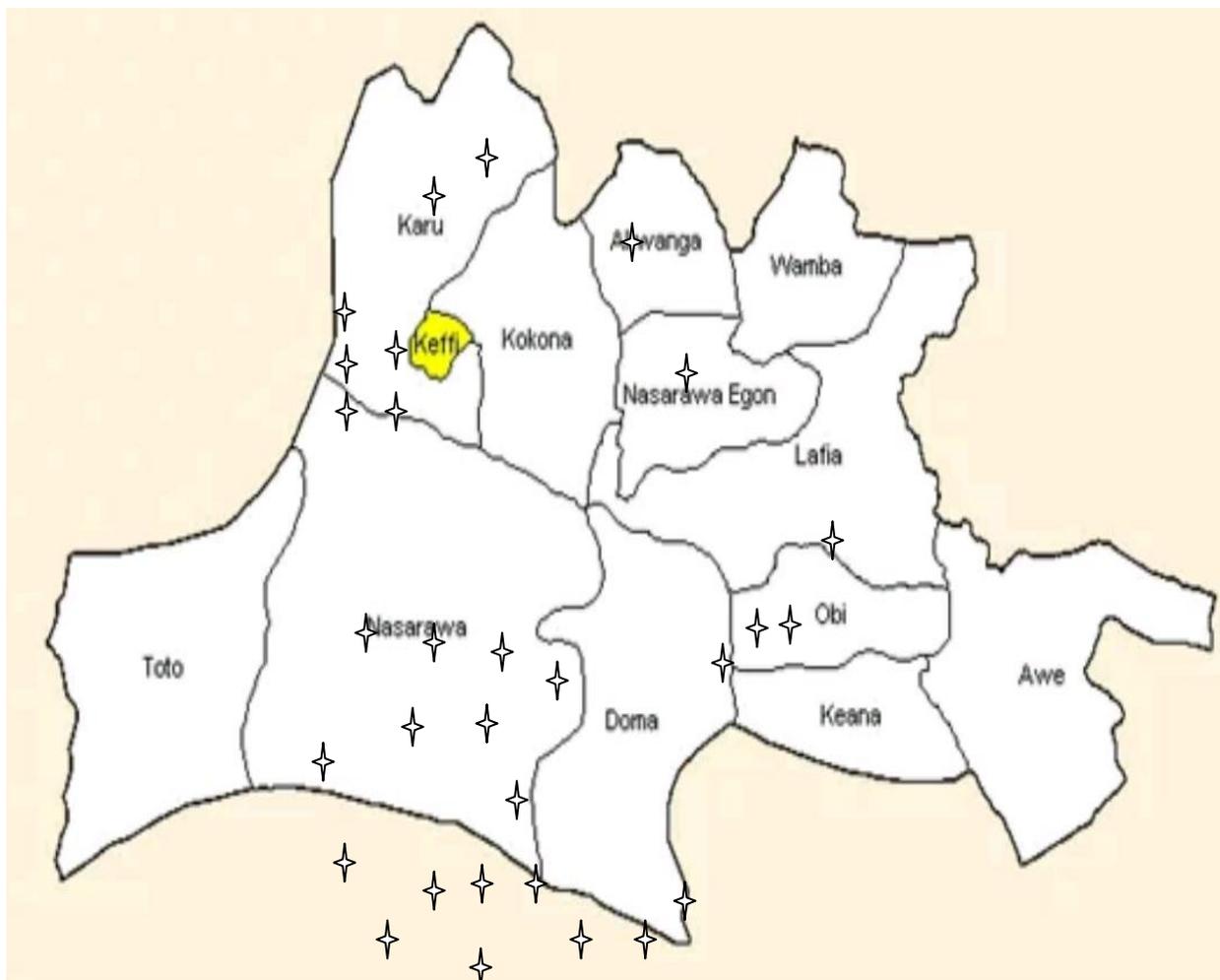
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Figure 4: Map of Nasarawa Showing the Location of the Study Area.

Source: Adapted from NADP (2010).

3.3 Population of the Study

The population of this study comprised all rural farmers in Benue and Nasarawa States.

3.4 Sample Size and Sampling Techniques

Multi-stage sampling technique was used to select sampled size for this study. First, Benue and Nasarawa States were randomly selected and defined population for this study was stratified into three zones based on the existing agricultural zones in each State. namely; zones A,B and C for Benue State while Central, Southern and Western zones for Nasarawa State. Secondly, two Local Government Areas (LGAs) from each of the zones (Kastina Ala, Ukum, Guma, Gboko, Oju and Okpokwu LGAs for Benue State, while Akwanga, Nassarawa Eggon, Lafia, Doma, Karu and Nasarawa LGAs for Nasarawa State) were purposively selected due to high occurrences of perturbations. Thirdly, a purposive sampling technique was also used to select two rural communities in each selected Local Government Areas in the State. Fourthly, a sample for each rural communities was developed using proportional allocation of 20% (0.2) across board. A total sample size of 350 respondents were selected for this study.

Instrument of Data Collection

Data for this study were collected mainly from primary sources. The primary data were collected from the rural farmers in Benue and Nasarawa States of North-Central Nigeria using a well structured questionnaire.

Method of Data Collection

Data for this study were collected mainly through primary sources. Structured questionnaire was used to collect the primary data.

Data Analysis Techniques

The data for this study were analyzed using descriptive statistics involving frequency, percentages and mean to analysed objectives 1 and 2.

RESULTS AND DISCUSSION

Major Casualties of Perturbations in Benue and Nasarawa States

Major Casualties of Perturbations in Benue State: Result in Table 1 reveals that in Benue

State, the casualties of perturbations were decrease in annual yield of farm produce ($\bar{x}$=2.57), low level of income generation ($\bar{x}$=2.53) low level of rural development($\bar{x}$= 2.53), loss of lives and properties($\bar{x}$=2.51),damage of rural infrastructure ($\bar{x}$=2.33), lack of access to improved farm inputs ($\bar{x}$=2.45),fluctuation in prices of farm produce ($\bar{x}$=2.46), poor production management practices ($\bar{x}$= 2.45), decrease in quality of farm produce ($\bar{x}$=2.43) and increase in cost of transportation ($\bar{x}$=2.38). Others include decrease in water supply ($\bar{x}$= 2.37), difficulty in accessing farm labor ($\bar{x}$=2.36), health hazard ($\bar{x}$=2.35), and reduction in the quality of housing pattern ($\bar{x}$=2.32).

Major Casualties of Perturbations in Nasarawa State: In Nasarawa State, result in Table 1 indicated major casualties of perturbations to include: decrease in annual yield of farm produce ($\bar{x}$=2.61), low level of income generation ($\bar{x}$=2.45), low level of rural development($\bar{x}$=2.51), loss of lives and properties($\bar{x}$=2.57),damage of rural infrastructure ($\bar{x}$=2.23), lack of access to improved farm inputs ($\bar{x}$=2.37),fluctuation in prices of farm produce ($\bar{x}$=2.47), poor production management practices ($\bar{x}$= 2.48), decrease in quality of farm produce ($\bar{x}$=2.43) and increase in cost of transportation ($\bar{x}$=2.35). Others include decrease in water supply ($\bar{x}$= 2.25), difficulty in accessing farm labor ($\bar{x}$=2.30), health hazard ($\bar{x}$=2.18) and reduction in the quality of housing pattern ($\bar{x}$=2.32).

Result Table 1 further showed that pooled casualties of perturbations in the study area were; decrease in annual yield of farm produce ($\bar{x}$=2.69),loss of lives and properties ($\bar{x}$=2.64,) damage of rural infrastructure ($\bar{x}$=2.55), lack of access to improved farm inputs ($\bar{x}$=2.50=),fluctuation in prices of farm produce (x=2.46), low level of rural development($\bar{x}$= 2.45), decrease in quality of farm produce ($\bar{x}$=2.43), low income generation ($\bar{x}$=2.43) and increase in cost of transportation ($\bar{x}$=2.38). Others included decrease in water supply ($\bar{x}$= 2.37), difficulty in accessing farm labor ($\bar{x}$=2.36) and reduction in the quality of housing pattern ($\bar{x}$=2.32). It means perturbations affected expected outcome of the respondent's daily activities. Raizada (2017) reported that distraction by insect pests and cattle degraded the quality of cowpea in North East Nigeria such that the annual yield dropped below optimum standard of market value.

This result means the major casualties of perturbations in agricultural settings in the study area were decrease in annual farm yield, low level of income, fall in price of farm produce, poor access to farm inputs, increase in cost of transportation, decrease in water supply, lost of lives and properties

and damage of rural infrastructure. It also means that increase in perturbations could lead to increase in above mentioned casualties. Botkin and Keller (2012), observed that perturbations in agricultural settings destabilize the whole food chain and the entire local economic activities in developing countries. IPCC (2014) discovered that perturbations in agricultural activities affect negatively agricultural systems. This implies that casualties of perturbations are indications of set back on agricultural settings and socio-economic activities in the study area.

Table 1: Casualties of Perturbations in Agricultural Settings in Benue and Nasarawa States (n=350)

Variables	Benue State		Nasarawa State		Pooled	
	Mean	STD	Mean	STD	Mean	STD
Decrease in annual farm yield	2.57	0.551	2.61	0.567	2.69	0.557
Lack of access to improved farm inputs	2.45	0.541	2.37	0.621	2.41	0.521
Decrease in quality of farm prod.	2.43	0.556	2.43	0.556	2.43	0.576
Change in membership of cooperative associations	2.23	0.676	2.19	0.680	2.21	0.670
Difficulty in accessing farm labour	2.42	0.583	2.30	0.603	2.36	0.603
Fluctuation in prices of farm produce	2.46	0.533	2.47	0.543	2.46	0.553
Poor agric production mgt. practice	2.48	0.527	2.27	0.597	2.38	0.597
Reduce livestock production	2.37	0.566	2.21	0.664	2.29	0.564
Decrease in rainfall and temp.	2.35	0.578	2.14	0.742	2.25	0.642
Decrease in water supply	2. 47	0.560	2.25	0.610	2.37	0.580
Increase in cost of transport	2.40	0.597	2.35	0.577	2.38	0.597
Loss of lives and properties	2.51	0.427	2.50	0.527	2.64	1.727
Health hazard	2.31	0.604	2.18	0.704	2.24	0.604
Reduced quality of housing and increase migration	2.35	0.587	2.28	0.587	2.32	0.587
Low level of income	2.53	0.570	2.45	0.570	2.50	0.570
Low level of rural development	2.53	0.573	2.32	0.573	2.45	0.573
Damage rural infrastructure	2.33	0.570	2.35	0.570	2.55	0.570

Source: Field survey, 2019.
NB: 2.0 = Cut off mean (x)

4.7 Major Effect of Perturbations on Agricultural Setting in Benue and Nasarawa States

Major Effect of Perturbations on Agricultural Setting in Benue State: Result in Table 2 revealed that the mean scores for the effect of perturbations on agricultural settings in Benue State were low yield ($\bar{x}$= 2.64), low income ($\bar{x}$= 2.50), low standard of living condition ($\bar{x}$=2.45), decrease in market activities ($\bar{x}$=2.48),degrade settlement pattern ($\bar{x}$= 2.56) decrease health care services ($\bar{x}$=2.25), degrade school facilities ($\bar{x}$=2.24) and decrease in availability of water ($\bar{x}$=2.23). Others include degrade electricity ($\bar{x}$=2.22), decrease in communication ($\bar{x}$=2.16) and decrease in religion activities ($\bar{x}$=2.02).

Major Effect of Perturbations on Agricultural Setting in Nasarawa State: For Nasarawa State, the effect were low yield ($\bar{x}$=2.53), low income ($\bar{x}$=2.48), degrade settlement ($\bar{x}$=2.46), degrade health care services ($\bar{x}$=2.45), degrade market activities ($\bar{x}$=2.38),degrade religion activities($\bar{x}$=2.38), low living standard ($\bar{x}$=2.36) and degrade school facilities ($\bar{x}$=2.15). The pooled result indicated that the major effects were low yield ($\bar{x}$=2.58), degrade settlement ($\bar{x}$=2.52), low income ($\bar{x}$=2.52) and low standard of living ($\bar{x}$=2.41).

This implies that increase in perturbations will lead to more negative effect on the above identified variables, meaning that perturbations have negative effect/ influence on agricultural settings which resulted to low yield, low income, degrade of settlement and low standard of living conditions among the respondents in the study area. FAO (2013) observed that perturbations affect agricultural settings by devastating agricultural activities, livelihood, causing economic loss, food insecurity and damage of infrastructure on large scale. This implies that low yield, low income and low standard of living conditions are indications that perturbations has serious negative effect capable of reducing the level of growth and development in agricultural settings. Once income in any community falls there is the possibility of underdevelopment because the economic status is little to support development process due to low capital for development activities and projects. Based on result in Table 2, perturbations brought negative effect in agricultural settings leading to low standard of living condition among rural people in the study area.

Table 7: Effect of Perturbations in Agricultural Settings in Benue and Nasarawa States   (n=350)

Variables	Benue State		Nasarawa State		Pooled	
	Mean	STD	Mean	STD	Mean	STD
Low yield	2.64	0.520	2.53	0.530	2.58	0.510
Low-income	2.50	0.537	2.48	0.557	2.49	0.557
Degrade electricity	2.22	0.702	2.25	0.702	2.23	0.702
Decrease availability of water	2.23	0.637	2.37	0.627	2.25	0.627
Degrade school facilities	2.24	0.627	2.15	0.637	2.20	0.637
Decrease in health care service	2.25	0.630	2.45	0.533	2.35	0.633
Decrease religious association	2.02	0.666	2.38	0.646	2.15	0.746
Decrease in rate of communication	2.16	0.684	2.10	0.774	2.13	0.764
Degrade settlement pattern	2.56	0.503	2.46	0.523	2.52	0.503
Decrease market activities	2.48	0.565	2.38	0.515	2.43	0.535
Low standard of living	2.45	0.570	2.36	0.590	2.41	0.580

NB   2.0 =cut off mean
Source: Field survey (2019).

CONCLUSION

Perturbations in agricultural settings refer to the disturbances that are cause by natural factors or man-made activities which retard progress in daily livelihood of rural people. Casualties of perturbations such as decrease in farm yield, low income generation and loss of lives and properties were indication that perturbations in agricultural settings in the study area is an issue of concern that need to be addressed by stakeholders in agricultural settings. Perturbations had negative effect on yield, income and the standard of living condition of rural people in the study area, this affect negatively the economy and other daily livelihood activities of people in the study area.

RECOMMENDATIONS

1. Economic empowerment of rural dwellers should be improve by provision of grant by the government and other financial bodies with very low interest rate to enable them embark on better coping strategy that could help curtail causes of perturbations.
2. More efforts should be made by the government, donor agencies and individuals to aid farmers who incurred losses (casualties of perturbations) due to perturbations. This could help reduce shock due to loss of properties/assets, revive hope for food production and livelihood among the affected rural people.
3. Farmers should form cooperative associations to enable them enjoy share of ideas and resources that could help them adopt strategies to cope with perturbations in their locality.
4. Government as a matter of urgency should formulate policy on sustainable use of environmental resources and take prompt action on implementation of the policy to ensure perturbations effects are reduce to the minimum level for livelihood.

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