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FARMERS' PERCEPTION ON THE RELATIONSHIP AMONGST ENVIRONMENTAL QUALITY, SECURITY OF LAND TENURE SYSTEM AND FARMING ACTIVITIES AT THE BAKOLORI IRRIGATION SCHEME IN ZAMFARA STATE, NIGERIA

Hadi, ALIYU[1] and Kasimu, B. ATTAHIRU[2]
[1&2]Department of Geography, Federal University Birnin Kebbi
Corresponding author's e-mail: aliyuhadi14@gmail.com

ABSTRACT

Purpose: *The security of land tenure systems and changes in farming activities play a critical role in shaping environmental quality within agricultural landscapes, making them an important area of scholarly inquiry. This study examines farmers' perceptions and awareness at the Bakolori Irrigation Scheme regarding the relationship between environmental quality, land tenure security, and changes in farming practices.*

Methodology: *To achieve this objective, an assessment of farmers' perceptions of environmental quality within the irrigation scheme was conducted. Both primary and secondary data were utilized for the study. Primary data were collected through the administration of 380 structured questionnaires to targeted farmers across the three sectors of the Bakolori Irrigation Scheme Talata Mafara, Bakura, and Maradun. The survey sought to determine how land tenure security and various farming activities contribute to environmental degradation within the scheme. Data analysis employed both descriptive statistics (tables and percentages) and inferential statistics (correlation analysis).*

Findings: *The findings reveal a strong relationship between environmental quality and the security of the land tenure system in the study area ($p < 0.804$ and 0.867), indicating that variations in land tenure security and farming practices significantly influence key environmental quality indicators. The results suggest that insecure land tenure and unsustainable farming activities contribute to environmental degradation within the irrigation scheme.*

Research Limitations and Implications*:*

The study was limited by time constraints and the availability of financial and logistical resources. Despite these limitations, the study contributes to existing knowledge by establishing the extent of farmers' perceptions regarding how land tenure insecurity and changes in farming activities affect environmental quality. The findings highlight the need for further research on the extent to which environmental degradation influences crop yield and overall agricultural productivity within the Bakolori Irrigation Scheme.

Practical Implications: *Based on the study's findings, it is recommended that appropriate measures be implemented to mitigate practices responsible for environmental degradation in the study area. These include regulating the use of agrochemicals to reduce pollution, adopting sustainable land clearing and preparation methods to minimize soil erosion, and improving water management practices to prevent waterlogging and nutrient leaching that led to soil fertility loss. Additionally, the study recommends the prompt replacement and repair of damaged or stolen irrigation infrastructure to enhance system efficiency and environmental sustainability.*

Key words: Farmer's perception, Awareness, Environmental Quality and Security of Land Tenure

[1] Email: kesj@kasu.edu.ng

1.0 INTRODUCTION

Nigeria is predominantly an agricultural economy with agriculture employing about 58 percent of the labour force and contributing a substantial percent of the (measured) Gross Domestic Product (GDP). Apart from labour, land is the major factor of production extensively used. Capital in the form of equipment, farm machinery, and output increasing technology embodied in current inputs are sparingly used. Yet agricultural production in Nigeria is more constrained by land compared with production in most other sectors of the economy. The traditional land tenure system in Nigeria is mainly that of communal ownership. However, individual ownership was becoming popular because of the pressures of population on the land and the advances being made and sought in the economy. These factors had made land scarce and therefore valuable. Farming systems found in Nigeria are that of owner-operatorship, group farming, corporate farming and share-tenancy. Share tenancy was important in the tree-crop sector (Berry, 1972) as well as in the food producing sector (Udo, 1975) in the south-western part of Nigeria. However, share tenancy reduces the incentive for intensive use of labour inputs as well as technical inputs such as fertilizer and –insecticides. The tenant-farmers are often constrained in the type of crops they can grow while the amount of tribute (rent) demanded from them may be so excessive as to kill incentives to invest in agricultural innovation. However, a rapid technical change is essential to achieving growth in productivity in Nigeria's agriculture. The Aggregate demand for land is a derived demand. It is derived from the need of people for products and services of land. Most people want land as a means to an end. They want land resources because land offer opportunities for incomes and employment; land supplies our needs for food, housing, recreation, transportation and open the way for the realization of various human satisfaction (Barlowe, 1972: 20). The agricultural demand for land, however, derives from the need for and to grow food crops as well as tree crops and especially industrial crops such as cotton, cocoa, rubber. oil-palm, etc.

Agricultural development requires modification and restructuring of the old, re-existing institutions, especially the land tenure system, to make it responsive to changes in factor proportions. The (pre-Land Use Decree) customary land tenure system was designed to serve objectives quite different from those required under policies that seek a rapid increase in productivity and an equitable distribution of the fruits of development. In short, the pre-existing land tenure system was survival oriented and therefore have significant impact on their decisions on environmental quality and conservation.

Farmers' land use decisions are closely related to land conservation; such as, decisions about soil Fertility cultivation, land use efficiency, adoption of protective farming systems, and the utilization of agricultural waste resources (Xu, et al., 2013). In addition, cognitive behavioral theory indicates that humans' awareness, perceptions, and behaviors are interconnected. Land protection awareness and land use behavior are closely linked and interrelated (Zhang, et al., 2016 and Tatsvarei, et al., 2018). For example, farmers with strong land protection awareness will adopt some land conservation practices, in terms of using organic fertilizer and formula fertilizer, and more environmentally friendly activities. In addition, the characteristics of farm households and farmlands, as well as land protection policies in place, age, educational attainment are closely help in shaping farmers' perceptions on land protection and conservation (Alchian and Demsetz, 1973, Hongbin, 2018). Farmer's age and education positively affect his land protection awareness, indicating that older farmers with higher levels of education are more likely to form stronger land protection intentions (Adimassu, et al., 2015). A dependence on agricultural income and sense of moral responsibility also plays a promoting role in farmers' willingness towards land protection (Illukpitiya et al., 2004 and Kessler, 2016). Specifically, farmers are more willing to implement farmland conservation, due to a stronger sense of moral responsibility, implying that land protection policy should be focused on motivating farmers' sense of social responsibility (Greiner, et al., 2011)

Moreover, farmers' awareness of land protection may vary due to their age, experience, knowledge, and ability. External and internal drivers also indirectly influence farmers' land use behaviors, which in turn play an indirect role in shaping their land protection cognition. Various land use behaviors are determined by farmers' land protection perceptions, and thus they directly cause a series of positive or negative effects on land quality. Examples of land use behavior responses include land use type, land use degree and land investment. The land use type is mainly reflected in the crop planting structure, which affects the soil fertility level and the material circulation process in the agro-ecosystem. The land use degree mainly refers to the extent to which humans change or interfere with the land ecosystem in order to meet their needs. Among which land investment has the most direct impact on the farmland quality. Reasonable land investment is beneficial to the supplementation and the accumulation of soil nutrients, thus improving soil fertility. Meanwhile, farmers also adjust their land use behaviors according to their perceptions and cognitions about differences in farmland soil quality. Farmland quality essentially consists of the change in soil quality in terms of soil acidity, inorganic and organic matter content in the soil. Considering that the changes of environment are the results of human behaviors, we do not regard the changes of land quality as drivers, but as effects. Conversely, land quality changes also cyclically influence farmers' perspectives and land use behaviors.

Furthermore, agricultural land-use changes (ALUC) and urban expansion are among the major global land use changes affecting farmer's perception on environmental quality, sustainability and agricultural productivity (Ihemezie, et al., 2021). Hence, agricultural land use changes encompass both the conversion of natural vegetation to agricultural lands and also the reverse process, whereby agricultural lands transition to non-agricultural uses. The drivers of these phenomena are complex and have remained contentious, necessitating further empirical study. They vary according to local context, making it challenging to generalize findings (Van Vliet, 2015). Some drivers of changes such as urban expansion and land degradation can lead solely to a reduction in agricultural land leading to intensification which in the end affects the quality of land and environment in general. Others, such as population growth and government policies, can drive either expansion or reductions depending on the context where they are in operation (Polyakov, et al., 2008). Summarily, factors such as economic opportunities, poverty, food and land tenure insecurity, agricultural activities which includes, land clearance and preparation, the excessive use of agrochemicals etc have been found to be part of the causes of changes on environmental quality.

Moreover, partial or incompatible property rights encourage farmers to adapt measures that may lead to soil degradation and other environmental problems. Hardin, (1968) argues that, when property rights are non-existent, natural resources are subjected to over-exploitation because the costs are borne by the community, but all the potential advantages will benefit an individual. Coase (1960) also assert that, the absence of clearly defined property rights inevitably leads to the degradation of soils and other natural resources. Therefore, there are important theoretical and practical reasons for investigating the interrelationship between farmers' perceptionon and environmental quality changes. Hence, the aim of this paper is to assess perception of farmers on the relationship between the insecurity of land tenure system and farming activities, and environmental quality at Bakolori irrigation Scheme in Zamfara State, Talata Mafara.

2.0 AREA OF STUDY:

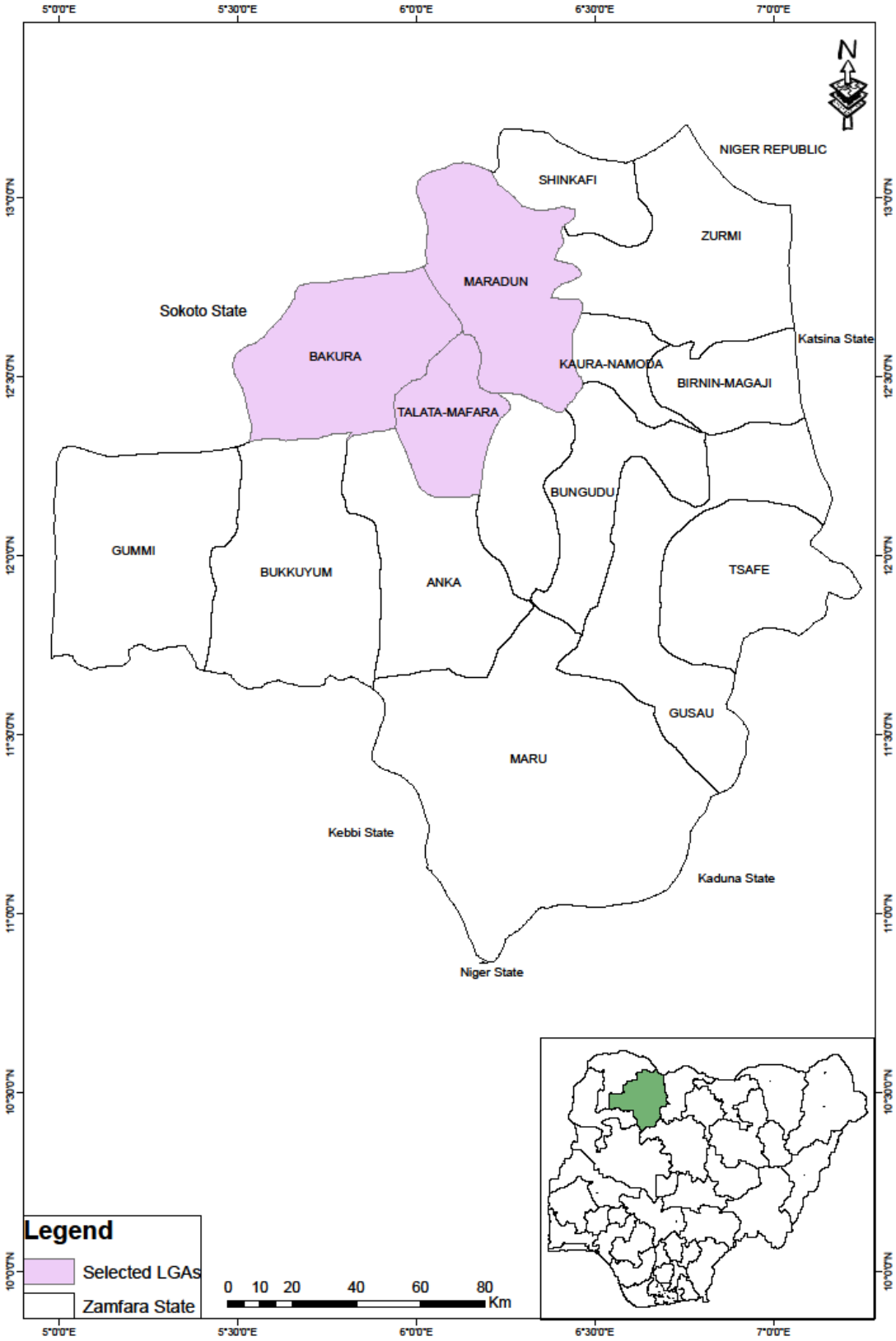


Fig.1: Locational Map of the Study Area

The Bakolori irrigation project with the farmer's population of about 30,000.00 (SRRBDA, 2024) is located in present day Zamfara State specifically in Talata Mafara, Maradun and Bakura local government areas, between Latitude 12°2'00''N and 12°5'00''N, and Longitude 5°30'00''E and 6°30'00''E. It is one and first among the projects within the Sokoto Rima River Basin located at the North-west corner of Nigeria. Others include; Goronyo Dam Project, Zauro-Binin Kebbi Polder Project, Niger River Valley Project, Gagare and Bunsuru River Basin Projects, Karaduwa River Basin Development Project and Katsina Water Resources Development Project (SRRBDA, 1978). The Dam was commissioned in 1975; with water storage capacity of about 450 million cubic meters. The projects comprise a storage dam on the Sokoto River, irrigation and drainage canals, flood protection dikes, pumping stations for sprinkler irrigation, hydro and diesel power stations, transmission lines, road network, residential and service centres. The reservoir covers 8000 hectares and extends some 119 km upstream from the dam. Fifteen-kilometre (15km) supply canal carries water from the dam downstream of irrigation area where the water is distributed several hundreds of kilometres through secondary and tertiary canals (SRRBDA, 1978 and Muhammad, 2002).

3.0 METHODOLOGY

Before starting the actual data collection, reconnaissance survey was conducted to develop familiarity with the study area, to make contact with the stakeholders to create a friendly and congenial atmosphere. This also gave familiarity information on the physical characteristics and setting of the study area for preparing modalities and easier ways of reaching the target farmers.

3.0.1 Sampling procedure

Krejcie and Morgan's (1970) table was used to determine the sample size of the study due to its simplicity, standard confidence and error built-in, widely accepted and citable. The sample size of this study (with a total population of 30,000 farmers) was therefore 380. Out of the total sample size, Bakura Sector is having 217 (57%, 6 Intakes), Talata Mafara Sector 152 (40%, 5 Intakes) while Maradun Sector 11 (3%, 1Intake) respondents based on the population distribution.

3.0.2 Data collection:

To achieve the objectives of the study both Secondary and Primary data were collected. Secondary Data sources include information from journals, text books, internet, published and unpublished materials. Others include documents from Sokoto Rima River Basin Development Authority (SRRBDA). while data from Primary source was generated from the fieldwork through Physical Observation, Structured Interview, In-Depth Interview and Focus Group Discussion (FGD).

3.0.3 Sampling techniques for field ddata collection

For the purpose of this study Stratified and systematic random samplings were adopted as the sampling techniques for structured interview. Therefore, the study area was stratified in to three (3) sectors; Bakura, Talata Mafara and Maradun and each stratum (consist of an intake (s)) was divided into clusters. In each cluster (made up of many Units) - one (1) unit is equivalent to 20hactares- one (1) respondent was selected systematically and interviewed.

3.0.4 Methods of data analysis

Both Qualitative and quantitative techniques were employed. Descriptive (tables and percentage) and inferential statistics (correlation analysis) were used in analyzing the data (on the land tenure and farming activities) to test the level of relationship between dependent and independent variables from which inferences were drawn that serve as the basis for making recommendations on ways to improve and preserve environmental quality in the study area.

4.0 DATA PRESENTATION AND RESULTS DISCUSSION

This section of the paper present how data collected was summarised, interpreted, analysed and discussed to revealed the inferences.

4.1 Farmers Perception on the Relationship between Environmental and Environmentally Related Problems, and Insecurity of Land Tenure and Property Rights

Table 1.0: Awareness of Farmers on Environmental Problems in the Study Area

Farmers Awareness	T/M	%	BKR	%	MRD	%	TOTAL	%
Yes	116	76	163	75	9	82	288	76
No	36	24	54	25	2	18	92	24
Total	152	100	217	100	11	100	380	100

Source: Author's Field Survey, (2022).

Table 1.0 reveals that 76% of the respondents responded positively that they are aware of environmental problems in the study area. The argument was cemented more, during an in-depth interview with some officials of Sokoto Rima River Basin Development Authority Talata Mafara and FGDs with some groups of farmers. The interviewees and discussants responded mostly in the affirmative. This, according to them, it was due to extensive cultivation, changes in cropping pattern (from wheat to rice or from vegetable to rice), maximization in the use of fertilizers and other chemicals for bumper harvest, coupled with other dangerous practices (for example, cutting of canal for irrigation, vandalization of water gates, indiscriminate use of agrochemicals etc.) that damages the environment.

Table 2.0: Farmers Perception on the Relationship between Environmental and Environmentally Related Problems, and Insecurity of Land Tenure and Property Rights

Perceived problems	**Increasing**	**%**	**Decreasing**	**%**	**Unchanged**	**%**	**Total**	**%**
Pollution	239	83	17	6	32	11	288	100
Excess Encroachment	259	90	9	3	20	7	288	100
Poor Maintenance of Irrigation facilities	255	78	26	9	37	13	288	100
Loss of Soil Fertility	274	95	3	1	11	4	288	100

Source: Author's Field Work, 2024

Table 2.0 reveals the perception of respondents with regards to environmental problems in the study area due to insecurity of land tenure and property right. Most of the farmers are aware of the increase in the problem, though at different degrees. Loss in soil fertility ranked highest, with 274(95%) responses of the total, followed by excessive encroachment with 259 (90%). These were followed by pollution (mostly water and soil) with 239 (83%), while poor maintenance of irrigation facilities has 225 (78%) of the total outcome of the survey. In accordance with the above, unsuitable rules (either formal or informal) for acquiring or accessing land has resulted in increases in environmental problems due to insecurity of tenure, property rights and changes in farming activities.

Loss in soil fertility

Loss in soil fertility as one of the perceived environmental problems in the study area, has the highest percentages of responses of about 95% of the total. This shows how serious the problem is. Various activities result in losses in soil fertility in the study as elaborated by farmers during an interview and they include, intensity in land use. This agrees with the finding of Kamai, et al., (2020) and Haberle (2009) in their study in Northern Nigeria.

Pollution

It reveals on Table 2.0 that pollution (water, soil and air), as one of the perceived environmental problems by farmers in the study area. 83% of the total respondents indicate an increase in it. Different types of pollution occur in the area which include water, land and air as result of different types of chemical use in excess or not in the right proportion. This is with the aim of achieving maximum yield across the land ownership types due to fragile duration of land right they exercise. The assertions by Haberle, (2009) is in line with the findings of this study, that the use of chemicals, changes in soil structure and intensive farming are the most important among the stated activities taking place in different parts of the Bakolori Irrigation Scheme that caused different types of pollution.

Excessive encroachment

Table 2.0 reveals that excessive encroachment has 90% of the total respondents responding in the increase of the problem. This refers to the extension of farm land towards reserve and circulation areas, (walk ways) canals and water reservoirs by (especially) land owners for the expansion of their farmlands, for the increase of yield and maximization of profit. The activity has great effects on the farmland, as it causes water leakages that damages farm lands and breakages of canals that may cause erosion, water logging, damage of water reservoir and blockage of drainage at long run.

Poor maintenance of irrigation facilities

Having up to 78% of the total responses as indicated on Table 2.0, poor maintenance of irrigation facilities is one of the problems perceive by respondents to be on the increase due to insecurity of land tenure and property right in the study area. The 'I don't care attitude' of most farmers towards managing and repairing of irrigation facilities like primary and secondary canals, water distribution gates, access roads, drainage and reservoirs contribute significantly to the increase in the damages. Resources committed by most tenants' farmers and even 'owners' (those with family and communal tenure system) towards land conservation is very insufficient. This Poor practice and poor utilization of irrigation facilities cause erosion in the Scheme due to sharp practices in irrigation activities, environmentally ill modes of watering and contravention of laid dawn procedures by authorities in farming activities, thus, leading to water logging and water shortages in some farmlands with serious repercussion on the yield and environment as well. all results in the blockage and breakage of water drainages and canals in the Scheme. Though some efforts were made to repair the damages in some places, most of it yielded very little or nothing (as reported during the in-depth interview and FGD by Mal. Abubakar Jabe, a community leader in Talata Mafara sector) as substantial hectares in the scheme are out of cultivation or are experiencing serious water crisis presently. It can, therefore be deduced

that poor maintenance attitude has great impact on the level of environmental quality in the study area. This is in agreement with the findings of Oigonji, et al., (2015) in their study at Bakolori Irrigation Scheme, Talata Mafara and Sukhdeo, (2013) at Muktsar Irrigation District in Punjab in India

4.2 Farmers Perception on the Relationship between Environmental and Environmentally Related Problems, and Farming Activities

Table 3.0 Farmers Perception on the Relationship between Environmental Problems and Irrigation Farming Activities

Perceived Environmental Problems	Increasing	%	Decreasing	%	Unchanged	%	Total	%
Increase the risk of desertification	161	56	43	15	84	29	288	100
Its effects on Biodiversity	144	50	40	14	104	36	288	100
Undulation of Land	210	73	26	9	52	18	288	100
Changes in Soil Structure	175	61	32	11	81	28	288	100
Soil Compaction	203	70.3	18	6.3	67	23.4	288	100
Water Pollution	239	83	17	6	32	11	288	100
Water Erosion	210	73	26	9	52	18	288	100
Leaching	225	78	23	8	40	14	288	100

Source: Author's Field Work, 2024

Table 3.0 indicates what is called an on-farm environmental impact, from which the perception of respondents was generated on the environmental and related problems in the study area. Water pollution has the highest respondents of about 239 (83%) followed by leaching with 78%. Undulation of farm land has 73.4%, water erosion 73%, soil compaction has 70.3% fallowed by changes in soil structure with 69% while increase in the risk of desertification has 56% and its effect on biodiversity has 54% of the total respondents indicating the percentage of increase in environmental problems as a result of changes in farming activities. It may be concluded based on Table 3.0 that water pollution is the most pronounced environmental problem presently as perceived by respondents in the study area, because its impact is felt by both farmers and other residents within the Scheme, due to intensity in the use of chemicals for weeds and pest's control.

Desertification

One of the perceived environmental problems caused by farming activities (land clearance) is the increase in the risk of desertification, having 56% of responses in the study area, due to continuous cutting down of trees, shrubs as well as overgrazing. Irrigation projects in Northern Nigeria were built

with the aim of complementing rainfall received in the region, which in most cases falls short of satisfying the agricultural needs and vis-à-vis food security, and also to combat the increase in desert encroachment in the region, by creating moist environment that can prevent it against desertification. However, the activities taking place in the Scheme in the name of land clearance are against environmental hygiene, and therefore retard the expected developments. This agrees with the findings of Lai and Cumming, (1973) as reported at the International Institute of Tropical Agriculture, (llTA) Ibadan.

Effects on biodiversity

It is one of the problems perceived by respondents to be on the increase due to persistent bush burning, as a means of land clearance, with 50% of respondents indicating its increase in the study area. The cut down trees and shrubs are normally buried or burnt in the farm, with the aim of adding manure to the farm, and decreasing soil acidity and incidences of soil pests, diseases and undesirable invasive species as disclosed by farmers and some officials at SRRBDA Office Talata Mafara. This agrees with the findings of Auid, et al., (2006). Farmers also introduce burning to remove moribund and unpalatable grasses from previous growing season, to stimulate the re-growth of fresh herbage with higher nutrient contents as opined by Snyman, (2003) and Sanyaolu, (2015). But from the other side, it affects the quantity of some microorganisms that are of great importance to the crops to be planted, soil structure and soil texture, thereby making it prone to any available agent of denudation, which are all detrimental to the quality of the environment. as a lot of organisms contribute immensely in farming activities. Therefore, frequent bush burning is generally considered to have negative effects on biodiversity Bradstock, et al., (2010). This finding is at par with the studies of Robinson, et al., (2003), Pyke et al., (2010), Paltridge et al., (2009) and Birnin-Yauri, et al., (2008).

Undulation of Farm Land by the movements of heavy machines

Undulation of farm land is one of the environmental problems caused by land preparation and perceived to be in the increase, having 73.4% of responses. It is the formation of hilly and valley like patterns on the farm, by accumulating land on certain places more than others, by plough or harrow disc, due to setting problem of ploughing or harrowing discs, or some obstacles, like stones or buried trunks of trees in the land, making the attachment to bounce and therefore unbalance the distribution of tillage land, which if not well levelled will make watering very difficult and can trigger the activities of agent of denudation in the area.

Soil Compaction

Compaction occurs when a compressive stress is applied to soil, causing air to be forced from the soil voids, and the process is called consolidation, when water is expelled from soil voids (Piwowarczyk, et al., 2011). It is one of the perceived physical problems identified in the study area with 70.3% of the total respondents. It is caused by the movement of heavy machines during land clearance and land preparation, which are common practices in the study area. It alters the physical (particularly the soil structure) and hydrological characteristics of the soil. The problems manifest in poor aeration, accelerated surface runoff, eluviation of clay and humus from surface to subsoil, all of which are environmentally ill problems, as put forward by Godwin, et al., (2017) and Shaheb, et al., (2018), that in severe cases, soil compaction substantially impacts environmental quality.

Soil structure

For any good agricultural production, soil quality is paramount, despite its importance in crop production. 61% of respondents revealed, that the soil structure is continuously being affected by the use of simple farm tool and more complex machines like tractors during land clearance and land preparation on the irrigation farm lands at Bakolori irrigation Scheme, Talata Mafara, as identified on

Table 3.0. This seriously affects the water retention capacity of soil, and therefore facilitates leaching, which in turn causes acidity. This study finding agrees with FOA (2005), that the soil is said to be degraded due to lack or shortage of some basic elements or changes in its structure that may affect its water retention capacity, aeration, composition, fertility etc.

Pollution

This is one of the farmers perceived environmental problems caused by farming activities in the study area, with 83% of the total respondents as indicated on Table 3.0. Respondents revealed from the interview, that agro-chemicals used in the farm at varying quantities and quality pollute water, air and land which in one way or the other affects environment, depending on the quantity and solubility of the chemicals used. Among the identified types of pollution, water and land pollutions are the two most important types of pollution identified in the irrigation scheme. This agrees with the findings of Muhammad, et al., (2013) and Oiganji, (2015), at Bakolori Irrigation Scheme. The study finding was also corroborated by the study conducted by USAID, (2010).

Soil Erosion

Soil erosion is one of the perceived environmental problems with 73% of respondents (as indicated on Table 3.0). This problem is increasing due to poor watering techniques, removal of vegetation, the use of farm machines and changes in cropping pattern in the scheme. The effect was revealed to be more along water canals, drainages and reservoirs by causing the breakage of the embankments, thereby causing temporal shortage of water to the affected areas. This study finding is at par with the study of Rafiu, (2008).

Leaching:

Leaching is one of the perceived environmental problems with 78% of the total respondents, attesting to its increase in the study area as indicated on Table 3.0. This was assessed by respondents; through the quantity of fertilizer, they apply and the duration of its impact on the crop. The increasing application of fertilizer and other agrochemicals on the farm and its leaching has some consequences on the yield and soil. By weakening its potentialities and accumulation of unabsorbed nutrients, which causes salinity and rise in soil pH. This study finding is in agreement with the findings of Rafiu, (2008).

Water Logging

Up to 80% of the total responses in the scheme perceived the increase in water logging as one of the environmental problems in the study area (as shown on table 4.0). This study observed changes in quantity of water supplied to crops, the blockages of reservoirs and dilapidation of drainages. This caused the accumulation of excess water in the farms, causing a lot of damages to the crops and environment in the Scheme. This is at par with the USAID, (2010) report. Moreover, water logging as an environmental problem identified in the Scheme, is also related to insecurity of land tenure and property rights due to fear of eviction or termination of right. This leads to the mismanagement of water resources for better harvest and maximization of the profit resulting in the increase in water logging. This was confirmed by respondents during FGD. In a statement, the Hakimi of Awala (Alhaji Muhammadu) says ‘we vacated our settlements due to marshy conditions which leads to the collapse of houses and difficulties in burying our dead ones due to rise in water table, and this is not the case before the construction of Bakolori Irrigation Scheme, He stress that, before the scheme water table was relatively deep compared to the present situation, rendering a substantial percentage of hectares in the Scheme currently as water logged sites’. This assertion is at par with the findings of Dharmadhikary, (2005) who reported, that about 200,000ha of land in Pujab was under water logging as result of tenure problem.

Table 4.0: Correlations (Pearson) analysis on the relationship between the perception of farmers on the level of security of land tenure, and property right and farming practices, and environmental quality in the study area

Variables	Stat.	Level of Insecurity of Land Tenure and Property Rights in the Study Area	Environmental Problems Cause by the Insecurity of Land Tenure and Property Right	Environmental Problems Caused by Farming Activities in the Study Area	Other Problems Caused by Changes in Farming Practices
Level of Insecurity of Land Tenure and Property Rights in the Study Area	Pearson Correlation	1	0.804	0.867	0.653
	Sig. (2-tailed)		0.000	0.000	0.000
	N	380	380	380	380

Correlation is significant at 0.05 level (2-tailed)
Source: Author's Field Work, (2024).

Correlation analysis was used to test if there is relationship between the level of security of land tenure and property right and environmental quality in the study area. The finding on table 4.0 reveals that, there exists positive relationship of 0.804, 0.867 and 0.653 at 0.05 significant levels when compared with P value of 0.000. This indicates that, the more the level of security the less the environmental problems in the study area and vice versa. From the above therefore, relationship exists between the level of security of land tenure system and property rights and environmental quality in the study area.

This agrees with the finding of Tsue, et al., (2014) in their study at North-Central Nigeria that, increase in land tenure security either through inheritance or purchase of land increased sustainability of the environment.

5.0 CONCLUSION

The study concludes that, there is an increase in various environmentally degrading activities in the study area as revealed from the responses of farmers. This is really dangerous and alarming, as if the condition was not arrested in good time, it will result to serious havoc to the environment. Which will eventually affect the yield and productivity in the scheme. Hence sabotaging the aim and objective of the scheme. The study therefore recommends the following for rescuing and protecting the 431environment from further deterioration;

1. There should be a serious enlightenment campaign on the negative consequences of activities capable of damaging the environment.

2. Federal Ministry of water resources should give more attention to regular maintenance and provision of needed facilities in the Scheme to checkmate the persistent breaking of canals and other irrigation facilities
3. There should be an expansion of the project to accommodate the teeming and astronomical increase in population, to reduce intensification in cultivation due to its environmental consequences.
4. Land protection policy should be focused on motivating farmers' sense of social responsibility in preserving the environment and the use agrochemical that are environmentally.

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