

# **The Social Construction of Land Degradation among Farmers in Rural Kano, Nigeria: Implications for Development Policy**

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## **Abstract**

*Land degradation is one of the main drivers of natural resource degradation, and can lead to loss of agricultural livelihoods, and food insecurity. This paper analyses smallholder farmers' experience of land degradation in rural areas of Kano Nigeria, using a social constructivist perspective. The study used semi structured interviews with 44 farmers and 6 focus group discussions to examine these perceptions. The findings show that farmers' main conception of land degradation is a loss in soil fertility, a decline in productivity and crop yield, and in some cases, a change in vegetation. The study finds that farmers' conceptualization of land degradation is contextual and shaped by a variety of factors, including social and physical factors. The three most important drivers that shape farmers' construction of changes in land are their socioeconomic conditions, the Islamic belief about rainfall and climate, and the local ecology and context. Given the recognition of land degradation as a driver of rural poverty, and the importance of smallholder farmers to food security in Africa, farmers' experience of land degradation need to be taken into account in the design of policies to redress, and restore degraded land.*

**Keywords:** Land Degradation, Social Construction, Rainfall, Vegetation, Soil Fertility, Kano

## **Introduction**

Land degradation is defined as the loss of the productive potential of the land (Herrmann *et al.*, 2020). It refers to the deterioration of land resources such as soil, water, vegetation or relief. It could be temporary and the degraded resource may recover, or it can represent the start of a downward cycle of degradation, resulting in a long-lasting, irreversible alteration in the condition of the land resource (Stocking & Murnaghan, 2013). In many developing countries, land degradation is an environmental as well as a socioeconomic problem, and manifests itself in different ways such as soil erosion, soil fertility depletion or vegetation loss. It is responsible for reducing the quality of land and lowering its capacity to produce (Stocking & Murnaghan, 2013). Food security has emerged as one of the most important global issues and

estimates suggest that by 2050, the worldwide food demand is projected to increase by more than half compared to 2006 levels, due to urbanisation and population expansion (FAO, 2016).

Smallholder farmers are widely regarded as the backbone of global food security (Chappell & LaValle, 2011). Most people in the developing world and in Africa in particular rely on agriculture for a living. Land degradation has been highlighted as a driver of rural poverty and natural resource degradation and is a significant constraint on agricultural production (Bado & Bationo, 2018). In Nigeria, land degradation is associated with increased resource conflict, desertification, drought, flood, and erosion, and has typically been examined with an emphasis on the quantification of its physical indicators. Development policy interventions are usually based on these quantitative assessments, but qualitative assessments of farmers' perceptions of degradation are equally important. However, this paper examines how farmers socially construct land degradation - manifested as changes in soil fertility and crop output in two farming communities in rural Kano, northwest Nigeria.

## **Literature Review**

### **Concept of Social Construction**

The key principle of social constructivism is that our understanding and perception of the world, and of people and events does not always reflect the reality of that world, but instead is a result of the way the world is portrayed or constructed (Burr & Dick, 2017). In relation to the environment, social constructivists posit that the knowledge and perceptions of environmental problems is inextricably linked and cannot be detached from social experience (Jones, 2002; Galbin, 2014). They argued further that, research should be focused toward understanding the diversity of constructions of an issue, how different assertions are made, how these relate to different stakeholder groups' interests, and the way power relations between these stakeholders influence outcomes (Jones 2002).

Social constructivism can be viewed as a sociological study of environmental problems (Burningham & Cooper, 1999). One of its useful aspects is its examination of power relations of different actors within environmental issues such as land degradation, desertification or climate change. Certain environmental issues by their very nature lend themselves to constructivist studies, as the perception of such environmental issues cannot be divorced from the social, political and economic forces.

### **Concept of Land Degradation**

Land degradation has been described at various times as elusive (Andersson *et al.*, 2011), relative (Gray & Morant, 2003), contextual (Warren, 2002) and socially constructed (Stocking & Murnaghan, 2013). Because different social classes use and view resources in different ways, land degradation is socially defined and perceptual (Scoones, 2010). According to Warren (2002) degradation for one group of land users might mean quite the opposite for another and it can only be assessed “in its spatial, temporal, economic and cultural context”. Degradation is therefore in the eye of the beholder and subject to interpretation. There are social and institutional dimensions of land degradation, and spatial and temporal variation in people’s perception and assessment of land degradation (Crossland *et al.*, 2018; Yageta *et al.*, 2019). Consequently, this leads to what has been called the ‘multiple realities’ of land degradation because perceptions of local people are multiple and varied (Maconachie, 2012).

### **Land Degradation as a Social Construction**

Land degradation is a socio-political cum economic issue, and can never be overemphasized as it’s germane to survival of people, through food security. It always calls for policy direction to re-engineer the need to keep the environment intact for quality yield, and curbing erosion. It is however noteworthy, that there are social and institutional dimensions to issues arising from land degradation, as well as existence of spatial and temporal variation in people’s perception and assessment of land degradation (Crossland *et al.*, 2018; Yageta *et al.*, 2019). Consequently, this leads to what has been called the ‘multiple realities’ of land degradation because perceptions of local people are multiple and varied (Maconachie, 2012).

On the other hand, social constructivism viewed land degradation as a sociological study of environmental problems (Burningham & Cooper, 1999). Its useful in the examination of power of relations of different actors within environmental issues such as land degradation, desertification or climate change. It is however be reiterated that certain environmental issues by their nature offer themselves to constructivist studies, as the perception of such environmental issues cannot be divorced from the social, political and economic forces.

### **Empirical Review of the Literature**

Human and environmental systems are interconnected, and both biophysical and social factors contribute to land degradation. (Macaulay, 2014). Current conceptualizations of land degradation place a strong emphasis on the connections between ecological and social issues and provide equal attention

to the biophysical and human elements (Reynolds *et al.*, 2011). They also advocate placing a larger value on local environmental knowledge which is central to many land managers (Nkonya *et al.*, 2011). The individual characteristics of farmers (such as age and gender) and their social and economic circumstances can determine their perceptions of, and responses to land degradation.

A number of studies in Nigeria shown that land degradation is driven by both natural processes such as land atmosphere feedback and rainfall variability, and human activities such as agricultural expansion and fuel wood extraction. For instance, a study by Akinagbe and Umukoro (2011) assessed farmers' perception of the effects of land degradation in Delta State and reported that the main drivers of land degradation were soil erosion and degradation, and that the main effects on agricultural activities were decrease in farm land available for cultivation, loss of soil nutrients and reduction in farm yields (output). In a similar study by Usman et al (2013) that studied farmers' perceptions of soil degradation in Kebbi State and found that soil and soil properties have changed, and this change resulted in poor soil quality, poor crop performance and a reduction in crop yield. In addition, Maconachie (2016) examined local people's knowledge and perceptions of environmental change in the urban fringes of Kano, and found different interpretations of land degradation by individuals. Farmers' perceptions regarding vegetation, fuel wood and decline in soil fertility and crop yield suggested that population pressures and land use are negatively affecting environmental change. Maconachie further argues that global economic forces and present economic conditions in Nigeria significantly influence degradation and the land use decisions of local farmers and other land users. In Niger state, Adenle et al (2022) examined how local land users perceive land degradation and how they rate sustainable land management solutions, and identified soil erosion, loss of soil fertility and reduced vegetation as indicators of land degradation, and drivers as overpopulation, urbanization and natural factors and deforestation.

In other parts of the developing world, a study in the drylands of Ethiopia examined to what extent presents farmers' perceptions of land degradation influenced their investments in land management and showed that farmers perceive an increase in water erosion and soil fertility deterioration (Adimassu et al, 2014). A related study of land degradation in Western Kenya was carried-out by, Odendo et al. (2010) they found several indicators such as declining soil fertility, including declining crop yields, weak crop growth and soil colour were resultant effect of land degradation. Their results also showed that institutional factors and farm and farmer characteristics were the primary predictors of farmers' perceptions of the extent of degradation. A seemingly

related study by Crossland et al (2018) in northwest Ethiopia found that land users have different perspectives and are socially differentiated. The researchers concluded that it is important to engage with land users' opinions to understand how land degradation interventions affect livelihoods.

Other studies within the African states shows similar indication, this includes Toure et al (2020) they examined farmers' perceptions of land degradation along a climatic gradient in three regions of Mali. Their results showed there was a high awareness of land degradation and that farmers' perceptions are not influenced by gender, age, or education level, but by other factors such as agricultural training, participation in agricultural labor and household size. A related study from Nepal by Paudel *et al*, (2019). show that farmers' perceptions were based on socioeconomic variables as the crucial drivers of changes in land, and major drivers include population growth, urbanization infrastructure and government policy. The empirical studies cited show land degradation is not entirely viewed and framed by natural physical processes, but by social and economic ones as well.

## **Research Methodology**

### **Study Area and Characteristics**

The study area covers two dryland communities in rural Kano - Behun in Dawakin Kudu Local Government Area (LGA) and Yadai in Gabasawa LGA, both in Kano state, Nigeria. The climate of both communities is semi-arid Sudan Savannah. Agriculture is the main source of livelihoods, with some livestock rearing, trading, and crafts also present. Compared to Yadai, which is a little more desert and has less rainfall and vegetation, Behun enjoys a longer wet season. Due to this small geographic and climatic variance, there were some variations in the soil, vegetation, and crops cultivated. The main crops cultivated in Yadai are millet, sorghum, groundnuts, cowpea and sesame. In addition to all these crops, pumpkins, melon and chili peppers are also cultivated in Behun. In the Kano region, mean annual rainfall is about 884mm, and it varies widely from as low as 600mm in the north to 1200 mm in the south (Mohammed *et al.*, 2015), therefore the region is classified ecologically as drylands because of the annual variability in the amount of rainfall. Generally, it has a short-wet season from June to September or October and a long dry season which usually lasts from October to May, but the length of the wet season diminishes northward.

### **Data Collection**

The aim of the research is a constructivist study of the farmers' perceptions of land degradation, to determine indicators of land degradation and drivers that frame these perceptions in rural Kano. The study design and methods were

purely qualitative. Data were collected through focus group discussions (FGD) and individual semi structured interviews with 44 farmers comprising of male and female. The individual interviews and notes from FGDs were recorded, transcribed and organized into codes and subsequently themes. Thematic analysis was used to examine the data with the help of NVivo qualitative analysis software. Because of the entirely qualitative nature of the study, no quantification of perceptions was made, and quotes and themes are used to represent the patterns found in data.

### **Results and Discussion**

In this section the study examined the normative characteristics of land degradation from the small holder farmers' perspectives in both communities, and consider how they are constructed. Several themes emerged from the analysis of the interview and focus group data. The main indicators of land degradation that emerged were; soil fertility decline, reduction in crop yield, vegetation change and changes in rainfall. These were shaped by the social and economic underpinnings. This section also considers the factors which influence these perceptions including religion, ecology, socioeconomic conditions etc.

### **Farmers' Construct of Land Degradation**

#### **Soil Fertility and Crop Yield**

The main manifestation of land degradation, according to almost all the farmers interviewed, is the reduction in the productivity of the land and consequently in the crop yield over time. The land was perceived to have been more fertile in the past, and now in the words of one respondent it had gone 'cold'. There was a strong consensus among the farmers in both communities about soil fertility reduction and the consequent effect on crop yield. A majority of the respondents interviewed observed a decline in soil fertility and crop yield, and the land is described as being tired or dead. Farmers reported that a reduction in yield particularly for the main food crops of millet and sorghum expressed in the reduction in number of *damis* (bundles) of grain produced. According to the farmers, unlike in previous decades, it was increasingly difficult to feed their families for a whole year with the crop yield they produced. A farmer commented;

*Crop yield has definitely decreased. In the past here on this piece of land, I could get 10 dami of millet, but now I have to work very hard to get even five. The reason is simple, Allah has said that one day where you used to get 70 dami of grain, and you will struggle to get seven. Everything Allah says will come to pass.*

Some of the reasons proffered for the decline in soil fertility and subsequently in crop yield included; rainfall variability, a reduction in fallow, cutting off of

water resources, lack of agricultural inputs (such as fertilisers and seeds) and corruption. The rapid increase in population in the region was also linked to land degradation. A farmer articulates some of these reasons:

*I'm not really sure what led to the reduction in soil fertility. It's possible that there has been excessive farming. In the past, the soil was much healthier and did not require as much taki or even fertiliser. A plot of land could once go uncultivated for five years, but now that Allah has increased population, there is not enough land for everyone. The yield will not be good if a parcel of land is continuously farmed without being permitted to fallow for one or two years, unless you add a lot of taki or fertiliser.*

Farmers also linked the issue of soil fertility and crop yield to the availability of *taki* and fertiliser, and to the rain that Allah sends from the sky. The main source of organic fertiliser in northern Nigeria is manure, locally known as *taki*. *Taki* is the foundation of smallholder farming in the region, and is made from a combination of manure and household refuse. Livestock ownership is therefore critical to agricultural livelihoods. According to the interviews, the lack of *taki* and the high cost and fertilisers were central factors in soil fertility. As a result, they believed that in order to obtain a satisfactory harvest, they needed to use far more *taki* than in the past and, when possible, augment it with fertiliser.

*The crop yield has declined. In the past, we may receive a full rumbu (granary) of grain from one or more farms in exchange for our crop. But as times have changed and according to Allah's will, the soil has also changed. We farm and produce a lot when Allah bestows his bounties, but we produce little when the soil is cold and there isn't any fertiliser. If you don't want to farm in vain, you must apply taki or fertiliser. We have always required taki in order to cultivate. We don't have enough taki to visit every one of our farms. To supplement the taki, we need fertiliser, but most times it is too little and does not come on time. Since the soil is no longer fertile, we need to apply fertilizer for us to get high yield.*

To link these constructions of land degradation to literature, some studies on soil degradation in rural Kano indicate that there is little scientific evidence of a decline in soil fertility (Mortimore & Adams, 2001; Hoffman et al 2001; Maconachie, 2016). However, despite the scientific quantitative findings of a lack of decline in soil nutrients, the farmers in these same studies believe that crop productivity has declined. Other semi-arid regions of Africa also exhibit this gap between scientific research and local perceptions (Stocking & Murghanan 2013; Kiage, 2013). This may be explained by the fact that scientific studies of soil fertility only provide a partial picture, and other broad, external issues influence farmers' perceptions of their soils (Maconachie 2012; 2016). Conflict and mismatches occur not only between local perceptions of

land degradation within a community, but also between land users, scientists and policy makers.

### **Agricultural Inputs – Fertiliser and Taki**

Farmers regulate soil fertility and achieve sustainability by integrating crops and livestock (Mortimore & Harris, 2005), and with manure use and management (Harris & Yusuf, 2001). Studies in the Kano Zone have noted how different social actors in the Kano region evaluate their resource base differently and local perceptions of the loss in soil fertility are related to the increasing difficulty in getting both inorganic and organic fertilisers.

From farmers' responses in this study, the availability of *taki* and fertiliser is one of the most important issues that they face in relation to soil fertility. Farmers believed that there were some factors linked to land degradation that they could control, and these are the factors they perceived to have changed. One of the main constraints of agricultural production for smallholder farmers is the low use of fertilisers. Crop yields in Africa are the lowest in the world and decades of low fertiliser and manure application has stripped soil of nutrients (Sánchez, 2010). The amount of *taki* and fertiliser that is applied on the farms depends on a farmer's personal circumstances and financial resources, hence, when crop yield is seen to either decrease or increase, it is linked to a farmers' ability and those two variables of *taki* and fertiliser that are brought into account. Farmers linked the issue of soil fertility and crop yield, (and by analogy to land degradation) to the availability of *taki* and fertiliser. Inputs of *taki*, fertiliser and seed varieties were very crucial to agricultural cultivation to the farmers. Many farmers believe that it is not the inherent properties of the soil that have changed per se, but external conditions that have affected the productivity of the land. Therefore, farmers perceive the productivity of the soil as not necessarily internal, but depending on what is applied to it. In Behun community, the soil is viewed as being inherently good fertile soil, which produces a good yield if there are sufficient inputs. As one farmer commented, other things affect the soil:

*A lack of money and lack of fertilizer are our two biggest problems. But there are no problems with the soil. There is good soil here. What we plant grows. The soil is fine, thank Allah. Our only problem is that we don't always have enough money to hire workers and buy fertilizer, so we don't get as much from farming as we would like.*

### **Rainfall**

According to the respondents, soil fertility was not the only determinant of crop yield. Rainfall was the main determinant of crop in a farming season, and the control of timing and amount of rainfall was completely out of their control. Farmers gave different answers to the question of whether they



perceived a decline in average rainfall over the years which would explain the decrease in yields, and its effect on their perceptions of their land. All the farmers agreed that there was variability in annual rainfall over the years, and that sometimes the rains are abundant and sometimes they are not. The quantity of rains influenced the quality of land farmed that year, because of its effect on moisture content and workability. Crop yields fluctuated from year to year based on the amount of rainfall and the financial situation of a specific farmer. Farmers believed that only divine will could determine annual rainfall amounts and consequently how good a harvest they obtain. As one respondent put it:

*If we have a good rainy season then our yield is good, and if the rainy season is not good, how can you get a good yield even with all the taki in the world. So, it is in the hands of Allah. Everything is in his Hands, even our lives.*

Another farmer also commented:

*The rainfall itself has decreased. It is not like it used to be. This is because as I said before, times have changed. There is too much inequality in the world. Some have too much and others too little. There are also too many sins and sinners. In the cities and villages, people commit sins that could destroy towns if not for the mercy and promise of Allah. Allah forgives everything except injustice. And there is injustice in the land.*

### **Vegetation Change**

The conversion of woodland to farmland is the main factor in woodland degradation in the drylands (Behnke & Mortimore, 2016). Dryland farmers are also foresters, and the management of trees are an integral part of agricultural production (Mortimore & Turner, 2005). The study area's landscape is known as farmed parkland, a characteristic landscape where numerous tree species are planted or kept on farms alongside cultivated crops. The local population's livelihoods depend on the resources provided by this landscape. Trees are regarded as distinct resources from the land they are situated on, and land and trees on the land may belong to different people.

There were a few differences between the communities regarding vegetation change. In Yadai, farmers perceived there to be a decline in the tree cover in the area, and they attributed this to anthropogenic causes, chiefly the cutting down of trees to sell as firewood. They suggest that this had happened more often in the past but had been declining in recent years. As with soil degradation, the decrease of vegetation is attributed to economic conditions and people's need for money than to natural causes. A majority of respondents expressed the view that natural vegetation was declining for a variety of reasons. The most common reason given was people cutting down trees to sell for firewood, or selling their trees to others who then cut them down. This

perception of the influence of economic conditions on vegetation change appears to be widespread in the Kano area, as noted by Maconachie & Binns (2006). A farmer comments:

*I think there has been a decrease in the number of trees here. It used to be that there was a lot more trees here. But people started bringing big machines to cut them down, and trucks to take them away. In the past, dorawa was left to bring forth its fruit and we ate them and used the seeds for kalwa. But people love money more than they love trees now.*

A second reason given was the clearing of previously uncultivated land to make way for new farms. Farmers acknowledged that woodland being cleared to make way for farms contributed significantly to vegetation decrease. However, several men interviewed were at pains to mention that they personally did not cut down trees, because they knew the value of trees, even though they knew people who did. They saw a connection between tree cover on a farm and productivity. They believed that loss of tree cover had a negative effect on farms, in particular by exposing crops to the effect of wind.

*There has been a decrease definitely, because when you go round places where there used to be trees, you find that there are not much more now. And it is a shame, because where the trees exist, the crops grow better because they shield them from the effect of the wind. Yes, where there are trees, the crops are better than the one without trees near it.*

In Behun the overwhelming perception was that vegetation is not decreasing at all but in fact is increasing. Both men and women believe trees are thriving and farm trees provide sufficient fuel wood and other produce. In both communities, men bear the responsibility of providing fuelwood and this means that they measure vegetation change in relation to the availability of fuelwood, i.e. in a change in how easy or difficult it is to acquire this vital resource. In Behun, they did not believe there was a problem. The farmers indicated that only dead trees and trees which have grown too big are cut down, and other trees are stripped back in the process of farm clearing known as *sassabe*. Though some men did concede that woodland was being cleared to make way for farms, and they were no longer able to get wood from forests, this did not seem to have a significant impact on the availability of fuelwood for majority of the men, as their farm trees were sufficient in providing it. For example:

*We have enough trees in this community and the number of trees have not decreased. We are blessed with many trees here. Even though we cut them for firewood, many of them grow back. You will see many trees around when we go out to see the farms.*

However, even though they perceived no decline in vegetation, farmers in Behun are aware that though this might not be a pressing concern for them, it could be a problem in other areas and were careful to stress that this was a characteristic feature of their locality. One farmer comments:

*We have a lot of trees in this area, despite the fact that many are cut down for firewood. We have been blessed with many trees and a good soil. I have not noticed a decrease in trees because even when we cut down the trees there are already others growing that will replace them. Trees grow very quickly in this part. When we go to other places, we are surprised at how few trees they have got.*

However, some men conceded that there has been a change in the landscape because land around the village which used to be common resources has been sold off and woodland has been cleared to make way for new farms. This presumably would have led to a substantial change in landscape in the area, but it did not seem to have impacted greatly on their ability to provide fuelwood.

*There used to be a forest close to this village where we get firewood. Anyone can get firewood from there, but they have now been cleared of most of the trees and are now farms. Now we have to rely only on our farms for firewood. The leaders have all sold the forests, the village head, the local government chairman, the mai unguwa have all sold off the land, and they have been turned into farms. We used to load donkeys with wood from the forests but not anymore.*

This view is supported by literature. Research into fuelwood in the Kano Zone has documented increase in trees in areas close to urban centres and of high population densities (Usman & Nichol, 2018). And despite a recognition that the landscape has changed, local peoples' livelihoods had not been affected significantly by the change in the characteristics of vegetation cover in woodland.

### **Drivers of Farmers' Constructs**

Local land users' perception of environmental change and land degradation are affected by a variety of factors including location, ecology, type of land users, type of land use, characteristics of the land manager and the resources available to them. Farmers' perceptions of vegetation loss, soil fertility and crop productivity are shaped by population pressures and certain land use practices that have had a negative effect on environmental change (Maconachie, 2016).

### **Socio Economic Conditions**

Farmers recognise complex interactions of yield, soil fertility and technology, so their perceptions may reflect changes in social and economic factors that

differs from farmer to farmer (Adenle et al., 2022). The economic abilities and attitudes of farmers are important influences on their vulnerability to degradation. A familiar refrain in the research is of lack of agricultural assets and money and means to purchase inputs. The cost of pesticides and labour and the cost and availability of agricultural inputs were the preoccupation of the farmers in both communities. Agricultural production is the main source of income in both communities, but many farmers lack the resources and the capital needed to acquire sufficient quantities of inputs such as organic and inorganic fertiliser.

Only a few farmers are wealthy enough to afford them. In Behun only two farmers said they could afford all the inputs they required, and in Yadai, which is more remote, no farmer felt he was wealthy enough to afford sufficient inputs for all his farms.

Socioeconomic factors are clearly the driving forces in management of some vital indicators of land degradation such as soil fertility. Soil fertility management and management of the whole growing cycle depend on these economic realities, and the perception of land degradation will vary according to a particular farmer's circumstance. Variations in the quality of soil could be inherent or caused by its use and management (Ilah & Nuhu, 2018). Changes in soil fertility therefore often are 'nested within a variety of social, political and economic factors that clearly encourage or prohibit investment in the land' (Maconachie 2016). The intrinsic qualities of the land were not seen to be as important as the external inputs, and it was up to each farmer to maximise his production using all available resources, such as fertilisers, labour, individual skills and social capital. Given the intricate economic realities of agriculture in both communities, social factors are crucial.

**Religion: The moral thesis**

An important aspect of the social construction of land degradation in both communities is that farmers ascribed rainfall patterns and environmental change to divine will. Therefore, faith and belief play an important role in the construction of environmental perceptions. Common to almost all the respondents is the referral to the will of Allah in relation to the environment. This is clearly part of the response and coping mechanisms to the uncertainty of agricultural livelihoods in both communities. One of the reasons proffered for declining yields and change in rainfall patterns was divine retribution for societal immorality. Many respondents blamed *zamani* (the times). It is a deeply and widely held belief that increased immorality and injustice in the society affects the productivity of the land because it affects rainfall, and leads to decreased yield. This sense of fatalism and resignation - that it was meant to

be-underlined many of the interviews. Many believe that human action can and does influence rainfall patterns, but not in the conventional sense, as the comment below suggest:

*The land is suffering because people are more corrupt today and there are many more sins. In the past, ten days after a rainstorm, you could continue to enjoy its advantages. But today the world is filled with so many sins that even murder is commonplace. So, everything has been impacted, including farming. But all of this comes from Allah. What you receive from the land now cannot be compared to what you received previously; this is a punishment.*

There was also a focus on general official corruption and injustice, which is a reflection of the general view of government and the tough economic situations farmers face. When farmers see shortage of inputs and scarcity of fertilisers, it is the incompetence of leadership and *zalunci* (oppression) they stress.

The Islamic belief system is assumed to support fatalism about the environment (Haq *et al.*, 2020). This attribution of environmental changes to the divine i.e. the ‘moral thesis’ is not new, and probably to be expected in area where Islam and its practice are deeply inscribed in people’s everyday lives. Mortimore (1989) observed that at the time of the Sahel droughts and progressive reduction of yields and famine of 1972-1974, many people saw it as a punishment for sins of bribery and corruption, prostitution, unmarried women, and a decline in charitable giving and as a warning from God for society to mend its ways. This presumed passivity may reveal the powerlessness of local people in the face of forces over which they have no control, but in no way implied inactivity in those that they could and “the omnipotence of God excluded neither self-reliance nor social criticism” (Mortimore, 1989:81). Similar evidence from Africa showed that farmers consider rainfall to be from God and therefore unpredictable, so attribute declining harvests more to drought by divine will than to human induced degradations (Golo & Yaro, 2013; Slegers, 2008). In both examples though, farmers still remained largely proactive and ready to take advantage of the timing and quantity of rainfall. A succinct comment from a male farmer sums up these different issues. ‘It is what you put in the soil, and what Allah brings from the sky’.

### **Local Ecology and Context**

Farmers are major actors in processes of environmental and agricultural change (Scoones, 2010) and evaluations of degradation can differ between villages, and even between fields in the same village (Hermann *et al.*, 2020). In Yadai, construction of Jakara Dam on River Huda led to a significant

reduction in the water resources available downstream and this has affected soil and vegetation in the area. The dry season agriculture and the economic opportunities it provided was consequently lost. In Yadai, the loss of this dry season activity appears to have had a profound effect on the livelihood options of many residents. Therefore, in this community, the loss of hitherto available water resources was an important driver in land degradation, as it led to a loss of productivity and a drastic decline in wetlands. Some respondents perceived this to have also affected the quality of land.

*I think the main reason (for soil fertility decline) is because of the cutting off of the water to the village because of the dam built at Wasai. In the dry season, we used to farm vegetables and also some cassava in the "korama". But now because of the dam, the land is not fertile anymore and we cannot do any dry season farming.*

There is a vast difference in perceptions between the two communities when it comes to vegetation change. Respondents in Behun perceive no decline in tree cover in their village and surrounding ones, although they acknowledge an increase in commercial fuelwood extraction and economic incentives for cutting down trees, but in general report that many tree species are thriving, and even increasing. However, Yadai farmers believe that vegetation is declining, as a result of increased extraction. It must be noted that there are slight differences in ecology in both communities to begin with, as Yadai is drier, has less rainfall, and thus less vegetation. These local contextual differences have an impact on perceptions.

### **Conclusion**

Land degradation constructs in both communities is contextual and defined by both physical and socioeconomic factors. It is defined by soil fertility reduction and reduction in crop yield and vegetation change, but rainfall and availability of inputs are strong determinants. The social construction of land degradation is connected to local people's political, cultural, social realities.

The study has demonstrated that farmers' construct of land degradation in the study area is influenced by wider socioeconomic forces, the physical environment, and climate (especially rainfall). Farmers subconsciously divide these factors into those they can control and those they have no control over. Rainfall, climate and ecology are beyond their control and but their economic circumstances determine agricultural inputs which the farmers have access to, and these in turn affect farmers' view and experience of land degradation. Socioeconomic factors largely determine the quantity and quality of these inputs, and influences land management and ultimately land degradation. Vegetation change is linked to the availability of fuel wood, and wider economic forces are seen to have an important impact on its change. Nigeria

has committed to the 2015 UNCCD Policy on Land Degradation Neutrality (LDN), as part of the SDGs, Target 15.3; to restore damaged land and soil, particularly that which has been impacted by desertification, drought, and flooding. While the LDN policy provides significant benefits for the mitigation and adaptation to climate change, it is evident that no attainment of LDN is probable without taking into due account farmer's religious faith, their skills, attitudes and their perceptions of the underlying factors contributing to the degradation.

To succeed, the study recommends taking into due account farmers' perceptions of these factors in policy design and programme implementation, especially those that require the participation and cooperation of local land users. An essential step in this direction is first; to ensure that farmer's perception, values and priorities are mainstreamed in the policy design process. This will be line with the UNCCD's objectives of maintaining land productivity and the resilience of the populations dependent on it. Secondly, farmers should be involved in the choice of trees in government reforestation and afforestation projects designed to halt land degradation. Since fertilisers are crucial for ensuring land remains productive over the long term, policy needs to address the costs of fertilisers and improve farmers' access to them to ensure food security and safeguard the productive potential of land.

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