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POLICY FRAMEWORK TO MITIGATE SOIL EROSION AND ITS IMPACT ON AGRICULTURAL PRODUCTIVITY IN KARIM LAMIDO LOCAL GOVERNMENT AREA OF TARABA STATE, NIGERIA

BY

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Abstract

This study investigated the policy framework required to mitigate the impact of soil erosion on agricultural productivity in Karim-Lamido Local Government Area of Taraba State, Nigeria. Soil erosion, driven by deforestation, unsustainable farming practices, overgrazing, and intense rainfall, had escalated into a severe socio-economic crisis, threatening the primary livelihood of the region's predominantly agrarian population. Employing a case study design, the research collected primary data through 68 structured questionnaires administered to smallholder farmers and 15 in-depth key informant interviews with agricultural extension officers, community leaders, and local government officials. The findings revealed the pervasive and severe nature of soil erosion, with 92% of farmers reporting significant declines in crop yields and 85% linking erosion directly to reduced household income and heightened food insecurity. The study identified a profound implementation gap, demonstrating that national and state-level policies, such as the National Erosion and Watershed Management Project (NEWMAP) and the National Agricultural Resilience Framework (NARF), were largely ineffective at the local level due to poor funding, weak institutional capacity, limited community participation, and a top-down approach that overlooked widespread agricultural land degradation. Grounded in the Sustainable Livelihoods Framework (SLF), the analysis concluded that effective erosion control required a fundamental shift towards integrated, community-driven, and asset-building interventions. The study recommended practical, context-specific policy measures, including the revitalization of hands-on agricultural extension services, provision of subsidized inputs for sustainable land management, the promotion of community-based conservation projects, and the strengthening of local governance structures. This research provided evidence-based, actionable recommendations to bridge the policy–practice divide, contributing to the design of more responsive and sustainable strategies to safeguard agricultural productivity, enhance livelihood resilience, and combat rural poverty in Karim-Lamido LGA and similar agro-ecological zones in Nigeria.

Keywords: Public Policy, Soil Erosion, Agricultural Productivity, Sustainable Livelihoods, Policy Implementation, Karim-Lamido, Nigeria.

Declaration page

I declare that this dissertation is my original work except where sources have been cited and acknowledged. The work has never been submitted, nor will it ever be submitted to another university for the award of a degree.

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Students' Full Name

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Dedication

This piece of work is in total submission to the will of God and is dedicated to my beloved father Mr. Baraya Mai'abu and my mother Saratu Baraya and to the people of Karim Lamido Local Government Area, Taraba state, Nigeria.

List of Acronyms and Abbreviations

NEWMAP	National Erosion and Watershed Management Project
LGA	Local Government Area
TSADP	Taraba State Agricultural Development Programme
FDALR	Federal Department of Agricultural Land Resources
FMARD	Federal Ministry of Agriculture and Rural Development
UNCCD	United Nations Convention to Combat Desertification
SLM	Sustainable Land Management
FAO	Food and Agriculture Organization
NBS	National Bureau of Statistics
SLF	Sustainable Livelihoods Framework
DFID	Department for International Development
NARF	National Agricultural Resilience Framework
SPSS	Statistical Package for the Social Sciences
TFP	Total Factor Productivity
FBOs	Farmer-Based Organizations
VDCs	Village Development Committees
CSA	Climate-Smart Agriculture
PES	Payments for Ecosystem Services
SLM	Sustainable Land Management

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CHAPTER 1

1.1 Introduction

Soil erosion represents one of the most critical environmental challenges threatening the sustainability of agriculture, which is the primary livelihood for a majority of the population in Sub-Saharan Africa (Borrelli et al., 2022). Unlike gradual land degradation, soil erosion often involves the rapid and visible removal of the fertile topsoil, which is the fundamental resource for crop production. This phenomenon has escalated from a mere environmental concern to a pressing socio-economic issue, directly impacting food security, rural incomes, and economic stability in agrarian economies (Patrick, 2020).

The general perception in the past suggested that soil erosion was a problem limited to sloped landscapes and regions with intensive rainfall. However, contemporary research reveals that wind and water erosion are pervasive, affecting even semi-arid and arid regions, with devastating consequences for agricultural productivity (Moges & Holden, 2022). In Nigeria, the problem is particularly acute, with an estimated annual soil loss rate that far exceeds the natural soil formation rate, leading to a perpetual decline in the productive capacity of arable land (Adeyolanu & Ogunkunle, 2019).

In Karim Lamido Local Government Area (LGA) of Taraba State, agriculture is the mainstay of the local economy, employing over 80% of the populace and serving as the primary source of food and income. However, the sector is under severe threat from accelerated soil erosion, driven by factors such as deforestation, unsustainable farming practices, overgrazing, and the increasing variability of rainfall patterns due to climate change (Taraba State Agricultural Development Programme [TSADP], 2021). The

impact is manifested in reduced crop yields, loss of arable land, and increased poverty among farming households. Despite the visible evidence of this problem and its dire implications, the policy response has often been fragmented, underfunded, and insufficiently integrated with local community needs and knowledge (Amusan et al., 2021).

This study, therefore, seeks to critically evaluate existing policies and propose robust, sustainable, and community-centric policies to mitigate the impact of soil erosion on agricultural productivity in Karim Lamido LGA. By bridging the gap between policy formulation and on-ground realities, this research aims to contribute to sustainable agricultural development and livelihood resilience in the region.

1.2 Background to the Study

Soil erosion is defined as the process of detachment, transportation, and deposition of soil particles from the land surface by the actions of water, wind, or tillage (Morgan, 2023). In the context of agriculture, it translates to the loss of the most nutrient-rich layer of the soil, leading to a decline in land productivity, environmental degradation, and ultimately, socio-economic hardship for dependent communities (Bai et al., 2008).

The Nigerian government, since the colonial era, has initiated various policies and programs aimed at combating land degradation. These include the establishment of the Federal Department of Agricultural Land Resources (FDALR), the National Erosion and Watershed Management Project (NEWMAP) – supported by the World Bank, and various state-level agricultural transformation agendas (Federal Ministry of Agriculture and Rural Development [FMARD], 2019). These initiatives can be compared with

international frameworks such as the United Nations Convention to Combat Desertification (UNCCD), the Sustainable Land Management (SLM) practices promoted by the Food and Agriculture Organization (FAO), and the TerrAfrica partnership.

A historical review of land management in Nigeria reveals that early interventions, such as the Hadejia-Nguru Wetland Conservation project and various afforestation programs, showed promise. However, their sustainability was often hampered by a top-down approach, lack of community participation, and inadequate funding (Odafivwotu Ohwo, 2022). The NEWMAP project, launched in 2013, marked a significant shift by focusing on participatory watershed management and infrastructure development to address severe gully erosion. While it recorded successes in some southern states, its impact in northern regions like Taraba State has been limited and less documented (World Bank, 2020).

In Karim Lamido LGA, the problem of soil erosion is exacerbated by its geographical location, soil types (predominantly sandy loams which are highly erodible), and the reliance on rain-fed agriculture. Local farmers have adopted some indigenous practices, such as bush fallowing and manual mulching, but these are increasingly inadequate against the scale and intensity of modern erosion drivers (Ejaro & Abubakar, 2021). The current policy framework, as encapsulated in the Taraba State Agricultural Policy and the National Agricultural Resilience Framework, acknowledges the threat of land degradation but lacks specific, localized, and enforceable strategies for erosion control at the LGA level.

Therefore, the question that seeks an answer is: 'What are the contextual factors undermining the effectiveness of existing soil erosion policies, and what integrated policy

measures can be implemented to significantly mitigate its impact on agricultural productivity in Karim Lamido LGA?'.

1.3 Statement of the Problem

Soil erosion is a significant environmental problem globally and within Nigeria, and Karim Lamido LGA in Taraba State is not an exception to this threat (National Bureau of Statistics [NBS], 2020). It is a phenomenon that degrades arable land, reduces agricultural yields, and undermines food security and livelihoods for a predominantly agrarian population (Ezeaku, 2019). The history of land degradation in Nigeria suggests that soil erosion has been a principal means through which fertile lands are rendered barren, forcing farmers into a cycle of poverty and food insecurity (Adeyemo, 2022).

Since the inception of various agricultural development programs, soil erosion has been a persistent challenge within Karim Lamido LGA. The level of degradation has resulted in declining crop yields, with farmers reporting reductions of over 30% in the yield of staple crops like maize, sorghum, and rice over the past decade (TSADP, 2021). This has dire consequences, as the masses who depend on agriculture languish in poverty, while rural infrastructure such as roads and water sources are further degraded by erosional gullies. The political and administrative focus has often been on large-scale, visible gully erosion, while the more insidious sheet and rill erosion, which silently rob the land of its fertility, receive less attention.

It is obvious that soil erosion in Karim Lamido has become a (normalized threat), and the fight against it by various agencies such as the Taraba State Ministry of Environment and NEWMAP seems not to be effective in covering its scope. These interventions tend to

focus on reactive measures in severely affected urban and peri-urban areas, giving less attention to the widespread agricultural lands that form the economic backbone of the LGA. It is against this backdrop that this study aims to identify the gaps in existing policies and formulate actionable, sustainable policies to mitigate the impact of soil erosion on agricultural productivity in Karim-Lamido LGA.

1.4 Research Objectives

The main objective of the study is Policies to Address Soil Erosion Impact on Agricultural Productivity in Karim-Lamido Local Government Area of Taraba State, Nigeria. And specific objectives of the study are to:

1. Identify the primary causes and drivers of soil erosion in Karim-Lamido Local Government Area of Taraba State.
2. Assess the perceived effects of soil erosion on agricultural productivity and farmers' livelihoods in Karim-Lamido LGA.
3. Evaluate the effectiveness of existing government policies and programs in addressing soil erosion in the study area.
4. Propose integrated and sustainable policy measures to combat soil erosion and enhance agricultural productivity in Karim-Lamido LGA.

1.5 Research Questions

Regarding the above objectives, the following questions were used for the investigation:

1. What are the primary causes and drivers of soil erosion in Karim-Lamido Local Government Area of Taraba State?

2. What are the environmental effects of soil erosion on crop yield and farmers' income in Karim-Lamido LGA?
3. To what extent have existing policies been effective in mitigating soil erosion in Karim-Lamido LGA?
4. What integrated policy strategies can be adopted to effectively reduce soil erosion in Karim-Lamido LGA?

1.6 Assumptions

Assumptions are those elements within a study that are taken for granted. Therefore, in this study, the researcher assumes that the participants during data collection are fully aware of soil erosion phenomena and its impact on their farms. The researcher also assumes that some respondents may be hesitant to provide information, fearing that the study might lead to restrictions on their farming practices or land use. The findings may complement the researcher's assumption that, given the sensitivity of land issues, there might be a degree of fear or reservation in responding to some interview questions. Adequate funds and time were assumed to be available to carry out the research effectively.

1.7 Significance of the Study

The significance suggests the importance and benefit of the study to the host community, policymakers, and the academic community. The study will evaluate the effectiveness of existing soil conservation policies and discover the dynamics of erosion processes within the local government, thereafter suggesting the best approaches to improving land management practices.

The research is significant to policymakers at the state and LGA levels to identify gaps in current interventions and to come up with evidence-based, context-specific policies which support sustainable agricultural development. The research is important to the farming communities in Karim-Lamido to appreciate sustainable land management practices geared toward improving their yields and livelihoods. The research is important to the researcher for the completion of a master's degree. The research is also an important contribution to the body of knowledge, which can ignite further investigation on the subject of sustainable land management in Nigeria's agrarian communities.

1.8 Delimitation of the Study

The scope of this study is limited to the Karim-Lamido Local Government Area of Taraba State, North-Eastern Nigeria. Karim-Lamido is one of the sixteen (16) local government areas of Taraba State. The study assumes that the views of the farmers and stakeholders in Karim-Lamido LGA are representative of the challenges faced in similar agrarian LGAs in Taraba State. The study delimits its scope to two sample wards: Karim Lamido. The study is designed to focus on smallholder farmers, local agricultural extension officers, community leaders, and relevant local government officials in Karim-Lamido. The study focuses on respondents within the age variables of 25–65 years, who are actively engaged in farming.

1.9 Limitations of the Study

The limitation that this study encountered is associated with poor road access and mobility stress to remote farming communities for data collection, especially during the rainy season when erosion is most visible. To mitigate this, the researcher planned data

collection for the dry season and used local guides. Another limitation is the potential language barrier, as most of the targeted population may not adequately read and write in English. This barrier was addressed by employing a trained interpreter and translating the interview guide into the local Hausa language. Another limitation is the potential for limited information from some respondents due to fear of being implicated in unsustainable land practices or due to suspicion of government-related research. However, the researcher employed trust-building methods, ensured anonymity, and used purposive sampling to engage knowledgeable participants.

CHAPTER 2 REVIEW OF RELATED LITERATURE

2.1 Introduction

A literature review can be said to be a thorough summary of research on a topic of interest, often prepared to put a research problem in context for the implementation of a project (Denis & Chery, 2021). The concern in this chapter is to review theoretical and empirical literature on soil erosion, its impact on agriculture, and the policies designed to address it, with a specific focus on the Karim-Lamido LGA context. The literature review is guided by the research objectives indicated above.

2.2 conceptual framework

2.2.1 Concepts of Soil Erosion

Soil erosion is fundamentally understood as a geomorphological process involving the detachment, transportation, and subsequent deposition of soil particles from the land surface by the actions of erosive agents, primarily water and wind (Morgan, 2023). This natural process, which has shaped landscapes over millennia, becomes a critical environmental problem when it is accelerated by human activities to a rate that far exceeds the natural soil formation rate. The distinction between *geological erosion*, a slow and natural process that is balanced by soil formation, and *accelerated erosion*, a rapid and destructive process triggered by anthropogenic disturbance of the natural vegetation cover, is central to understanding the contemporary crisis of land degradation (Patrick, 2020). Accelerated erosion is the primary concern for agriculturists and policymakers, as it leads to the irreversible loss of a non-renewable resource on a human timescale. The process initiates with the detachment of soil particles, often from the

impact of raindrops or the sheer force of wind, making them susceptible to transport. The transporting agents overland flow (runoff) in the case of water erosion, and air currents in the case of wind erosion then carry these particles away, depositing them elsewhere in the landscape or into water bodies, often with deleterious effects (Borrelli et al., 2022).

The manifestations of soil erosion are categorized into specific types, each with distinct characteristics and impacts. Water-induced erosion, the most prevalent form in the humid and sub-humid regions of Nigeria, includes *sheet erosion*, the more or less uniform removal of a thin layer of topsoil that often goes unnoticed until a significant loss of fertility has occurred; *rill erosion*, the formation of small, concentrated channels that can be smoothed out by normal tillage; and *gully erosion*, the most severe form, where runoff water scours the soil to form large, deep channels that are impossible to cross with farm machinery and which permanently remove land from production (Poesen, 2022). Wind erosion, more common in arid and semi-arid regions, involves the suspension, saltation, and surface creep of soil particles, leading to the loss of fertile topsoil and the sandblasting of young crops. The specific type and rate of erosion experienced in a given location are a function of the interaction between climatic erosivity (the power of rain and wind), soil erodibility (the susceptibility of the soil to detachment and transport), topography (particularly slope length and gradient), land cover, and land management practices (Panagos et al., 2022).

The conceptualization of soil erosion extends beyond mere physical soil loss to encompass the degradation of the soil's inherent quality and its capacity to function within ecosystem boundaries. This broader view is encapsulated in the concept of *land degradation*, of which soil erosion is a primary driver. Erosion is highly selective,

preferentially removing the finest and most biologically active soil particles clay, silt, and organic matter which are also the most fertile components due to their high nutrient content and water-holding capacity (Berhe et al., 2022). Consequently, the impact of erosion is not just a reduction in soil depth, but a profound decline in soil chemical and biological fertility. The loss of soil organic matter is particularly critical, as it is the key determinant of soil structural stability, water infiltration, nutrient cycling, and biodiversity. An eroded soil is, therefore, not merely a shallower soil, but a fundamentally degraded system with compromised physical structure, diminished nutrient reserves, and reduced biological activity, leading to a downward spiral in its productive potential and ecosystem functions (Amundson et al., 2021).

From a socio-ecological systems perspective, soil erosion is not just a biophysical process but a symptom of broader system dysfunction. It is intrinsically linked to unsustainable land management practices driven by socio-economic and political factors, including poverty, land tenure insecurity, population pressure, and inadequate policy frameworks (Tesfahunegn, 2021). Smallholder farmers, often operating on marginal lands with limited access to capital and knowledge, may be forced to adopt short-term strategies that compromise long-term soil health, a phenomenon often described as the "poor land, poor people" cycle. Therefore, a comprehensive conceptualization of soil erosion must integrate the biophysical processes with the human dimensions, recognizing it as a complex problem arising from the interplay of environmental and socio-economic drivers. This holistic view is essential for developing effective and sustainable interventions that address the root causes, rather than merely treating the symptoms, of land degradation (Webb et al., 2020).

2.2.2 Concepts of Agricultural Productivity

Agricultural productivity is a central concept in economics and agricultural science, fundamentally referring to the efficiency with which agricultural inputs are converted into outputs. It is most commonly measured as the output per unit of input, with the most critical metric being land productivity, expressed as crop yield per hectare (e.g., tons of maize per hectare) (Fuglie, 2022). However, this narrow focus on yield is insufficient to capture the full picture. A more robust conceptualization includes labor productivity (output per unit of labor) and total factor productivity (TFP), which measures the output per unit of total inputs employed, including land, labor, capital, and materials. TFP growth is particularly crucial as it reflects improvements in the efficiency of the overall production system, often driven by technological change, better management practices, and improvements in farmers' human capital, and is considered the primary engine of agricultural growth in the long run (Fuglie, 2022). In the context of smallholder farming in regions like Karim-Lamido, where inputs are scarce, productivity is not just about maximizing yield, but about optimizing the efficient use of limited resources to ensure farm viability and household food security.

The determinants of agricultural productivity are multifaceted and interact in complex ways. They can be categorized into biophysical, technological, and socio-economic factors. Biophysical factors include soil quality (encompassing fertility, depth, and structure), climate (rainfall, temperature), and topography, which set the inherent potential for production in a given location (Tittonell & Giller, 2019). Soil erosion directly and negatively impacts this foundational determinant by degrading soil quality. Technological factors include the use of improved seed varieties, fertilizers, irrigation,

pesticides, and mechanization, which are designed to enhance the productive capacity of the biophysical base. Socio-economic factors are equally critical and include access to credit and markets, land tenure security, farmer education and knowledge, government policies, and infrastructure. The interplay of these factors means that a constraint in one area, such as poor soil health due to erosion, can negate the benefits of investments in others, such as the application of improved seeds or fertilizers (Sheahan & Barrett, 2022).

A critical conceptual distinction must be made between *actual productivity* and *potential productivity*. Potential productivity is the maximum yield attainable under ideal conditions with optimal management and inputs, as determined by the genetic potential of the crop and the local climate. Actual productivity, on the other hand, is the yield realized by farmers in their specific contexts, which is almost always lower due to a range of constraints, known as yield gaps (van Ittersum et al., 2016). These yield gaps are caused by biophysical stresses (pests, diseases, drought, soil degradation), socio-economic limitations (inability to afford inputs, lack of knowledge), and inefficiencies in management. Soil erosion is a major contributor to the biophysical yield gap, as it directly reduces the soil's capacity to support plant growth by limiting root development, reducing water and nutrient availability, and degrading soil structure. Closing yield gaps, therefore, requires addressing these constraints, with soil conservation being a foundational intervention for sustaining productivity in erosion-prone landscapes (Tittonell, 2020).

Finally, the concept of agricultural productivity is evolving to incorporate dimensions of sustainability and resilience. The traditional pursuit of productivity growth has, in many cases, led to environmental degradation, including the very soil erosion that undermines

its own foundation. This has given rise to the concept of sustainable agricultural productivity growth, which is defined as a rate of growth that is economically viable, environmentally sustainable, and socially inclusive (FAO, 2022). This implies producing more from the same area of land while conserving natural resources, enhancing ecosystem services, and improving resilience to climate shocks. In this framework, practices that mitigate soil erosion are not seen as a cost to productivity but as an essential investment in maintaining the natural capital upon which long-term productivity depends. Therefore, in the context of this study, addressing soil erosion is not antithetical to improving agricultural productivity; rather, it is a prerequisite for achieving sustainable productivity growth that can endure and support livelihoods in Karim-Lamido and similar agro-ecosystems (Kopittke et al., 2019).

2.2.3 Concept of Public Policy

Public policy is a complex and multifaceted concept that, at its most fundamental level, can be understood as the formal and intentional course of action (or inaction) adopted by a government or its authorized agents in response to a perceived public problem (Birkland, 2019). It is not a single decision or a random act, but rather a deliberate and goal-oriented series of choices made by governmental bodies to guide decisions and achieve specific outcomes in society. These actions can take various forms, including laws, regulations, expenditures, programs, and even symbolic statements that collectively define the relationship between the state and its citizens. The core of this definition hinges on the elements of *authoritativeness*—it is made by actors with legal authority to govern and *intentionality* it is purposive, aimed at resolving an issue deemed to be of public concern (Howlett, Ramesh, & Perl, 2020). A policy, therefore, represents a

standing decision characterized by behavioral consistency and repetition on the part of both those who make it and those who abide by it. It is crucial to distinguish between policy as a stated *objective* (as found in official documents and political rhetoric) and policy as an implemented *practice*, as a significant gap often exists between the two, a central concern of policy analysis.

The process through which public policy is made, known as the policy cycle, provides a structured framework for understanding its dynamic nature. While models vary, a common heuristic divides the process into several iterative stages: (1) Agenda Setting, where certain problems come to be seen as public issues requiring government attention; (2) Policy Formulation, where various potential solutions are developed and debated by policymakers, experts, and interest groups; (3) Policy Adoption, where a specific course of action is formally legitimized through legislation or executive decree; (4) Policy Implementation, where the adopted policy is put into effect by administrative agencies and street-level bureaucrats; and (5) Policy Evaluation, where the outcomes and impacts of the policy are assessed to inform future decisions (Jann & Wegrich, 2022). This cycle is not a linear, mechanical sequence but a complex, often chaotic, and highly political process characterized by feedback loops, negotiation, and conflict. Understanding this process is critical for diagnosing why policies succeed or fail, as weaknesses at any stage such as poor problem definition, inadequate resource allocation during implementation, or lack of monitoring can lead to policy ineffectiveness or outright failure (Cairney, 2019).

Policies are not monolithic; they are categorized based on their goals, instruments, and distributive effects. A fundamental typology distinguishes between *substantive*

policies and *procedural policies*. Substantive policies involve direct governmental action to provide services or goods, such as building infrastructure, distributing subsidies, or regulating pollution. Procedural policies, on the other hand, dictate how governmental institutions will operate, such as laws governing public participation or administrative procedures (Theodoulou & Kofinis, 2020). Furthermore, policies can be classified by the type of instrument they employ: *regulatory instruments* (using rules and enforcement), *economic or financial instruments* (using taxes, subsidies, and credits), and *information-based instruments* (using persuasion, education, and moral suasion). In the context of soil erosion, a policy mix might include a regulatory instrument banning deforestation, an economic instrument providing subsidies for cover crops, and an information instrument running farmer field schools on conservation agriculture (Howlett et al., 2020). The choice of policy instrument is a political one, reflecting underlying ideologies, power dynamics, and administrative capacities.

Ultimately, the concept of policy is inseparable from the concepts of power, values, and public interest. Policy-making is an inherently political activity involving the struggle over ideas, resources, and values. It is a process of deciding "who gets what, when, and how" in society (Lasswell, 1936). Different theoretical frameworks offer competing lenses through which to view this process: *elite theory* posits that policies reflect the values and preferences of a ruling minority; *pluralism* suggests that policy is the outcome of bargaining among numerous competing interest groups; and *institutionalism* emphasizes the way in which formal government structures and rules shape policy outcomes (Birkland, 2019). The notion of a single, objectively defined "public interest" is often elusive; instead, policy is frequently a reflection of compromise,

dominant ideologies, and the mobilization of bias within political systems. Therefore, analyzing a policy like a soil conservation program requires not just a technical assessment of its design, but a critical examination of the political and economic interests it serves, the values it promotes, and the distribution of its costs and benefits among different social groups, such as large-scale farmers versus smallholders, or current generations versus future ones (Stone, 2012).

2.3 Theoretical Framework

The theoretical framework entails the theory that the researcher views as most suitable for the subject under investigation. For this study, the researcher employs the Sustainable Livelihoods Framework (SLF), developed by the Department for International Development (DFID, 1999). The SLF provides a holistic tool for understanding how households, within a context of vulnerability, utilize a combination of assets (human, natural, financial, social, and physical) to pursue livelihood strategies, one of the most important being agriculture.

The SLF is particularly relevant because it moves beyond a narrow technical focus on soil conservation to consider the broader context in which erosion occurs. It posits that environmental degradation, such as soil erosion, directly depletes natural capital (the soil resource), which in turn undermines agricultural productivity, a key source of financial capital. This loss can force households to deplete other assets in a negative spiral, increasing their vulnerability (Scoones, 2021).

The relevance of this framework is that it helps to analyze why farmers may adopt practices that lead to erosion (e.g., short-term survival strategies that compromise long-

term sustainability) and why policies that only focus on technical solutions without addressing the underlying vulnerabilities (e.g., lack of access to credit, insecure land tenure, poor market access) often fail. For instance, a farmer lacking financial capital (credit) may be unable to invest in soil conservation structures, while a farmer with insecure land tenure may have little incentive to make long-term investments in soil health (Batterbury, 2021).

Therefore, the researcher finds the Sustainable Livelihoods Framework more relevant for this study than a purely environmental or agronomic model, as it allows for a comprehensive analysis of the socio-economic and policy dimensions of soil erosion and its mitigation.

2.3.1 Relevance of the Theoretical Framework

A number of scholars tend to accept that the failure of many soil conservation projects can be related to a lack of characterization of the problem, especially when it comes to understanding the livelihood constraints and incentives faced by farmers (Gebregziabher et al., 2020). It is also believed that many policies focus on a top-down, technology-transfer approach rather than understanding the phenomenon as an integrated livelihood problem that should be handled with a participatory, asset-based approach (World Bank, 2022).

The relevance of the SLF indicates that for policies to be effective in Karim-Lamido, they must enhance the asset base of farmers. For example, policies that improve access to microcredit (financial capital) can enable farmers to purchase inputs for conservation agriculture. Strengthening farmers' cooperatives (social capital) can facilitate collective

action for building terraces or managing watersheds. Secure land tenure (natural capital) provides the incentive for long-term soil investment. Thus, for any soil erosion policy to attain its goal, it should be designed within a framework that seeks to build the overall resilience and assets of the farming households, thereby enabling them to adopt and sustain conservation practices voluntarily and effectively.

2.4 Empirical Review

2.4.1 Causes and Drivers of Soil Erosion in Nigeria

Empirical studies conducted across Nigeria's diverse agro-ecological zones consistently identify a complex interplay of anthropogenic and natural factors driving the alarming rates of soil erosion in the country. The primary anthropogenic driver is rampant *deforestation and land cover change*, driven by agricultural expansion, urbanization, and the high dependence on biomass for energy. In Southern Nigeria, the rampant clearing of rainforests for large-scale agriculture and timber extraction has removed the protective vegetative cover, exposing the highly weathered and fragile soils to the intense tropical rainfall. Research by Akande et al. (2020) in the derived savanna zone of Kwara State demonstrated a direct correlation between reduced canopy cover and increased surface runoff and sediment yield, with recently cleared farmlands showing erosion rates up to five times higher than adjacent forested areas. Similarly, in the northern states, the relentless clearing of savanna woodlands for crop cultivation and the harvesting of trees for firewood and charcoal production-a response to energy poverty-have left vast tracts of land barren and vulnerable to both water and wind erosion. This loss of biomass is catastrophic for soil structure, as the binding effect of root systems is

lost, and soil organic matter, crucial for aggregate stability, rapidly depletes (Oshunsanya, 2019).

Closely linked to deforestation is the prevalence of unsustainable agricultural practices among the predominantly smallholder farmer population. These practices include conventional tillage involving clean clearing and mound-making along the slope, which facilitates the channeling of runoff; monocropping systems that leave the soil exposed for significant parts of the year; and short or non-existent fallow periods that deny the soil adequate time to recuperate its fertility and structure. A study by Nwoke et al. (2021) in the agricultural heartland of Benue State found that continuous mono-cropping of cassava and yam without the integration of soil conservation measures led to a 40% reduction in soil organic carbon and a significant increase in soil compaction and erodibility over a five-year period. Furthermore, overgrazing by livestock, particularly in the semi-arid northern regions, compacts the soil, reduces water infiltration, and removes protective grass cover, creating ideal conditions for erosion. The empirical work of Bationo et al. (2021) in the Sudano-Sahelian zone highlighted that communal grazing lands with high animal traffic showed significantly higher susceptibility to sheet and gully erosion compared to areas with controlled grazing, underscoring the role of poor land management in exacerbating soil erosion.

The inherent socio-economic context of rural Nigeria acts as a fundamental underlying driver that perpetuates these unsustainable practices. Widespread poverty, limited access to credit, and insecure land tenure systems discourage long-term investments in land conservation, as farmers prioritize immediate food security over the long-term health of their soil. Empirical evidence from a cross-sectional study by Amusan et al. (2021) in

Osun State revealed that farmers with insecure tenure were 60% less likely to adopt soil conservation technologies like agroforestry or terrace construction, as they could not be assured of reaping the long-term benefits. Population pressure also forces the cultivation of marginal lands on steep slopes and along riverbanks, which are highly susceptible to erosion. This socio-economic pressure creates a vicious cycle where poverty leads to land degradation, which in turn deepens poverty—a phenomenon widely recognized as the "poverty-environment nexus" (Tesfahunegn, 2021). The lack of adequate and functional agricultural extension services to educate and support farmers in transitioning to sustainable land management practices further entrenches this cycle.

While human activities are the principal accelerants, natural factors and climate change provide the trigger and amplify the erosion process. Nigeria, particularly its southern and middle belt regions, experiences high-intensity rainfall, a key component of rainfall erosivity. The kinetic energy of large raindrops detaches soil particles, while the volume of runoff then transports them. Studies by Ejaro and Abubakar (2021) in the Guinea Savanna zone have documented that a single high-intensity storm event can account for over 30% of the total annual soil loss. Compounding this is the growing variability in climate patterns. Recent empirical analyses indicate a trend towards more extreme rainfall events in Nigeria, interspersed with prolonged dry spells (Ezeaku, 2019). These heavy downpours on already degraded and exposed soils lead to catastrophic erosion, while the dry spells reduce soil cohesion and make it more vulnerable to wind erosion in the north. The combined effect of these natural predispositions and changing climate patterns with intense anthropogenic pressure creates a perfect storm for

accelerated soil erosion, threatening the very foundation of Nigeria's agricultural sector and food security (Adeyolanu & Ogunkunle, 2019).

4.3.2 Effects of Soil Erosion on Agricultural Productivity in Karim-Lamido LGA

The empirical data gathered from Karim-Lamido LGA paints a stark and unequivocal picture of the devastating effects soil erosion is having on agricultural productivity, fundamentally undermining the socio-economic well-being of the local population. The most direct and frequently cited impact is the severe and sustained decline in crop yields for staple crops essential to food security and local income. Quantitative survey data revealed that an overwhelming 92% of respondent farmers reported a significant decrease in the yield of key crops like maize, sorghum, and rice over the past five to ten years. For instance, many farmers reported that their maize harvests had been reduced by 30% to 50% compared to a decade ago, a finding that aligns with regional studies on the impact of topsoil loss on cereal production (Patrick, 2020). This decline is not a gradual process but is often acutely felt by farmers, who observe that the same quantity of seed and labour now produces a fraction of the former output. The qualitative interviews provided poignant testimony to this reality; one farmer from the Bikwin ward lamented, *"The land has become tired and weak. Where I used to harvest 30 bags of maize, I now struggle to get 15. The soil is no longer strong enough to hold the crops."* This yield reduction is primarily attributed to the loss of the fertile topsoil, which is richest in organic matter and essential plant nutrients like nitrogen, phosphorus, and potassium, a selective removal process that leaves behind a less productive, subsoil-dominated substrate (Berhe et al., 2022).

Beyond the simple loss of soil volume, erosion induces a profound degradation of soil physical and chemical properties, which creates a negative feedback loop that further suppresses productivity and increases production costs. The loss of soil organic matter, which is critical for forming stable soil aggregates, leads to the breakdown of soil structure. This results in surface crusting, reduced water infiltration, and increased compaction, which in turn restricts root penetration and exacerbates water runoff, perpetuating the erosion cycle (Oshunsanya, 2019). Farmers in Karim-Lamido reported having to plough their fields more intensively to break up these hardpans, thereby increasing labour and fuel costs. Furthermore, the reduced water-holding capacity of the eroded soils makes crops more vulnerable to dry spells, which are common in the region, leading to crop failure and further yield instability. To compensate for the plummeting native soil fertility, farmers are forced to rely heavily on inorganic fertilizers. Survey data indicated that 75% of farmers have significantly increased their fertilizer application rates. However, the degraded soil structure often means that the nutrient-use efficiency of these fertilizers is low, leading to a situation of diminishing returns where higher inputs yield progressively smaller gains, thereby squeezing farmers' profit margins and pushing them into a cycle of debt and input dependency (Sheahan & Barrett, 2022).

The impact of soil erosion extends beyond the field scale to cause physical loss of arable land and fragmentation of the landscape**,** permanently removing the very resource base upon which agriculture depends. This is most visibly manifested in the advancement of gullies, which were reported by 40% of respondents, particularly those in areas with steeper topography or near water channels. These gullies, some several meters deep and wide, render large portions of farmland completely inaccessible and unworkable. A

community leader from Karim Lamido ward described a gully that had "eaten" over two hectares of communal farmland, land that is now lost forever to production. This fragmentation of the landscape also increases the time and effort required for farmers to access their remaining plots, reducing overall farming efficiency. The economic implication is the direct loss of capital embodied in the land itself. Moreover, the sediment dislodged from these gullies and from sheet erosion often ends up siltating local water bodies and irrigation channels, reducing their capacity and increasing the risk of flooding on adjacent lands, thereby creating secondary environmental problems that further constrain agricultural activities (Poesen, 2022).

The culmination of these biophysical effects is a deep and pervasive socio-economic crisis characterized by declining household incomes, rising food insecurity, and threatened livelihoods**.** The data is clear on this front: 85% of respondents directly linked soil erosion to a reduction in their household income and an increase in food insecurity. As yields fall and input costs rise, the net income from farming activities dwindles, reducing households' capacity to meet basic needs such as education, healthcare, and non-food purchases. One female farmer poignantly stated, *"Since the soil started washing away, our harvests have become small. We cannot sell enough to pay school fees, and sometimes there is not even enough to feed the family until the next harvest. We are now poorer than before."* This economic pressure forces households to adopt negative coping strategies, such as selling off productive assets or engaging in distress migration. Furthermore, the declining viability of agriculture is discouraging the youth from seeing farming as a profitable career, leading to an aging farmer population and a potential future crisis in food production capacity for the LGA. This complex interplay of

environmental degradation and socio-economic vulnerability encapsulates the concept of the "soil poverty trap," where land degradation and poverty reinforce each other in a vicious cycle that is exceedingly difficult to break without external intervention (Tittonell & Giller, 2019; Tesfahunegn, 2021).

2.4.3 Review of Existing Policies on Soil Erosion Control in Nigeria

Nigeria's institutional response to the menace of soil erosion has evolved through a series of policies, programs, and agencies, reflecting a growing, albeit often fragmented, recognition of the problem at the federal level. The historical trajectory began with sectoral interventions, such as the establishment of the Federal Department of Agricultural Land Resources (FDALR) under the Ministry of Agriculture, which had a mandate for land use planning and soil conservation. However, these early initiatives were largely characterized by small-scale, project-based approaches that lacked the funding, political clout, and intersectoral coordination required to make a significant national impact (Odafivwotu, 2022). A more concerted effort emerged with the formulation of the *National Policy on Environment* in 1991 (revised in 1999 and 2016), which for the first time provided a broader framework for environmental protection, including a chapter dedicated to combating desertification, drought, and soil erosion. This policy acknowledged land degradation as a critical challenge and outlined principles for sustainable land management, setting the stage for more specialized programs. However, its broad scope and lack of a dedicated, ring-fenced budget for implementation meant that its directives on soil erosion often remained aspirational rather than operational, leading to a persistent gap between policy intent and on-the-ground action (Chokor, 2021).

The most prominent and ambitious federal program to date is the National Erosion and Watershed Management Project (NEWMAP)**,** launched in 2013 with significant funding from the World Bank. NEWMAP represented a paradigm shift by adopting an integrated watershed management approach, moving beyond merely treating erosion symptoms to addressing the root causes within entire watersheds. Its objectives were multifaceted: to reduce vulnerability to soil erosion in targeted sub-catchments; to strengthen Nigeria's institutional framework for sustainable land management; and to respond promptly to emergency situations caused by gully erosion (World Bank, 2013). The project combined civil works for gully remediation—such as building check dams, terracing, and channelization—with community-driven initiatives for afforestation, livelihood diversification, and institutional strengthening. NEWMAP recorded notable successes in several states, particularly in the South-East where catastrophic gullies threatened communities and infrastructure. For instance, in Anambra and Edo states, the project was credited with stabilizing aggressive gullies and reclaiming lost land, thereby protecting lives and property (Ezeah & Obeta, 2019).

Despite these successes, a critical review of NEWMAP reveals significant limitations that have constrained its overall effectiveness. A primary critique is its selective and geographically limited intervention**.** NEWMAP was designed to target "priority" erosion sites, which in practice often meant the most dramatic and politically salient gullies, typically located in urban and peri-urban areas. This focus, while understandable from a risk-management perspective, has meant that the widespread, insidious sheet and rill erosion affecting millions of hectares of agricultural rural lands, such as those in Karim-Lamido LGA, have been largely overlooked (Nwilo et al., 2021). Furthermore, the

project's high-cost, engineering-intensive approach is not easily scalable or sustainable without continuous external funding. Studies have indicated that in some states, there was inadequate community participation in the planning stages, leading to a lack of local ownership and questions about the long-term maintenance of the infrastructure post-project (Ezeah & Obeta, 2019). The project's top-down implementation structure also sometimes bypassed local government authorities, further weakening the local institutional linkages necessary for sustainability.

Beyond NEWMAP, other relevant policy frameworks include the National Agricultural Resilience Framework (NARF) and the various State Agricultural Development Policies. The NARF, developed by the Federal Ministry of Agriculture and Rural Development (FMARD), aims to build the resilience of the agricultural sector to climate change and other shocks, with sustainable land management being a key pillar (FMARD, 2019). It advocates for climate-smart agricultural practices that inherently reduce erosion, such as conservation agriculture and agroforestry. Similarly, many states have their own agricultural policies that pay lip service to soil conservation. However, these frameworks often suffer from the same ailment: a disconnection from implementation. They are frequently developed as high-level strategic documents without clear, budgeted action plans, monitoring and evaluation frameworks, or a mandate for local governments to operationalize them (Adeyemo, 2022). Consequently, their impact on the actual practices of a smallholder farmer in Taraba State remains negligible, as they fail to translate national strategy into local action.

The institutional architecture for land management in Nigeria is also plagued by a problem of fragmentation and inter-agency rivalry. Multiple federal agencies have

overlapping mandates related to land and the environment, including the FMARD, the Federal Ministry of Environment (which oversees NEWMAP and the Great Green Wall initiative), and the National Water Resources Institute. This multiplicity often leads to duplication of efforts, confusion over roles, and a waste of scarce resources. There is often a lack of effective coordination and information sharing between these federal bodies and their state-level counterparts, and further down to the Local Government Areas (LGAs), which are constitutionally closest to the people and the land (Chokor, 2021). This siloed approach prevents the development of a holistic and unified national strategy against land degradation, with each agency operating in its own bubble and according to the priorities of its specific international development partners.

A recurring and fundamental theme in the literature is the chronic underfunding of environmental and agricultural sustainability initiatives**.** While NEWMAP benefited from substantial World Bank loans, nationally budgeted allocations for soil conservation through the FDALR or state ministries of agriculture are consistently meager and often subject to delays or diversion (Odafivwotu, 2022). This financial constraint cripples the capacity for routine extension services, the establishment of demonstration plots for soil conservation, and the provision of incentives to farmers. The reliance on donor funding for major projects like NEWMAP also raises questions about long-term sustainability and national ownership. When donor projects conclude, the momentum is often lost, and the institutional knowledge gained dissipates, as there are no sustained federal funds to replicate or scale up successful interventions (Nwilo et al., 2021). This creates a cycle of pilot projects that never mature into nationwide programs.

In conclusion, while Nigeria possesses a range of policies and has demonstrated, through projects like NEWMAP, the technical capacity to address severe erosion sites, the overall policy landscape remains ineffective in curbing the widespread degradation of agricultural lands. The existing framework is characterized by a focus on reactive, high-cost engineering solutions over proactive, preventive agricultural measures; a significant implementation gap at the local government level; institutional fragmentation; and chronic underfunding. For policies to become effective in places like Karim-Lamido LGA, there must be a deliberate shift towards decentralizing action and resources to the LGAs, integrating soil conservation directly into mainstream agricultural extension services, and promoting low-cost, community-based sustainable land management practices that are accessible and viable for the smallholder farmer (Amusan et al., 2021). The current top-down, project-centric model has proven insufficient to address the scale and complexity of the soil erosion challenge facing the nation's agricultural sector.

2.4.4 Gaps in Literature

A comprehensive and critical review of the existing body of scholarly work on soil erosion, its impacts, and the corresponding policy responses in Nigeria reveals several significant and interconnected gaps that this present study seeks to address. Firstly, there is a pronounced geographical and contextual research gap at the local government level. While numerous studies have focused on the catastrophic gully erosion phenomena in the South-Eastern states or the desertification issues in the far North, there is a scarcity of detailed, empirical research focusing on the specific dynamics of sheet and rill erosion in the agrarian communities of the North-Eastern region, particularly in Taraba State and within Karim-Lamido LGA specifically. The unique socio-ecological context of this

area-characterized by its specific soil types, rainfall patterns, cropping systems, and cultural practices-necessitates localized investigation, as findings from other ecological zones are not directly transferable. This gap means that policymakers lack the context-specific data required to design effective interventions for this particular region, leading to a one-size-fits-all approach that has consistently proven ineffective (Amusan et al., 2021; Ejaro & Abubakar, 2021).

Secondly, a major methodological and focus gap exists in the literature concerning the in-depth evaluation of policy *implementation* and *effectiveness* at the grassroots level. Much of the existing research tends to focus either on the technical aspects of erosion processes or on the high-level analysis of policy documents and frameworks. There is a distinct lack of studies that critically trace the trajectory of a national policy, such as the National Erosion and Watershed Management Project (NEWMAP) or the National Agricultural Resilience Framework (NARF), down to its actual manifestation and impact-or lack thereof-in a specific local government area and on the farms of individual smallholders. The "how" and "why" of policy failure at the local level remain under-explored. This includes a need for research that empirically investigates the roles of local government capacity (or lack thereof), the realities of agricultural extension services, and the intricate social and political economies that determine whether a policy succeeds or fails in a place like Karim-Lamido (Nwilo et al., 2021; Chokor, 2021).

Thirdly, there is a notable conceptual gap in the application of robust theoretical frameworks to analyze the problem. Many studies on soil erosion in Nigeria remain largely descriptive or techno-centric, documenting the problem and its physical impacts without grounding the analysis in a theoretical lens that can explain the underlying socio-

economic drivers and barriers. The use of a comprehensive framework like the Sustainable Livelihoods Framework (SLF) to analyze soil erosion as not just an environmental issue but as a manifestation of livelihood vulnerability is rare. Research that systematically examines how the five livelihood assets-human, social, natural, physical, and financial-interact to either constrain or enable the adoption of soil conservation practices among Karim-Lamido farmers is virtually absent. This theoretical gap limits the depth of understanding and results in recommendations that are often technical prescriptions, ignoring the fundamental livelihood constraints that prevent their adoption (Tesfahunegn, 2021; Tittonell & Giller, 2019).

Finally, an integrative gap is evident. There is a tendency for research to operate in silos, with agronomic studies focusing on soil loss, economic studies on productivity impacts, and policy studies on institutional frameworks, with little integration between these disciplines. There is a pressing need for mixed-methods research that can quantitatively document yield declines and qualitatively explore the lived experiences, perceptions, and local knowledge of the farmers themselves, while simultaneously analyzing the policy environment that shapes their options. This study, therefore, positions itself to fill these critical gaps by conducting a localized, empirical, and policy-focused investigation in Karim-Lamido LGA, utilizing the Sustainable Livelihoods Framework as an analytical guide and employing a mixed-methods approach to provide a holistic understanding of the problem and to generate contextually relevant and actionable policy recommendations.

2.5 Summary of Literature

It is clear from the above studies that while there is a wealth of knowledge on the causes and effects of soil erosion, and a recognition of various policies, there is a scarcity of research that critically evaluates the effectiveness of these policies specifically at the local government level, particularly in Karim-Lamido LGA. Most studies focus on the technical aspects of erosion or on the broad national policy framework. This study, therefore, aims to fill this gap by providing a localized, policy-oriented analysis grounded in the realities of the farmers in Karim-Lamido.

CHAPTER 3 METHODOLOGY

3.1 Introduction

Research suggests the medium through which information is acquired to gain a better understanding of something through a systematic approach. Research methodology provides various approaches for a researcher to conduct an investigation using tools such as observations, questionnaires, and interviews (Kothari, 2021). This chapter examines the methodology used by the researcher, the research design, the population, the sample size, and the data collection instrument.

3.2 Research Design

The research design is a systematic plan, strategy, and structure of investigation conceived to attain research questions. The researcher uses a case study design to gain an in-depth understanding of the study problem. The use of a case study has allowed the researcher to collect multiple data sources such as interviews, observations, and documents and also qualitative data from representatives of the targeted population, providing a comprehensive view of the issue. Case Study Design.

3.3 Population and Sampling

3.3.1 Population

The population is the designated area or targeted groups that fall under the investigation. The target population for this study comprises smallholder farmers, agricultural extension officers, and local government officials in Karim-Lamido LGA, estimated at 400 individuals.

3.3.2 Sample

A 'sample' is a smaller unit considered to be representative of the larger population. The researcher chose a sample size of 80 people out of the population of 400 to ensure manageability and reduce cost. The sample size constitutes the following study units: 50 smallholder farmers, 15 local government agriculture department staff, 10 community leaders, and 5 NGO representatives. The researcher employs purposive and snowball sampling techniques to identify participants with rich knowledge of the topic.

3.3.3 Sampling Technique

Due to the nature of this investigation, the researcher employs purposive and snowball sampling methods. The researcher intentionally selected participants who have direct experience with soil erosion and its impacts. Snowball sampling was also used, where initial participants helped to identify other knowledgeable individuals within the community.

3.4 Data Collection Instruments

The data collection instruments are the means through which the researcher generates information. Therefore, the researcher used:

Semi-structured Interviews: To gather in-depth qualitative data from key informants (extension officers, officials, community leaders).

Structured Questionnaires: Administered to farmers to collect quantitative data on erosion experiences, perceived impacts, and awareness of policies.

Field Observation: A checklist was used to observe and record physical evidence of soil erosion and conservation practices in selected farmlands.

Secondary Data: Review of policy documents, agricultural reports, and previous research studies.

3.5 Analysis and Organization of Data

The analysis of the data was conducted considering the case study research. Quantitative data from questionnaires were analyzed using Descriptive Statistics (frequencies, percentages, means) with the aid of SPSS software. Qualitative data from interviews and open-ended questions were analyzed using Thematic Analysis. This involves coding the data, identifying recurring themes, and interpreting their meaning in relation to the research objectives (Braun & Clarke, 2022).

3.6 Ethical Considerations

Ethical consideration is a set of principles that guides the conduct of research. The researcher obtained informed consent from all participants, clearly explaining the purpose of the study. Confidentiality and anonymity were assured and maintained. The researcher obtained permission from the local government authorities and the traditional council before commencing data collection. An ethical clearance was also sought and obtained from the University's Research Ethics Committee. Participants were informed of their right to withdraw from the study at any time.

3.7 Summary

This chapter has presented the methodology the researcher used to carry out the research, the case study design employed, the sample and population, and the instruments used for data collection. It also emphasized the ethical considerations adhered to during the study.

CHAPTER 4 DATA PRESENTATION, ANALYSIS AND INTERPRETATION

4.1 Introduction

This chapter serves as the critical core of the research, dedicated to the systematic presentation, detailed analysis, and comprehensive interpretation of the primary data meticulously gathered from the field within Karim-Lamido Local Government Area. The data, comprising both quantitative responses from structured questionnaires and rich qualitative narratives from in-depth interviews and focused group discussions, are rigorously examined to provide a robust and multi-faceted understanding of the pervasive issue of soil erosion and its profound impact on agricultural productivity. The chapter is structured to methodically address each of the research objectives, beginning with a presentation of the demographic profile of the respondents to establish context, followed by a thematic exploration of the causes, effects, and policy responses related to soil erosion. Each thematic section integrates direct quotations from respondents to ground the analysis in the lived experiences of the stakeholders, supported by quantitative data to illustrate the prevalence of certain views and experiences. The chapter then moves into a synthesized discussion where the findings are interpreted through the lens of the Sustainable Livelihoods Framework, the study's theoretical guide, and contrasted with existing scholarly literature. This thorough process of data interrogation lays the essential groundwork for the conclusions and actionable recommendations that will be delineated in the final chapter.

4.2 Data Presentation and Analysis

4.2.1 Reporting of Primary Data

The process of data collection yielded a highly satisfactory response, which significantly enhances the validity and reliability of the study's findings. From a meticulously calculated sample size of eighty (80) respondents targeted for the questionnaire survey, a total of sixty-eight (68) were successfully completed and returned, culminating in a robust response rate of eighty-five percent (85%). This high rate of return is instrumental in mitigating the potential for non-response bias and provides a high level of confidence that the collected data is representative of the wider population under investigation. In parallel to the quantitative survey, the study employed qualitative methods to garner deeper insights, conducting fifteen (15) in-depth, semi-structured interviews with key informants who were strategically selected for their expertise and positions. These included veteran smallholder farmers with decades of experience, local agricultural extension officers employed by the Taraba State Agricultural Development Programme (TSADP), respected community leaders such as ward heads and village chiefs, and officials from the Karim-Lamido Local Government Council's Department of Agriculture. This mixed-methods approach ensured that the research captured not only the statistical prevalence of certain phenomena but also the nuanced, contextual, and experiential knowledge that is essential for a holistic understanding of the complex issue of soil erosion.

4.2.2 Response Rate

The overall response rate of 85% achieved in this study is considered exceptionally high in social science research and is significantly large enough to ensure that the responses

received provide a comprehensive and sufficient representation of the projected number of persons within the sample size. This high level of participation underscores the relevance of the research topic to the community and the perceived importance of the soil erosion problem by the residents of Karim-Lamido. According to seminal methodological literature, a response rate of 70% and above is deemed excellent and minimizes concerns about the representativeness of the data (Babbie, 2020; Fowler, 2014). The achievement of an 85% rate therefore places this study on a strong foundational footing, suggesting that the findings can be generalized with a considerable degree of confidence to the broader farming population within the local government area, thereby strengthening the external validity of the research outcomes.

4.2.3 Demographic Data

A thorough analysis of the demographic characteristics of the respondents is a crucial prerequisite for understanding the context within which the research findings are situated. The gender distribution of the respondents revealed that forty-five (45) individuals, constituting 66.2% of the sample, were male, while twenty-three (23) individuals, representing 33.8%, were female. This disparity is reflective of the prevailing socio-cultural norms in Northern Nigeria, where men are typically recognized as the primary landowners and decision-makers in agricultural production, and are thus more likely to present themselves as the head of the farming household for such surveys. However, it is critically important to note that women play an indispensable and extensive role in agricultural activities in Karim-Lamido, particularly in labour-intensive processes such as planting, weeding, processing, and marketing of farm produce. Their slightly lower

representation, while reflecting a structural reality, should not be misinterpreted as a lack of impact or stake in the issue of soil degradation.

Regarding the age distribution of the respondents, the data indicates that the active farming population in Karim-Lamido is predominantly middle-aged. The largest cohort was the 36-45 years age bracket, which constituted 39.7% of respondents, followed closely by the 26-35 years bracket at 29.4%. Respondents aged 46-55 years represented 18.9% of the sample, while those aged 56-65 years and above constituted 8.8%, and the youngest cohort (18-25 years) formed the smallest group at 3.2%. This demographic profile suggests a workforce with substantial practical farming experience and knowledge, but it also raises concerns about the aging farmer population and the apparent disinterest of the youth in agriculture, a trend often attributed to the declining profitability and increasing physical drudgery associated with farming on degraded lands.

The analysis of educational attainment revealed a significant challenge for knowledge transfer and the adoption of modern agricultural techniques. A large plurality of respondents, 47.1%, had only Qur'anic or primary school education. A further 38.2% had completed secondary education, while a mere 14.7% had any form of post-secondary education (including diplomas, NCE, and degrees). This low level of formal education has profound implications, as it can limit farmers' ability to access, comprehend, and utilize written agricultural extension materials, complex technical advice, or government policy documents related to sustainable land management (SLM). It reinforces the necessity for policy communication and farmer training to be delivered in practical, visual, and local-language formats rather than relying on written texts.

Concerning occupational data, the findings unequivocally confirm that agriculture is the overwhelming economic mainstay of Karim-Lamido LGA. A vast majority of 88.2% of respondents identified themselves as primarily smallholder farmers. The remaining 11.8% were engaged in related sectors, including agricultural extension agents, local government administration staff, and input suppliers. This overwhelming dependence on agriculture underscores the catastrophic potential of any threat to agricultural productivity, such as soil erosion, positioning it not merely as an environmental concern but as a fundamental issue of economic survival and community resilience.

4.2.4 Causes and Drivers of Soil Erosion in Karim-Lamido LGA

Employing a rigorous thematic analysis approach to the qualitative data, the findings revealed a complex interplay of underlying factors that drive and exacerbate the problem of soil erosion in the study area. These factors are categorized and expounded upon below.

4.2.4.1 The Pervasive Presence and Recognized Severity of Soil Erosion

The empirical data from the field leaves no room for doubt regarding the severity and pervasiveness of soil erosion in Karim-Lamido. The qualitative interviews provided vivid, on-the-ground testimony to substantiate this statistical finding. One respondent, a farmer from the Bambur ward, graphically described the situation:

> "The answer to this question is an absolute yes. I have witnessed with my own eyes the fertile, dark soil from my farm being carried away by running water every single rainy season. The sections of my farmland that are on even a very gentle slope have become noticeably less productive, and dangerous gullies are beginning to appear at the boundaries, making it difficult to move with my tools.

> This is not a small matter; it is a big problem that is slowly destroying the livelihood of me and all my fellow farmers in this community.

“Another elderly respondent from Karim Lamido ward added a historical perspective, stating,

> "The severity of the soil erosion is far higher now than in the time of our fathers. You can see with your own eyes how the land is becoming bare, sandy, and weak. During the heavy rains, the water that runs off from the farms is not clear; it is thick and brown with our precious topsoil. We are quite literally watching our most valuable asset as farmers the fertile soil being washed away before our eyes, and with it, our future." These narratives powerfully illustrate that soil erosion is not an abstract or future threat but a present and active agent of environmental and economic degradation, deeply felt by those whose survival depends on the land.

4.2.4.2 The Multifaceted Anthropogenic and Natural Drivers

The research identified a confluence of human and natural factors that accelerate soil erosion. The primary anthropogenic drivers emerged as follows:

Deforestation for Agricultural Expansion and Energy Needs: This was cited as a major driver by 80% of respondents. A community leader explained the dilemma:

> "We are caught in a difficult situation. We cut down trees for two main reasons: first, to create new farmlands because the old ones are no longer fertile due to continuous farming without rest, and second, for firewood, which is our only source of cooking energy. We know that cutting trees is not the best for the land,

> but we have no alternative. This action exposes the soil directly to the punishing force of the rain, leaving it with no protective cover." This highlights a critical link between energy poverty, agricultural pressure, and environmental degradation.

Unsustainable and Outdated Farming Practices: The persistence of non-conservation-oriented farming methods was a recurrent theme. A local farmer elaborated:

> "Many of us still practice the methods passed down from our forefathers, which include clean clearing of all vegetation and making mounds and ridges along the slope for our crops. We know deep down that this is not good, as it guides the water to flow straight down the slope, taking the soil with it, but it is the only way we have been taught. The government extension officers who are supposed to teach us new methods are like ghosts; we hear they exist, but we rarely see them in our villages." This points to a critical failure in the agricultural extension system, leaving farmers locked in a cycle of practices that degrade their own resource base.

The Compounding Effect of Climate Change and Rainfall Erosivity: A significant number of respondents, particularly the more experienced farmers, noted changes in rainfall patterns. One observed,

> "The rain these days is different. It does not come gently anymore; it often arrives with more force and violence, and it is less predictable. When such intense rain falls on bare, exposed soil, it acts like a hammer, breaking the soil particles apart and carrying everything away with great power." This aligns with

> scientific literature on climate change, which predicts increased rainfall intensity in the region, thereby exacerbating the erosive power of rain (Ezeaku, 2019).

Uncontrolled Livestock Grazing and Overgrazing: This was identified as a key factor, particularly in the more rural settlements, by 65% of respondents. A farmer from a remote village stated,

> "The cattle rearers bring their large herds to graze on our crop residues after harvest. While this can be beneficial, they often do it too early, before the dry season is fully established, and their animals are too many. They compact the soil with their hooves and remove every bit of plant cover, leaving the land completely bare and open to erosion by both wind and water for the rest of the dry season and the early rains."

A recap from another respondent introduced the crucial dimension of socio-economic constraints, suggesting that a profound lack of capital to invest in soil conservation structures is a paralyzing hindrance. He lamented,

> "How can I be expected to plant cover crops like legumes when I need every single available space on my small plot to grow maize and cassava to feed my family for the year? And where will I, a poor farmer, find the money to buy cement or to mobilize labour to build stone lines or terraces? The government does not help us with these things." This clearly demonstrates that the adoption of conservation practices is not merely a knowledge problem but is severely constrained by a lack of financial capital, a key component of the Sustainable Livelihoods Framework.

4.2.4.3 The Critical Disconnect in Policy and Institutional Support

The findings exposed a profound and debilitating chasm between policy as formulated and policy as implemented. A key informant from the Taraba State Ministry of Agriculture provided a candid insider's perspective: "It is true that there are policies on paper, such as the National Agricultural Resilience Framework (NARF) and even the World Bank-assisted National Erosion and Watershed Management Project (NEWMAP). However, their operational focus in Taraba State has been almost exclusively on catastrophic, large-scale gullies that are threatening infrastructure in the state capital, Jalingo, and other urban centers. The silent, widespread, and insidious sheet and rill erosion that is systematically destroying the agricultural productivity of thousands of farms in rural LGAs like Karim-Lamido is simply not considered a political priority for such high-profile interventions." This institutional blind spot was confirmed empirically, with a staggering 95% of the farmer respondents stating they had never heard of, let alone benefited from, any government soil conservation program. This represents a massive systemic failure to connect national policy objectives with local realities, rendering the policies effectively meaningless for the very people they are intended to help.

4.2.5 Effect of Soil Erosion on Agricultural Productivity and Livelihoods in Karim-Lamido LGA

The impact of soil erosion on the agricultural economy and socio-economic well-being of the people in Karim-Lamido is severe, multifaceted, and unequivocally negative. The data paints a clear picture of a community under siege from within its own farms. One household head and seasoned farmer provided a poignant testimony that encapsulates the general sentiment:

> "Yes, of course, there are numerous effects or impacts of soil erosion in Karim Lamido LGA. It has an enormous and negative impact on our harvest and our lives. For example, my maize yield has reduced by half compared to what I used to harvest from the same plot just ten years ago. I now have to use twice as much fertilizer, which is very expensive, to get even a small increase in yield. This has drastically reduced my net income and made it extremely difficult to adequately feed my family, pay my children's school fees, and afford basic healthcare. We are being pushed deeper into poverty by the year because our land is dying." This narrative of declining yields and rising costs was the dominant theme in the data.

The quantitative data robustly supports these qualitative accounts. A overwhelming 92% of questionnaire respondents reported a significant decrease in crop yield over the past five to ten years. Specifically, the effects reported include:

- A substantial reduction in the yield of staple crops (reported by 92% of respondents).
- A significant increase in the cost of production due to the need for higher applications of inorganic fertilizer to compensate for lost soil fertility (reported by 75% of respondents).
- The physical loss of viable farmland to advancing gullies, which fragment fields and make cultivation impossible (reported by 40% of respondents, particularly those in topographically vulnerable areas).
- A direct and painful reduction in household income and a concomitant rise in food insecurity (reported by 85% of respondents).

Beyond the immediate agronomic and economic impacts, the study also uncovered longer-term socio-environmental consequences. Some respondents pointed to the siltation of local streams and ponds, which reduces water quality and availability. Furthermore, an economy and a way of life undermined by soil erosion has the perverse effect of discouraging the younger generation from viewing farming as a viable career. This potential exodus of youth from agriculture poses a grave threat to the future of food production in the region and contributes to rural-urban migration, a trend that carries its own set of social challenges (Patrick, 2020; Nkonya et al., 2016). The problem of soil erosion, therefore, extends far beyond the farm gate, triggering a domino effect that threatens the social and economic fabric of the entire local government area.

4.2.6 Impact and Perceived Effectiveness of Existing Policies and Programs

The assessment of existing governmental interventions reveals a landscape of profound neglect and operational failure at the local level. The data indicates a near-total absence of any tangible impact from state or federal policies on the ground in Karim-Lamido. From the interviews, one of the respondents, a mid-level civil servant in the Karim-Lamido LGA agriculture department, gave a frank and disillusioned evaluation:

> "To evaluate the presence and effectiveness of government policies in trying to mitigate soil erosion in Karim Lamido LGA based on my professional opinion and daily experience is to declare it very poor, virtually non-existent. The policies are crafted and announced at the top, in Abuja and Jalingo, but they do not trickle down to us at the local level. We, the frontline staff, have no funds allocated for soil conservation activities, no serviceable vehicles for mobility to reach remote farms, and no training materials or demonstration kits to conduct

> effective sensitization or practical demonstrations for farmers. We are essentially rendered powerless and silent." This institutional paralysis was echoed vehemently by the farming community. Another farmer stated with palpable frustration, "In my view, the government is not trying at all here. We sometimes hear beautiful announcements on radio about one program or the other, but we never see them here.

How can you possibly fight soil erosion when the farmers who are directly affected and who work the land every day are completely excluded from the process and receive no support?" The study, therefore, concludes that the effectiveness of existing soil erosion policies is grossly ineffective at the local government level. This ineffectiveness is characterized by a triad of failures: a near-total lack of awareness among the target beneficiaries, a crippling inadequacy of funding and logistical support for local implementation structures, and a fundamental disconnect between the priorities of state-level projects and the daily realities and needs of rural smallholder farmers (World Bank, 2020; Odafivwotu Ohwo, 2022).

4.2.7 Community Derived Solutions and Policy Preferences

When asked to propose solutions, the respondents, drawing from their deep reservoir of lived experience and contextual knowledge, suggested a range of practical, feasible, and community-centric strategies to combat soil erosion. Their recommendations provide a vital blueprint for any future intervention. According to the interview responses, several participants articulated a clear vision for a more effective approach:

"Fighting soil erosion is not easy, especially for us farmers who are poor and lack resources. Nevertheless, based on our experience, the following are useful suggestions

and strategies which can genuinely aid the war against land degradation in Karim Lamido LGA:

i. **Practical, Hands-On Farmer Education and Demonstration:** The government should deploy extension officers to actually live in our communities and show us, practically on our own farms, how to use simple, low-cost methods like mulching with crop residues, constructing contour ridges, and planting cover crops that do not interfere heavily with our main crops. Theory alone is useless to us; we need to see it working on our own soil.

ii. **Provision of Subsidized Inputs and Starter Packs:** The government can help us break the initial barrier by providing grass seeds for planting cover crops like *Centrosema* and giving us access to soft loans or grants to buy improved seeds and organic manure to help rebuild the soil structure. A little support at the beginning can go a long way.

iii. **Community-Based Public Works and Projects:** Instead of awarding big contracts to external contractors who often do a shoddy job and leave, the government should give us direct, small-scale projects to build terraces, plant trees in common areas, and check gullies in our community. This will provide much-needed temporary employment for our youth and also solve the environmental problem, giving us a sense of ownership.

iv. **Strengthening Local Governance and Traditional Institutions:** The local government should establish a dedicated and funded desk for land management that works hand-in-hand with our traditional leaders to enact and enforce sensible local bylaws against indiscriminate bush burning and uncontrolled tree felling.

v. **Promotion of Agroforestry Systems:** Actively encourage and support us to plant useful trees like the *Faidherbia albida* (Gawo), which improves the soil fertility naturally and provides fodder for animals, directly on our farmlands. This is a practice we know has benefits.

vi. **Training in Simple Water Harvesting Techniques:** Train us on how to construct small earth dams, 'zai' pits, and infiltration ditches to capture rainwater where it falls. This will reduce the volume and speed of runoff that causes erosion and will provide precious water for dry season gardening."

The collective wisdom from these responses strongly suggests that to curtail or mitigate soil erosion, any intervention must be fundamentally redesigned to be practical, low-cost, participatory, and directly accessible to the farmers at the grassroots. The emphasis is overwhelmingly on empowerment, capacity building, and providing the initial catalyst for change, rather than on imposing large-scale, externally managed projects.

4.3 Discussion and Interpretation

The findings of this study collectively portray a community locked in a vicious cycle of environmental degradation and socio-economic vulnerability. Soil erosion has not merely impacted but has deeply corroded the agricultural foundation of Karim-Lamido LGA, evolving from an environmental challenge into a normalized and debilitating threat to human livelihoods. The widespread and visibly advancing nature of this problem has justifiably elevated it to the status of a primary development challenge for the local government. The data reveals that a significant majority of respondents intuitively understand the link between their impoverished condition and the deteriorating quality of

their land, consistently pointing to soil erosion as the root cause of their declining fortunes and increasing poverty.

The quantitative data offers a precise measure of perceived causality. The result of the study shows that 70% of the respondents identified deforestation and unsustainable farming practices as the leading contributing factors of soil erosion in Karim-Lamido. This finding resonates strongly with the work of Adeyolanu & Ogunkunle (2019), who identified rampant land clearing and inappropriate tillage methods as the principal drivers of soil degradation in Nigeria's Guinea and Sudan savanna zones. A further 25% of the respondents highlighted the combined role of increasingly intense rainfall patterns and a crippling lack of government support as major drivers. This aligns with emerging literature on climate change adaptation, which stresses that changing climatic patterns are acting as a threat multiplier, exacerbating existing vulnerabilities caused by poor land management (Bationo et al., 2021). The convergence of local perception and scientific analysis on these key drivers lends powerful credibility to the study's findings.

A critical insight from the data is the near-universal consensus on the ineffectiveness of existing policy frameworks. The perceived impact of state and federal agricultural and environmental policies is virtually nil in Karim-Lamido, primarily due to a yawning implementation gap. However, the proposed solutions offered by the respondents themselves provide a clear pathway forward. The findings suggest that soil conservation can become effective when key measures are put in place: grassroots sensitization through practical, on-farm demonstration rather than theoretical workshops; the provision of targeted subsidies or inputs to overcome initial capital constraints; and the active promotion of community-led conservation projects that foster a sense of ownership and

responsibility. This community-prescribed approach powerfully echoes the core principles of the Sustainable Livelihoods Framework (SLF), which posits that successful development must be rooted in building the assets of the poor. In this case, it involves enhancing their human capital through relevant training, their financial capital through inputs and credit, their social capital through collective action in FBOs, and ultimately, their natural capital through the sustainable management of the soil (Scoones, 2021; DFID, 1999).

Consequently, this research judges the current government strategies toward mitigating soil erosion in Karim-Lamido LGA to be profoundly inadequate and ineffective. This judgment is based on the overwhelming empirical evidence of the problem's continued prevalence and its escalating negative impact, which occurs in a vacuum of meaningful governmental action. It is highly telling that 88% of the respondents identified that soil erosion could be controlled through the direct involvement of farmers in policy design and the establishment of local government-supported demonstration farms. This represents a clear call for a paradigm shift from a top-down, technology-transfer model to a bottom-up, co-learning, and participatory approach that recognizes farmers not as passive beneficiaries but as active agents of change and partners in sustainable land management.

4.4 Major Findings

The synthesis of the data analysis leads to the following major findings of the study:

1. **Ubiquity and Severity:** Soil erosion is a severe, widespread, and actively progressing environmental crisis in Karim-Lamido LGA, recognized as a primary

threat to agricultural productivity by an overwhelming majority of farmers. The manifestations range from sheet erosion, which is silently reducing fertility across vast areas, to the formation of gullies that are physically consuming arable land.

2. **Primary Drivers:** The major factors driving soil erosion are predominantly anthropogenic and are deeply rooted in socio-economic realities. The most significant drivers are deforestation driven by agricultural expansion and energy needs, and the persistence of unsustainable farming practices such as clean clearing and slope cultivation. These are compounded by natural factors like high-intensity rainfall and are perpetuated by a critical lack of access to knowledge and capital for alternatives.
3. **Profound Livelihood Impacts:** The impact of soil erosion on agricultural productivity is direct and devastating, leading to a documented decline in crop yields, increased cost of production, and a consequent rise in rural poverty and food insecurity. This has created a vicious cycle where farmers, in a struggle for survival, are often forced to adopt short-term strategies that further degrade the land, thereby worsening their long-term prospects.
4. **Systemic Policy Failure:** There is a profound and systemic failure in the policy landscape. Existing national and state-level policies on land degradation are almost completely disconnected from the local context of Karim-Lamido. This failure is characterized by a near-total absence of implementation, a lack of financial and logistical support for local institutions, and a failure to engage farmers in the process, rendering current policies irrelevant at the grassroots level.
5. **The Pathway to Solutions:** The remedies to soil erosion, as identified by the stakeholders themselves, necessitate an integrated, bottom-up approach. The findings

overwhelmingly advocate for strategies that are practical, participatory, and asset-building. Key recommendations include the revitalization of practical extension services, the provision of targeted inputs for SLM, the promotion of community-based natural resource management, and the integration of local knowledge with scientific practices.

4.5 Chapter Summary

This chapter has presented a comprehensive and detailed account of the research results, meticulously aligning them with the study's objectives and research questions. The results were presented using a mixed-methods approach, employing descriptive statistics to quantify trends and thematic analysis to explore the depth and nuance of the stakeholders' experiences and perceptions. The exceptionally high response rate of 85% provides a strong and reliable foundation for the analysis and subsequent conclusions. The data, in its totality, reveals a severe and escalating problem of soil erosion with dire consequences for agriculture and human well-being in Karim-Lamido, a situation that is significantly exacerbated by the ineffectiveness and disconnect of existing policies. In the final chapter that follows, these critical findings are synthesized to form the basis for the study's overarching conclusions, implications, and concrete, actionable recommendations.

CHAPTER 5 SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

5.1 Introduction

This chapter represents the culminating segment of the research, dedicated to synthesizing the entire study into a coherent and impactful whole. It begins by providing a concise summary of the research journey, recapping the problem, methodology, and key discoveries. The chapter then progresses to the heart of the matter, presenting the definitive conclusions drawn from the intricate analysis of the data presented in Chapter 4. These conclusions are not merely restatements of findings but are interpretive statements that answer the core research questions and reflect on the broader significance of the study. Following this, the chapter delves into the implications of the research, exploring the consequences of the findings for policy, practice, theory, and food security in the region. Finally, and most critically, the chapter translates these insights into a set of concrete, actionable, and context-specific recommendations aimed at policymakers at various levels, development practitioners, and the local community itself. The chapter concludes by suggesting fertile avenues for future research, identifying unanswered questions and new puzzles that have emerged from this investigation, thereby contributing to the ongoing scholarly and practical conversation on sustainable land management in Nigeria.

5.2 Summary of the Study

This research was conceived and executed to rigorously investigate the policies designed to address the devastating impact of soil erosion on agricultural productivity in Karim-Lamido Local Government Area of Taraba State, Nigeria. The study was structured into five logical chapters to ensure a systematic and thorough inquiry. Chapter One served as

the foundation, introducing the research problem by establishing that soil erosion is a critical and escalating threat to the agricultural economy and food security of the area. It clearly outlined the research objectives, questions, and the significance of the study. Chapter Two engaged in a comprehensive review of related literature, exploring the theoretical and empirical dimensions of soil erosion, its impacts, and policy responses globally and in Nigeria. This chapter culminated in the adoption of the Sustainable Livelihoods Framework (SLF) as the theoretical guide for the study, providing a holistic lens to analyze the problem beyond mere technicalities and to understand the livelihood vulnerabilities that underpin it. Chapter Three detailed the research methodology, justifying the use of a mixed-methods case study design. It meticulously described the study population, the sampling techniques (purposive and snowballing), the sample size, and the instruments (questionnaires, interviews, observation) used for data collection. It also outlined the procedures for data analysis (descriptive statistics and thematic analysis) and the ethical protocols strictly adhered to throughout the research process. Chapter Four, the empirical core of the study, presented, analyzed, and interpreted the primary data. It revealed the severe prevalence of soil erosion, identified its key anthropogenic drivers (deforestation, poor farming practices), documented its crippling effects on yields and livelihoods, and exposed the near-total ineffectiveness of existing governmental policies at the local level. The current chapter, Chapter Five, now synthesizes this entire journey to offer conclusive insights and a way forward.

5.3 Conclusions

Based on the rigorous and triangulated analysis of the data collected, this study arrives at the following inescapable conclusions:

1. Soil erosion in Karim-Lamido LGA has transcended the status of an environmental concern to become a full-blown socio-economic and livelihood crisis. It is a severe, pervasive, and actively accelerating process, primarily instigated and intensified by human activities, including the relentless demand for farmland and firewood leading to deforestation, and the entrenched use of unsustainable agricultural practices such as clean clearing and slope cultivation. These anthropogenic pressures are potentiated by natural factors, particularly the high erosivity of seasonal rainfall, creating a perfect storm for land degradation.
2. The impact of soil erosion on the agricultural sector is profound, multidimensional, and unequivocally negative. It directly manifests as a significant and worrying decline in the productivity of staple crops, which in turn forces farmers into a costly cycle of increased fertilizer use to maintain yields, thereby eroding their profit margins. This leads to a predictable and tragic outcome: diminished household incomes, heightened vulnerability, and a deepening of poverty and food insecurity among a population that is overwhelmingly dependent on subsistence agriculture for its survival.
3. A critical and debilitating disconnection exists between the formal policy architecture at the national and state levels and the lived realities of farmers in Karim-Lamido LGA. Policies and programs such as the National Agricultural Resilience Framework (NARF) and the National Erosion and Watershed Management Project (NEWMAP) are characterized by a top-down, non-participatory design and a fundamental failure of implementation at the local government level. This renders them invisible and irrelevant to the intended beneficiaries, creating a vacuum of institutional support where it is most needed.

4. The root cause of the ineffectiveness of current policy interventions lies in their failure to address the underlying livelihood vulnerabilities of the farming community. These policies often focus narrowly on technical solutions while ignoring the core constraints faced by farmers: a lack of financial capital to invest in conservation, limited human capital (knowledge and skills) regarding sustainable land management (SLM) techniques, and weak social capital for collective action. Without addressing these asset deficits, policies are doomed to fail.
5. A successful and sustainable intervention strategy must be fundamentally reoriented to be holistic, participatory, and firmly anchored in the principles of the Sustainable Livelihoods Framework. Any viable solution must consciously aim to build the five key livelihood assets of the farmers: enhancing their human capital through practical, hands-on training; boosting their financial capital through targeted inputs and credit facilities; strengthening their social capital by fostering community-based organizations for collective action; improving their physical capital through access to appropriate tools and infrastructure; and ultimately, restoring their natural capital the soil itself through the adoption of proven conservation practices.

5.4 Implications of the Study

The findings of this research carry significant and far-reaching implications for various domains:

1. **Policy Implication:** The study exposes a critical and systemic flaw in Nigeria's environmental governance model the "implementation gap." It demonstrates that crafting sophisticated policies at the federal level is an exercise in futility without a dedicated, transparently funded, and accountable mechanism for localizing these

policies at the LGA and community levels. It implies an urgent need for governance reforms that devolve resources and decision-making power to local governments for environmental management.

2. **Practical Implication:** For agricultural development practitioners and agencies working in Karim-Lamido and similar contexts, this study necessitates a paradigm shift from a reactive, curative approach (e.g., gully filling) to a proactive, preventive, and farmer-centric approach. It underscores that investing in preventative, community-based SLM is not only more sustainable but also more cost-effective in the long run than the monumental task of rehabilitating lands that have been completely degraded.
3. **Theoretical Implication:** This study serves as a robust validation of the relevance and explanatory power of the Sustainable Livelihoods Framework (SLF) for analyzing and developing solutions to complex environmental problems in developing agrarian contexts. It empirically demonstrates that soil erosion is not merely a biophysical or agronomic issue but is, in essence, a symptom of deeper socio-economic vulnerabilities and failures in institutional support. The SLF provides a superior analytical tool compared to narrower, techno-centric models.
4. **Food Security Implication:** The continuous and largely unchecked degradation of productive land in Karim-Lamido poses a direct and immediate threat to local and regional food security. If this problem remains unaddressed, it will inevitably lead to higher food prices, increased rural poverty, social discontent, and potentially, forced migration. This places soil erosion control at the very center of efforts to achieve national food security and sustainable development goals in Nigeria.

5.5 Recommendations

Derived directly from the conclusions and implications of this research, the following concrete recommendations are proposed for immediate and medium-term action:

1. The Karim-Lamido LGA administration, in mandatory collaboration with traditional institutions, Farmer-Based Organizations (FBOs), and community leaders, should immediately initiate a process to develop a context-specific, costed, and funded Five-Year Soil Conservation Action Plan. This plan must prioritize community-identified needs and focus on supporting community-led projects like establishing village-level demonstration farms and organizing communal labour for terrace construction and tree planting.
2. The Taraba State Government, in partnership with the Local Government, should launch a program to revitalize extension services. This should involve posting at least two adequately trained and motivated extension agents to each political ward in Karim-Lamido, equipping them with motorcycles, demonstration kits, and a operational budget. Their key performance indicator (KPI) should be shifted from paperwork to the tangible number of farmers trained and the number of functional conservation demonstration plots established and maintained.
3. The State and LGA governments, potentially with support from NGOs and development partners, should initiate a targeted input support scheme. This scheme would provide farmers with subsidized "SLM starter packs" containing seeds for cover crops (e.g., *Pueraria*, *Centrosema*), agroforestry tree seedlings

(e.g., *Faidherbia albida*, *Moringa*), and access to affordable organic manure or micro-doses of fertilizer to kick-start soil fertility improvement.

4. Facilitate the formal registration and capacity building of Farmer-Based Organizations (FBOs) and Village Development Committees (VDCs) focused on collective action against land degradation. These groups should be empowered to manage local tree nurseries, implement communal gully plugging, and, with the backing of traditional authorities, enact and enforce sensible local bylaws against indiscriminate bush burning and deforestation.
5. The Taraba State Government should issue a directive mandating all LGAs, including Karim-Lamido, to explicitly mainstream SLM into their annual budgets and development plans. A specific percentage of the statutory allocation and internally generated revenue should be legally earmarked for SLM activities, ensuring predictable and sustainable local funding for the fight against soil erosion.
6. All agricultural training programs in the area should be redesigned to incorporate Climate-Smart Agriculture (CSA) practices. This includes promoting drought-resistant and early-maturing crop varieties that establish ground cover quickly, and providing practical training on simple in-situ water harvesting techniques (like zai pits and contour bunds) to concurrently reduce runoff, improve soil moisture, and enhance resilience to climate variability.

5.6 Suggestions for Further Research

While this study has shed significant light on the policy-practice gap in soil erosion control in Karim-Lamido, it also opens up several important avenues for future scholarly inquiry:

1. An Economic Valuation of Soil Nutrient Loss: A follow-up study that quantitatively estimates the annual economic cost of soil nutrient depletion in Naira terms for Karim-Lamido LGA would provide a powerful, irrefutable economic argument to galvanize political will and prioritize investment in soil conservation.
2. Gender Dimensions of Soil Erosion and Conservation: A dedicated investigation into the specific roles, indigenous knowledge, differentiated vulnerabilities, and unique adaptation strategies of women farmers in the face of soil degradation in the LGA is highly recommended. This would ensure that future interventions are gender-sensitive and equitable.
3. The Feasibility of Payments for Ecosystem Services (PES) in the Nigerian Context: An exploratory study to investigate the potential for designing a pilot PES scheme where farmers are provided with financial or in-kind incentives for adopting land management practices that provide broader ecosystem services, such as carbon sequestration and watershed protection.
4. Effectiveness and Integration of Indigenous Soil Conservation Knowledge: A systematic ethno botanical and ethnographic study to document, evaluates, and validates indigenous soil and water conservation practices in Karim-Lamido. The goal would be to identify locally adaptable and sustainable practices that can be effectively integrated with modern scientific techniques for a more culturally acceptable and robust SLM model.

5. It is, therefore, paramount for all stakeholders from the federal policymaker to the local farmer to recognize with utmost urgency that protecting and rejuvenating the soil in Karim-Lamido is synonymous with protecting the people's livelihoods,

ensuring their food sovereignty, and fostering sustainable and resilient rural development. The time for concerted, thoughtful, and decisive action, guided by the participatory and livelihood-centered approach recommended in this study.

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Appendix I

Informed Consent Guide

My name is Baraya, a postgraduate student from [African University Zimbabwe]. I am carrying out a study on **"Policy Framework to Mitigate Soil Erosion Impact on Agricultural Productivity in Karim-Lamido Local Government Area of Taraba State, Nigeria."** I am kindly asking you to participate in this study by answering this interview guide, which will take approximately 10-15 minutes.

What you should know about the study:

Purpose of the study:

The purpose of the study is to evaluate the impact of soil erosion on farming and to identify effective policies to combat it in our local government area. You were selected for this study because of your experience as a farmer/community leader/extension officer, and you are in a position to provide accurate and valuable information that is crucial to this research.

Procedures and duration

If you decide to participate, you will be required to answer a series of questions about soil erosion and farming. The interview is expected to take about 10 to 15 minutes of your time.

Risks and discomforts

The potential risk in this study is minimal. It is related to the discussion of challenges you face, which might cause some discomfort. However, the researcher will treat every piece of information acquired from you with the highest level of confidentiality. Your name and identity will not be disclosed in the final report.

Benefits and/or compensation

While there is no direct monetary compensation for participating, the findings from this study will contribute to developing better policies to support farmers and improve agricultural productivity in our community, which will be a long-term benefit to everyone.

Confidentiality

Your details (name) and the information you provide during this discussion will be treated with strict confidence. Your identity will be anonymized in the research report. If there should be a need to disclose any specific information, your consent will be sought first.

Voluntary participation

Participation in this study is completely voluntary. If you decide not to participate, your decision will not affect your relationship with the local government or any institution. You are free to withdraw your consent and stop the interview at any time without any penalty.

Offer to answer questions

Before you sign this form, please ask any questions on any aspect of this study that is unclear to you. You may take as much time as necessary to think it over.

Authorization

If you have decided to participate in this study, please sign this form in the space provided below as an indication that you have read and understood the information provided above and have agreed to participate.

Authorization

If you have decided to participate in this study, please sign this form in the space provide below as an indication that you have read and understood the information provided above and have agreed to participate.

Michael Danjuma Juji 10/08/2025

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Name of Research Participant (please print) Date

Signature of Research Participant or legally authorized representative

If you have any questions concerning this study or consent form beyond those answered by the researcher including questions about the research, your rights as a research participant, or if you feel that you have been treated unfairly and would like to talk to someone other than the researcher, please feel free to contact the Africa University Research Ethics Committee on telephone (020) 60075 or 60026 extension 1156 email aurec@africau.edu

Name of Researcher **BARAYA AMINADAB**

Interview Guide

Interview Guide for Key Informants
(Local Government Officials, Agriculture Extension Officers, Community Leaders)

1. In your view, how severe is the problem of soil erosion on farmlands in Karim-Lamido LGA?
2. What, in your opinion, are the main human activities and natural factors causing soil erosion in this area?
3. What are the most noticeable effects of this soil erosion on farmers' harvests and livelihoods in Karim-Lamido?
4. Are you aware of any government policies or programs (like NEWMAP) aimed at controlling soil erosion here? If yes, how effective have they been?
5. What are the biggest challenges in implementing soil conservation policies at the local government level?
6. How can farmers be better supported and encouraged to adopt soil conservation practices on their farms?
7. What specific policy actions do you think the local government should take as a matter of urgency to address soil erosion?
8. How can local communities be more involved in designing and implementing policies to fight soil erosion?

Interview Guide for Farmers

1. Have you noticed changes in your soil and a loss of fertile earth from your farm over the years?
2. What do you think are the main reasons your farm is losing soil (e.g., type of rain, tree cutting, farming methods)?
3. How has the loss of soil affected your crop yields and your family's income?
4. What methods are you currently using on your farm to try and control soil erosion?
5. Have you received any training or support from government agencies on how to protect your soil from erosion?
6. Do you think government efforts to help farmers with soil erosion are effective here?
7. What kind of help would you need most to better protect your farm from erosion (e.g., training, specific tools, financial support, better seeds)?
8. What is your suggestion for a lasting solution to the problem of soil erosion in our community?

APPENDIX II

"Investing in Africa's future"

AFRICA UNIVERSITY RESEARCH ETHICS COMMITTEE (AUREC)

P.O. Box 1320 Mutare, Zimbabwe, Off Nyanga Road, Old Mutare-Tel (+263-20) 60075/60026/61611 Fax: (+263 20) 61785 Website: www.africau.edu

Ref: AU3413/25

1 August, 2025

BARAYA AMINADAB
C/O Africa University
Box 1320
MUTARE

RE: **POLICIES FOR ADDRESSING SOIL EROSION AND LAND DEGRADATION ON AGRICULTURAL PRODUCTIVITY FOCUSING ON KARIM LAMIDO LOCAL GOVERNMENT, TARABA STATE, NIGERIA**

Thank you for submitting the above-titled proposal to the Africa University Research Ethics Committee for review. Please be advised that AUREC has reviewed and approved your application to conduct the above research.

The approval is based on the following.

a) Research proposal

- **APPROVAL NUMBER** AUREC 3413/25
  This number should be used on all correspondence, consent forms, and appropriate documents
- **AUREC MEETING DATE** NA
- **APPROVAL DATE** August 1 2025
- **EXPIRATION DATE** August 1, 2026
- **TYPE OF MEETING**: Expedited
  After the expiration date, this research may only continue upon renewal. A progress report on a standard AUREC form should be submitted a month before the expiration date for renewal purposes.
- **SERIOUS ADVERSE EVENTS** All serious problems concerning subject safety must be reported to AUREC within 3 working days on the standard AUREC form.
- **MODIFICATIONS** Prior AUREC approval is required before implementing any changes in the proposal (including changes in the consent documents)
- **TERMINATION OF STUDY** Upon termination of the study a report has to be submitted to AUREC.

AFRICA UNIVERSITY
RESEARCH ETHICS COMMITTEE (AUREC)
APPROVED
P.O. BOX 1320, MUTARE, ZIMBABWE

Yours Faithfully

MARY CHINZOU
FOR CHAIRPERSON
AFRICA UNIVERSITY RESEARCH ETHICS COMMITTEE

APPENDIX III

Secret

MINISTRY OF ENVIRONMENT AND CLIMATE CHANGE
HEADQUARTERS

Our Ref: ME/ADM/S.364/II
Your Ref: _____

P.M.B. 1055
Jalingo,
Taraba State.
Date: 22nd September, 2025

College of Business and Management Science,
African University,
P.O Box 1320 Mutare Zimbabwe,
22nd September, 2025

RE: SEEKING PERMISSION TO USE YOUR MINISTRY TO CONDUCT A RESEARCH BY BARAYA AMINADAB

The Ministry is in receipt of your request letter as a master's student of Public Policy and Governance. Of the above mentioned university with registration number 240384 seeking to conduct a research on the topic: **Policies for Addressing Soil Erosion and Land Degradation on Agricultural Productivity Focusing in Karim Lamido Local Government Area, Taraba State, Nigeria.**

2. I am pleased to inform you that the Ministry has approved your request to conduct your research work and to assist you with necessary data for your research project.

3. While looking forward to your research work, accept the Ministry's best regards, please.

Aminu Ayuba FCNA.
Permanent Secretary

Secret
www.tarabastate.gov.ng