ALVAN JOURNAL OF SOCIAL SCIENCES (AJSS)
FACULTY OF SOCIAL AND MANAGEMENT SCIENCES
ALVAN IKOKU FEDERAL UNIVERSITY OF EDUCATION, OWERRI
https://www-ajsspub-org.b12sites,com https://www.ajsspub2.org
E- ISSN: 3043 – 5463 ISSN: 1595 – 5842 **VOLUME 3, ISSUE 2A, 2026**

RESEARCH ARTICLE

RIVER YEDZARAM RESOURCE UTILIZATION AND RURAL LIVELIHOOD DYNAMICS IN MUBI METROPOLIS, ADAMAWA STATE, NIGERIA

OLUFEMI J. ANJORIN [1], ADILA M. MOHAMMED [2], PAUL Z WACHE [3]

[1 & 2] Department of Urban and Regional Planning, Federal Polytechnic, Mubi, Adamawa State, Nigeria; [3] Department of Geography, Nigeria Army University, Biu, Borno State

ABSTRACT

This study focuses on the contribution of River Yedzaram to rural livelihoods and community development among riverine communities in Mubi Metropolis, Adamawa State, Nigeria. The study which adopted a cross-sectional survey design was guided by the Sustainable Livelihoods Framework (SLF), being an appropriate platform for assessing the contribution of natural resources to livelihood dynamics. The multistage and proportionate sampling methods were used to select 144 respondents from 3 riverine communities for data collection. Questionnaire administration, filed observations, and the review of the relevant literature were used for data collection. Descriptive statistics (frequencies and percentages count) were used for data analyses, the findings and interpretations were enriched through the field observations. Findings from the study show that River Yedzaram significantly supports various economic activities, including sand mining, domestic water supply, and irrigation farming. These ultimately enhance the level of food security, income generation, and livelihood diversification among the riverine residents in the study area. On the other hand, the use of the river Yedzeram is restricted by environmental factors such as seasonality in the water volume and human factors such as economic activities like sand mining. These factors result in the fluctuation in the water volume, increased water pollution, and reduced reliability of water supply, among other findings. The study concludes that River Yedzaram remains a vital livelihood resource in Mubi Metropolis, and made appropriate recommendations towards its sustainable utilization. These recommendations include the need to strengthen water resource management in the study area in order to enhance the river's long-term contribution to livelihoods and sustainable development

Keywords: River Resources, rural livelihoods dynamics, resources utilization, sustainable livelihoods, riverine communities

Corresponding Author

Olufemi J. Anjorin
Email Address: anjorinfemi2002@yahoo.com ORCID: https://orcid.org/0000-0003-3940 1728

Received: 22/5/2026; **Revised:** 3/6/2026; **Accepted:** 13/7/2026; **Published:** 20/7/2026

ALVAN JOURNAL OF SOCIAL SCIENCES (AJSS)
FACULTY OF SOCIAL AND MANAGEMENT SCIENCES
ALVAN IKOKU FEDERAL UNIVERSITY OF EDUCATION, OWERRI
https://www-ajsspub-org.b12sites,com https://www.ajsspub2.org
E- ISSN: 3043 – 5463 ISSN: 1595 – 5842 VOLUME 3, ISSUE 2A, 2026

1.0. INTRODUCTION

River systems constitute fundamental components of rural and peri-urban socio-ecological systems, particularly in developing regions where livelihoods are closely tied to natural resource access. Beyond their hydrological role, they provide essential ecosystem services that support agriculture, domestic water supply, fisheries, livestock production, and a wide range of informal economic activities. In many rural economies of sub-Saharan Africa, rivers function as critical natural capital underpinning livelihood diversification, resilience, and household survival strategies.

Recent rural development scholarship increasingly emphasizes the centrality of water resources in shaping livelihood outcomes. Empirical studies across developing regions indicate that access to reliable water sources significantly enhances agricultural productivity, stabilizes rural incomes, improves food security, and strengthens adaptive capacity under climatic stress (Onyima, 2025; Wudil et al., 2023). Irrigation-based agriculture has particularly emerged as a key pathway for rural transformation, enabling dry-season farming and reducing dependence on rain-fed systems.

Beyond agriculture, riverine environments support diversified livelihood systems including fishing, sand mining, petty trading, and water vending. These activities contribute to income diversification and shape spatial livelihood structures in rural and peri-urban settings. Evidence from African river basins suggests that households with access to river resources often exhibit greater livelihood resilience due to diversified income portfolios (Kinnoumè et al., 2024; Gwapedza, et al., 2025).

However, increasing environmental and demographic pressures are altering the sustainability of river-based livelihoods. Studies across Nigeria indicate that land-use change, population growth, urban expansion, and unregulated extraction activities are contributing to channel instability, bank erosion, and declining water quality (Bibi et al., 2021; Onyima, 2025). These changes directly affect rural livelihoods by reducing the reliability and productivity of river systems. This is especially evident in north-eastern Nigeria, where river systems are particularly important due to strong rainfall seasonality and dependence on rain-fed agriculture. Rivers provide essential support for dry-season farming and act as buffers against climatic variability. However, studies in the Yedzaram Basin show increasing geomorphological instability driven by both natural processes and anthropogenic pressure (Zheng et al., 2023).

Mubi Metropolis, located within this basin, is undergoing rapid socio-spatial transformation characterized by urban expansion, agricultural intensification, and land-use change. Recent spatial analyses indicate significant conversion of vegetated land into built-up areas, increasing pressure on surrounding ecological systems, particularly river corridors (Enoguanbhor et al., 2022). Despite the importance of River Yedzaram in supporting livelihoods, empirical evidence linking River Yedzaram to structured livelihood outcomes remains limited. Existing studies have largely focused on hydrology, geomorphology, and environmental degradation, with limited attention to livelihood systems and rural development outcomes. This study addresses this gap.

The contribution of River Yedzaram to the sustainable livelihoods and socio-economic development of Mubi Metropolis is tremendous. However, there is a dearth of empirical evidence to support these contributions, as existing studies on River Yedzeram often focused on hydrology, erosion, and

ALVAN JOURNAL OF SOCIAL SCIENCES (AJSS)
FACULTY OF SOCIAL AND MANAGEMENT SCIENCES
ALVAN IKOKU FEDERAL UNIVERSITY OF EDUCATION, OWERRI
https://www-ajsspub-org.b12sites,com https://www.ajsspub2.org
E- ISSN: 3043 – 5463 ISSN: 1595 – 5842 VOLUME 3, ISSUE 2A, 2026

environmental degradation, neglecting its contribution to livelihood activities and socio-economic benefits derived from the river by households. These create a knowledge gap on the associated livelihood activities of the river, the extent of household dependence on it, and the challenges affecting its utilization. This knowledge gap limits effective rural development planning and sustainable resource management, making it difficult to design interventions that address both livelihood needs and environmental sustainability.

1.1. Aim and Objectives of the Study

This study aimed at investigating the contribution of River Yedzaram to rural livelihoods in Mubi Metropolis, Adamawa State, Nigeria, in order to identify its significance to the development of rural communities. To achieved the aim, the following specific objectives were investigated

1. To identifying the main livelihood activities along the bank of River Yedzeram.
2. To assess the socio-economic contributions of the river to households in the study area.
3. To examining the challenges affecting the utilization of the river.
4. To proposing river-based sustainable strategies that will enhance livelihood development in the study area.

2.0. Conceptual Framework

The Sustainable Livelihoods Framework (SLF) was used to anchor this research. SLF is a tool that clarifies the usage of natural resources under different socio-environmental conditions by residents of the rural communities. Its aim is to examine, explain, and reduce poverty, especially among the rural residents. As a result, River Yedzaram is a natural system within this SLF that supports rural livelihoods, especially sand mining, domestic water use, fishing, and irrigation farming through which rural residents earns a living to sustain their welfare and improve food security and community development.

However, various factors such as seasonal water fluctuations, environmental degradation, domestic activities, and population pressure, among others, have a tremendous influence on the effectiveness of these strategies. In addition, government policies being implemented through various institutions and agencies also shape access to river resources and patterns of utilization. These factors interact to generate rural livelihood outcomes such as food security, household welfare, income generation, and employment opportunities. Therefore, SLF is a suitable tool useful in examining and understanding the contribution of River Yedzaram to sustainable livelihoods in Mubi Metropolis.

3.0. METHODOLOGY

3.1. Study Area

This study was carried out in the riverine communities along River Yedzaram in Mubi Metropolis, Adamawa State, Nigeria. According to Zheng et al. (2023), due to various anthropogenic pressures and natural flow variability, the River Yedzaram, a major tributary in the Lake Chad drainage system, has active river features, including migration, widening, and bank erosion. Although Mubi is a fast-urbanizing metropolis, it possesses the rural–urban characteristics, including sand mining, agriculture, expanding settlements, and commercial activities that are prominent, especially among the riverine

ALVAN JOURNAL OF SOCIAL SCIENCES (AJSS)
FACULTY OF SOCIAL AND MANAGEMENT SCIENCES
ALVAN IKOKU FEDERAL UNIVERSITY OF EDUCATION, OWERRI
https://www-ajsspub-org.b12sites,com https://www.ajsspub2.org
E- ISSN: 3043 – 5463 ISSN: 1595 – 5842 VOLUME 3, ISSUE 2A, 2026

communities along the River Yedzaram bank within the metropolis. Consequently, households in these rural settings largely engage in primary economic activities like animal rearing, crop farming, sand mining, and other land- and water-based activities for economic survival. These characteristics make this study area an appropriate setting for examining the contribution of river resources, particularly River Yedzeram, to rural livelihoods and community development amid ongoing urbanization.

According to Enoguanbhor et al. (2022), there has been an increase in the level of land-use change in the Mubi metropolis especially from 2010 to 2024. Such land-use changes, which result in the conversion of vegetation and farmlands to residential areas, heighten pressure on riverine resources. In terms of weather and climate, Mubi Metropolis experiences a tropical wet and dry climate with high rainfall variability. These climatic features significantly impact the river-dependent socio-economic activities within the metropolis (Bibi et al., 2021).

Adelalu et al. (2024) submit that rivers enhances rural livelihood in numerous ways, including fishing, irrigation, and domestic water supply which often generate income and enhance food security for the rural households. Unfortunately, the rapid urbanization process and other land-use pressures in the Mubi metropolis are altering the spatial and ecological dynamics of River Yedzeram. Figure 1 shows the section of River Yedzaram that is falls within Mubi Metropolis.

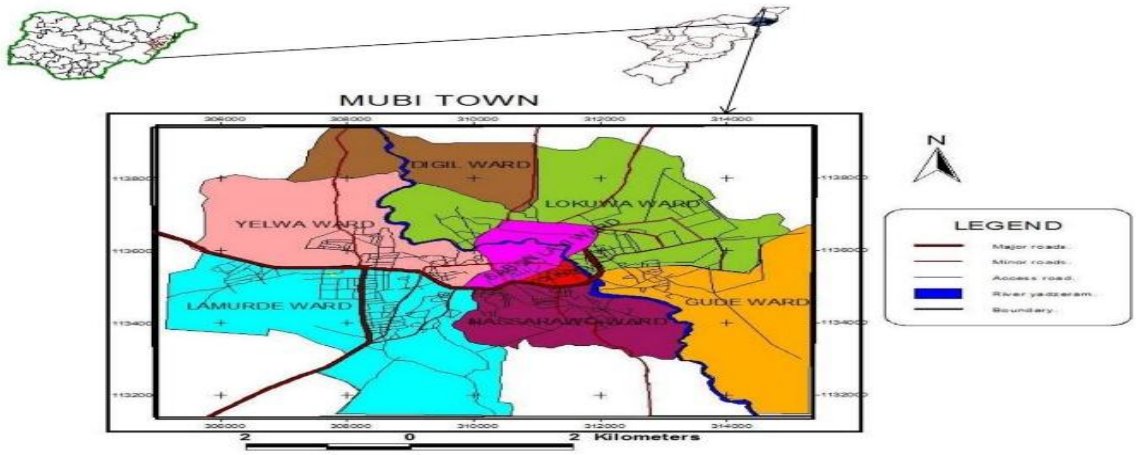

Figure: 1. Map of Mubi Metropolis showing River Yedzaram
Source: Adapted from Yohanna et al. (2015)

3.2. Research Design

A cross-sectional survey design was adopted. The design was considered appropriate because it enabled the collection of data from multiple livelihood groups and facilitated the assessment of the contribution of river resources to rural livelihoods within the study area.

3.3. Population, Sample Size and Sampling Technique

The total population of the study was 466 individuals. These were the individuals that explore the natural resources of the River Yedzeram in order to earn a livelihood. The population was grouped into 4 categories, namely, farmers (105), domestic users of the river (216), small-scale industrial operators (67), and sand miners (78). Using Yamane (1967) at a 5 percent margin of error, a sample

ALVAN JOURNAL OF SOCIAL SCIENCES (AJSS)
FACULTY OF SOCIAL AND MANAGEMENT SCIENCES
ALVAN IKOKU FEDERAL UNIVERSITY OF EDUCATION, OWERRI
https://www-ajsspub-org.b12sites,com https://www.ajsspub2.org
E- ISSN: 3043 – 5463 ISSN: 1595 – 5842 VOLUME 3, ISSUE 2A, 2026

size of 215 individuals (respondents) was estimated for the study. This formula is used to determine an appropriate sample size from a finite population. However, out of the 215 sample size, 144 respondents (31 percent of the study population) identified as active explorers of the River Yedzeram resources for various economic purposes, including farming and sand mining, among others, which were used for the study.

According to Krejcie & Morgan (1970), the sampled percentage is more than the number of respondents that is sufficient for any descriptive survey research. In terms of the sampling technique, a multistage sampling method was used. Accordingly, given the intensity of socio-economic activities along the bank of the River Yedzeram in the Wuro Gude, Kolere, and Lokuwa communities, these three communities were purposively selected for the study. The four major livelihood activities identified in the study area were stratified, and respondents were drawn from the strata and communities using the proportionate sampling method. Finally, a simple random sampling method was used to select the respondents from the stratified groups and communities. The Yamane (1967) formula used is $n = N / [1 + N(e^2)]$. Also, the sampled respondents are presented in Table 1.

Table 1: Proportionate Distribution of Sampled Respondents by Livelihood Activity and Community

River-related Livelihood Activity	Wuro Gude	Kolere	Lokuwa	Total Sample
Irrigation Farmers	12	12	8	32
Domestic Users	24	22	21	67
Small-scale Industrial Operators	5	9	7	21
Sand Miners	10	7	7	24
Total	51	50	43	144

Source: Author's Computation (2025)

3.4. Data Collection and Analysis

The study sought and used primary and secondary data. The primary data collected include the respondent's biodata, information on the livelihood activities, types of socio-economic activities at the bank of the River Yedzeram, and the challenges confronting the river and sustainability perceptions. These data, and others, were collected using a structured questionnaire that was developed based on the sustainable livelihood framework, which focused on livelihood activities along the River Yedzeram bank, significance of the resources from the river, constraints to the river's utilization, and sustainability concerns.

Rural development experts who are mainly geographers reviewed the questionnaire in order to validate its content. Thereafter, in order to ensure that the questionnaire attained a high level of clarity and relevance and was suitable for the study, it was pilot tested in communities with a similar environment to the selected study area. After the pilot test, every observed anomaly was corrected before the actual administration of the questionnaire for data collection. The total population of the study area, among other secondary data, was sourced from the Mubi office of the National Population Commission (NPC), and relevant literature was reviewed.

4.0. PRESENTATION OF RESULTS AND DISCUSSION

ALVAN JOURNAL OF SOCIAL SCIENCES (AJSS)
FACULTY OF SOCIAL AND MANAGEMENT SCIENCES
ALVAN IKOKU FEDERAL UNIVERSITY OF EDUCATION, OWERRI
https://www-ajsspub-org.b12sites,com https://www.ajsspub2.org
E- ISSN: 3043 – 5463 ISSN: 1595 – 5842 VOLUME 3, ISSUE 2A, 2026

4.1. Presentation of Results

Socio-Demographic Characteristics of Respondents

The bio-data of the respondents which are significant in explaining the nature of livelihood activities that takes place in the communities at the bank of the River Yedzeram as well as the river's resources.

Table 2: Socio-Demographic Profile of Respondents in River Yedzaram Communities

Variable	Category	Frequency	Percentage (%)
Age (years)	Below 25	26	18
	25–35	35	24
	35–40	43	30
	40 and above	40	28
Gender	Male	112	78
	Female	32	22
Educational Level	Primary	49	34
	Secondary	35	24
	Tertiary	23	16
	Others (informal)	37	26
Occupation	Civil servant	26	18
	Mining (sand mining)	20	14
	Farming	35	24
	Others (informal activities)	63	44
Monthly Income (₦)	Below 20,000	20	14
	20,000–60,000	43	30
	60,000–100,000	38	26
	100,000 and above	43	30

Source: Field Survey (2025).

Table 2 shows that 18 percent of respondents are below 25 years, 24 percent are 25–35 years, 30 percent are 35–40 years, and 28 percent are 40 years and above, indicating a predominance of economically active age groups. Males constitute 78 percent of respondents, while females account for 22 percent, reflecting a male-dominated sample.

Regarding education, 34 percent attained primary education, 24 percent secondary, 16 percent tertiary, and 26 percent informal education. Occupationally, 24 percent are farmers, 18 percent civil servants, 14 percent engaged in mining, while 44 percent are involved in other informal activities. Monthly income shows that 14 percent earn below ₦20,000, 30 percent earn ₦20,000–₦60,000, 26 percent earn ₦60,000–₦100,000, and 30 percent earn ₦100,000 and above.

Major livelihood Activities along River Yedzaram in Mubi Metropolis

The dependence of local communities on River Yedzaram is reflected in the range of socio-economic activities carried out along its course. Table 3 shows the distribution of respondents according to the primary activities they undertake in and around the river environment.

ALVAN JOURNAL OF SOCIAL SCIENCES (AJSS)
FACULTY OF SOCIAL AND MANAGEMENT SCIENCES
ALVAN IKOKU FEDERAL UNIVERSITY OF EDUCATION, OWERRI
https://www-ajsspub-org.b12sites,com https://www.ajsspub2.org
E- ISSN: 3043 – 5463 ISSN: 1595 – 5842 VOLUME 3, ISSUE 2A, 2026

Table 3: Major Socio-Economic Activities Undertaken Along River Yedzaram

Items	Frequency	Percentage (%)
Farming	32	22
Fishing	14	10
Livestock grazing	0	0
Sand mining	26	18
Waste disposal	29	20
Others	43	30

Source: Field Survey (2025)

Table 3 presents the major socio-economic activities along River Yedzaram. Results show that 30 percent of respondents engaged in other unspecified activities. Farming accounts for 22 percent, waste disposal 20 percent, sand mining 18 percent, fishing 10 percent, while livestock grazing was not reported. This indicates that River Yedzaram supports diverse livelihood activities, with farming, waste disposal, and sand mining being the most prominent visible uses of the river corridor.

The Role of River Yedzaram in Rural Livelihood and Community Development

Table 4 displays data on various ways through which River Yedzaram plays a role in the livelihood activities of the respondents and their communities.

Table 4: Major Socio-Economic Contributions of River Yedzaram to Livelihoods

ems	Frequency	Percentage (%)
Water source	63	44
Fishing	17	12
Irrigation	41	28
Recreation	3	2
Others	20	14
Total	144	100

Source: Field survey (2025)

Table 4 presents the socio-economic roles of River Yedzaram in the lives of the rural residents and the development of the riverine communities. Accordingly, water supply accounts for 44 percent of the contribution of the river, while irrigation, fishing and others are 28 percent, 12 percent, and 14%, respectively. The least significant role of the river is recreation, as reported by only 2 percent of the respondents. This finding is an indication that River Yedzeram is a primary source of productive and domestic water, with limited recreational significance in the Mubi metropolis.

The Challenges Affecting Utilization of River Yedzaram for Livelihood and Development Purposes

Data on the dominant factors that limit the extent to which the River Yedzaram is utilized by the respondents who are residents of the sampled riverine communities are presented in Table 5.

ALVAN JOURNAL OF SOCIAL SCIENCES (AJSS)
FACULTY OF SOCIAL AND MANAGEMENT SCIENCES
ALVAN IKOKU FEDERAL UNIVERSITY OF EDUCATION, OWERRI
https://www-ajsspub-org.b12sites,com https://www.ajsspub2.org
E- ISSN: 3043 – 5463 ISSN: 1595 – 5842 VOLUME 3, ISSUE 2A, 2026

Table 5: Major Challenges Affecting the Utilization of River Yedzaram

Items	Frequency	Percentage (%)
Water pollution	55	38
Over fishing	0	0
Erosion/flooding	15	10
Seasonality	60	42
Others	14	10
Total	144	100

Source: Field survey (2025)

The major challenges limiting the use of the River Yedzeram are presented in Table 5. These issues range from seasonality (42 percent) to water pollution (38 percent). while erosion and flooding as well as other challenges account for 10 percent of the reported limitations respectively.

Proposed Strategies for Enhancing the Sustainable Utilization of River Yedzaram for Rural and Community Development

Data on what the respondents considered top priorities for effective utilization of River Yedzeram towards sustainable development of their communities are presented in Table 6. These priorities include the perceived conservation awareness and the preferred development interventions, among other.

Table 6: Community Priorities, Conservation Awareness, and Preferred Development Interventions for River Yedzaram

Variables	Items	Frequency	Percentage (%)
The suggest priorities for Rive	Irrigation	35	24
Yedzaram	Fishing	14	10
	Recreation	26	18
	Water supply	55	38
	Others	14	10
	Total	**144**	**100**
Level of awareness of th	Yes	9	6
conservation effort on rive	No	135	94
Yedzaram by the respondents	**Total**	**144**	**100**
The conservation success	Initiative on waste management	0	0
	Program on afforestation/reforestation	9	6
	Measures on water conservation	0	0
	Others	135	94
	Total	**144**	**100**
The development projects tha	Irrigation system	23	16
respondent's wish on rive	Fishing infrastructure	20	14
Yedzaram	Recreational facilities	26	18
	Water treatment plants	75	52
	Others	0	0
	Total	**144**	**100**

Source: Field survey (2025)

ALVAN JOURNAL OF SOCIAL SCIENCES (AJSS)
FACULTY OF SOCIAL AND MANAGEMENT SCIENCES
ALVAN IKOKU FEDERAL UNIVERSITY OF EDUCATION, OWERRI
https://www-ajsspub-org.b12sites,com https://www.ajsspub2.org
E- ISSN: 3043 – 5463 ISSN: 1595 – 5842 VOLUME 3, ISSUE 2A, 2026

The three most prioritised activities along the bank of the River Yedzeram are water supply, irrigation, and recreation (38 percent, 24 percent, and 18 percent, respectively), distantly followed by fishing (10 percet). In terms of the level of awareness of the government's conservation efforts being made on river Yedzaram, most of the respondents (94 percent) reported not being aware of any such efforts. This shows either a very low awareness level among the residents of the communities or a total absence of such effort. Similarly, only 6 percent of the respondents identified afforestation/reforestation as a conservation success.

Hence, the result further point to limited recognition of interventions. Consequently, respondents indicated their preferred development projects. More than half (52 percent) of the respondents preferred that the government invest in the treatment of the River Yedzeram water, while between 14 percent and 18 percent of them preferred investment in fishing infrastructure, irrigation systems, and recreational facilities. Overall, respondents prioritise improved water quality and supply, alongside enhanced development of river-based infrastructure.

4.2. Discussion

These findings show that the youths of the riverine communities who are in their productive ages predominantly rely on and explore the natural resources of the River Yedzeram as a means of livelihood and sustainable development. These affirm that the availability of an active labour force is central to effective livelihood strategies. These findings agree with the submission of Henrietta et al. (2024), who asserted that an economically active workforce that is engaged in natural resource-dependent activities mostly shapes the rural livelihood systems in sub-Saharan Africa. These indicate availability of sufficient human resources to intensively explore environmental resources in many aspects, including agriculture and sand mining, among others, as operational within the Sustainable Livelihoods Framework (SLF).

In terms of gender access to the river-based economic activities, the study reveals more male-dominated access than female access. This suggests that males access the physically demanding natural capital and economic activities, such as irrigation farming, car washing, sand mining, and block moulding, around the River Yedzeram more than the females. This finding is in agreement with Basimine et al. (2024), who reported that in Africa, males dominate the physically demanding economic activities in the riverine communities more than females.

However, the finding shows that there is unequal access to livelihood opportunities and differentiated exposure to environmental risks across gender groups. Also, due to the reported low educational achievement among the respondents, there is a higher chance of poor access to formal employment opportunities, a heightened rate of dependence on informal resource-based livelihood systems, and a reduced level of human capital availability in the riverine communities. According to Wudil et al. (2023), there is a strong correlation between education levels and the level of reliance on natural capital for survival among the rural dwellers and communities.

Evidently, River Yedzeram significantly contributes to the livelihood system in the study area through its multifunctional roles. It supports irrigation farming, especially in view of the rainfall variability being experienced in these regions of Nigeria. This is visually illustrated in Plate 1, which shows household dependence on riverine water for dry-season cultivation. This finding is in agreement with

ALVAN JOURNAL OF SOCIAL SCIENCES (AJSS)
FACULTY OF SOCIAL AND MANAGEMENT SCIENCES
ALVAN IKOKU FEDERAL UNIVERSITY OF EDUCATION, OWERRI
https://www-ajsspub-org.b12sites,com https://www.ajsspub2.org
E- ISSN: 3043 – 5463 ISSN: 1595 – 5842 VOLUME 3, ISSUE 2A, 2026

previous studies that stated that agricultural productivity in semi-arid northern Nigeria strongly relies on access to river water (Wudil et al., 2023).

Also, due to the fast-increasing urbanization process in the Mubi metropolis and the need to earn a living by the residents, there is an increased sand mining process along the bank of River Yedzeram as shown in Plate 2. Although this is being done for economic reasons, studies have shown that constant sand mining at the riverbank is a potential modifier of river morphology and cause of environmental degradation (Rentier and Cammeraat, 2022).

Plate 1: Lettuce farm at River Yedzaram bank.

Plate 2: Sand Mining Activities along the river bank.

Furthermore, there is evidence of poor municipal waste management systems as well as weak environmental management in the study area. This weak governance is much revealed in the way waste is disposed of along the bank of the River Yedzeram. These waste disposals shown in Plate 3 demonstrate increased human activities in which the river banks are used as dumpsites and which ultimately often exert pressure on the river environment. Onyima et al. (2025) stated that for various reasons, including weakness of the government institutions, urban households often turn urban riverbanks into dumpsites, which, in effect, pollutes the water, reduces the water quality, and degrades the capacity of such rivers to enhance household and industrial uses.

Conversely, there is evidence of low fishing and absence of livestock grazing activities along the River Yedzeram, which is an indication of declining dependence on aquatic resources in the River Yedzeram corridor. This finding is in tandem with previous studies that reveal that in many African rivers, both the diversification of livelihood sources and environmental stress have caused a downward trend in income generation from fishing activities (Kinnoumè et al., 2024). The effect of this downward trend is the limitation of the traditional rural livelihood practices within riverine environments due to ecological and spatial constraints.

Plate 3: Waste dumps along River Yedzaram.

ALVAN JOURNAL OF SOCIAL SCIENCES (AJSS)
FACULTY OF SOCIAL AND MANAGEMENT SCIENCES
ALVAN IKOKU FEDERAL UNIVERSITY OF EDUCATION, OWERRI
https://www-ajsspub-org.b12sites,com https://www.ajsspub2.org
E- ISSN: 3043 – 5463 ISSN: 1595 – 5842 VOLUME 3, ISSUE 2A, 2026

Furthermore, the study has proved that the River Yedzaram does not only support rural livelihood systems; it is, as well, critical to household welfare, resilience, buffering climatic variability and enabling dry seasons in the rural settings. For instance, the residents of the riverine communities source domestic and agricultural water from the river and engage in dry-season farming. These activities sustain daily life survival activities in rural communities. Olutumise (2024) previously submitted that due to erratic or lack of public water supply in the rural areas, there is a heavy dependence on natural water sources. Plate 4 shows farming activities at the bank of the River Yedzeram, which further demonstrates its significance to rural livelihood systems.

Plate 4: Irrigated farmland along River Yedzaram.

Regardless of the contribution of the River Yedzeram to the livelihood systems of the riverine communities in the Mubi metropolis, availability in the river and its water use are strongly dictated by environmental variability, which restricted its use. During the dry season, when the water volume drastically reduces, the river becomes less useful for domestic, agricultural, and productive use. As such, alternative means, particularly by drilling local boreholes along the river channel where pumping machines are used to extract water, are devised to sustain livelihoods.

The studies of Bibi et al. (2021) and Henrietta et al. (2024) have earlier confirmed that variations in climatic elements largely challenge effective sustainable rural livelihood strategies in the northern part of Nigeria. This challenge is further exacerbated by the human actions around the river Yedzeram, which cause the water to be polluted. Such water pollution significantly reduces the usability of river systems for domestic and agricultural purposes (Onyima et al., 2025). The study reported less incidence of erosion, which implies a reduced risk of flooding in the study area. According to Zheng et al. (2023), erosion and flooding remain secondary risks associated with land-use change and sand mining activities, which alter river morphology and increase environmental instability.

Another limitation to sustainable usage of the River Yedzeram is the low level of institutional management and poor environmental governance. Respondents' rare awareness of any conservative efforts indicates a total disconnection between formal institutions and the local who depends on the river to earn a living. This finding is not peculiar to the Mubi metropolis, as previous studies have noted that in Africa, effective management of river basins is often challenged by poor participation of the community (James and Simatele, 2024). Hence, the collective action that aimed at sustainable resource use is weakened by the limited institutional capacity and environmental governance. Also, the increased concern over the river water quality and the related public health issues prompt the

demand for investment in improved water infrastructure and quality water supply. Additionally, the centrality of farming to rural livelihood systems causes a strong push for the development of efficient irrigation systems on the River Yedzeram. Taken together, these results within the SLF point to institutional shortcomings that obstruct sustainable management of natural capital and diminish livelihood resilience.

In totality, the River Yedzeram stands as a natural capital asset that significantly contributes to the rural livelihood system in the Mubi metropolis. But the usability and sustainability of this asset are challenged by numerous factors, including the weak governance management and institutional framework, environmental issues, and unequal access to the water resources, among others. Therefore, it is imperative that measures such as improved environmental governance and institutional framework and provision of adequate water management infrastructure are initiated to address these issues so as to enhance a sustainable river-based livelihood system and community development in the Mubi metropolis.

5.0. CONCLUSION AND POLICY IMPLICATIONS

This study has examined and identified the main livelihood activities along the bank of River Yedzeram and the socio-economic contributions of the river to households in the study area. Accordingly, the study reveals that the River Yedzeram is a critical natural asset that supports livelihood systems that enhance various socio-economic activities and strategies. The river does not only aid food production through irrigation farming; it supports sand mining and other small-scale industrial activities like block moulding, car washing, and domestic water supply, among others.

These roles are central to rural household income generation, especially amidst the climatic variability and low education status, which create a higher chance of poor access to formal employment opportunities and a heightened rate of dependence on informal resource-based livelihood systems in the study area. Therefore, the River Yedzeram is found to significantly contribute to household welfare, livelihood diversification, and food security in the Mubi metropolis.

Unfortunately, despite the glaring contribution of the river to the livelihood systems and community development of the Mubi metropolis, sustaining these benefits is fast becoming challenging due to institutional and environmental issues. While the water volume in the river fluctuates due to seasonal variability, the quality of the water for domestic use cannot be guaranteed as a result of persistent anthropogenic activities in and around the river. These challenges reduce the use of the river as a reliable source of income and the safe utilization of the water for domestic purposes.

While this study has shown that the River Yedzeram is a major livelihood asset in the Mubi metropolis, institutional frameworks and environmental governance need to be enhanced in order for the river to guarantee sustainable rural development. Therefore, it is imperative to improve the quality, reliability, and management of natural capital and reinforce institutional support structures in order to sustain livelihood outcomes in the study area, as envisaged by the SLF.

In terms of policy formulation and implementation, it is imperative that integrated river basin management that combines environmental protection with livelihood support is not only advocated but provided. On that, attention needs to be paid to controlling waste disposal and water pollution

along the river corridors so as to guarantee quality water that is safe for utilization. To achieve these, an increased investment in water treatment and the provision of effective and efficient mini-irrigation infrastructure facilities are needed. Additionally, to end the issue of lack of conservation awareness and encourage participation and stewardship of river resources among the residents of the study area, there is a need to establish and strengthen grassroots conservation initiatives.

Although the incidence of erosion is minimal, it is important to ensure the stability of the river system, particularly by stabilizing the riverbank and ecological restoration programmes. Lastly, efforts need to be made towards ensuring a reduction in the degradation of the environment, aiding resilient livelihoods, and sustainable rural development in Mubi Metropolis.

Conflict of interest

The authors declare that no conflict of interest exist in this manuscript.

Ethical statement

In terms of ethical considerations, participation was voluntary and confidentiality of information provided by the respondents was maintained.

Artificial Intelligent (AI) Statement

The authors declare that artificial intelligence (AI)-assisted technologies were used solely to support the preparation of this manuscript. Specifically, AI was employed to assist with language editing, improving clarity and readability, refining sentence structure, and checking grammar and style. The study conception, research design, field data collection, data analysis, interpretation of findings, discussion, conclusions, recommendations, and all intellectual contributions are entirely authors' own. All factual claims, analyses, citations, and references were independently verified by the author, who accepts full responsibility for the accuracy, originality, and integrity of the work.

REFERENCES

Adelalu, T. G., Moghorukor, J. O., & Hembaor, D. Z. (2024). Socio-economic implication of Yedzeram River bank erosion and flooding on the livelihood of Southern Mubi community dwellers, Adamawa, Nigeria. *Global Journal of Earth and Environmental Science, 9*(4), 135–145. https://doi.org/10.31248/GJEES2024.165

Awuah, K. G. B., & Bijimi, C. K. (2024). Discovering the core stakeholders in the Nigerian urban water supply system. *Sustainable Water Resources Management, 10*(8), 8. https://doi.org/10.1007/s40899-023-00986-0

Basimine, G., Wellens, J., Mushagalusa, N. G., et al. (2024). How rural communities relate to nature in Sub-Saharan regions: Perception of ecosystem services provided by wetlands in South-Kivu. *Sustainability, 16*(16), 7073. https://doi.org/10.3390/su16167073

Bibi, U. M., Adebayo, A. A., Umar, A. S., & Musa, Y. (2021). Rainfall variability and agricultural vulnerability in northeastern Nigeria. *Journal of Environmental Geography, 14*(3–4), 45–57.

Enoguanbhor, E. C., Gollnow, F., Walker, B. B., Nielsen, J. Ø., & Lakes, T. (2022). Simulating urban land expansion in the context of land use planning in the Abuja city-region, Nigeria. *GeoJournal, 87*(3), 1479–1497. https://doi.org/10.1007/s10708-020-10317-x

Gwapedza, D., Pierre, K., Lidzhegu, Z., & Makungu, E. (2025). River riparian zones in Sub-Saharan Africa: Processes, functions, and sustainability. In *Afrotropical streams and rivers: Structure, ecological processes and management* (pp. 267–288). https://doi.org/10.1016/B978-0-443-23898-7.00011-7

Henrietta E. M. George-Williams, Dexter V. L. Hunt, & Christopher D. F. Rogers (2024). *Sustainable water infrastructure: Visions and options for Sub-Saharan Africa*. Sustainability, 16(4), 1592. https://doi.org/10.3390/su16041592

James, L. N., & Simatele, M. D. (2024). Bystanders or active participants? Mobilising meaningful participation in river basin management: Lessons from the Gauteng Province, South Africa. *International Journal of River Basin Management, 24*(3), 355–369. https://doi.org/10.1080/15715124.2024.2417405

Kinnoumè, S. M. D., Adomou, S., Gouwakinnou, G. N., Houehanou, T. D., et al. (2024). Community perception of riparian corridor ecosystem services and implications for environmental education in Upper Ouémé Catchment in Benin, West Africa. *Open Journal of Ecology, 14*(2), 125–147. https://doi.org/10.4236/oje.2024.142008

Kitaka, N., Omondi, L. A., Mureithi, P. W., Bauer, A., Melcher, A., & Ssanyu, G. A. (2024). A critical review of biomonitoring in East African rivers: Fostering community-based collaboration for environmental change observation. *Frontiers in Water, 6*, 1360941. https://doi.org/10.3389/frwa.2024.1360941

Krejcie, R. V., & Morgan, D. W. (1970). Determining sample size for research activities. *Educational and Psychological Measurement, 30*(3), 607–610. https://doi.org/10.1177/001316447003000308

Okello, C., Githiora, Y. W., Sithole, S., & Owuor, M. A. (2024). Nature-based solutions for water resource management in Africa's arid and semi-arid lands (ASALs): A systematic review of existing interventions. *Nature-Based Solutions, 6*, 100172. https://doi.org/10.1016/j.nbsj.2024.100172

Olutumise, A. I. (2024). Preference for water sources and agricultural utilisation among rural households: A case of Akoko District of Ondo State, Nigeria. *Discover Water, 4*(78), 1–17. https://doi.org/10.1007/s43832-024-00148-z

Onyima, B. N., Nwabueze, L. N., Nnadozie, C. F., Omovoh, G. O., Mmachaka, T., Omovoh, B. O., Arimoro, F. O., Uku, J. E., Akamagwuna, F. C., Onyima, G. O., & Odume, O. N. (2025). Livelihood risks arising from urban river pollution in selected marginal communities in the Federal Capital Territory, Nigeria. *Urban Ecosystems, 28*, 33. https://doi.org/10.1007/s11252-024-01646-7

Rentier, E. S., & Cammeraat, L. H. (2022). The environmental impacts of river sand mining. *Science of the Total Environment, 838*, 155877. https://doi.org/10.1016/j.scitotenv.2022.155877

Wudil, A. H., Ali, A. A., & Aderinoye-Abdulwahab, S. A. (2023). Determinants of food security in Nigeria: Empirical evidence from beneficiaries and non-beneficiaries rice farmers of the Kano River Irrigation Project. *Frontiers in Sustainable Food Systems, 7*, 999932. https://doi.org/10.3389/fsufs.2023.999932

Yamane, T. (1967). *Statistics: An introductory analysis* (2nd ed.). Harper & Row.

Yohanna, P., Gadiga, B. L., & Mshelia, A. D. (2015). Land use/land cover change detection in Mubi Metropolis, Adamawa State, Nigeria. *Sky Journal of Soil Science and Environmental Management, 4*(6), 70–78.

Zheng, S., An, C., Wang, H., Li, L., Wang, F., & Hassan, M. A. (2023). The migration of the erosion center downstream of the Three Gorges Dam, China, and the role played by underlying gravel layer. *Water Resources Research, 59*, e2022WR034152. https://doi.org/10.1029/2022WR034152