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An Assessment of the Impact of Nigerian Erosion and Watershed Management Project (NEWMAP) on Gully Erosion Control in Enugu and Abia States

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Abstract

The southeastern Nigeria is besieged by gully erosion with significant ecological, infrastructural, and socio-economic consequences, particularly in Enugu and Abia States that has defiled government efforts until NEWMAP. This study thus, examined the impact of NEWMAP interventions on gully erosion control in Enugu and Abia States. It focused on how the Resettlement Action Plan affected gully erosion control projects and how the Damage Control component addressed the project sustainability. Data came from the primary and secondary sources. Primary data were obtained through key informant interviews and observations. Secondary data were sourced` from text books, internet sources, journal articles, government publications particularly NEWMAP documents. Data from Key Informant Interview and NEWMAP Reports were presented in tables Observational data appeared thematically accompanied with pictorial representations. Secondary data supported these presentations and analysis was done with the descriptive method. Findings revealed that RAP implementation had a significant positive impact by securing community buy-in, compensation and livelihood restoration which facilitated smooth project implementation. The funding arrangement positively impacted the projects by ensuring availability of funds commencement and completion of RAPs and the damage control components. However, haphazard afforestation implementation and non-fixing of emerging gullies adversely affected the project sustainability. Based on these findings, scaling-up and sustaining gully erosion gully control projects by converting NEWMAP into a state Agency is recommended. Revisiting afforestation and addressing new gully formations were also recommended. Institutionalizing state-based sustainable funding mechanisms is also recommended. In conclusion, NEWMAP made undeniable progress in mitigating gully erosion but long-term success will depend on the implementation of the above recommendations.

Keywords: *Gully Erosion Control, NEWMAP Interventions, Resettlement Action Plan (RAP), Damage Control, Project Sustainability.*

1. INTRODUCTION

Gully erosion represents one of the most spatially violent forms of environmental degradation in the Global South, producing not only ecological destruction but also deep socio-economic dislocation. In Nigeria, this process has assumed systemic proportions, transforming landscapes, fragmenting communities, and undermining rural livelihoods. While erosion is a national challenge, its spatial intensity is unevenly distributed, with southeastern Nigeria emerging as a critical epicentre. The World Bank's classification of the region as a global hotspot of severe erosion reflects the convergence of geomorphological vulnerability, high rainfall regimes, fragile soils, and long-standing anthropogenic pressures rooted in

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deforestation, infrastructure expansion, and unsustainable land-use practices (Oformata, 2002; Iruoma, 2021).

In Enugu and Abia States, gully erosion has evolved from an environmental problem into a structural development crisis. Expanding gullies have reconfigured agrarian systems, disrupted transport networks, destroyed homes, displaced populations, and eroded the material foundations of rural economies (Yakubu, 2020). Beyond physical destruction, the phenomenon has generated cascading socio-spatial consequences, including internal displacement, livelihood collapse, and intensified rural-urban migration, which further strain urban infrastructures and governance systems (Egboka, Orji, & Nwankwoala, 2019). Gully erosion in this context functions not merely as a biophysical process but as a socio-ecological destabilizer, reshaping patterns of vulnerability, exclusion, and environmental risk. It was within this context of escalating ecological crisis and developmental destabilization that the Nigerian state sought external intervention, culminating in the establishment of the Nigeria Erosion and Watershed Management Project (NEWMAP) in partnership with the World Bank. Conceived as a multi-sectoral environmental governance intervention, NEWMAP adopted an integrated model that combined civil engineering, bioengineering, and watershed management within a decentralised implementation framework (Ohwotite, 2018). Operationalized through state-level project management structures, the project represented a shift from fragmented erosion responses to coordinated, large-scale environmental intervention governance (World Bank, 2013).

Yet, despite official narratives of success, gully erosion continues to expand in both treated and untreated landscapes, raising critical questions about sustainability, institutional capacity, spatial coverage, and long-term ecological resilience. Against this backdrop, the central problem addressed by this study is the disconnect between NEWMAP's reported achievements and the continuing severity of gully erosion in Enugu and Abia States. While acknowledging the project's contributions, this study critically examines how the implementation of the Resettlement Action Plan, the provision of damage control measures, and the collaborative financing framework of NEWMAP have shaped the effectiveness and sustainability of gully erosion control between 2013 and 2023.

2. RESEARCH QUESTIONS

In sync with the critical objectives of the paper, the following research questions are posed:

1) How did the implementation of Resettlement Action Plan (RAP) of NEWMAP affect the gully erosion control projects in Enugu and Abia states, from 2013 to 2023?
2) How did the provision of Damage Control component of NEWMAP address the sustainability of gully erosions control projects in Enugu and Abia States from 2013 to 2023?

3. LITERATURE REVIEW

Empirical scholarship on the Nigeria Erosion and Watershed Management Project (NEWMAP) largely converges on its multidimensional impacts across engineering effectiveness, livelihood outcomes, community participation, and sustainability governance. From an engineering and technical standpoint, several studies affirm the effectiveness of NEWMAP's intervention designs in mitigating gully erosion. Maduka and Dike (2022) demonstrate that the deployment of bioremediation techniques, gabion boxes, retaining walls,

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and drainage infrastructure significantly reduced environmental degradation in Abia State. Complementing this, Oguaghamba and Onyia (2019) provide robust hydrological and GIS-based evidence showing that World Bank-supported NEWMAP hydraulic modeling and rainfall–runoff simulations enhanced the scientific accuracy of gully control designs, particularly in flood routing and channel capacity determination. Similarly, Eze et al. (2023) highlight the effectiveness of NEWMAP's integrated GIS mapping, stakeholder engagement, and awareness programs in identifying erosion hotspots and guiding targeted remediation in Enugu State. Collectively, these studies establish that NEWMAP's engineering and spatial planning frameworks are technically sound and aligned with global best practices.

Beyond physical infrastructure, a substantial body of literature emphasizes NEWMAP's livelihood enhancement components and their poverty-reduction outcomes. Studies conducted in Abia, Anambra, and Enugu States consistently report statistically significant improvements in household income, per capita expenditure, and poverty status following participation in Community Interest Group activities (Chukwu, Osuafor & Morgan, 2022; Chukwu, Ekumankama & Ukpai, 2022; Maduka & Dike, 2022). These findings suggest that livelihood diversification particularly in livestock rearing, crop farming, and small-scale trading has strengthened household resilience and contributed to local economic recovery in erosion-prone communities. However, while these outcomes validate NEWMAP's social safeguard objectives, they remain largely project-specific and raise questions about scalability and sustainability beyond intervention sites.

Community participation and governance emerge as a critical but weak link in the implementation chain. Maduka, Kalu & Dike (2023) reveal that overall community participation in NEWMAP activities remains low despite targeted engagement mechanisms, largely due to political interference, limited trust in government and donor agencies, and poorly timed meetings. Oyati & Lawal (2021) further demonstrate that while NEWMAP positively influences economic, social, and environmental dimensions of sustainable development, these effects are significantly moderated by the depth of community participation. This aligns with findings by Ike (2017), who argued that gully erosion in southeastern Nigeria is predominantly human-induced and therefore requires strong community-based land management, awareness creation, and behavioral change alongside engineering solutions.

Sustainability and post-intervention performance constitute another major concern in the literature. Oyati, Lawal & Ojo (2021) acknowledge that NEWMAP has reduced land degradation and improved agricultural productivity through hydraulic structures and watershed protection, but stress the need for continuous monitoring and evaluation to sustain gains. Igwe, Ajadike & Ogbu (2023) broaden this perspective by demonstrating that gully erosion impacts extend beyond physical damage to infrastructure, affecting biodiversity, mobility, and social wellbeing dimensions that require integrated remediation strategies rather than isolated site interventions. Furthermore, Eze et al. (2024) underscore the centrality of communication and inter-sectoral coordination in sustaining NEWMAP outcomes, arguing that effective information flow between engineers, livelihood officers, communities, and policymakers is pivotal to project success.

The empirical literature portrays NEWMAP as an intervention with demonstrable technical and socio-economic benefits, particularly in localized erosion control and livelihood improvement. Nonetheless, recurring challenges limited spatial coverage, uneven community participation, weak maintenance frameworks, and sustainability deficits persist across states and study contexts. These gaps point to the need for deeper interrogation of institutional

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arrangements, resettlement action plans, and damage control mechanisms underpinning NEWMAP.

4. RESEARCH METHODOLOGY

This study adopted a descriptive survey design to examine the impact of the Nigeria Erosion and Watershed Management Project (NEWMAP) on gully erosion control in Enugu and Abia States between 2013 and 2023. Descriptive surveys are appropriate for systematically collecting and analyzing data on phenomena to provide a comprehensive snapshot of processes, outcomes, and perceptions (Kpolovie, 2010). The design allowed for the integration of multiple data sources to assess project implementation, Resettlement Action Plan (RAP) execution, and damage control measures.

4.1 Population of the study

The population consisted of residents of Enugu (4.69 million) and Abia (4.14 million) States, totaling 8.83 million (City Population Projection, 2023). The study focused on six Local Government Areas (LGAs) hosting the majority of NEWMAP gully erosion projects, where meaningful primary data could be obtained.

4.2. Sampling Strategy

A multi-stage sampling approach was employed. The study area was first stratified into six senatorial districts across 34 LGAs. Using purposive sampling, six high-risk gully erosion sites (three per state) were selected for observation and data collection based on erosion severity and project presence. Additionally, six key informants (three from each state NEWMAP office) were purposively selected for interviews due to their direct involvement in project implementation, RAP execution, and damage control interventions:

Table 1: Sample Size Distribution of the Study

S/n.	Gully Sites	LGA	State
1.	Onuiyi Nsukka Gully Erosion site	Nsukka	Enugu State
2.	Enugu Ngwo Gully Erosion sites	Enugu North	Enugu State
3.	AgbajaNgwo Gully Erosion site	Udi	Enugu State
4.	Umuogele Umuakwu Gully Erosion site	Isialangwa North	Abia State
5.	Amuda-Achara Gully Erosion site	Umunneochi	Abia State
6.	Amuzukwu-Umuagu-Ibeku Gully Erosion site	Umuahia North	Abia State

4.3 Data Collection

Primary data were collected through semi-structured interviews with key NEWMAP officers and direct field observations at the six selected gully sites. Interviews focused on RAP implementation, damage control measures, and sustainability interventions. Observations were on documented structural interventions, completion status, repair measures, and reforestation efforts. Secondary data were sourced from NEWMAP reports, Federal Ministry of Environment documents, World Bank publications, peer-reviewed literature, and government/NGO records. Secondary sources were used to triangulate primary data, ensuring accuracy, reliability, and contextual depth.

4.4 Instrument Validity and Reliability

Validity was ensured through content and face validation. The interview guide was reviewed by the study supervisor and two experts in Public Administration and Local Government, ensuring clarity, appropriateness, and alignment with the study objectives.

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Reliability was established via a pilot study with two residents of Amaogbo, Nsukka. Test-retest analysis using Spearman's correlation yielded a coefficient of 0.917**,** indicating high consistency and reliability of the instrument.

4.5 Data Analysis

Qualitative data from interviews were analyzed using a thematic approach**,** with results summarized in tables to facilitate clear interpretation. Observational data were illustrated pictorially to demonstrate project status, erosion control interventions, and environmental conditions. Descriptive analysis integrated primary and secondary data to identify trends, evaluate the implementation of RAP and damage control measures, and assess the sustainability and impact of NEWMAP interventions on gully erosion control in the study areas.

This methodology ensured a robust, evidence-based assessment of NEWMAP's effectiveness in mitigating gully erosion while integrating multiple perspectives, from project implementers to community-level impacts, providing a strong basis for policy and strategic recommendations.

5. DATA PRESENTATION, ANALYSIS AND DISCUSSION 1

Responses to research question one- how did the implementation of Resettlement Action Plan (RAP) of NEWMAP affect the gully erosion control projects in Enugu and Abia states, between 2013 and 2023 are presented in the table below:

Table 2: Key Informant's responses on the impact of the implementation of Resettlement Action Plan (RAP) of NEWMAP on the completion of gully erosion control projects

No	Items	Abia	Enugu
1	What are the components of the RAP?	Compensation for affected families to relocate, and livelihood restoration programme, and infrastructural development	Compensation for affected properties and relocation of affected families and infrastructural development
2	The impact of the implementation of RAP on gully erosion control projects.	Very massive impact. Lives and livelihoods were saved and infrastructures were restored	Those whose houses were affected were compensated for relocation
3	Were there specific delays or accelerations directly attributable to RAP implementation?	There were delays in the commencement and completion of the projects because of delay in release of funds for the implementation of RAP	There were no delays in the release of funds hence the projects were started in earnest and completed at least at 90 percent

Sources: Field study (2025)

The above table illustrated the Key Informant Interview responses to research question 1 that is centred on how NEWMAP intervention affected gully erosion control projects in Abia and Enugu state. The questions and responses revolved around the components of the Resettlement Action Plan; the impact of the implementation of RAP on gully erosion control projects as well as the basic challenges especially the financial challenges. Therefore, we first discuss the components of RAP, its impact and the challenges across both states.

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Indeed, the offices of the Nigeria Erosion and Watershed Management Project (NEWMAP), Abia and Enugu states respectively, implemented a comprehensive Resettlement Action Plan (RAP) to address the socio-economic impacts of gully erosion control projects which played crucial role in the successful completion of these projects by providing compensation, relocation assistance and livelihood restoration to affected individuals and communities. These roles are discussed below under the key components of the Resettlement Action Plan (RAP).

1) Compensations for affected properties

Among the key components of the NEWMAP project is the provision of compensation to individuals and communities whose properties and livelihoods were affected by erosion control efforts. The table below shows the compensatory activities of Abia State NEWMAP.

Table 3: RAP Compensation payment for ABS –NEWMAP

Site	Amount approved per site	Total amount paid (n)	Outstanding balance (n)	Total PAPS/ site	Total PAPS paid	Male	Female	PAPS not paid	Property saved
Amuzukwu	34,590,400	34,350,400	240,000	28	28	17	11	0	Nil
Amuzukwu Addendum	9,538,000	9,538,000	0	9	9	8	1	0	Nil
Amuda- Achara	323,600	323,600	0	2	2	1	1	0	Nil
Umuogele/ Umuakwu	4,348,300	4,318,300	30,000	45	45	25	20	0	Nil
Umuogele Addendum	985,500.00	1,170,500.00	-185,000	23	23	14	9	0	Nil
Umuezekwu	3,380,822.69	3,159,317.33	221,505.36	43	43	27	16	0	Nil
Umuezekwu	13,979,731	11,624,900	2,354,831	65	65	37	28	0	Nil
Umuagu/ Umuda	87,587,000	33,820,531	53,766,469	34	34	30	4	0	5
Umuagu /Umuda (1st	14,064,479	13,574,199	490,280	6	6	5	1	0	5
Umuagu /Umuda (2nd	24,507,350	10,063,500	14,443,850	4	4	3	1	0	5

Source: ABS-NEWMAP (2022)

Table 4: RAP Compensation payment for ENS –NEWMAP

Site	Amount approved per site	Total Amount paid (n)	Outstanding balance (n)	Total paps per site	Total PAPS paid	PAPS not paid
Enugu Ngwo	7,047,936	7,047,936	-	8	8	-
Agbaja Ngwo	1,510,800	1,510,800	-	4	4	-
Udi-Ozalla	4,500,000	4,500,000	-	15	15	-
Onuiyi- AlorUno	10,000,000	9,800,000	200,000	30	30	-
Anyazuru Ohom Orba	9,000,000	6,000,000	3,000,000	21	19	2
Obinagu-Abia	4,000,000	3,800,000	200,000	5	5	-
9th Mile corner	3,901,760	3,901,760	0	88	88	0
Imiliki Etiti	5,000,000	5,000,000	-	120	117	3
Umuavulu-Abor Gully Erosion Site	11, 000,000	11,000,000	-	73	73	-

Sources: RAP implementation Reports for ENS-NEWMAP (2022); Dennis Agbo (2018)

The compensation scheme under NEWMAP significantly enhanced community cooperation and project efficiency in the Amuzukwu-Umuagu-Ibeku gully erosion intervention. By addressing losses to homes, farmlands, and infrastructure, compensation functioned both as restitution and a goodwill gesture that built trust and community buy-in, reinforced through the active involvement and endorsement of local leaders and traditional rulers. Financial compensation cushioned socio-economic disruptions for vulnerable households, enabling relocation or rebuilding and reducing risks of displacement, while

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temporary employment opportunities during project implementation stimulated local economic activity. Crucially, the early and transparent disbursement of compensation minimized land-related disputes, ensured uninterrupted site access for contractors, and contributed to the timely completion and stabilization of the gully project. Although challenges such as payment delays, valuation discrepancies, and land ownership disputes emerged, these were largely mitigated through the grievance redress mechanisms within the NEWMAP framework.

2) Livelihood Restoration Program (LRP)

While the Resettlement Action Plan (RAP) is mainly compensation for the affected properties for the purposes of restoring affected properties and relocating affected families, however, in Abia state, livelihood restoration programs as also part of the Resettlement Action Plans (RAP).

For instance, beyond monetary compensation, NEWMAP implemented livelihood enhancement initiatives such as poultry farming, fishery, piggery, and cassava farming aimed at providing sustainable income sources for affected persons, thereby improving their economic resilience. The table below showcases the livelihood restoration activities of NEWMAP in the six selected communities for this study.

Table 5: Livelihood Restoration Programme (LRP) Chart for Gully Erosion Project

SN	Project Sites	Skills Acquisition Areas	Start-up Supports Provided	Other LRP Initiatives
1	Enugu Ngwo	Agro-processing	Processing kits, startup capital, carpentry toolkits	Business development; workshops, mentorship
2	Agbaja Ngwo	Agro-processing, ICT, Carpentry	Processing kits, startup capital, carpentry toolkits	Financial literacy training
3	Onuiyi–Alor-Uno	-	-	Community enterprise support groups
4	Amuzukwu–Ibeku	Carpentry, Agro-processing, ICT	Agro equipment, seed capital, tech starter packs	Monthly monitoring and mentorship
5	Umuogele–Umuakwu	Tailoring, Agro-processing, ICT	Seed capital, tailoring machines, agro kits	Grants for women cooperatives
6	Amuda–Achara Isuochi	Hairdressing, ICT Carpentry	Hair kits, laptops, carpentry starter tools	Youth engagement programmes, skill fairs

Source: Abiakam (2022) and Enugu State Project Management Unit (SPMU) 2022

The success of the erosion control project extended beyond engineering solutions to the social sustainability achieved through the Livelihood Restoration Program, which was implemented in line with the Resettlement Policy Framework to support project-affected persons in rebuilding sustainable livelihoods. The programme combined skills acquisition training covering areas such as tailoring, hairdressing, carpentry, agro-processing, ICT, and other vocational skills with start-up support including tools, equipment, and seed capital, and specifically targeted vulnerable groups such as women, youth, the elderly, and persons with disabilities. Evidence shows that beneficiaries experienced increased income, self-reliance, and improved household welfare shortly after training, which reduced resistance to project activities, discouraged return to unsafe sites, and strengthened community ownership. By directly addressing economic losses, the programme reduced social tensions and grievances, enhanced transparency through grievance redress mechanisms and feedback sessions, and fostered goodwill that translated into smoother site access, local security support, and community participation in project monitoring.

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Beyond economic empowerment, the Livelihood Restoration Program also promoted environmental sustainability and long-term resilience. Beneficiaries were engaged in environmental awareness training and reforestation initiatives, nurturing a culture of environmental stewardship while reducing dependence on environmentally harmful survival practices such as deforestation and sand mining. A similar approach was evident at the Umuogele-Umuakwu-Nsulu gully erosion site, where NEWMAP complemented compensation with livelihood enhancement initiatives including poultry, fishery, piggery, and cassava farming. These interventions, supported by agro-processing training and start-up packages, provided sustainable income sources, improved economic resilience among affected persons, and reinforced the overall success and acceptance of the erosion control projects in Abia State.

Fig i: Alternative Livelihood activities of ABS-NEWMAP at Umuogele-Umuakwu Nsulu

Source: Field work (2025)

Severe gully erosion in Umuogele–Umuakwu, Isialangwa North, resulted in the destruction of farmlands and the collapse of roads, thereby restricting access to agricultural activities and endangering lives and property (Abia State NEWMAP, 2021). This loss of agricultural livelihoods necessitated the introduction of Agri-entrepreneurship skills acquisition and support packages, with minimal residential relocation but significant relocation of agro-based businesses.

The Livelihood Restoration Programme enhanced community participation and ownership, as beneficiaries of skills training and start-up support became active partners in project implementation, cooperating with contractors and safeguarding project materials (Yakubu, 2020).

The programme also mitigated economic shocks arising from loss of farmlands and informal businesses, with over 75% of beneficiaries engaging in productive income-generating activities within six months of completing training (Abia NEWMAP, 2022). By proactively addressing livelihood concerns, resistance, protests, and legal disputes were reduced, while emerging grievances were resolved through established community-based mechanisms (Oyati, Lawal & Ojo 2024).

3) Infrastructure Development

The NEWMAP intervention projects also featured the construction of community infrastructure like roads, solar-powered street lights, multi-purpose solar dryers, and civic halls.

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Table 6: Infrastructure Development Projects under NEWMAP Resettlement Action

SN	Project site	Infrastructure Projects Implemented
1	Enugu Ngwo	Construction of drainage channels and culverts; Rehabilitation of access roads; Installation of solar-powered street lights; Establishment of community water supply systems
2	Agbaja Ngwo	Erosion control through retaining walls and check dams; Improvement of local road networks; Provision of boreholes for potable water; Installation of street lighting for enhanced security
3	Onuiyi– Alor-Uno	Development of storm-water management systems; Reconstruction of affected bridges and footpaths
4	Amuzukwu–Ibeku	Construction of 2.1 kilometre Road; Provision of solar-powered street lights; Provision of multi- purpose solar dryer; Drilling of boreholes for clean water supply
5	Umuogele-Umuakwu	Rehabilitation of damaged roads and drainage systems; Development of access roads to connect isolated areas; Installation of solar-powered street lighting; Construction of community Civil hall for social and economic activities
6	Amuda-Achara Isuochi	Construction of 2.1 kilometre Road; Installation of solar-powered street lights; Provision of multi- purpose solar dryer; and construction of boreholes

Source: Abiakam (2022); Enugu State Project Management Unit (SPMU) 2022

The Umuogele-Umuakwu gully erosion control project in Abia State demonstrates how infrastructure development under NEWMAP contributed significantly to project success by providing durable solutions to erosion control while improving community well-being. Key interventions included the reconstruction and rehabilitation of rural roads to restore connectivity, installation of solar-powered streetlights to enhance security and support night-time economic activities, establishment of civic halls for community engagement, and provision of multi-purpose solar dryers to support agro-processing, particularly for women and local farmers (Abia State NEWMAP, 2022). These infrastructures improved project logistics, reduced delays, enhanced safety, minimized vandalism, reduced post-harvest losses, and increased household incomes. As communities directly benefited from these facilities, perceptions of the project shifted from a purely government-driven initiative to a shared development effort, fostering community ownership, cooperation, and improved monitoring of erosion control structures, with reduced resistance and sabotage (Oyati, Lawal & Ojo 2024). Table 7 below showcased the impact of RAPs on NEWMAP projects in both states.

Table 7: Impacts of RAP implementation on selected Gully Erosion Sites

Site, State, LGA & Year Implemented	RAP Activities	Observed Impact on Project
Amuzukwu/Umuagu-Ibeku-Abia State– Umuahia North.2018–2019	Enumeration of PAPs Property valuation Compensation disbursed Community consultations	Strong community cooperation Timely project start High RAP transparency and effectiveness
Umuogele Umuakwu Nsulu- Isiala Ngwa North, 2019–2020	Identification of affected farmlands Compensation for crops and structures Grievance redress mechanism set up	Moderate delays due to initial valuation disputes. Resolved with community engagement
Amuda-Achara Isuochi. Abia – Umunneochi 2020–2021	Delayed RAP rollout due to terrain/access Extensive PAP consultations Livelihood training for youth and women	Project faced early delays Improved outcomes postcompensation Livelihood support helped gain local trust
Enugu- Ngwo Enugu state - Enugu North.2017–2018	Early RAP engagement Displacement and resettlement planning Public awareness campaigns	Smooth contractor access Few disputes Successful site stabilization

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Agbaja Ngwo- Udi, 2020–2021	Compensation was prompt Involved local leaders in planning	Improved RAP documentation No major project delays
Onuiyi–AlorUno Enugu – Nsukka 2016–2017	PAPs were mainly farmers; Compensation paid for land, crops, and housing	community trust; Quick mobilization of technical teams

Source: Authors compilation from the various RAP reports.

By implementing the Resettlement Action Plan (RAP) which prioritized fair compensation, livelihood restoration, and infrastructure development NEWMAP ensured that erosion control efforts in both Abia and Enugu States were socially inclusive, environmentally sustainable, and resilient in the long term. This holistic approach not only mitigated environmental degradation but also laid a strong foundation for sustainable development and improved living conditions in the affected communities.

Therefore, it is found that the RAP's implementation facilitated the gully erosion control projects in Enugu and Abia states by securing community buy-in through compensation and livelihood restoration assistances, which ensured smooth project implementation is accepted.

5.2 Data Presentation, Analysis and Discussion 2

In response to research question two- How did the provision of Damage Control component of NEWMAP address the sustainability of gully erosions control projects in Enugu and Abia States between 2013 and 2023, data generated from the Key Informants are presented in the table below

Table 8: Key Informant's responses on the impact of the provision of NEWMAP's Damage Control on the sustainability of gully erosions control projects

No	Items	Abia NEWMAP project coordinator	Enugu NEWMAP project coordinator
1	What are the components of the "Damage Control" component of NEWMAP	Community sensitization programs on erosion prevention and sustainable land use; the afforestation and reforestation initiatives to restore degraded landscapes; Repairing of roads and bridges affected by erosion; putting up a steel fence; and fixing emerging gully erosion	Repair and reinforcement of roads and bridges affected by erosion; putting up a steel fence with wire gauze; and fixing emerging gully erosion
2	How were the damage control components applied in the course of projects for successful completion and sustenance?	Communities were sensitized on erosion prevention and sustainable land use; the afforestation/reforestation methods were incorporated into the project to restore degraded landscapes; Areas selected experienced repair and reinforcement of roads and bridges affected by erosion; at the repaired roads, there were solar powered street light.	Recreating the roads around the projects and rebuilding bridges affected by erosion; putting up a steel fence around the completed projects with wire gauze; and fixing identified emerging gully erosion, erosion within the environs of the completed gully projects
3	Was there any long-term effect the damage control measures had on post-completion project sustainability?	Yes. The damage control was aimed at ensuring sustainability of the projects and thus far, where this component was not adhered to, the adverse impacts are noticeable now.	In all the completed projects, protective steel fences were built, warning signs were placed to warn people against dumping of refuse, which is part of the sensitization programs, the emerging gullies were not actually fixed

Sources: Field study (2025)

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Table 9 above showcased the components of Damage Control such Community sensitization programs on erosion prevention and sustainable land use; the afforestation/reforestation initiatives to restore degraded landscapes; Repairing of roads and bridges affected by erosion; putting up a steel fence; and fixing emerging gully erosion alongside their impact on the sustainability of the gully erosion control projects. However, data from the field observation showed facing sustainability challenges despite the provisions of three (3) (community sensitization on erosion prevention and sustainable land use; Repair and reinforcement of roads and bridges affected by erosion; and installation of steel fence protective measures with wire gauze) out of the five (5) component of the NEWMAP's Damage Control as shown in table 10 below

Table 9: Rating of the Provision of Damage control for the selected projects

S/N	Gully site name	Damage Control components					
		Community sensitization	Sign Post	Afforestation	Roads/ Bridges/ culvert	Steel fences	Fixed emerging gullies
1	UmuogeleUmuakwu	Yes	Yes	No	Yes	No	No
2	Amuzukwu-Ibeku	Yes	Yes	Very scanty	Yes	Yes	No
3	Amuda-Achara	Yes	Yes	No	Yes	Yes	No
4	Enugu-Ngwo	Yes	No	Very scanty	Yes	Yes	No
5	Agbaja-Ngwo	Yes	No	No	No	No	No
6	Onuiyi-AlorUno	Yes	yes	No	Yes	Yes	No
		6/6	4/6	1/6	5/6	4/6	0/6

Sources: Authors compilation from field observation

1) Community engagement/sensitization on erosion prevention and sustainable land use

NEWMAP recognized that meaningful community engagement was crucial to the sustainability of its projects in both states such that table 11 below showed the various community engagement and sensitization activities of NEWMAP in the 6 selected communities in Abia and Enugu State.

Table 10: Community Engagement and Sensitization activities of NEWMAP in both states

S/N	State	Community	Community Engagement & Sensitization Activities	Specific Examples
1	**Abia**	Amuzukwu-Umuagu-**Ibeku**	**Stakeholder consultations, environmental education, compensation sensitization**	– Town hall meetings with elders and youths – Sensitization on compensation eligibility – Training on proper waste disposal
2	Abia	**Umuogele-Umuakwu**	Participatory ESIA, community-based planning, erosion education	– Women-led awareness efforts – Local committee for vegetation management
3	Abia	Amuda-**Achara Isuochi**	**Livelihood training, Awareness campaigns, Conflict resolution workshops**	– **Soap-making and tailoring training** – **Public sensitization via town criers** – **IEC materials in local language**
4	**Enugu**	**Enugu-Ngwo**	Sensitization forums, Participatory planning, Media outreach	– Community meetings on erosion – Radio awareness campaigns – Liaison officers for updates
5	Enugu	**Agbaja Ngwo**	**Environmental awareness, Women/youth involvement, Capacity building**	– **Farmer training on land use** – **Women's reforestation drives** – **Leaflets shared in churches and markets**
6	Enugu	Onuiyi-**Alor-Uno**	**ESIA engagement**	– **Skills acquisition for PAPs**

Source: Authors compilation from the various RAP Reports

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It is in recognizing that sustainable erosion control extends beyond engineering solutions, the project implemented extensive community engagement and sensitization programs aimed at education on erosion causes and prevention. This was pretty important given the fact that residents have turned the site into a massive refuse dump site. This trend continued after the intervention projects. And so part of the engagement was educating them about the underlying causes of gully erosion and the importance of adopting sustainable land-use practices to mitigate further degradation, under which sign posts against continuing dumping of refuges there were firmed established as shown below:

Fig ii: Awareness sign post for NEWMAP project sustainability in Amuzukwu-Umuagu-Ibeku

As a result of non-compliance to sensitization, the reclamation, channeling and remediation work Enugu state seems to been covered with refuges from the running drain.

Fig iii: Enugu Ngwo and Onuiyi gully site as an alternative refuge dumping site

Source: Field study (2025)

By fostering awareness and understanding of erosion issues, residents are supposed to became active participants in maintaining the implemented structures and adopting practices that prevent further degradation. Sadly, there was not even a sign warning against this misuse.

2) The afforestation and reforestation methods of restoring degraded landscapes

The intervention was supposed come with heavy afforestation because of its crucial role in restoring the degraded landscapes. Unfortunately, that was not the case. Where it featured at the Amuzukwu-Umuagu-Ibeku gully erosion site, afforestation was scantily done.

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Fig iv: Scanty afforestation at Amuzukwu-Umuagu-Ibeku- Enugu-Ngwo gully erosion site

Source: Field study (2025)

The scantiness of the afforestation implementation has had a huge toll on the sustainability of the executed project. For instance, instead of achieving soil stabilization that reduces soil erosion by anchoring soil particles and decreasing the velocity of surface runoff as well as achieving a significant return of various fauna that contributes to the restoration of the local ecosystem what we have is soil leaching that has negatively impacted the completed project. These soil leaching can have significant devastative impact on the sustainability of the project as it recreates emerging gullies within the immediate environment of the completed project. Apart from those effect already shown in the pictures above, such soil leaching has shown direct impact on the project as shown in the pictures below:

Fig v: Effects of scanty aforestation at Amuzukwu-Umuagu gully erosion control project

Source: Field study (2025)

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3) Repair and reinforcement of roads and bridges affected by erosion

The remediation work carried out by NEWMAP in Enugu and Abia state featured a significant number of roads and bridges. While some bad roads and bridges were fixed, there are instances were new ones were created a damage control measure to the completed gully erosion control projects. For instance, Amuzukwu-Umuagu, Umuogele and Amuda-Achara communities, gully erosions had torn the linking road into shreds thereby making it difficult for motorist and even pedestrian to connect between these communities. However, with the coming of the NEWMAP intervention, the road was repaid with solar-powered street light as shown in the picture below:

Fig vi: The repaired roads at Amuzukwu, Umuogele, Amuda gully erosion control project site

Source: Field study (2025)

At the Onuiyi-Alor-Uno gully erosion site, two major bridges were built- one at the Zik's house axis of the erosion gully and the other at the MCC road that linked Onuiyi community to Alor-Uno community. The MCC road bridge came with a remedial work at the road itself that was until the NEWMAP intervention, a nightmare to motorists having been torn apart by galloping flood during rainfall. The pictures below show the bridge and the road recreated along the gully control projects.

Fig vii: A double view of a newly constructed road and bridge at MCC road Alor-uno gully site

Source: Field study (2025)

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These bridge and road also have remedial culverts that connect Amaogbo to the MCC road. Amogbo community shares this gully erosion menace with Onuiyi and Alor-uno hence any remedial action or intervention is expected to include it. Below are Onuiyi Bridge and roads

Fig viii: The Onuiyi erosion re-constructed bridge and recued roads at Ibeziako Street Onuiyi

Source: Field study (2025)

The successful completion and sustenance of the Enugu-Ngwo gully erosion sites control project was made possible by the various bad roads that were repaired alongside the various culverts and bridge that were built as part of the remedial, rechanneling and reclamation work at Colliery gully erosion site, St Theresa gully erosion site, Amuzam gully erosion site; and Ezata gully erosion site. While these roads are not asphalted, but for once inaccessible road to be accessed and community members can make movement, a significant impact was made.

4) Installation of protective measures such as a steel fence with wire gauze

The remediation works carried out by NEWMAP in Enugu and Abia states were significantly provided for protective measures. The roads were provided with solar powered street light while the bridges and culverts were provided with protective rings and steel fence with wire gauze. These safety measures were created as damage control measure to the completed gully erosion control projects in both states. For instance, at Amuzukwu-Umuagu, Enugu-Ngwo and Onuiyi-Alor-uno gully erosion site, there were visible protective ramps at both edges of the repaired road and steel fence with wire gauze was fixed as part of the damage control as shown below:

Fig ix: A view of the installed steel fence at Amuzukwu-Umuagu gully erosion sites

Source: Field study (2025)

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At Umuogele-Umuakwu and Amuda-Achara gully erosion site, there were visible protective ramps at both edges of the newly constructed bridge as well as the road and steel fence with wire gauze was fixed as part of the damage control as shown below:

Fig x: A protective measures at Umuogele-Umuakwu and Amuda-Achara-Isuochi gully site

Source: Field study (2025)

5) Fixing emerging gully erosions

The NEWMAP intervention in Enugu and Abia states needed the fixing of emerging gully erosion as one of the Damage Control measures but unfortunately, both the key informant interview and on the spot assessment (observation) revealed zero attendance to this all-important component. For instance, at Amuzukwu-Umuagu gully erosion site, there are many emerging gully erosions and a very threatening one that the completed NEWMAP intervention did not capture but it has viciously ravaged the area to the point of forced displacement of residents.

Fig xi: A side view of full-blown erosion gully & emerging ones at Amuzukwu & Amuda

Source: Field study (2025)

These pictures are testaments to and an example of agonizing experience that could have been avoided if this arm of Damage Control component was provided for. Residents and occupant have been forcefully evicted from their own homes by erosion gully and as it stands, more houses are going down into the gully as the raining reason gathers momentum and the soil has been deeply compromised. Unfortunately, hope is nowhere in sight for them as the project coordinator of Abia NEWMAP said that work will only commence there anytime

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counterpart fund their international partners arrives. This sad situation is made hopeless by the fact that the state government has indeed acknowledged the near impossibility of it engaging this level of gully without external financial assistance. Assuming this area was fixed when it was still minor, this insalubrious situation would have been averted.

While these emerging gullies are not forming exactly at the place of NEWMAP intervention, concern is that if these emerging gullies are not fixed today, they will certain become a threat too big to handle within few years to come. This fully formation within few years after the NEWMAP intervention was foreseen by the program think tanks who thought it wise to assert that damage control that comprises fixing emerging gullies should be part of the NEWMAP intervention package. These spots are just but a tip of an iceberg because there are many other emerging gully formations within these communities that could have been fixed in the course of delivering the Amuda-Achara Isuochi gully erosion intervention project.

Unfortunately, the above listed and discussed are not all there are as the Onuiyi-Alor-Uno Nsukka gully erosion also has many emerging gullies that could have been fixed as a part of the damage control proviso to ensure the sustainability of this project. In fact, the case of OnuiyiAlor-Uno Nsukka gully erosion is more than it seems. For instance, firstly, the project was not completed hence the in-between where the engineering work has not been completed has continued to escalate in terms of depth and wideness. While the fear of the escalation due to seeming abandonment is still on the horizon, the speed with which the Amaogbo road that is connected to the Ibeziako street where the Onuiyi-Alor-Uno Nsukka gully erosion site is situated, is unimaginable worrisome. Even when the last NEWMAP intervention extended a culvert at the end of the street connecting it to the Alor-Uno end of the gully erosion, the area has been mopped up by emerging gully formations to the extent that about 25 building and 15 shops have been disconnected from the main road as residents and occupants improvise to have access to their homes. Some of these houses have actually lost their fence to these emerging erosion gullies. The pictures below show some of the emerging gully formations.

Fig xii: A view of emerging erosion gully at Onuiyi-Alor-Uno Nsukka gully erosion site

Source: Field study (2025)

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5.2 Conclusion

This study has critically examined the impact of the Nigeria Erosion and Watershed Management Project (NEWMAP) on gully erosion control in Enugu and Abia States from 2013 to 2023. Indeed, NEWMAP interventions represent a landmark initiative in the fight against land degradation and gully erosion in Nigeria. In Enugu and Abia States, the project has had a profoundly measurable impact on restoring degraded environments, protecting critical infrastructure, and improving community resilience to environmental hazards. This study has provided evidence that the implementation of NEWMAP in these states significantly reduced the severity and spread of gully erosion in several high-risk areas. In Enugu State, intervention sites such as Ajali Water Works, 9th Mile (Amaeke Ngwo), and Onuiyi Nsukka benefitted from targeted engineering works, proper drainage, and improved water management. In Abia State, notable progress was recorded at gully-prone sites in Amuzukwu-Umuagu-Ibeku, Umuahia North, and Isingwu, where the interventions helped to stabilize land, safeguard homes and infrastructure.

There is no gainsaying the fact that the central element of NEWMAP's success in these states was its multi-sectoral and integrated approach that combined civil engineering, environmental science, social safeguards, and community engagement. The execution of Resettlement Action Plans (RAPs) ensured that affected populations were not only compensated but also involved in the project implementation processes, thereby promoting inclusiveness and local ownership. However, the study also reveals that the effectiveness of these interventions was closely tied to the availability and timeliness of counterpart funding from the state governments.

The findings reveal that NEWMAP interventions have significantly contributed to environmental restoration, infrastructure protection, and community resilience in both states. Through a combination of engineering solutions, watershed management, and community-based approaches, the project has successfully addressed some of the most severe erosion challenges in these states. Overall, the impact of NEWMAP on gully erosion control in Enugu and Abia States has been substantial. While challenges remain, the successes recorded demonstrate the potential of integrated environmental management strategies when supported by strong institutional frameworks and sustainable financing. Moving forward, the insights from this study can inform policy decisions on climate resilience, environmental sustainability, and disaster risk reduction in Nigeria and other regions facing similar ecological threats.

5.3 Recommendations

For sustained impact of the NEWMAP gully erosion intervention projects in Enugu and Abia state, based on the findings of the study, the study recommends as follows:

1) **Scaling up and sustaining Erosion gully management projects through the conversion of NEWMAP into an Agency at the state level:** Between Enugu and Abia state are over 900 active gully erosion sites. The government inspection teams alluded that over 51 in Enugu and 25 in Abia state required urgent attention**.** Unfortunately, only 23 made the list and out of the 23 (13 for Enugu and 10 for Abia), only 19 were worked on. Out of this 19, one in Enugu has not been completed while 4 were not even started at all in Abia state. This recommendation is in tandem with suggestion by many who have observed the impact the NEWMAP intervention has had on gully erosions in Southeast Nigeria.

2) **Revisiting the afforestation arm of the projects, urgent commencement of fixing emerging gully erosion formations and ensuring other means of strengthening**

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maintenance for post-project sustainability: Since it was observed that in almost all the projects, afforestation was not given its pride of place despites its relevance being opulently announced in extant literature, we strongly recommend immediate revisit of those sites with scanty afforesation yet in dire need of it. Also, emerging gully formations in the various communities where these various NEWMAP gully erosion intervention projects were carried out should be urgently worked on by the government of Enugu and Abia state. This recommendation is based on observed evidences of emerging gully erosions escalating into monumental threats. Further waste of time before attending to them will be costlier than these projects executed by NEWMAP under this stringent financial condition. Some of the fixed gully erosions have started showing sign of corrosion in their basements. This is very typical of the Amuzukwu-Umuagu-Ibeku gully erosion project.

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