



→ Ex post evaluation of Adaptation Fund project "Increased Resilience to Climate Change in Northern Ghana through the Management of Water Resources and Diversification of Livelihoods"

Final Inception Report

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Prepared for: Technical Evaluation Reference Group of the Adaptation Fund (AF-TERG)

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ADAPTATION FUND



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Acronyms and Abbreviations

24E	24-hour Economy
AF	Adaptation Fund
AF-TERG	Adaptation Fund Technical Evaluation Reference Group
CWSA	Community Water and Sanitation Agency
EE	Executing Entity
EPA	Environmental Protection Agency (Government of Ghana)
FGD	Focus Group Discussion
GoG	Government of Ghana
IE	Implementing Entity
KII	Key Informant Interview
MESTI	Ministry of Environment, Science, Technology and Innovation (currently MEST)
M&E	Monitoring & Evaluation
MoFA	Ministry of Food and Agriculture
MWRWH	Ministry of Water Resources, Works and Housing
NGO	Non-governmental Organization
ID1F	One District One Factory
IVID	One Village One Dam
PFJ	Planting for Food and Jobs
PPR	Project Performance Report
UNDP	United Nations Development Program
UNFCCC	United Nations Framework Convention on Climate Change
WACDEP	Water Climate Programme and Development Programme
WRC	Water Resources Commission

1 Introduction

1.1 Purpose of the ex post evaluation

In 2022, the Technical Evaluation Reference Group of the Adaptation Fund (AF-TERG) launched a multi-phase approach to ex-post evaluation of Adaptation Fund (AF) interventions to develop and encourage the use of fit-for-purpose evaluation tools and approaches, and to enhance planning and monitoring, evaluation, and learning capacity across the Fund. This work entailed conducting a study on ex-post evaluation approaches, developing an ex-post framework, and piloting its methods and guidance in select countries, focusing first on a single outcome, then moving to multi-outcome cases. The AF-TERG has since moved into Phase 3 of the approach, in which it implements ex-post evaluations using this framework and methodology, as captured in the *2025 Toolkit for the Ex Post Evaluation of Adaptation Interventions* (Ex Post-EAI).

In October 2025, the AF-TERG commissioned an ex-post evaluation of the AF-funded project: *“Increased Resilience to Climate Change in Northern Ghana through the Management of Water Resources and Diversification of Livelihoods”* (GHA/MIE/Water/2012/1). Implemented by the United Nations Development Programme (UNDP) and the Government of Ghana (GoG) from 2016 to 2020, this project sought to enhance the resilience and adaptive capacity of rural livelihoods to climate impacts and risks affecting water resources in Ghana's northern regions. This evaluation seeks to assess the adaptive sustainability and resilience of the project five years post-closure.

1.2 Objective and scope of the evaluation

The evaluation aims to assess the adaptive sustainability and resilience of the three outcomes delivered by the project and to understand the factors that have influenced their persistence or transformation since project closure. The key objectives of the evaluation are to:

- Assess **changes in project outcomes** (positive and negative) since the final evaluation was conducted in 2021.
- Identify **enabling and constraining conditions** that have influenced the sustainability of adaptation outcomes since project closure.
- Analyze **how sustained outcomes contribute to enhanced local resilience**, especially in the context of climatic and other possible shocks.
- Determine what, if anything, emerged from **local efforts and other pathways to sustain results** (also known as emerging outcomes), including any unintended or maladaptive results or evidence of scale-up by other organizations.

Two additional goals of the evaluation are 1) to meet the learning needs of UNDP and GoG regarding replicating future activities based on what has worked well or poorly in the vital water sector in light of rising climate variability and impacts, and 2) to inform participating communities and partners of what the team learned in the ex-post evaluation process.

Building on learning from other AF-TERG ex-post evaluations, the evaluation team will also examine the hypothesis that combining improved, well-managed water sources (i.e., project outcomes 1 and 2) with support for diversified livelihoods (i.e., project outcome 3) makes communities more resilient to climate change than either intervention alone (see also section 2.4 on the theory of sustainability).

1.3 Intended users

This evaluation seeks to generate useful information for a variety of stakeholders, including the AF Fund, UNDP, GoG, local communities, multilateral and bilateral funders, and NGO implementers. It will contribute to the growing body of ex-post evidence maintained by the AF-TERG to inform future programming, while also offering lessons on project design and implementation, sustainability planning, and results monitoring and reporting for Adaptation Fund Secretariat teams.

UNDP, GoG—at national, regional, and district levels—and NGO implementers can apply the evaluation findings to strengthen future AF-supported interventions, while multilateral and bilateral funders may draw on the evaluation’s insights into drivers of sustainability that can be replicated across development and adaptation contexts. Local communities, meanwhile, can benefit from understanding the experiences of other project-affected groups, learning what worked well and what did not, and using that knowledge to implement more effective and sustainable adaptation solutions in the future.

2 About the project

This section provides background information on the AF-funded project, including basic project details (Table 1), and the project justification and strategy.

Table 1. Project Summary Table

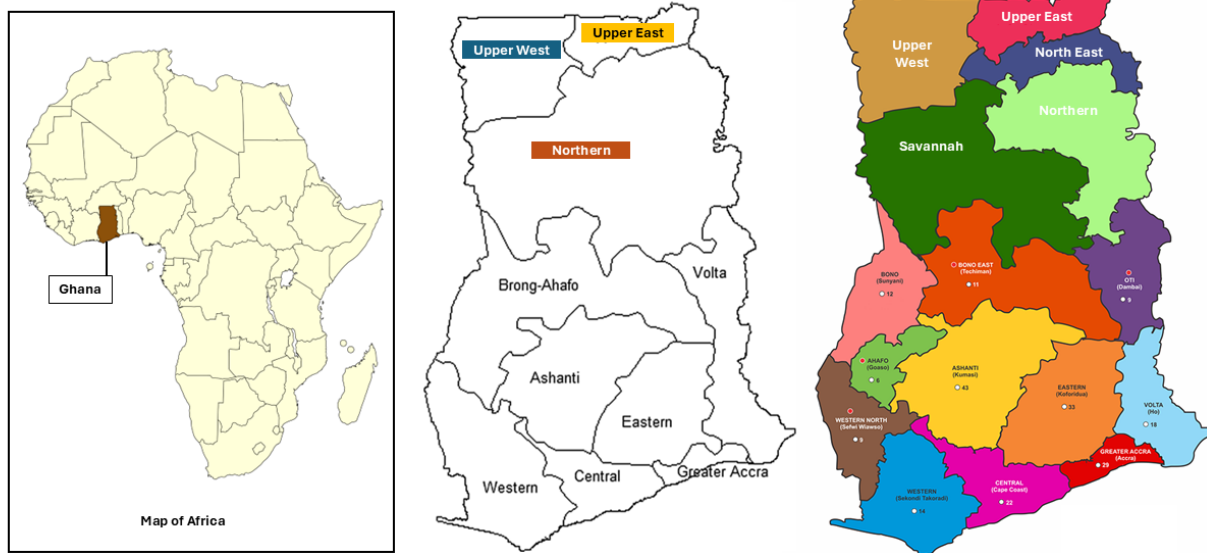
Project Information	
Project/Programme Category	Regular project
Country	Ghana
Regions	Northern, Upper East, Upper West and Savannah
Title	Increased resilience to climate change in Northern Ghana through the management of water resources and diversification of livelihoods
Adaptation Fund Project ID	GHA/MIE/Water/2012/1
UNDP Project ID	4952
Implementing Entity	United Nations Development Programme (UNDP)
Executing Entity / National Partners	Ministry of Environment, Science, Technology and Innovation (MESTI)
Adaptation Fund Financing	USD 8,293,972
Government of Ghana Co-financing	USD 750,557
Project Start Date	April 2016
Project Closing Date (Proposed/ Actual)	April 2020/December 2020
Project Final Evaluation Date	October–December 2020 Report submitted March 2021

2.1 Project justification

The main objective of the project was to enhance the resilience and adaptive capacity of rural communities in northern Ghana to climate impacts and risks on water resources and livelihoods. The project focused on the Volta River System, which contains the White Volta, Black Volta, and Oti Basins, and which spans roughly 70 percent of Ghana’s land area. Activities were implemented in a

total of 10 districts across four¹ northern regions within the Volta River System, as shown in Figure 1: two in the Northern Region, one in the Savannah Region, four in the Upper East Region, and three in the Upper West Region.

Figure 1. Maps of the Project Areas



Source: Final evaluation, 2021. Recreated for legibility by the evaluation team.

Northern Ghana is the driest part of the country, receiving less than 1,100 millimeters of rainfall annually at the time of project design. Climate projections also indicated further declines in rainfall volumes alongside increasingly erratic patterns of rainfall.² These regions were also identified as the most vulnerable to drought and the least equipped to adapt to climate impacts due to low socioeconomic development and heavy dependence on rain-fed livelihoods, such as agriculture and forestry.

The project recognized the disproportionately high difficulties that poor farmers in northern Ghana face in managing climate risks. Increasingly unpredictable rainy seasons undermine farmers' ability to plan crop production, which in turn threatens household food security. This was especially concerning given that 10–34 percent of the population in the target districts was food insecure at the time of project design.³ With a large share of Ghana's population relying on agriculture for their livelihoods, the destabilizing effects of climate change on rainfall patterns posed significant risks to income stability. Consequently, the project sought to take on these challenges from multiple angles. It emphasized improved water resource management to reduce vulnerability to climate variability, while also promoting livelihood diversification to lessen dependence on climate-sensitive agriculture.

The project aligned closely with Ghana's national climate change adaptation and development frameworks and national initiatives focus on building resilience across agriculture, infrastructure, and coastal zones. These include the National Climate Change Policy (NCCP, 2013), National Adaptation Strategy (NCCAS, 2012), the National Adaptation Plan (NAP, implemented 2020–2025),

¹ The current Northern and Savannah Regions formed one unified region at project design and were split into two regions during project implementation. Thus, the project originally targeted three regions.

² Source: Project proposal, 2015.

³ Source: Project proposal, 2015.

and Ghana's Updated Nationally Determined Contributions (NDCs). Key priorities identified in these plans include:

- Climate-smart agriculture.
- Early warning and disaster risk management systems.
- Mobilizing climate finance for sustainable development.
- Promoting resilient livelihoods, inclusive urban planning, and protection of women and vulnerable groups.

2.2 Project strategy

Project objectives, components, and intended impact

The project was approved by the AF Board in May 2015 and was launched in May 2016 with the expectation to improve water resource management and long-term planning to effectively address the underlying drivers of water resource degradation and stimulate investments, while taking into account and trying to reduce the impact of climate change on surface and groundwater sources and livelihoods. The project was executed by the Ministry of Environment, Science, Technology and Innovation (MEST(I)) of Ghana in partnership with UNDP as the Implementing Entity, with close cooperation with sectoral ministries (Ministry of Food and Agriculture (MoFA) and Ministry of Water Resources, Works and Housing), District Assemblies and decentralized agencies (Community Water and Sanitation Agencies, district-level Department of Agriculture, and Forestry Services Division), NGOs and the private sector. The expected implementation period was May 2016 to April 2020, however due to funding disbursement delays and the COVID-19 pandemic, the project received a no-cost extension to December 2020, albeit with fewer communities reached and assets constructed versus planned.

The project pursued three outcomes, the first on basin-level planning, the second on local water resource management, and the third on livelihood diversification (see Table 2). Collectively, project activities sought to enhance the adaptive capacity of 50 communities in 10 districts (93,909 direct and indirect beneficiaries total) to climate risks through institutional and individual capacity strengthening and awareness raising, investments in physical infrastructure, and livelihood diversification activities.

Table 2. Project Components and Contribution to AF Results Framework

No.	Component	Intended Outcome	Fund-Level Outcome	Cost (Million US\$)*
1	Water Resource Management Planning	Outcome 1: Improved basin level management and planning of water resources, taking into account climate change impacts on surface and groundwater sources	Outcome 2: Strengthened institutional capacity to reduce risks associated with climate induced socioeconomic and environmental losses	\$0.364
2	Community Level Implementation of Water	Outcome 2: Climate resilient management of water resources by 50	Outcome 3: Strengthened awareness and ownership of adaptation and climate risk reduction processes at local level	\$4.496

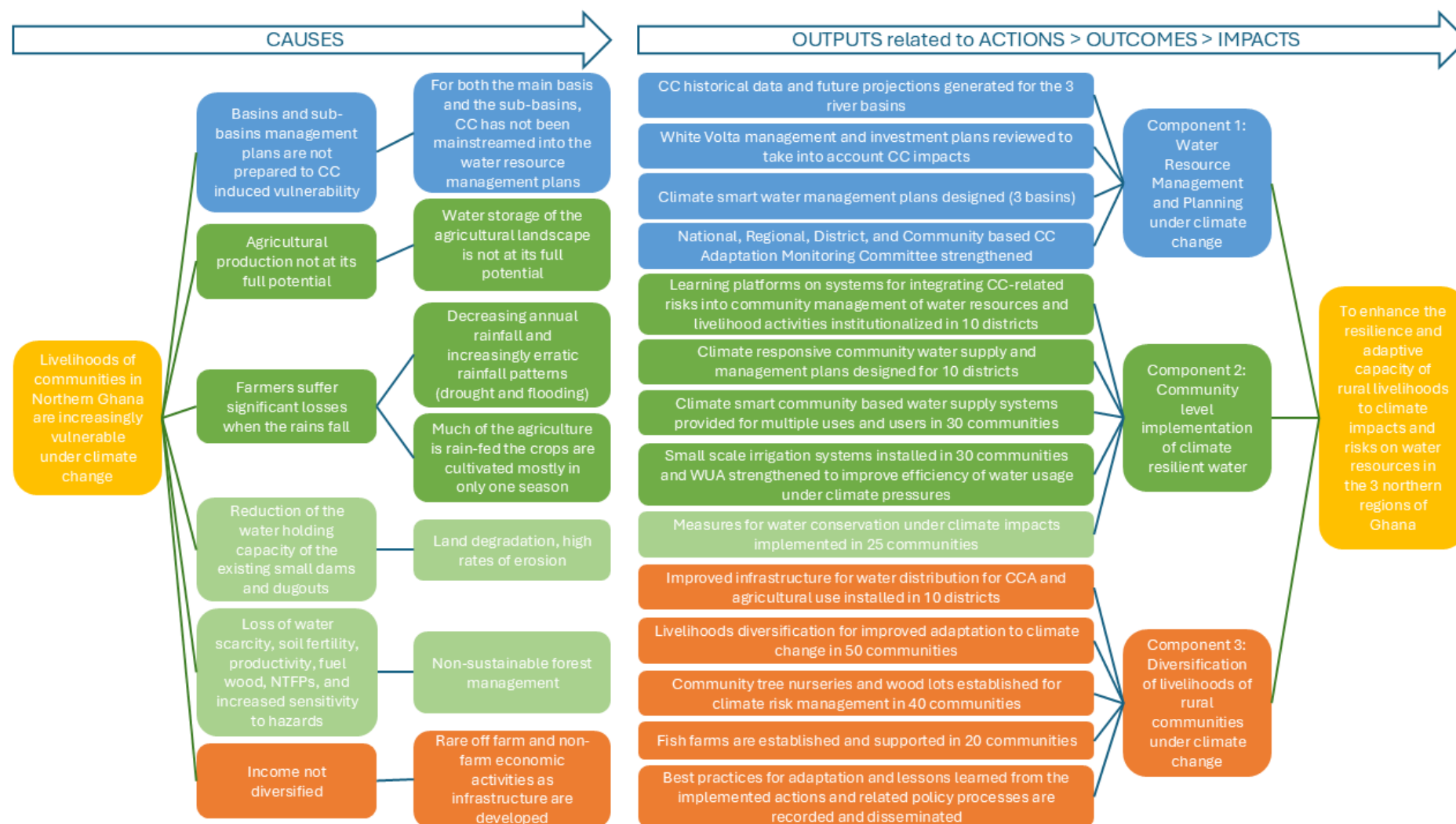
No.	Component	Intended Outcome	Fund-Level Outcome	Cost (Million US\$)*
	Resource Management Activities	communities in northern Ghana	Outcome 4: Increased adaptive capacity within relevant development and natural resource sectors	
3	Diversification of Livelihoods of Rural Communities	Outcome 3: Livelihoods diversification for improved adaptation to climate change in 50 communities in northern region	Outcome 6: Diversified and strengthened livelihoods and sources of income for vulnerable people in targeted areas	\$2.251

*Project expenditures at completion. Project fund utilization was 84.48% at the time of the final evaluation. Source: Final evaluation, 2021.

Theory of Change

While the original project proposal did not include a Theory of Change (ToC), one was developed by the Mid-term Evaluation team and confirmed by the Final Evaluation team, as shown in Figure 1 below. One key consideration is not clearly represented in the ToC but emerged from the Final Evaluation and scoping interviews: that is, the interlinkages and inter-dependencies among the outcomes. For example, the Final Evaluation found that enhanced water resource management and planning at the basin- and sub-basin level (Outcome 1) should create a supportive enabling environment for community-level water management and conservation (Outcome 2), but that those theoretical interlinkages were not demonstrated. There was insufficient empirical evidence that basin planning was actively used by local governments or communities and that implementation experiences informed basin policy processes. Similarly, enhancing climate-resilient water supply (Outcome 2) was identified as theoretically linked to the effectiveness of new climate-resilient diversified livelihoods (Outcome 3); this interdependency was highlighted in interviews. These interlinkages are highly relevant also for the Theory of Sustainability and discussed in Section 2.4 further below.

Figure 2. Theory of Change



Source: Mid-term evaluation, 2019. Recreated for legibility by the evaluation team.

Sustainability strategy

A sustainability strategy in a project is the plan for how the project's benefits, services, and capacities will continue (and ideally grow) after the project ends. It explains who will do what, with what resources, partnerships, and capacities based on local resources, as well as how risks will be managed so outcomes are sustained after external funding or support ends.

Sustainability planning and exit. Some exit planning was intended to be done through developing a detailed work plan for the last year of the project and efforts to engage partners on scaling up and incorporating climate science and adaptation into other government programmes.⁴ Yet the Final Evaluation and PPR3 lessons indicate that no formal exit strategies or phase-over plans were implemented, due in part to delays in project execution and incomplete activity delivery by the time of extended closure and COVID-19. Some project stakeholders indicated in scoping consultations that exit planning was not necessary because programming was already owned by the GoG and designed in consultation with communities.

The Final Evaluation found no evidence that monitoring systems for the project-supported assets (Outcomes 2 and 3) had been put in place before closure and recommended assessments to measure the state of functional operational of dugout/dams and boreholes. Scoping interviews indicated that such assessments were not ultimately carried out. A scoping interview also indicated that the Environmental Protection Agency (EPA) was tasked with oversight of the activities under Outcomes 2 and 3, so future consultations with EPA representatives will explore any sustainability planning by that organization.

See also Section 2.3 for a discussion of the sustainability ratings assigned by the Final Evaluation.

Risk and adaptive management. The Final Evaluation offered limited discussion of formal risk management during implementation, aside from repairs to flood-damaged infrastructure (e.g., Tampion dam, Lamboya walkway repairs). The project also experienced two instances requiring adaptive management during implementation:

- Delayed AF disbursement combined with rising construction costs, which decreased ability to complete infrastructure construction. The number of dams/dugouts was reduced from 30 to 12, then to 10,⁵ due to costs that were higher than expected.
- COVID-19 restrictions limiting gathering for community engagement.

Beyond these two major challenges, the Final Evaluation noted that additional adaptive management decisions were made, even if they were not systematically recorded. One example was the reallocation of resources from underperforming community tree nurseries to support the establishment of community fish farms. The Final Evaluation also observed that although mechanisms existed for community feedback, there was no evidence that suggestions led to changes in programming, and NGO involvement in project formulation and gender-responsive monitoring was limited. Fieldwork will verify whether community concerns were addressed in practice and the extent to which women participated in decision-making processes. Fieldwork will follow up on these adjustments to assess whether they affected sustainability.

⁴ Source: Final evaluation, 2021.

⁵ MEST provided a list in January 2026 with the locations of all the dams that were ultimately completed under AF funding. The ex post evaluation will select among all these dams.

While not formally part of the sustainability strategy, sustainability prospects are also influenced by the project's relevance to needs. A key aspect to sustainability is ownership, which is in turn based on activities being relevant to the lives and livelihoods of participants and partners. Relevance is discussed below.

Relevance. The Final Evaluation rated project relevance as Highly Satisfactory (HS), noting that the intervention strengthened national adaptation actions to address climate impacts, risks, and vulnerabilities. The project supported three of the ten national priorities outlined in the 2011 National Climate Change Adaptation Strategy (NCCAS), including related to alternative livelihoods, improved land use management, and managing water resources to enhance productivity and livelihoods.

Northern Ghana faces high poverty levels and climate impacts, particularly droughts and floods, making the project's focus on water and livelihoods well aligned with local needs. Significant increases in temperatures are projected between 2010–2050, with the northern regions experiencing increases of 2.2–2.4°C and the widest range of temperature variability (5.7°C).⁶ These projections further reinforce the importance of interventions centered on water availability and livelihood resilience (Outcomes 2 and 3). This strong alignment between national priorities, climate risks, and community needs strengthens the likelihood that project outcomes remain relevant and sustainable over time.

The basin and sub-basin water management plans (Outcome 1) were also highly relevant to the needs of groundwater management given overuse and a variety of stresses. For the Black Volta basin, the top challenges were a lack of enforcement capacities, insufficient data and basin information, farming on rivers, illegal mining, insufficient buffers, riverbank degradation and siltation. For the Oti basin, challenges included too much logging, herding, farming, and fishing 'inappropriately' along rivers. The basin plans also confirmed that the project addressed the second of three recommendations, which was to invest in dams/dugouts and livelihoods sustainability.⁷

2.3 Adaptation outcomes at final evaluation

At project completion, the Final Evaluation stated that the project met or surpassed many of its outcome and output indicator targets, earning it an overall Effectiveness rating of Satisfactory. Despite this overall positive rating, the Final Evaluation offers contradictory evidence on outcome achievement between secondary document review and fieldwork evidence.⁸ Secondary document review was the basis for reported outcome achievement, as indicated by a detailed review of the Final Evaluation, as well as scoping consultations with the Final Evaluation team. Fieldwork findings on outcome achievement (covering 64 percent of project communities across all 10 project districts) did not always align with documentary evidence. However, these findings were not integrated into the ratings, nor was independent verification conducted, due in part to fieldwork delays.⁹

⁶ Source: World Bank, 2010.

⁷ Other suggestions, possibly for future donors were needs of rainwater harvesting, and environmental sanitation.

⁸ Comprehensive supporting materials (e.g., interview guides, coded notes, and outcome-focused visual evidence) were not available to help resolve inconsistencies between secondary and primary data.

⁹ In addition, COVID-19 was declared a global pandemic in April which coincided with the last eight months of implementation, so from April to December people were unclear of the risk this virus posed but many planned activities were not possible, likely much exit planning, or integrating fieldwork into the secondary reports. Therefore, the final evaluation consultants "leveraged technological innovativeness (Microsoft teams and skype) for key informant interviews, [and] Offline mobile data collection (CAPI) for beneficiary survey interviews."

As such, in preparation for the ex post evaluation, both document-based and fieldwork-based findings have been assembled side-by-side in Table 3 below. This table presents project outcomes, ratings, and the status of these outcomes as reported in the Final Evaluation.

Table 3. Project Outcomes and Status as Reported in the Final Evaluation

Outcome target	Rating at final evaluation	Description of outcome achievement from document review	Additional findings from fieldwork, as reported in the Final Evaluation ^d
<i>Outcome 1: Improved basin level management and planning of water resources, taking into account climate change impacts on surface and groundwater sources</i>			
1.1: Existence of historical and downscaled climate projects	Achieved	Downscaled historical climate trends and future projections developed for White Volta, Black Volta, and Oti river basins; Water Resources Commission and other relevant stakeholders now have access to these data	
1.3: Management plans ^a in the Black Volta and five sub-basins in the White Volta and the Oti basins at ministerial level	Achieved	Black Volta plan and 5 sub-basin plans in the White Volta and the Oti Basins have been fully developed and validated for adoption at the inter-ministerial level	
1.4: Three regional Climate Change Adaptation Monitoring Committees	Achieved	Regional Climate Change Adaptation Monitoring Committees (3 regional, 10 districts, and 50 community) are fully established and functional in the three target regions. To ensure effective implementation of the management plans, five sub-basins committees were established, namely, Numbiel, Dapola, Bamboi, Bui and Vonkoro for the Black Volta basin.	
<i>Outcome 2: Climate resilient management of water resources by 50 communities in northern Ghana</i>			
2.1: Number of communities in which management plans have been developed and are being implemented	Achieved	Four sub-basin plans covering 50 communities have been developed for implementation: Dapola and Buie sub-basins (Black Volta); and Gambaga and Nasia sub-basins (White Volta).	Insufficient empirical evidence that basin planning was actively used by local governments or communities, or that implementation experiences were feeding back into basin-level policy processes
2.2: Improved infrastructure for water distribution for CCA and agricultural use installed in 10 districts	Achieved	145 boreholes (out of 100 planned) drilled covering 50 communities; communities have started making monthly financial contributions towards repair and maintenance	Most communities reported boreholes not operational, but full degree of non-operational boreholes not known; Tamale CWSA recorded non-satisfactory performance in some boreholes in Tampion; operational boreholes have been essential in providing water for dry season farmers and drinking water, to avoid river waterborne diseases

Outcome target	Rating at final evaluation	Description of outcome achievement from document review	Additional findings from fieldwork, as reported in the Final Evaluation ^d
	Partly achieved ^c	15 dams rehabilitated (out of original target of 50) for rainwater harvesting and water storage systems; 10 dams were rehabilitated under phase 1 and 5 additional dams were expected to be completed after the final evaluation	Two (2) of the rehabilitated dams at Goli and Tampion developed a breach on one side of the embankments, destroying livelihood projects; footbridge at dam in Lamboya washed away and being repaired at time of final evaluation; most farmers have left Timonde dam site to farm at river side due to lack of space; Yidongo water supply valve for dam not repaired
2.3: Number of operational community scale irrigation systems installed	Achieved	40 small irrigation systems (out of 30 planned) in place such as watering cans, pumps and pipes, to facilitate dry seasoning gardening by women	
2.4: Measures for water conservation under climate impacts implemented	Achieved	44,000 tree seedlings planted in 30 communities, including around dams to reduce evaporation and extend holding capacity. Other buffers zones created and fire belts established	
Outcome 3: Enhance diversification of livelihoods by 50 communities in northern Ghana			
3.2 Livelihoods diversification for improved adaptation to climate change in 50 communities in northern region ^b	Achieved	40 (out of 50 planned) dry season gardening schemes for women established, with fencing for security from livestock grazing and adequate water supply schemes	Generally successful with increased yield where seeds and fertilizer were given; farmers showing preference for dry season gardening over rain-fed due to higher yields and income; also reducing youth migration during the dry season; district assemblies aim to replicate the success under government program of planting for food and jobs; challenges related to canals drying up for irrigation, inadequate water supply from dams, and inadequate pest control
	Achieved	50 (out of 40 planned) beekeeping schemes established	Low colonization and productivity in concrete hives; insufficient training leading to some communities missing harvesting period; lack of clear profit-sharing by members of groups; harvesting being done by trainers rather than beneficiaries; need for more PPE; some women would have preferred livestock since men traditionally dominate beekeeping

Outcome target	Rating at final evaluation	Description of outcome achievement from document review	Additional findings from fieldwork, as reported in the Final Evaluation ^d
	Achieved	24 (out of 40 planned) community level women-led agricultural product (shea butter, groundnut and baobab) processing schemes established	Most processing equipment installed but other equipment and electricity needed; urgent need for training on use of machines and maintenance
3.3: Community tree nurseries and wood lots established for climate risk management in 40 communities	Partly achieved	25 tree nurseries (out of 40 planned) established benefitting 400 people in tree seedling establishment and marketing	Did not meet expectations due to poor market; majority of seedlings not sold as expected; tree nurseries in Tampion destroyed due to dam overflow
3.4 Number of operational community fish farms established	Partly achieved	39 fish farms (out of 20 planned) established in rehabilitated dams/dugouts	Low success rate in most communities; fishpond in Goli had good harvest; fish cages in Tampion washed away by flood; another breached dam led to loss of cages; other communities had theft cases.

^a The final evaluation and initial interviews confirmed that Outcome Indicator 1.2 (the White Volta management plan) was developed under a different project funded by DANIDA. Therefore, this ex post evaluation will not trace the sustainability of this specific sub-outcome. However, the ex post will verify the extent to which the Black Volta and Oti Basin management plans were implemented.

^b These livelihood activities were expected to increase income for households in the target communities, but the final evaluation reported that formal data collection for that indicator was postponed “due to the delays on the effective launching of livelihood activities,” noting that “it is also expected that beneficiaries of ‘economic trees’ will begin to reap the benefits within 3 years,” suggesting that more time was needed to see results.

^c Due to several challenges, including the late release of funds from the Adaptation Fund and the COVID-19 pandemic, only 10 dams were successfully rehabilitated prior to project completion. The project was expected to end in April 2020, but the Adaptation Fund approved a No-Cost Extension, valid until 31 December 2020, allowing sufficient time to complete 5 additional dams. Subsequently, UNDP initiated procurement and signed contracts in August 2020, but construction was not finished at the time of the final evaluation.

^d As reported in the Final Evaluation and in supporting fieldwork documentation prepared for the Final Evaluation, as shared with the evaluation team by the final evaluator.

In the Final Evaluation, sustainability was considered **Likely**. The Final Evaluation did not provide outcome-specific sustainability ratings, however, and the supporting evidence for this overall determination focused primarily on Outcomes 2 and 3, with no discussion of the likelihood of sustainability of Outcome 1. This positive sustainability projection was based on the following findings and assumptions:

- **Increased productivity and income generation from dry season farming** through irrigation and controlled water use. Dry season farming has become the preferred smallholder farming practice, indicating positive expectations for both community ownership and capacities.
- **Integration of project activities with existing government programs, suggesting expectations of sustained partnership and resources.** The Final Evaluation anticipated that dry season farming would be integrated into the government's programme of planting for food and jobs (PFJ), which could provide the needed support for fencing, water supply and inputs for communities to sustain the livelihood diversification. Similarly, small-scale shea nut processing and shea butter production plans and cereals and grains milling plants established by the project "could be packaged as bundled projects to benefit from the governments flagship programme of one district one factory (1D1F) for sustainability. Likewise, the maintenance of the 15 small dams and dug outs constructed or rehabilitated by the project under the government's one district one dam policy and projects."¹⁰
- **Financial mechanisms for continued repairs and maintenance, indicating both ownership and resources.** At project close, communities were making monthly financial contributions to Village Saving & Loan Associations (VSLAs) to meet repairs and maintenance needs for project-established infrastructure.

2.4 Theory of sustainability

A Theory of Sustainability describes the pathways through which project outcomes are expected to deliver long-term benefits after project closure, including the institutional, financial, technical, and social elements needed for adaptive sustainability. A Theory of Sustainability for each project outcome has been derived from the Theory of Change and sustainability strategies articulated in project documents, sustainability projections from the final evaluation, and initial interviews with UNDP and GoG representatives. These theories will need to be further updated and refined as new evidence is collected through additional KIs and fieldwork, and as pathways and assumptions become clearer.

Outcome 1: Improved basin level management and planning of water resources, taking into account climate change impacts on surface and groundwater sources

Sustainability of Outcome 1 requires that the water management plans reported as developed and adopted¹¹ were ultimately implemented by the Water Resources Commission. The plans, which were generated by GoG teams were grassroots based, prioritizing risks within the basins and sub-basins as well as documenting water quantity and quality and recommending investments. Successful implementation of the plans requires sufficient capacity within government agencies to understand climate risks and how to address them in water management, as well as sufficient budget allocation and expenditure for climate-resilient water management activities at basin and sub-basin levels. It

¹⁰ Source: Final evaluation, 2021. The relevant basin and sub-basin plans were received from MEST in February 2026.

¹¹ There was terminal evaluation proof that they were 'validated' at the national government level, supported by basin plan proof they had been produced as per Adaptation Fund funding as of 2018, during implementation. Source: Germane Black Volta and Oti Basin plans and sub-basin plans for our northern areas were received February 2026 from MEST.

also requires effective water resource governance, including through the sustained functionality of Regional Climate Change Adaptation Monitoring Committees at regional and sub-basin levels. Benefits of producing downscaled climate projections could be maintained by using this new information to inform other climate-informed planning efforts. Gains in improved water resource planning and management could be further sustained or even scaled through the use of the management plans to focus and leverage investment and/or partnerships, such as research institutions using improved knowledge or donors investing in increased numbers of boreholes, water harvesting, or other water access approaches.

Outcome 2: Climate resilient management of water resources by 50 communities in northern Ghana

The sustainability of community-level climate resilient management of water resources depends on the continued functionality of water infrastructure, the existence and effectiveness of local operations and maintenance arrangements, and evolving patterns of water availability and use, as well as whether communities understand water use and supply-related climate risks.

Dams and dugouts, along with boreholes and sometimes supplemented by irrigation systems (e.g., pipes, canals or watering cans), will need to continue to be operational and provide sufficient and consistent water supply for agricultural and domestic use. Sustained dam/dugout operations will require high-quality engineering design, siting, and construction, and capacity and resources to address potential technical failures, erosion, siltation,¹² and to avoid damage from flooding or crocodiles. Dam/dugout buffer zones will need to continue to reduce evaporation and enhance water holding capacity, including through planted trees, whose survival depends on continued community benefit (e.g., mangoes, shea, and teak that also provide fruit and wood for communities). Water quality will need to be maintained to ensure sustained and safe water use, avoiding pollution from illegal gold mining or farm pesticide or fertilizer runoff. Boreholes will also need to continue to be operational and provide continuous water supply, avoiding technical, hydrogeological, and management failures, as well as conflict about water access and use.¹³

Sustaining the functionality of water infrastructure will require sufficient financial and technical mechanisms for regular asset maintenance. Financial mechanisms could include continued community payments into local VSLAs or local level water and sanitation agencies budgeting for maintenance and repairs. Sufficient technical expertise in water infrastructure repair will also need to be locally accessible.

Outcome 3: Enhanced diversification of livelihoods by 50 communities in northern Ghana

Sustaining the benefits under Outcome 3 requires that water infrastructure implemented under Outcome 2—including dams/dugouts (and their buffer zones), boreholes, and irrigation systems—remains functional and continues to provide access to sufficient water for livelihood activities including dry-season farming, fish farming, and tree nurseries. If water infrastructure has not been adequately designed to account for projected climate risks, or if an increase in promoted water-dependent livelihoods substantially increases water demand relative to supply (potential maladaptation risk), there are risks that water availability may be reduced for other needs or that achieved livelihood outcomes will not be sustained if water is allocated to address other needs.

¹² Source: Peasant Farmers Association of Ghana (PFAG), 2023.

¹³ Source: Benyarku, and Walraevens, 2025.

For livelihood benefits to be sustained, community members who adopted these new livelihood practices must also continue to maintain them (or to evolve or expand to other livelihoods) due to perceived social, economic, and environmental benefits, including sufficient productivity and access to markets. Community members must also have sufficient access to utilities (e.g., electricity) and necessary inputs (e.g., land tenure rights,¹⁴ raw material of shea nut; seedlings for tree nurseries; fish stock, feed, and cages for fish farming; seeds, fertilizer, and pesticides for dry season farming; protective equipment for honey harvesting) to maintain their new livelihood activities. Protective measures for some livelihoods (e.g., fencing or fire breaks to protect dry season farming areas) must be effective to avoid destruction by livestock grazing or arson. Community members must also have sufficient capacity—or durable access to capacity support, such as through NGOs or private sector partners—to continue to pursue their livelihood activities after project closure (e.g., sufficient knowledge of when and how to harvest honey, skills and/or resources to repair equipment for agro-processing).

As noted earlier, the evaluation team will also examine the hypothesis that combining improved, well-managed water sources (i.e., project outcomes 1 and 2) with support for diversified livelihoods (i.e., project outcome 3) makes communities more resilient to climate change than either intervention alone. Given the increasing incidence of droughts or floods in the project intervention areas, and given the diverse uses for water (e.g., domestic use, agriculture, power generation, transport, industry, fisheries), climate adaptation cannot be addressed solely by improved management of water resources, but also requires diversified livelihoods. In scoping interviews, project counterparts explained that introducing water-dependent livelihoods was expected to motivate community members to more sustainably manage water resources. At the same time, this strategy risked encouraging over-use of water resources, which was mitigated by introducing other livelihoods that are less water dependent (e.g., agroprocessing, beekeeping). The evaluation team will examine the sustainability and resilience of livelihoods (Outcome 3) based on the presence or absence of improved water resources and their management and conservation (Outcomes 1 and 2).

3 Preliminary findings based on deskwork

3.1 Deskwork phase methods

During the preparation and early deskwork phases, the ex post evaluation team engaged project stakeholders (see list in Annex C) through key informant interviews (KIs) and undertook extensive review of the Final Evaluation and other core project documents, as well as conducted external research on the project context since closure. These efforts informed a preliminary assessment of sustainability by outcome and driver and as well as a heightened understanding of the implications for primary data collection through fieldwork. This preliminary assessment is shown in Table 4 below.

In the deskwork phase, the evaluation team will continue to collect evidence of sustainability through multiple channels. We will continue to conduct KIs with key national government stakeholders, such as MEST, EPA, MoFA, and WRC, and preparatory consultations with district officials. These interviews will serve multiple purposes, including to refine the evaluation scope and questions, gather data aligned with the Ex Post-EAI framework, and identify additional sources of information and stakeholders for follow-up engagement.

¹⁴ The Final Evaluation noted that "a land tenure system that favors continuous crop fields for supply of services" is a principal cause of climate vulnerability in the Northern regions. Source: Final evaluation, 2021.

We also plan to conduct an online survey targeting NGO partners that helped implement the livelihood activities under Outcome 3. These NGOs were tasked with supporting project participants in agro-processing, dry season gardening, with fencing, tree nurseries, fish farming and beekeeping; they may also have key knowledge of community barriers to sustainability and resilience and the current status of assets and capacities. A draft survey instrument, presented in Annex G, was designed in consideration of our emerging deskwork findings, including the need to reconstruct plausible theories of livelihood change.

3.2 Sustainability assessment

3.2.1 Context analysis

Initial research indicates changes in both human and natural systems, including climate shocks and stressors, that could impact the sustainability of adaptation outcomes since project closure.

Changes in human systems include:

- **High inflation** between 2022 and 2024 significantly impacted livelihoods across Ghana, with more severe effects likely in the North compared to the South.¹⁵
- **Ethnic strife** has been reported in several parts of the Northern and Savannah Regions. While the situation in the Savannah Region is relatively recent, areas in the Northern Region (e.g., Yendi) and parts of the Savannah Region (e.g., Damongo) are still considered insecure.¹⁶
- **Political changes** will be expected given the new administration in Ghana that began in January 2026, which could affect ownership and resources. While the previous 5 years are the focus of this ex-post, changes in 2026 will also be considered. As noted above, the Final Evaluation anticipated that sustainability would be likely in part based on integration into flagship initiatives of the former government designed to create employment particularly for the youth in rural and peri-urban communities, thereby improving income levels and standard of living, as well as reducing rural-urban migration. Key initiatives to consider include **One Village One Dam (1VID)** from the previous government that supported dry-season farming, develop agriculture, built processing factories, and empowered women in agriculture; **Planting for Food and Jobs (PFJ)** that enhanced food security, reduced post-harvest losses, and created agribusiness opportunities; **One District One Factory (1D1F)** which created jobs, promoted local substitutes, and reduced rural-urban migration (e.g., via support for livelihoods like agro-processing and beehives¹⁷); and the **Feed Ghana Programme**, focusing on smart agriculture, supporting livestock, cocoa, oil palm, and infrastructure for processing.

The new administration's direction has shifted to a [24-hour economy](#) that aims to reduce imports and focuses on enhancing productivity in agriculture, manufacturing, and essential services. One geographic focus is also the Volta Lake, overlapping in part with the Volta River and other basins covered under the AF project. The KIs will probe which project activities were integrated into flagship initiatives of the former government and will be continued by the new leadership.¹⁸

- **Partner support** in the same areas during project implementation or in the five years after. As highlighted in scoping consultations, the government 1VID initiative was operating in parallel to

¹⁵ Source: Atawoge, 2023; World Bank, 2024; Ghana Statistical Service (GSS), 2025.

¹⁶ Source: Sulemana, 2009; Kendie et al, 2014; The Herald, 2025; International Organization for Migration (IOM), 2025; RFI, 2025.

¹⁷ Source: Modern Ghana, 2024.

¹⁸ Source: 24hplus, 2025.

the AF project, and at least one village or community was supported by multiple donor livelihood projects (see also Section 5.2 on evaluation risks and mitigation measures).

Known **climate-related shocks** since project closure relate primarily to shifts in the rainfall pattern. Recurrent droughts in northern Ghana have significantly increased livelihood insecurity in agro-pastoralist communities.¹⁹ In 2021, severe flooding occurred in parts of the Savannah and Upper West Regions. More recently in 2024–2025, there have been widespread reports of droughts and prolonged dry spells across the Northern, Upper East, Upper West, and Savannah Regions, and in 2026, there have been unusually early and severe downpours.²⁰ These include:

- June–July 2024 (Severe Drought).
- 2023 (Mild to Moderate Drought).
- 2023 (Dam Spillage and Heavy Rains).
- 2020–2022 (Recurrent Dry Spells).
- August 2021 (Destructive Floods).
- 2020 (Bagre Dam Spillage).
- 2020 & 2022 (Perennial Flooding).
- September 2020 (Severe Localized and Regional Flooding).

Annex B provides relevant sub-regional details on these climate-related events. Fieldwork seasonal calendars will confirm the extent to which climate shocks were experienced locally and how they affected resilience (see section 4.2).

Initial interviews also indicated that artisanal and illegal mining is affecting water quality in some parts of Ghana, but that these impacts are not being felt in local-level water infrastructure such as the dams/dugouts supported by this project. The ex post team will explore this potential change in water systems through KIs.

3.2.2 Sustainability of outcomes

This section provides initial findings from desk review and scoping interviews on the conditions that support sustainability of adaptation benefits and the barriers to sustainability. These insights, along with identified evidence gaps, inform the implications for designing ex post fieldwork, as shown in Table 4 below. These conditions are:

- Stakeholders' **ownership** of project outcomes and interventions.
- Development and maintenance of **capacities**
- Development and maintenance of **partnerships**.
- Availability of tangible and intangible **resources**, including **assets**.

For additional photographic and geospatial information on the baseline and sustainability of assets, please see Annex I.

¹⁹ Source: Madaki et al., 2025.

²⁰ Source: Boakye & Forgor 2020; GNA 2020; 2021; FloodList 2020; Davies, 2021a, 2021b; MoFA 2024; Owusuwaa, 2024; Suuk 2024; Tampah 2024; Tanko 2024; Alabira 2025; Umer et al. 2025.

Table 4. Sustainability Analysis and Implications for Fieldwork

Sustainability condition	Findings from desk review / initial interviews on conditions and barriers	Implications for ex post fieldwork
Outcome 1: Improved basin level management and planning of water resources, taking into account climate change impacts on surface and groundwater sources		
Ownership	- The continued availability of basin management plans and ready identification of key actors to contact to verify their sustained use is a potential signal of government ownership. Some initial interviewees indicated that the plans may still be in use at the national level in 2024/2025, which will need to be confirmed with the WRC. One interviewee noted that they were contacted recently by GoG about the use of basin plans recently, which bodes well for continued use. - One interviewee suggested that the project added substantial value by increasing the awareness of GoG of the 'upstream' effects of climate change to projects beyond environmental and disaster response ones, thereby helping reduce the tendency to operate in silos. - Local ownership from decentralized management of the sub-basin plans is important but unproven. No evidence was available on the sustainability of climate change adaptation monitoring committee at regional, district, and community levels. One interviewee explained that the basin plans were designed from grassroots up, prioritizing consultations and capacity building with communities.	Basin plan use will be probed for at national and district level, including evidence of continued operation of monitoring committees and training of GoG officers. Fieldwork will also probe on whether committees influenced water resource planning and management at district and local levels, integrating its results with Outcome 2. Key stakeholders will include the WRC, Community Water and Sanitation Agencies (CWSA), National Development Planning Commission, National Disaster Management Organization, Ministry of Women and Children Affairs, Regional House of Chiefs, Environmental Protection Agency, and Ministry of Food and Agriculture.
Capacities	Limited evidence post-completion. One interviewee explained that evidence might be found in the awareness of WRC, district offices, and local communities of the effects of climate change on water resources and usage.	KIs will probe on capacity of WRC to integrate climate change into water resource planning and management at basin and sub-basin levels. Fieldwork will also probe for recollection of participating in WRC trainings to traditional leaders, women and youth groups, civil society organizations and other community-based organizations that were educated and sensitized on various water resource management activities and climate and disaster risk preparedness.
Partnerships	Limited evidence. Two interviewees mentioned an emerging transboundary cooperation regarding planning and early warning for flooding from Burkina	KIs will explore existing and sustained partnerships between GoG, regional climate monitoring committees, and local committees.

Sustainability condition	Findings from desk review / initial interviews on conditions and barriers	Implications for ex post fieldwork
	Faso that has historically impacted Northern Ghana (and one of the dams constructed by the AF project).	Fieldwork will ask Tampion if flooding from Bagre Dam is being managed better since closure, especially since 2023 and if early warning is reaching them (to evacuate pre-planned flood).
Resources	Limited evidence. One interviewee suggested that the GoG may lack resources to act on recommendations in the basin management plans, while another questioned whether budget is allocated and released for climate-resilient water resource management activities at the local level.	Basin and sub-basin plan use will be probed for at national and district level, including evidence of budget allocation and expenditure for these purposes, which MEST indicated may be available. Evaluation team members will also conduct interviews with EPA staff at district levels.
Outcome 2: Climate resilient management of water resources by 50 communities in northern Ghana		
Ownership	- A signal of continued ownership is the July 2023 visit by MEST representatives to 13 project communities to observe/ascertain the status of the rehabilitated dams (and the constructed agro-processing facilities) in achieving the intended purpose of supporting resilience to climate change and livelihood empowerment. Apart from this visit, no other evidence is yet available of government monitoring of the status of water infrastructure such as operational or non-operational boreholes or dams. - Dams/dugouts were politically important given the 1V1D government flagship program. Dam upkeep is the purview of District Assemblies and Ghana Irrigation Development Authority (GIDA). In Tampion, the Assembly has replaced the vegetated embankment with concrete, indicating ownership. - In Tampion, the Tamale CWSA conducted a survey of performance in some boreholes, indicating potential ownership over assets. - Limited evidence of ownership of irrigation systems (including simple solutions like watering cans), including minimal photographic evidence of these systems.	Fieldwork will probe about local ownership of water infrastructure (particularly dams/dugouts) by District Assemblies and GIDA.
Capacities	In terms of capacity development of technical officers (geologists, repair staff for dams and boreholes), communities were trained in simple borehole pump fuse and socket repairs.	Fieldwork will probe about whether technical capacity to maintain and repair water infrastructure assets are locally available, including in trained communities.

Sustainability condition	Findings from desk review / initial interviews on conditions and barriers	Implications for ex post fieldwork
Partnerships	Initial interviews pointed to possible partnership support from World Vision or other development partners to maintain boreholes or to pay for desilting of dams/dugouts.	Partners will be explored since closure, especially who communities call when assets are not functioning.
Assets / Resources	- The July 2023 visit by MEST found that dams rehabilitated under the project (except for Goli) are in “perfect condition and are being utilized by the beneficiary communities as intended.”²¹ The visit also provided pictures indicating that buffer zones and fences are still visible in some areas (e.g., vertiva grass, mango trees). In one site (Tampion), the Assembly replaced the vegetated embankment with concrete; the impact on siltation and evaporation water losses are not known. - In Goli, the dam was breached by crocodiles, and the extent of the damage had significantly increased, with the dam showing low water levels and covered by water hyacinths. - A barrier to sustaining the buffer zones could be resistance by farmers whose farm area was selected to be used as buffer zones and were relocated, as noted in the Final Evaluation. - No post-closure evidence of sustainability of boreholes or irrigation systems. The final evaluation already identified that some boreholes were not operational at project closure, and interviewees also anticipated that some would be broken down and not repaired. - Limited evidence of availability of financial resources for maintaining water assets. The basin management plans recommended that such financing mechanisms could include the creation of a social business dedicated to providing borehole and dam maintenance services or funding from private sector of communities for operations and maintenance via user fees. Community-level village savings and loan associations (VSLAs) were mentioned by multiple interviewees as pivotal to maintenance, although this approach was not pursued in all communities. Interviewees noted that few locals can contribute water user fees, and it is unknown whether CWSAs have budgeted for maintenance of project assets. One interviewee also noted that companies now pay a higher rate for water use, but the government has the funding which does not directly return to maintenance funds for infrastructure.	Fieldwork will assess the continued functionality of water infrastructure, durability of buffer zones and fences, and presence of financing mechanisms to operate and maintain these assets. Fieldwork will also consider diversity and inclusion dynamics in access and use of water infrastructure. To better understand resilience, fieldwork will explore if water access is improved, sufficient, and continuous (e.g., through the dry season), and whether the project provided redundant water sources that can be accessed to cope with climate impacts. Two communities with buffer zones photographed (Tili and Wiesi) will be prioritized for fieldwork.

²¹ Source: MEST. 2023. Field Visit To Beneficiary Sites Under The Adaptation Fund Project Titled “Increased Resilience To Climate Change In Northern Ghana Through The Management Of Water Resources And Diversification Of Livelihoods.

Sustainability condition	Findings from desk review / initial interviews on conditions and barriers	Implications for ex post fieldwork
	- There were expectations communities would use their own resources to construct new water infrastructure, possibly from dry-season farming or agro-processing returns. - The delay of at least 1 year in the disbursement of funds by Adaptation Fund delayed project delivery and more resources had to be spent by GoG to re-survey communities and re-assess costs given a 4-year gap between original design and approval.	
Outcome 3: Enhance diversification of livelihoods by 50 communities in northern Ghana		
Ownership	- Evidence of variety of degrees of stakeholder engagement with NGOs and participants. Some interviewees indicated local ownership of livelihoods, which were selected with community participation. Others report low local participation (e.g., of local government agencies) or participation only by beneficiaries; At the beginning of the implementation, a lack of follow-up by state entities was reported. Some weaknesses are evident in the participation report of NGO projects, showing limited stakeholders' participation. - The Final Evaluation raised lessons about land tenure constraints that delayed siting of women-run agro-processing centers and community entry agreements for release of parcels of land, for the livelihood project implementation that were not honored by some communities. It also noted complete burning of water and surface pipe conduits, and the farm was observed in one community, attributed to the dissatisfied non-beneficiaries.	Fieldwork will explore sustainability based on local community members, groups and partners sustaining assets and training others in livelihoods or sharing costs (e.g. electricity, water). It will also examine community ownership of diversified livelihoods, including land tenure considerations.
Capacities	- Limited evidence post-closure, although unrepaired electrical and mechanical issues at agro-processing facilities suggests capacity is a barrier. - The Final Evaluation indicated that training may not have been sufficient for honey harvesting.	Fieldwork will explore available capacities to maintain livelihood activities and agro-processing facilities.
Partnerships	- The Final Evaluation describes government officials seconded to this project at no cost to the project, as well as a donation to the Wallembele gardeners by the Minister of Environment, Science, Technology and Innovation. Limited evidence of strategic alliances with other partner organizations. - Limited evidence post-closure of continued support from NGOs. Livelihood activities were primarily implemented by NGOs. With exception of few instances of dry season farming NGOs in the communities, most of the project implementors of the intervention were located far from the community and did not have good communication channels for active interactions with	Fieldwork will explore the extent to which NGOs and other partners (including private sector and government agencies) have stepped in to support project assets and benefits post-closure.

Sustainability condition	Findings from desk review / initial interviews on conditions and barriers	Implications for ex post fieldwork
	beneficiaries. This highlights questions of effectiveness of contractors compared with services provided by district-and regional level institutions such as CWSA, GIDA, MOFA Extension Services, Forestry Commission, and Game and Wildlife. The July 2023 visit by MEST identified one community that was seeking a partnership with a shea buying company that can help them mobilize resources and replace faulty equipment.	
Assets / Resources	- The July 2023 visit by MEST found that vegetable gardening is ongoing around many of the dams, but that agro-processing facilities are generally facing operational challenges ranging from total neglect in one site in Tumu to faulty equipment (e.g., electric motors, worn-out maize grinders) that have not been fixed and are affecting the functionality and usage of the facilities. The July 2023 visit by MEST found that one community invested their own resources (GHc5,000) to fix operational problems, although it was not successful. - The Final Evaluation found that "In communities with functional boreholes for potable water and rehabilitated dugouts/dams with active canals for irrigation, dry season farming is well supported and profitable. Though communities increased their acreage for farming, and productivity increased, marketing of produce became a challenge due to lack of transportation to market centers. Communities wished local transportation (motor king) were included in the facilities provided by the project to the youth as part of the value chain." - The Final Evaluation fieldwork found significant challenges with beekeeping and fish farming in some communities at completion. The July 2023 visit by MEST identified one community (Kakiase) where fishing cages were still being used on the dam site. - Barriers to livelihood sustainability were identified in the Final Evaluation, from access to electricity, to water access, to land tenure issues. - Interviewees cautioned that communities may have leapfrogged from project-promoted livelihoods to other ones, which should be interpreted as a positive evolution rather than a lack of sustainability.	Fieldwork will explore whether livelihood activities have been maintained (or evolved), and the extent to which this is dependent on improved water access through Outcome 2. Fieldwork will also explore the barriers to maintaining livelihood activities. Fieldwork will further check on recollected changes since closure, such as how livelihood revenues were used, e.g., a) in-kind consumption of honey, garden produce, or shea butter, or b) if the products were sold, how the revenues were used (e.g., reinvested in assets, or paid down debts), or c) something else. Women's livelihood support and sustainability and rankings of what are the most remunerative activities in 2026 vs 2020 will be done on-site. To better understand resilience, the ex post team will further explore how increased livelihood revenues/benefits may have been used to help cope with climate shocks.

3.3 Resilience analysis

The ex post evaluation will assess how sustained adaptation outcomes (including emerging outcomes and maladaptation) have contributed to the resilience of the human–natural system, particularly in the face of climate shocks and stressors. Climate shocks and stressors will be assessed at local level (see data collection strategies in Section 4.2), informed also by the known shocks since project closure (see context assessment in Section 3.1.1). As guided by the Ex Post–EAI Toolkit, **resilience** will be understood as “the capacity of interconnected social, economic and ecological systems to cope with a hazardous event, trend or disturbance, responding or reorganizing in ways that maintain their essential function, identity and structure.”

This analysis will include examining the system’s ability to adapt, absorb, and transform in response to change, using the five resilience characteristics and illustrative questions, as shown in Table 5.²² The analysis will also consider whether project benefits have been sufficient to reduce reactive and potentially maladaptive coping strategies typically employed in agro–pastoralist communities in Northern Ghana in response to water scarcity, including distress livestock sales, seasonal migration, and private water investments,²³ as well as destroying vegetation of the water catchment, and unsustainable water use by farming and grazing. The Final Evaluation concluded that this would be “critical in safeguarding sustainability of community livelihoods and economic development activities of the Basin in the face of climate change.”

Table 5. Resilience characteristics and human and ecological system examples

Resilience Characteristic	Human System	Ecological System
Scale: Impact on the temporal or spatial scale needed for human–natural systems to maintain or change their functions and structures in the face of climate disturbances	Are households able to grow enough food or generate enough income from livelihoods like agro–processing or honey sales to use when climate shocks like drought or floods threaten their livelihoods? Has access to water improved as a result of the project? To what extent do villagers have improved rainy and dry season access for their agricultural and livelihood needs, as well as domestic uses?	Have the buffer zones covered sufficient area to improve the functioning of water systems, like dams? Are community members sustaining the trees planted by the project and/or are they planting more trees and vegetation to supplement and improve water sources and expand their livelihoods?
Redundancy: Impact on the availability of resources, means, or options to support climate resilience	Has livelihood diversification improved people’s ability to manage risk (e.g., shifting among livelihoods depending on climate impacts)? To what extent and how have people used their diversified livelihoods to prepare for, respond to, and recover from climate shocks?	Are there multiple water sources to sufficiently meet community needs without sacrificing the ecosystem needs?
Diversity & inclusion: Impact on the variety of actors and inputs working/interacting towards common goals and the extent to which the project	Do all people (e.g., considering vulnerable groups like women, youth, poor, and people with disabilities) have equal access to water, improved livelihoods, and benefits of buffer zones (e.g. shea butter or	NA

²² The training of the field evaluation team will use these illustrative questions to contrast human and natural systems.

²³ Madaki et al, 2025.

Resilience Characteristic	Human System	Ecological System
outcomes support equity and inclusiveness	teak or mango trees and fruits for consumption or sale)? How have different groups benefited from changes in water access?	
Flexibility: Impact on the system's agility in responding to uncertainty, effectively tackling challenges and seizing opportunities that may arise from change	Does income from livelihoods enable communities to meet dry/hungry season demands better? Have people used their new water management and livelihood capacities to seize new livelihood or other opportunities? Are more robust water resources giving people a more secure source of water amidst droughts?	To what extent have vegetated buffer zones evolved to address greater climate shocks, while maintaining ecosystem health? For instance, have new species taken advantage of the buffer zones that were improved by the project's planting?
Connectedness & feedback loops: Impact on communication lines, access to information or partnerships to respond or adapt to shocks or stressors	Are early warning systems to do with flooding from Burkina Faso's Bagre dam getting to communities to decrease disaster damage? Are feedback loops established and maintained among basin, sub-basin, and community level water planning and management, that improve water systems?	Are water committees' continued meetings leading to more investments in viable ecosystems and water management?

4 Fieldwork design

4.1 Key data sources

The evaluation will draw upon both qualitative and quantitative data collected through a variety of fieldwork methods, described further in Section 4.2. The evaluation matrix in ties each evaluation question to the respective data sources and methods to provide clear guidance during implementation of the evaluation.

During fieldwork, the team will engage community members and district officials to understand experiences and perceptions of resilience changes since project closure. A variety of participatory methods will be used to capture these perspectives, including key informant interviews, large focus group discussions, and exercises such as seasonal calendars, ranking activities, and transect walks. These approaches will generate both narrative insights and quantitative data that may not be available through secondary sources (e.g., the number of climate shocks experienced or changes in income). Transect walks will also enable the team to collect quantitative observations directly, such as counts of physical assets maintained since project closure.

Community debriefs will be a key opportunity to confirm emerging findings and discuss gaps or questions before departure from the target communities. They also support the learning objective of AF ex post evaluations.

All fieldwork data will be triangulated with evidence gathered during the deskwork phase, including through project documentation review and the online survey described in Section 3, to build a comprehensive evidence base for the final evaluation report.

4.2 Data collection methods and tools

We will use five fieldwork methods to collect data around a series of ex-post research aims, as displayed in Table 6. These will be used to assess the sustainability and resilience through Outcomes 2 and 3; Outcome 1 will be assessed primarily through national- and regional-level interviews as described earlier in Section 3. Further description of each method is offered below after the table and draft data collection tools for each method are presented in Annex G.

Table 6. Qualitative Fieldwork Tools and Ex-post Research Aims

Line of Inquiry	Large FGD ²⁴	KIIs	Seasonal Calendars	Rankings	Transect Walks
Shocks to water and livelihoods			●	●	
Participation by gender in trainings	●				
Presence and continuous use of assets	●	●			●
Proof of livelihoods (e.g. machinery for milling grain, making soap, garden areas, fish cages in dams) ²⁵					●
Extent livelihood has survived and generates income	●	●		●	●
Proof of water conservation measures (e.g. trees at dam, vegetated embankments at dam)		●			●
Training around water management and climate adaptation (if found) ²⁶		●			
Barriers to activities continuing (e.g. land tenure, theft, arson, flooding)	●	●	●		●
Resilience and maladaptation evidence	●	●	●	●	●
Replication / scaling		●			●
Drivers of livelihoods – water		●		●	●
Drivers of livelihoods – other e.g. electricity, land		●		●	●
Emerging outcome pathways		●			●

Large focus group discussions (FGDs) will be used to explore collective experiences, perceptions, and narratives around the project's outcomes and their sustainability. These semi-structured discussions will be guided by topics (See Annex G) using qualitative tools aligned with the evaluation matrix and will incorporate participatory tools such as seasonal calendars also noting climate shock timelines to stimulate discussion and deepen insights.

Key informant interviews will be conducted with select community members, NGO partners, and, where possible, district-level GoG officials. These interviews will provide critical insights into how project outcomes have evolved on the ground, how they are perceived by those directly affected, and what factors have contributed to their sustainability or decline. All interviews will be conducted using semi-structured guides tailored to each stakeholder group. Interviewees will be informed of the evaluation's purpose and scope, assured that participation is voluntary, and that their responses will be treated confidentially. Interview notes will be lightly transcribed during the interviews and securely stored afterwards. Analysis will be conducted using content and pattern analysis methods, applying a realist lens to understand what works, for whom, and under what conditions.

Ranking exercises will be used to understand community perceptions of the relative importance/ownership and sustainability of different project activities or outcomes, especially related to livelihoods. This exercise will help identify which interventions have had the most lasting impact and why, which will then be triangulated with findings from interviews, documents, and

²⁴ Large focus group discussions will use seasonal calendars, climate shock timelines through rankings, they are separated for clarity.

²⁵ This supplements and confirms photographic evidence (2020, 2023) or lists without photographic evidence of assets by the project

²⁶ District officers will be asked about trainings given on water management linked to outcome 2, and communities will separately verify. no project documentation had a list of topics covered, so no capacity retention can be evaluated.

direct observation. It is particularly important for livelihoods as the community survey conducted a project completion indicated that some of the livelihoods supported by the project may represent small proportions of overall household income, which could limit their contribution to household financial resilience. Participants will be asked to rank the top four livelihoods. In rankings of livelihoods, a common Ghanaian process is taking 10 sticks and having respondents allocate them by proportion to yield a ranking. During fieldwork piloting, we will also explore the possibility of using rankings to understand the importance of different water sources (throughout the year or during the dry season), and thus the project contribution to scale and redundancy. This will be based on what the team has already gathered from focus group discussions, key informant interviews, transect walks and fieldwork learning will determine the use of rankings.

Seasonal calendars will be used to explore how project outcomes, such as agricultural practices, water availability, or livelihood activities, have evolved over time and across seasons during and since project closure in 2020 (and evaluation in 2021), especially in the context of disruptive shocks. This tool will help participants map out key events, stressors (e.g., climate shocks), water availability, and coping strategies throughout the year, offering insights into the timing and sustainability of adaptation benefits. It will also help determine whether potentially maladaptive coping strategies to water scarcity (such as seasonal migration, distress sales of livestock, and private water investments) have reduced. We will facilitate the development of seasonal calendars with community groups, ensuring that both men's and women's livelihood perspectives are captured.

Transect walks will be conducted with community members and local partners to observe physical infrastructure, land use changes, and environmental conditions. As part of the site sampling exercise during the fieldwork design phase, we will select two to three sites within each fieldwork community to conduct transect walks. These walks provide an opportunity to ground-truth reported outcomes, identify unintended effects, and understand spatial dynamics of sustainability (e.g., erosion control, water access, or infrastructure maintenance). During the walks, the field team will confirm and pictorially document the state of the assets built and used (e.g., dams, boreholes, trees, gardens, agro-processing facilities) while discussing the barriers and supports that influenced their continued use and resilience. Climate shocks identified by communities through seasonal calendars will be given special attention. Observations will be documented using structured templates and geotagged photos and integrated into the evaluation's spatial and contextual analysis. Transect walks will rely on direct observation and the testimonies of active informants to assess infrastructure use, community interactions, and signs of institutional or behavioral change. These insights will be systematically recorded and analyzed alongside other qualitative data, contributing to a holistic understanding of sustained outcomes and their enabling conditions.

4.3 Methodological considerations for baseline setting

The baseline for the ex post evaluation is at project closure, as documented particularly through the final evaluation. As previously discussed in Section 2.3, the final evaluation provides insufficient and inconsistent data (especially between secondary and primary sources) to create a suitable baseline against which to assess project sustainability. This presents a risk that our understanding of the baseline may be incomplete or inaccurate, which could lead to misinterpretation of sustainability outcomes or gaps in the questions posed during field data collection. The online survey and KIs conducted during the deskwork phase are intended to help fill these gaps and mitigate this risk.

A key part of the baseline that needs verification is around how the project approached gender equality and social inclusion. The final evaluation notes that “no evidence exists about a gender analysis or gender action plan per se in the design phase,” so the online survey will include questions about how women were targeted to benefit from livelihoods activities. The final evaluation also points to a lack of data on participation of women in training activities for market engagement. In general, there is conflicting information in the final evaluation regarding gender, and while an ex-post cannot gather data on something that was not assessed in the final evaluation, we will use retrospectively remembered data to evaluate change, such as by comparing participation in the project then with use of knowledge gained from the project now. See also gender analytical approach below in Section 5.1.

4.4 Sampling approach

Site selection

The evaluation team plans to visit 6 communities across 3 regions (see Table 7) during a 15-day field mission. This represents coverage of three of the four regions targeted by the project, with two communities selected per region. Site selection uses a purposive sampling strategy driven by:

- **Availability of photographic evidence of water and livelihood assets at completion:** The final evaluator provided photographic evidence of many water and livelihood assets in 23 communities, which we use as our sampling starting point.²⁷ From these 23 communities, we purposively selected a shortlist of 6 sites based on the following criteria.
- **Presence or absence of water assets and buffer zone activities:** We intentionally selected both sites that received water assets (dams/dugouts and boreholes) under Outcome 2 and those that did not (or that have been confirmed to have experienced breakage of the asset since project closure). This will allow us to test the hypothesis that having increased water supply alongside improved livelihoods leads to more local resilience. Water asset location and status is based on the MEST-provided list and map of boreholes and dams, and the 2023 MEST fieldwork report. As shown in the table below, five of the communities have project-enabled water sources (dams or boreholes), while one of the dams is already known to be dysfunctional. Another community was selected precisely for the lack of improved water resources to gauge the viability of diversified livelihoods in spite of a lack of water.
- **Intensity of livelihood activities implemented:** We selected communities that participated in multiple livelihood schemes (e.g., agro-processing, fish farming, dry season farming).

This approach ensures that communities selected have an established baseline and have benefitted from multiple project components (e.g., received a water asset under Outcome 2 and livelihood support under Outcome 3). This sampling strategy is designed to ensure that findings are both robust and generalizable across the full project area.

In site selection, the evaluation team also considered accessibility and safety. Sites must be reachable within the 15-day fieldwork window and must be deemed reasonably safe for our field team to access. Based on MEST’s recommendation, the Savannah Region was deemed safer to visit than Upper East Region due to chieftaincy conflict in the project communities. Unfortunately, the only two photographed buffer zones were in communities in Upper East that are

²⁷ Some communities were mentioned in the TE for particular characteristics, such as dam failure or presence of a successful agro-processing site, but have no photographic evidence that assets were put into place.

not safe to visit currently, but the evaluation team will visit two nearby buffer zones in the Northern region, as noted in the table below. We have already and will continue to work with our corporate advisory service, International SOS, and our national consultant to assess and stay aware of the safety and security of specific sites.

Two of the selected communities may have been part of government programs (e.g., 1VIF and 1VID initiatives). Chache has been noted as a 1D1F community, given its shea-butter production, and community members will be interviewed regarding these linkages. Similarly, initial indications are that Tampion may have been part of 1V1D, which lines of inquiry can explore from a sustainability perspective.

Table 7. Proposed Fieldwork Communities

Community	District	Region	Water Assets		Livelihood Schemes*					Buffer Zone
			Dam	Borehole	Agro-processing	Tree Seedlings	Dry Season Farming	Fish Farming	Bee Keeping	
Tampion	Savelugu	Northern								Zaazi†
Mognegu I	Zabzugu	Northern								Sabare†
Chache (Cheche)	Bole	Savannah								
Kiape (Chiape)	Sonyor	Savannah								
Tumu	Sisala East	Upper West								
Goli	Nadowli	Upper West	**							

*Green indicates that the ex post evaluation team has confirmed existence of such activities in the community via photographic evidence supplementing NGO lists. Yellow indicates that there is a possibility of such activities in the community, but their existence could not be confirmed through photographic evidence collected during the previous field visits (i.e., Nov 2020 for final evaluation; July 2023 for MEST).

**The dam in Goli was constructed before project closure but was documented as broken during the July 2023 field visit.

† Buffer zone is in nearby community and will be visited in tandem albeit for a much shorter, more focused time.

Stakeholder sampling

The evaluation will solicit input from a plethora of stakeholders, as demonstrated in Table 7. As described above, stakeholders will be engaged through multiple methods, including the online survey, remote and in-person KIIs, and participatory fieldwork methods like FGDs, seasonal calendars, rankings, and transect walks.

UNDP and MEST, as the IE and EE, respectively, have already been engaged in the co-creation of this evaluation, however, additional interviews may be requested to fill data gaps. All national government agencies that were involved in the delivery of the project will be targeted through KIIs. The survey will target all NGO delivery partners.

For each of the six communities selected for fieldwork, the evaluation team will engage with community members through large FGDs that are open to everyone, though individuals may self-select to participate or not participate, meaning that the exact number of individuals reached is to be determined. We will complement large FGDs with smaller, gender-disaggregated discussions to

conduct ranking and seasonal calendar exercises. All community members will be invited to join the evaluation team for transect walks, though we anticipate based on previous experience that only a handful will care to join. We will also conduct KIs in each community with both community members and leaders to allow for more targeted and in-depth questioning. Interviewees will be selected in a way that ensures an equal balance between women and men and diversity of experiences with project activities, including livelihood schemes and community water resource management.

Table 8. Stakeholder Sampling

Stakeholder Group	Sampling (Number of Individuals)	Method of Engagement
Implementing Entity	All (~3)	KIs
Executing Entity	All (~2)	KIs
National GoG partners	All (~6)	Online survey
Regional Authorities	All (~4)	Online survey
District Authorities	All (~10)	Online survey
	All in fieldwork districts (~6)	KIs
Community leaders	All in fieldwork communities (~6)	KIs
Community members	All in fieldwork communities (~200)	Large FGDs, seasonal calendars, rankings
	Self-selecting (~3–5 per site, ~18–30 total)	Transect walks
	Diversity of gender and engagement with adaptation committees and livelihood support (~5–6 per site, ~30–36 total)	KIs
NGO delivery partners	All (46)	Online survey
	Active in fieldwork communities (~2–3 per site, ~12–18 total)	KIs
Other stakeholders (e.g., private sector dam construction and maintenance service providers)	As relevant	KIs
Total	~280	

4.5 Timeline

Table 8 presents the timeline for the entire evaluation, while Table 9 offers a more detailed schedule for the fieldwork mission. Figure 3 presents a map of the selected fieldwork communities, numbered in the proposed order of visits. The schedule for the fieldwork mission may be further refined and will be finalized closer to the date of fieldwork based on initial outreach to communities and district officials.

Table 9. Ex Post Evaluation Timeline

Tasks and Deliverables	Dec 2025	Jan 2026	Feb 2026	Mar 2026	Apr 2026	May 2026	Jun 2026
Phase 1: Preparation							
Task 1.1: Kick-off meeting with AF-TERG, UNDP, and GoG.							
Task 1.2: Ex post training with AF-TERG.							
Task 1.3: Co-creation meetings with UNDP and GoG to finalize evaluation objectives and scope.							
Phase 2: Deskwork							
Task 2.1: Documentation review to collect secondary data and begin mapping drivers of sustainability.							
Task 2.2: Remote key informant interviews with final evaluation team and government stakeholders.							
Task 2.3: Site and sample selection for fieldwork visits.							
Task 2.4: Online survey of NGO project partners to collect primary data.							
Task 2.5: Inception report , including evaluation matrix, Theory of Sustainability, and draft data collection tools. (<i>Deliverables: Draft and Final Inception Reports.</i>)							
Phase 3: Fieldwork Preparation							
Task 3.1: Finalizing data collection procedures and instruments for fieldwork visits, including KII and FGD protocols and participatory tools (e.g., seasonal calendars).							
Task 3.2: Onboarding interpreters for each target community and training them on ex post methods.							
Task 3.3: Finalizing field mission and plan logistics , including mission schedule.							
Task 3.4: Initial outreach by interpreters to prepare selected communities and district officials for upcoming fieldwork.							
Phase 4: Ex Post Mission, Data Analysis, and Reporting							
Task 4.1: Fieldwork visits to project areas, including KIIs, IFGDs, transect walks, and validation gatherings with communities.							
Task 4.2: Data analysis , including triangulation of findings from fieldwork and deskwork.							
Task 4.3: Evaluation report preparation according to Ex Post Toolkit guidance, including findings, conclusions, lessons learned and corresponding recommendations, and annexes. (<i>Deliverables: Draft Final Evaluation Report; Final Evaluation Report</i>)							
Phase 5: Dissemination and Learning							
Task 5.1: Preparation of dissemination and learning materials , including 15-page evaluation summary brief and a slide deck for the AF-TERG to use in communicating evaluation findings with diverse audiences. (<i>Deliverables: Evaluation Summary and PPT Presentation</i>)							

Note: The district staff will be interviewed by the translators visiting in early March to prepare logistics for the upcoming fieldwork. They will ask questions around all three outcomes (see Annex G) of district officers and advise our team of responses. This will free up time for more concentrated community-level work and travel.

Table 10. Proposed Fieldwork Mission Schedule

Day	Date	Community	Activities
1	Sunday, March 29	Mognegu	Travel, community visits
2	Monday, March 30	Mognegu	Community visits
3	Tuesday, March 31	Mognegu/Tampion	Community visits, travel
4	Wednesday, April 1	Tampion	Community visits
5	Thursday, April 2	Tampion/Tumu	Community visits, travel
6	Friday, April 3	Tumu	Community visits or write-up day given Friday is a Muslim holy day in northern Ghana
7	Saturday, April 4	Tumu/Goli	Community visits, travel
8	Sunday, April 5	Goli	Community visits
9	Monday, April 6	Goli/Chache	Community visits, travel
10	Tuesday, April 7	Chache	Community visits
11	Wednesday, April 8	Chache/Kiape	Community visits, travel
12	Thursday, April 9	Kiape	Community visits
13	Friday, April 10	Kiape/Tampion	Community visits or write-up day given Friday is a Muslim holy day in northern Ghana
14	Saturday, April 11	Tampion	Travel and Community visits with videographer
15	Sunday, April 12	Tampion	Community visits with videographer

Figure 3. Map of Fieldwork Communities



Note: Buffer zone communities shown in green.

5 Data analysis strategy

5.1 Analytical approach

Overall approach

Our analytical approach is guided by an evaluation matrix (see Annex A) and is structured around the Ex Post–EAI framework, focusing on the context, project strategy, conditions driving sustainability, and system’s resilience characteristics. This framework has guided the initial desk-based analysis presented in Section 3 and will continue to shape our overall synthesis of findings. A core principle of our approach is iteration. The evaluation does not treat analysis as a single step but as a cycle in which evidence is progressively deepened, tested, and triangulated.

The analytical stages include before fieldwork (desk analysis, interpreter training, and pre-testing the tools and questions), during fieldwork (community-level validation), and after fieldwork (project-level assessment). At the conclusion of the field visits, we will convene half-day validation gathering in each project region to present and discuss emerging findings with local stakeholders. These sessions will bring together community members and local government authorities to review preliminary insights, test interpretations, and identify any gaps or misalignments. The workshops will serve as a critical opportunity to validate findings, incorporate local perspectives, share the team’s learning, and ensure that the evaluation reflects the lived experiences of those closest to the intervention. After fieldwork is complete, the ICF team will systematically assemble evidence from all data collection tools, compare it against the evaluation questions, and assess the strength and consistency of findings to support robust evaluative judgements.

Analytical components

The evaluation will apply three structured analytical components from the Adaptation Fund's *Toolkit for the Ex Post Evaluation of Adaptation Interventions*: outcome sustainability tracing, sustainability analysis, and resilience analysis. These components will be used to explain why certain project outcomes were sustained, evolved, or diminished over time, and how they contribute to long-term adaptation and resilience.

Outcome sustainability tracing will provide evidence that can be compared to the Theory of Sustainability presented in Section 2.4, reconstructed from the trajectory of key project outcomes since closure, identifying which have been sustained, evolved, or diminished.

Sustainability analysis will then examine the enabling and constraining conditions that have influenced the persistence of these outcomes, looking especially at the drivers (ownership, capacities, partnerships, and resources), as initially described in Section 3.1.

The **resilience analysis** will assess how sustained outcomes have contributed to the resilience of the human-natural system, particularly in the face of climate shocks and stressors. This includes examining the system's ability to adapt, absorb, and transform in response to change, using the resilience characteristics (scale, redundancy, diversity and inclusion, flexibility, and connectedness and feedback loops), as initially described in Section 3.2.

Across all three analyses, the evaluation team will consider the contextual conditions in which the project was implemented, including changes in climate risks, socio-economic dynamics, and governance structures since project closure. These contextual shifts will be used to interpret the sustainability of outcomes and the relevance of the project's impacts to the AF's strategic objectives.

Gender and inclusion considerations

Gender equality and social inclusion will be integrated throughout the evaluation, both analytically and operationally. The evaluation team will apply an equity lens to examine how sustainability and resilience outcomes have affected different groups, with particular attention to women and other vulnerable populations using the assets. We will disaggregate findings by gender, where possible, and explore how social norms, power relations, and institutional structures have shaped access to project benefits and the durability of outcomes. This is especially important given the project's strong gender equity aspirations and gaps identified in the final evaluation regarding women's actual participation and leadership and assertions of investments reducing youth migration.²⁸

Fieldwork will be designed to ensure culturally sensitive and inclusive engagement. The team will conduct gender-sensitive FGDs, including separate sessions for men and women, to reflect the gendered nature of project livelihoods. Our lead field evaluator is a woman and brings deep expertise in gender and land access. She will be supported by male translators and note-takers to enable gender-disaggregated discussions. Given the linguistic diversity of northern Ghana,

²⁸ The TE states: While "there was a commitment to obtain an equitable sex ratio across the beneficiaries" "no evidence exists about a gender analysis or gender action plan per se in the design phase, however the document project reflects the emphasis of gender equity in all the components for all the benefited communities... .." "despite there being a clear plan to involve communities and women groups, community-based NGOs lacked the capacity to understand gender issues". Positive unintended impacts have been reported, e.g. "in reducing the migration of young people due to the participation in the gardening in the dry season and the control of the sedimentation of the river due to the revegetation of the riparian zone."

interpreters fluent in local languages will be engaged to foster trust and ensure inclusive participation. The team will therefore minimize disruptive power dynamics, avoiding situations where chiefs, landowners, or other influential actors may inhibit open dialogue, particularly for women and youth.

A key focus of the evaluation will be verifying gender-related outcomes that remain uncertain. Fieldwork and the online survey will probe whether women's groups and leaders remain active, whether women participated in water resource and livelihoods trainings, and whether women's capacities built under the project have been sustained and the extent of women's leadership in livelihood activities. The team will also assess women's representation in community water management planning committees and verify whether at least 50 percent of beneficiaries of sustained activities (e.g., boreholes, rainwater harvesting for shea butter and honey processing) are women.

5.2 Risks and limitations

Table 11 presents specific risks, challenges, and limitations to the planning, management and organization, and execution of the ex-post evaluation, along with preventive and mitigation measures.

Table 11. Risk and Mitigation Measures (Likelihood and Severity)

Risk	L	S	Preventive and mitigation measures
Difficulty securing timely participation from certain groups of key stakeholders	Low	Med	The methodological approach for this evaluation foresees a high level of participation from key stakeholders. This can be difficult for a variety of reasons (e.g. stakeholder fatigue, limited availability and/or resources, difficulties identifying most relevant contacts within each organization who may have already left 5 years ex-post). Participation of local stakeholders can prove particularly challenging given the logistical and language barriers. Our strategy to mitigate this risk is based on: (1) early identification and engagement of key stakeholders; (2) working closely with the AF-TERG, UNDP, and MEST to identify and make official introductions to national authorities; (3) adopting a tailored and flexible consultation approach to facilitate participation, such as offering remote or in-person consultations, where possible. The team has also requested project participant lists to ensure that involved stakeholders can be interviewed at the local level, although these have not yet been received.
Difficulty identifying which infrastructure was funded by the project	Low	High	While it may be difficult for communities to discern the funder (especially of dams/dugouts and boreholes), investments should be traceable among the six fieldwork sites through several means. The team will look for signage that appears to be posted at many of the community assets photographed. The ex post team has also requested and received GPS locations of the dams/dugout. The ex post team will also ask the GoG and NGOs about other follow-on or scaled-up programming in the intervening years from 2021–2026. ²⁹

²⁹ During the inception workshop launching the AF project, several projects were mentioned (e.g., GIZ insurance, rainwater storage by Germany GIZ, CC-DARE from African Adaptation, and IWRM collaboration with the Water Resources Commission), ALP and URADAPT by FAO. The ex post team will specifically search for evidence of replication and scaleup. One possible project is a GCF-funded, UNDP-implemented shea butter project in Northern Ghana; initial research has found that this project does overlap regionally, however the

Risk	L	S	Preventive and mitigation measures
Language barriers	Low	High	We will hire a local interpreter in each region based on the majority language spoken. Selection of interpreters will consider both technical qualifications and gender-sensitivity awareness and capacity. District agricultural officers not involved in the project may be used for interpretation on an exceptional basis, only where very specific local languages are spoken
Weak M&E and baseline data	High	Med	This challenge was identified in the final evaluation and in subsequent communication with the lead final evaluator. The team has followed up with UNDP, GoG, and the final evaluator to request all supporting data to build an understanding of status at closure, although contradictions remain. The team will confirm details in the selected sites and the state of the assets during fieldwork through KIs and transect walks.
Ethnic insecurity and strife in northern Ghanaian regions	Low	High	Ethnic strife has been reported in several parts of the Northern and Savannah Regions. While the situation in most of the Savannah Region is relatively recent, areas in the Northern Region (e.g., Yendi) and parts of the Savannah Region (e.g., Damongo) are still considered insecure. Partners on the ground were consulted to exclude areas of insecurity from fieldwork, which would threaten the field team's safety. Chieftaincy insecurity had eliminated visits to Tili Azupunpuga and Kuka-Natinga in Bawku West and Bawku Municipality as per advice by MEST.
Disagreement over interpretation of findings, lack of credibility of results or relevance of recommendations	Low	High	The evaluation management team will critically assess whether the evidence gathered is sufficient to draw conclusions based on careful triangulation of all data gathered. We will also use collaborative sensemaking to test and validate the findings and recommendations with key stakeholders.
Evaluation deliverables do not meet the Fund's needs	Low	High	Our preventative strategy is built on three pillars: (1) assembling a team with a thorough understanding of the climate adaptation and finance context and the AF's needs, (2) adopting a highly participatory and consultative approach from the outset of the evaluation, and (3) regular communication with the AF-TERG focal point to align our approach with expectations.

districts differ and likely the exact communities directly involved. Another line of questioning is planned coordination with other relevant GEF-financed projects and/or other initiatives, such as the UNDP-GEF Small Grants Program in Ghana and by some local NGOs.

Annexes

Annex A. Evaluation matrix

COMPO NENT/ OUTCO ME/ OUTPU T	INDICA TORS & TARGE TS	FINAL EVALUATION INFORMATION		EVALUATION QUESTIONS (EQS) BY OUTCOMES with DATA SOURCE:		
		Actual	Data Source(s)	EQ1: Have the project outcomes been sustained since completion?	EQ2: Which factors have contributed towards – or detracted from – sustaining the project's adaptation outcomes over time?	EQ3: How do the sustained outcomes contribute to local resilience?
Outcome 1: Improved basin level management and planning of water resources, taking into account climate change impacts on surface and groundwater sources						
IMPLICIT: Evidence of the use of the policy and planning (Outcome 1) to inform local water management & conservation (Outcome 2) ³⁰						
Output 1.1: Climate change historical data and future projections generated for the White Volta, Black Volta and Oti basins	Downscaled and historical climate projections available for the White Volta, Black Volta and Oti Basins	Historical and downscaled climate projections established	MTE Report / Project MTE Report / PPR- 3 (2019); Project Annual Reports including 2020 Annual Report_Dr aft), /Physical Progress Report (Annex 9) /Project Documenta tion; Project documenta tion and publications at	Evidence of the continued generation of the policy and planning projections (Outcome 1) by the GoG for the White Volta, Black Volta and Oti Basins and sub- basin plans. Verification through technical reports as provided by GoG and KIIs w/GoG	Evidence of partnerships between national and local actors and resources allocated to producing the projections, disseminating them and meetings held, as evidence of the factors (driving) sustainability. Any evidence of trainings of new members of those in GoG at national and district level doing such coordination would show capacities were sustained Evidence through the survey and KII with GoG at national, and regional levels	Evidence of use of climate projections to inform water basin planning and coordination at transboundary, basin, and local levels. KIIs with GoG will probe for this and better understand why.

³⁰ In the design documents an implicit assumption was that the Outcome 1 planning and policy would inform and shape local water management in the local communities of the basins, but there was no data collected on the use of Outcome 1 locally.

COMPO NENT/ OUTCO ME/ OUTPU T	INDICA TORS & TARGE TS	FINAL EVALUATION INFORMATION		EVALUATION QUESTIONS (EQS) BY OUTCOMES with DATA SOURCE:		
		Actual	Data Source(s)	EQ1: Have the project outcomes been sustained since completion?	EQ2: Which factors have contributed towards – or detracted from – sustaining the project's adaptation outcomes over time?	EQ3: How do the sustained outcomes contribute to local resilience?
			MESTI-AF website			
Output 1.2: White Volta manage ment and investme nt plans compreh ensively reviewed to take into account climate change impacts	Revised White Volta Plan complete d and adopted at inter- ministeria l level	The White Volta Management and Investment Plans have been developed under Water Climate Programme and Development Programme (WACDEP) project which was implemented by the Water Resource Commission and funded by DANIDA. The project obtained a copy of the report which was used to inform other interventions.	Same as above	Evidence of Outcome 1 planning and water coordination at the district level and that has informed local water management (Outcome 2). Verified through KIIs and survey feedback from GoG and UNDP and NGOs and local communities during fieldwork Evidence would be checking online for technical reports and as provided by GoG and KIIs w/GoG since 2020	As above, drivers such as Partnerships would be examined between national and local actors and Resources continuing to be allocated to producing the investment plans and if they were funded ³¹ disseminating them and meetings being held would be evidence of the factors (driving) sustainability. Further, any evidence of trainings of new members of those in GoG at national and district level doing such coordination would show capacities were sustained, Evidence through the survey and KIIs with GoG (especially WACDEP and WRC staff) at national, regional and district levels	As above, KIIs on whether there is evidence of these investment plans affecting White Volta management and ecosystems in the basin. Survey input and Kii interviews with GoG including WACDEP and WRC staff

COMPO NENT/ OUTCO ME/ OUTPU T	INDICA TORS & TARGE TS	FINAL EVALUATION INFORMATION		EVALUATION QUESTIONS (EQS) BY OUTCOMES with DATA SOURCE:		
		Actual	Data Source(s)	EQ1: Have the project outcomes been sustained since completion?	EQ2: Which factors have contributed towards – or detracted from – sustaining the project's adaptation outcomes over time?	EQ3: How do the sustained outcomes contribute to local resilience?
Output 1.3: Climate smart water manage ment plans designed for the Black Volta and five sub- basins in the White Volta and the Oti River basins are adopted	Manage ment plans in the Black Volta and five sub- basins in the White Volta and the Oti basins adopted at ministeria level	The water management and investment plans for the Black Volta and Oti river basins have been finalized and validated. The implementati on of these plans is expected to result in improved water resource management and long- term planning to effectively address the underlying drivers of water resource	Same as above	Evidence of Outcome 1 planning and water coordination at the district level and that has informed local water management (Outcome 2). Verified through KIIs and survey feedback from GoG and UNDP and NGOs and local communities during fieldwork Evidence would be checking online for technical reports and as provided by GoG and KIIs w/GoG ³² since 2020.	Evidence of drivers such as partnerships would be examined between national and local actors, and resources continuing to be allocated to implement the management and investment plans; if they were funded, ³³ budget allocations and planning activities would be evidence of the factors (driving) sustainability. Further, any evidence of trainings of new members of those in GoG at national and district level doing such coordination would show capacities were sustained. Evidence through the survey and KIIs with GoG (especially WACDEP and WRC staff) at national, regional and district levels	KIIs on whether there is evidence of these plans affecting climate resilient basin management and investment, which is key for ecosystem resilience and local resilient to climate risks and shocks. KIIs on the impact of illegal gold mining on siltage and water quality. KIIs on linkages between basin and sub-basin level planning. Survey input and KII interviews with GoG including WACDEP and WRC staff

³² Clarity is needed on the sub-basins, and which sub-basin committees were supported as names of the sub-basins varied in the TE. In the TE, five sub-basins committees were identified, namely, Numbiel, Dapola, Bamboi, Bui and Vonkoro for the Black Volta basin, although elsewhere in the TE the first two were named (Dapola subbasin (Black Volta); Bui subbasin (Black Volta)), along with two new ones: Gambaga subbasin (White Volta) and Nasia subbasin (White Volta). In January 2026, the ex post team received 2018 basin plans for the Black Volta and Oti basin and the Bui, Dapola, Gambaga and Nasia sub-basin plans.

³³ There was no data in the TE confirming funding of these investment plans in 2020. Retrospective KIIs would be sought about evidence of funding since 2016.

COMPO NENT/ OUTCO ME/ OUTPU T	INDICA TORS & TARGE TS	FINAL EVALUATION INFORMATION		EVALUATION QUESTIONS (EQS) BY OUTCOMES with DATA SOURCE:		
		Actual	Data Source(s)	EQ1: Have the project outcomes been sustained since completion?	EQ2: Which factors have contributed towards – or detracted from – sustaining the project's adaptation outcomes over time?	EQ3: How do the sustained outcomes contribute to local resilience?
Output 1.4: National, Regional, District and Communi ty based Climate Change Adaptatio n Monitorin g Committe e establish ed/adopt ed and strengthe ned (as envisione d by the National Climate Change Adaptatio n Strategy) in the three target regions	Three regional Climate Change Adaptatio n Monitorin g Committe es	The Regional, District and Community based Climate Change Adaptation Monitoring Committees have been established. Three regional training meetings, 10 districts level meetings and 50 community level engagement s were completed. These trainings are expected to be done yearly.	Same as above	Evidence of continued committee functioning since 2020, and whether committee decisions may have led to change in Ghana's preparedness and resilience to climate shocks which happen annually (droughts and floods) in Northern Ghana during implementation and after the project closed. Evidence would be checking online for technical reports and KIIs would be sought with WACDEP and WRC and with Regional GoG staff at the three regions where fieldwork would be concentrated through calls or logistics visits pre- fieldwork.	Partnerships would be examined between national, regional, district and community-based Climate Change Adaptation monitoring committees Evidence of resources continuing to be allocated to meetings being held would be evidence of the factors (driving) sustainability. Further, any evidence of regional trainings continuing annually at national, district and local levels doing such coordination would show capacities were sustained. Evidence through the survey and KIIs with GoG at national, regional and district levels	Evidence through KIIs with GoG will probe to better understand how these committees could contribute to local resilience strengthening

COMPO NENT/ OUTCO ME/ OUTPU T	INDICA TORS & TARGE TS	FINAL EVALUATION INFORMATION		EVALUATION QUESTIONS (EQS) BY OUTCOMES with DATA SOURCE:		
		Actual	Data Source(s)	EQ1: Have the project outcomes been sustained since completion?	EQ2: Which factors have contributed towards – or detracted from – sustaining the project's adaptation outcomes over time?	EQ3: How do the sustained outcomes contribute to local resilience?
Outcome 2: Climate resilient management of water resources by 50 communities in northern Ghana						
Output 2.1: Climate responsive community water supply and manage ment plans designed for 10 districts in northern Ghana	50 communities water manage ment plans implemen ted by communit y institution s with at least 50% represent ation by women in place by end of program me year 2.	This indicator was not achieved in time. But at the end of 2019, 4 sub-basin plans contained over 50 communities. No data available about the representatio n by women. WRC carried out training workshops within river basin catchment areas to educate the communities on water resources managemen t issues relating to avoiding deforestation activities and illegal mining that	MTE Report / PPR- 3 (2019); Project Annual Reports including 2020 Annual Report_Dr aft, Physical Progress Report (Annex 9)/ Project Document ation; Project document ation and publication s at MESTI-AF website https://mesti.gov.gh/adaptationfund/ (https://mesti.gov.gh/adaptationfund/documents/communities)	Water supply and management plans at the community level were not evaluated at final evaluation in terms of use; no evidence in the final evaluation that Outcome 1 influenced or was influenced by these climate responsive community water supply and management plans Verification through technical reports as provided by GoG and KIIs w/GoG as well as through survey data and FGD and KIIs in communities probing for implementation of these plans and how they were used at the community, or even district levels, as well as evidence of community- level awareness of climate risks and how to address them in water management	Partnerships would be examined between district and local actors, and evidence of resources continuing to be allocated to implement the plans and meetings being held would be evidence of the factors (driving) sustainability. Use of these plans would be a mark of local ownership, and any absorption of new committee members (assuming natural attrition) would be a sign of both capacities to implement these plans and manage water. Evidence through KIIs with GoG and local FGD and KIIs in communities	Evidence that implementation of community water supply and management plans and changes in local behavior as a result of education on water resource management has led to local resilience Evidence from KIIs with GoG and local FGD and KIIs in communities

COMPO NENT/ OUTCO ME/ OUTPU T	INDICA TORS & TARGE TS	FINAL EVALUATION INFORMATION		EVALUATION QUESTIONS (EQS) BY OUTCOMES with DATA SOURCE:		
		Actual	Data Source(s)	EQ1: Have the project outcomes been sustained since completion?	EQ2: Which factors have contributed towards – or detracted from – sustaining the project's adaptation outcomes over time?	EQ3: How do the sustained outcomes contribute to local resilience?
		exacerbate climate impacts and vulnerabilitie s				
2.2.1: Number of operation al borehole s systems	100 borehole s were construct ed benefittin g at least 30,000 people (60% of whom should be women).	145 boreholes were constructed and the community have full ownership of the boreholes and have started making monthly financial contributions towards the	Same as above	Verification of these assets will be through community transect walks and KIIs about how they have been maintained (what funding, labor, technical expertise)	Evidence of resources and capacities for operations and maintenance ex-post and potential partnerships with local government agencies, NGOs, private sector, and other development partners; evidence of resources through locally led VSLAs or other community financing Evidence that community or farmer conflict (e.g., envy, resistance), or land tenure issues, may have detracted from sustainability Evidence through KIIs and local FGDs	Evidence of sufficient and continuous water access for domestic consumption and agricultural use such as for dry season gardening. Evidence that water access is improved during the dry season and provides a redundant source. Evidence that access to the water source is equitable and inclusive. Evidence from fieldwork FGD and transect walks with KIIs

COMPO NENT/ OUTCO ME/ OUTPU T	INDICA TORS & TARGE TS	FINAL EVALUATION INFORMATION		EVALUATION QUESTIONS (EQS) BY OUTCOMES with DATA SOURCE:		
		Actual	Data Source(s)	EQ1: Have the project outcomes been sustained since completion?	EQ2: Which factors have contributed towards – or detracted from – sustaining the project's adaptation outcomes over time?	EQ3: How do the sustained outcomes contribute to local resilience?
		repairs and maintenanc e of the boreholes without relying on central government support.				based on operability.
Indicator 2.2.2: Number of operation al dugouts (which are dam) systems	50 dams/dug outs serving as rainwater harvestin g and water storage systems in place, providing water supplies to 50 communi ty facilities	10 dams were successfully rehabilitated under phase 1; and 5 additional will be completed by March 2021. This brings to a total of 15 dams that would be rehabilitated under the project.				
2.3: Number of operation al communit y scale irrigation systems installed	30 operation al irrigation systems	40 small irrigation systems, one each in 40 communities . Final evaluation states: "given the absence of				

COMPO NENT/ OUTCO ME/ OUTPU T	INDICA TORS & TARGE TS	FINAL EVALUATION INFORMATION		EVALUATION QUESTIONS (EQS) BY OUTCOMES with DATA SOURCE:		
		Actual	Data Source(s)	EQ1: Have the project outcomes been sustained since completion?	EQ2: Which factors have contributed towards – or detracted from – sustaining the project's adaptation outcomes over time?	EQ3: How do the sustained outcomes contribute to local resilience?
		the revised planning of this outcome need to be analyzed carefully because there is no evidence provided by the team that the quantitative targets (50 irrigation systems) will be achieved on time despite the delays."				
2.4: <i>Measures for water conservation under climate impacts implemented</i>	30 buffer zones with fence created with effective water catchment/riverbank re-afforestation schemes to reduce siltation and evaporation losses as	30 Buffer zones have been created. Over all 44,000 tree seedlings have been planted in 30 communities which were designated for woodlots/ plantations. These tree planting will among others are secured from bush	Same as above	Evidence of vegetated buffer zones and surviving trees Verification of these trees and buffers zones will be through community transect walks and KIIs about how they have been maintained	Evidence of ownership of buffer zones through community benefit from economically beneficial trees (e.g., mango, teak) and through upkeep and respect for fencing and fire belts Resources and capacities to maintain buffer zones and fire belts were not part of the trainings mentioned in the final evaluation or other documentation. Nonetheless, the ex post will explore how resources and capacities have affected sustainability. Verification of these trees and any fire belts will be through community transect walks and KIIs about how they have been maintained	Evidence of improved ecosystem functioning through buffer zone sustainability Verification of these buffer zones (if found), and any fire belts will be through community transect walks and KIIs about how they have been maintained

COMPO NENT/ OUTCO ME/ OUTPU T	INDICA TORS & TARGE TS	FINAL EVALUATION INFORMATION		EVALUATION QUESTIONS (EQS) BY OUTCOMES with DATA SOURCE:		
		Actual	Data Source(s)	EQ1: Have the project outcomes been sustained since completion?	EQ2: Which factors have contributed towards – or detracted from – sustaining the project's adaptation outcomes over time?	EQ3: How do the sustained outcomes contribute to local resilience?
	water conserva tion measures	fires, encroachme nt and deforestation by farmers and livestock to reduce siltation in the watershed.				
NOTE: Output Indicator 2.5 and 3.5: Learning platforms on systems for integrating climate change-related risks into community management of water resources and livelihood activities in northern Ghana institutional in 10 districts will not be covered by the ex post. One video, photobook and newsletter were produced in 2017, making it outside of the evaluable 7 years.						
Outcome 3: Livelihoods diversification for improved adaptation to climate change in 50 communities in northern region						
3.2.1: Number of dry season gardenin g schemes for women establish ed	50 dry season gardenin g schemes for women establish ed, directly benefittin g at least 1,000 women	40 dry season gardenin g schemes for women established	MTE Report / PPR- 3 (2019); Project Annual Reports including 2020 Annual Report_Dr aft, /Physical Progress Report (Annex 9)/ Project Document ation; Project document ation and publication s at	Evidence that dry gardening schemes continue to be implemented Verification through survey data and FGD and KIIs in communities probing for continued viability of these gardens. To the degree possible, communities will be asked to rank the livelihoods they participated in, probing for female representation and asking them to rate the extent to which food crops harvested were produced, consumed, sold, and what assets could have been purchased as investments or used differently. Evidence that new water supply infrastructure	Partnerships within or outside of communities will be examined, and resources continuing to be allocated maintaining water sources and inputs for dry season gardens (e.g. seeds, fencing, tools including pipes and watering cans). Continued self-funding and gardening would be evidence of ownership. Evidence of government support through flagship programs, through KIIs at district level Evidence through survey responses and local transect walks and FGD and KIIs in communities	Evidence that dry season gardening has contributed to increased food security and/or income, and that income has been sufficient to enable households to cope with climate impacts Evidence that dry season gardening has contributed to reduced youth seasonal migration Evidence that benefits from dry season garden are equitable and inclusive Evidence through transect walks, FGD and KIIs in communities.

COMPO NENT/ OUTCO ME/ OUTPU T	INDICA TORS & TARGE TS	FINAL EVALUATION INFORMATION		EVALUATION QUESTIONS (EQS) BY OUTCOMES with DATA SOURCE:		
		Actual	Data Source(s)	EQ1: Have the project outcomes been sustained since completion?	EQ2: Which factors have contributed towards – or detracted from – sustaining the project's adaptation outcomes over time?	EQ3: How do the sustained outcomes contribute to local resilience?
			MESTI-AF website https://mesti.gov.gh/adaptationfund/ (https://mesti.gov.gh/adaptationfund/documents/communities)	(Outcome 2) is sufficient and continuous for dry season gardening. KIIs will be done during transect walks to explore whether the presence of improved water sources is a support and the absence of water sources is a barrier, or probe whether improved water sources that are oversubscribed or too distant (given land tenure issues the final evaluation noted) are no longer sufficient for gardening.		
3.2.2: Number of women led agricultur al product processin g schemes establish ed	40 communi ty tree nurseries and wood lots, incorpora ting bee keeping, establish ed	42 bee keeping schemes established in Phase I and 8 additional in Phase II, bringing the total to 50 communities (and Additional 25% communities benefitted from the bee keeping schemes along the honey production value-chain, but Women	Same as above	Evidence that livelihood activities continue to be implemented Verification of these assets will be through community transect walks and KIIs about how they have been maintained and, like the gardening, how many women participated and how the honey was produced, consumed, sold, and what assets could have been purchased as investments and if the hives have been maintained.	Resources and capacities are vital for operations and maintenance ex-post and potential partnerships regarding the honey value-chain will be explored. Ownership will be explored through how many women (vs men) still invest resources and labor into beekeeping Evidence through survey responses and local transect walks and FGD and KIIs in communities	Evidence that livelihood activities have contributed to increased food security and/or income, and that income has been sufficient to enable households to cope with climate impacts Evidence that benefits are equitable and inclusive Evidence through transect walks, FGD and KIIs in communities.

COMPO NENT/ OUTCO ME/ OUTPU T	INDICA TORS & TARGE TS	FINAL EVALUATION INFORMATION		EVALUATION QUESTIONS (EQS) BY OUTCOMES with DATA SOURCE:		
		Actual	Data Source(s)	EQ1: Have the project outcomes been sustained since completion?	EQ2: Which factors have contributed towards – or detracted from – sustaining the project's adaptation outcomes over time?	EQ3: How do the sustained outcomes contribute to local resilience?
		want increased quota in beekeeping). Final evaluation also noted issues: PPEs are not sufficient (One per group). Lack of clear accounting and profit-sharing regimes by members of the and different groups in relation to their harvest. Colonization of beehives low in concrete hives compared to wooden. Requesting replacement of concrete hives. Harvesting being done by other trainers, not beneficiaries, raising the				

COMPO NENT/ OUTCO ME/ OUTPU T	INDICA TORS & TARGE TS	FINAL EVALUATION INFORMATION		EVALUATION QUESTIONS (EQS) BY OUTCOMES with DATA SOURCE:		
		Actual	Data Source(s)	EQ1: Have the project outcomes been sustained since completion?	EQ2: Which factors have contributed towards – or detracted from – sustaining the project's adaptation outcomes over time?	EQ3: How do the sustained outcomes contribute to local resilience?
		question of insufficient training on harvesting techniques. In some communities , they would have preferred livestock to beekeeping because the men dominate the bee keeping. (low involvement not desirable)				
3.2.3: Number of women led agricultural product processing schemes establish ed	40 communi ty level women led agricultural product processing (shea butter or honey) processin g schemes establish ed	24 community level women-led agricultural product (shea butter, groundnut and baobab) processing schemes established, primarily with women	Same as above	Evidence that agro- processing facilities and associated equipment are still functioning and that communities are still processing and selling agricultural products Verification of the facilities still being accessible to women and successful will be done via the survey, transect walks and KIs	Evidence of sufficient resources and capacities for operations and maintenance ex-post; evidence of partnerships with NGOs, private sector, or other partners to sustain benefits, particularly for value-chains (e.g., transport was mentioned as a barrier to market access). Evidence of government support through flagship programs, through KIs at district level Survey will confirm operational agro-processing, and the fieldwork team will verify the presence of the machines and any maintenance in 2026 through transect walks and KIs	Evidence that livelihood activities have contributed to increased food security and/or income, and that income has been sufficient to enable households to cope with climate impacts Evidence that benefits are equitable and inclusive Evidence that agro-processing is not over-demanding electricity and water resources Village-level transect walks and KIs will confirm any effect (positive via income or negative via over-use of water)

COMPO NENT/ OUTCO ME/ OUTPU T	INDICA TORS & TARGE TS	FINAL EVALUATION INFORMATION		EVALUATION QUESTIONS (EQS) BY OUTCOMES with DATA SOURCE:		
		Actual	Data Source(s)	EQ1: Have the project outcomes been sustained since completion?	EQ2: Which factors have contributed towards – or detracted from – sustaining the project's adaptation outcomes over time?	EQ3: How do the sustained outcomes contribute to local resilience?
Indicator 3.3: Community tree nurseries and wood lots established for climate risk managem ent in 40 communit ies	40 community tree nurseries and wood lots, incorporating bee keeping, establishe d	25 tree nurseries established benefiting over 400 direct beneficiaries in tree seedling establishment and marketing The final evaluation reports that the: overall performance of the community tree nurseries sector did not meet expectations due to poor market, and some seedlings have been destroyed due to flooding.	Same as above	Given poor performance, related outcomes will be de- emphasized. Evidence of tree nurseries still operational and generating income for communities	Evidence of ownership, resources, partnership, and capacities to sustain tree nurseries	Evidence that tree nurseries have contributed to increased income, and that income has been sufficient to enable households to cope with climate impacts Verification of these trees in the ecosystem will be through FGD, community transect walks and KIIIs about how they have been maintained (what funding, labor, technical expertise). Given droughts and floods that have been climate shocks, the viability of trees will be examined for their effect on ecosystem resilience
Indicator 3.4 Number of operation al communi	20 community fish farms establish ed	A total of 39 Fish farms in rehabilitated dams/dugout s have been established in 23	Same as above	Evidence of fish cages still in use and operational in dams/dugouts Verification of these fish farms survival through community transect walks	Evidence of fully functional dams/dugouts (e.g., no issues with siltation or water quality) Evidence of capacities and resources for maintenance and for post-harvest fish storage and market access. Evidence of continued theft or arson as a challenge to	Evidence that fish farming activities have contributed to increased food security and/or income, and that income has been sufficient to enable households to cope with climate impacts

COMPO NENT/ OUTCO ME/ OUTPU T	INDICA TORS & TARGE TS	FINAL EVALUATION INFORMATION		EVALUATION QUESTIONS (EQS) BY OUTCOMES with DATA SOURCE:		
		Actual	Data Source(s)	EQ1: Have the project outcomes been sustained since completion?	EQ2: Which factors have contributed towards – or detracted from – sustaining the project's adaptation outcomes over time?	EQ3: How do the sustained outcomes contribute to local resilience?
ty fish farms establish ed.		Communities . Some theft and loss of fish cages reported at final evaluation.		and KIIs, especially in Tampion where there was flood damage, and theft of the cages will be done in communities and how they have been maintained will supplement the survey which will confirm if funding was taken from trees to fish farming and how the fish farms are surviving.	ownership. Verification through survey and KIIs along with transect walks and community rankings of livelihoods	Evidence that benefits are equitable and inclusive Evidence of increase in stock/cages by participants. Scale-up or adoption by non- project beneficiaries could speak to sustainability, and can be asked about in the sites, especially those with dams/dugouts in the surrounding areas.
NOTE: <i>Indicator 3.2.4</i> : Household income and the econometric tool was never developed. The final evaluation states: "This indicator has been postponed due to the delays on the effective launching of livelihood related activities." The ex post evaluation will pursue a qualitative ranking of how income was used, but this outcome will not be covered by the ex-post.						

Annex B. Severe weather in Ghana affecting site regions

In addition to the large flooding mentioned in the resilience section, the following extreme weather events are known to have affected local areas where the project was implemented since 2020. Fieldwork seasonal calendars will confirm the extent of damage.

Upper West Region (Davies 2021b; Tampah 2024; Umer et al. 2025)

Major Drought Events

- June–July 2024 (Severe Drought):
 - An unprecedented eight-week dry spell severely affected agricultural production and livelihoods, particularly in the Wa East, Lambussie, and Sissala East Districts.
 - Worst affected: Sissala East District.
- 2020–2022 (Recurrent Dry Spells):
 - The region experienced intermittent dry spells that, combined with long-term climate change trends, resulted in declining inter-annual rainfall and reduced agricultural productivity across multiple districts.

Major Flood Events

- August 2021 (Destructive Floods):
 - Intense rainfall lasting 12–15 hours triggered widespread flooding across 85 communities in six districts.
 - Worst affected: Nadowli–Kaleo District, Jirapa District, and Lawra Municipality.
 - Impact: Over 1,600 people affected, more than 100 homes destroyed, and critical infrastructure—including the Wa–Hale road—washed away, cutting off several communities.
- 2020 & 2022 (Perennial Flooding):
 - Recurrent flooding occurred in Wa Municipality, with significant impacts reported in the Mangu community.
- September 2020 (Regional Flooding):
 - Heavy rainfall caused widespread flooding across northern Ghana, including the Upper West Region. These events were linked to the overflow of the White and Black Volta rivers and spillage from the Bagre Dam in neighboring Burkina Faso, with impacts comparable to the 2019–2020 floods.

Upper East Region (FloodList 2020; GNA 2020; 2021; Owusuwaa 2024; Suuk 2024; Alabira 2025)

Key Flood Events (2020–Present)

- September 2020 (Severe Flooding):

- Heavy rainfall combined with the release of water from the Bagre Dam in Burkina Faso resulted in extensive flooding.
- Impact: 7,561 people affected; 1,596 homes damaged or destroyed; 5 deaths and 7 injuries recorded.
- Affected areas: Bolgatanga Municipal, Bolgatanga East, Bawku Municipal, Pusiga, Binduri, Tempene, Talensi, Nabdam, and Builsa North.
- Annual Flood Occurrence:
 - Flooding remains a recurrent hazard due to flat terrain, intense seasonal rainfall, and regular dam spillage.

Drought Context

- Although detailed localized drought data for 2020–2024 is less documented than flood impacts, the Upper East Region remains highly vulnerable to drought. The region has a long history of severe hydrological stress, including the major droughts of the 1980s, which significantly reduced crop yields and household food security.

Key Drivers of Flooding and Drought

- Annual spillage from the Bagre Dam in Burkina Faso
- Intense and erratic seasonal rainfall
- Low-lying and flat topography

Northern and Savannah Regions (Boakye & Forgor 2020; GNA 2021; B&FT 2024; MoFA 2024; Owusuwaa 2024; Suuk 2024; Tanko 2024; Alabira 2025)

Drought Events (2020–2025)

- 2024 (Severe Drought):
 - The most intense drought in decades affected northern Ghana, impacting over one million people and destroying an estimated 1.8 million hectares of crops. Rainfall was absent for more than two consecutive months, severely affecting staple crops such as maize, rice, millet, and groundnuts.
 - Affected areas: Northern, North East, and Savannah Regions, with major crop failures reported in Tamale, Bole, Bimbila, and Damongo.
- 2023 (Mild to Moderate Drought):
 - Erratic rainfall patterns led to localized drought conditions and reduced crop performance.
- 2025 (Forecasted Risk):
 - Seasonal forecasts indicated below-normal rainfall for the May–July (MJJ) period in the Northern Region, raising concerns about continued climate stress.

Flood Events (2020–2025)

Flooding in the Northern and Savannah Regions is primarily driven by heavy, erratic rainfall and annual spillage from the Bagre Dam, affecting communities along the White Volta River.

- 2023 (Dam Spillage and Heavy Rains):
 - While severe flooding was concentrated in southern Ghana, northern areas remained at high risk due to continued heavy rainfall.
- 2021 (Deadly Floods):
 - Flooding resulted in at least five deaths in the North East Region, with Chereponi particularly affected.
- 2020 (Bagre Dam Spillage):
 - Heavy rainfall led to dam spillage, flooding homes, farmland, and infrastructure in several districts.
 - Affected districts: Mamprugu Moagduri, West Mamprusi, East Mamprusi, and Bunkpurugu.

Annex C. Stakeholder analysis

No.	Institutions/ Persons	Remarks	Roles and responsibilities
1.	Secretariat/Project Management Unit (PMU), Ministry of Environment, Science, Technology and Innovation (MESTI)	National Programme Director, National Programme Coordinator, Technical Officer, Climate Change Oversight and M&E, Auditor (Internal/External)/ Procurement/ Project Accounts, IT support for project	Overall responsibility for project coordination, management, monitoring and evaluation as well as fiduciary management, with respective sector agencies responsible for management of field implementation, under the oversight of PSC
2.	UNDP Country Office (CO)	UNDP CO, UNDP RCU, UNDP RTA, UNDP EEG	Verify the project monitoring and evaluation (M&E) are in accordance with established UNDP procedures and carried out by the project team.
3.	Project Steering Committee members	High-level representatives from UNDP, MESTI, EPA, and key stakeholders from government agencies, civil society organizations, and other development partners	- Determine the necessity of further design or development of specific risk mitigation measures to avoid maladaptive outcomes. - Oversee the development of the portfolio of community-based projects, ensuring its alignment with AF requirements and that lessons learned are discussed and evaluated.

No .	Institutions/ Persons	Remarks	Roles and responsibilities
4.	Environmental Protection Agency (EPA)	Field regional and zonal EPA staff involved in field monitoring and evaluation of the NGOs	• To be the technical unit of the project, leading the implementation of all components on the ground. • Together with the PMU, to identify and engage the relevant Ministries and agencies to perform specific sub-components of the project. • To organize project operational activities, workshops, educational outreach in the project areas to provide the opportunity to discuss climate change adaptation, water resources management and rural livelihood issues with government agencies, related projects, beneficiary communities and development partners. • Timely submission of inputs on project reports to steering committee, as well as semi-annual updates and quarterly financial reports according to formats provided.
5.	Ministry of Food and Agriculture (MoFA)	AEA and District Director of Agriculture (DDA) per project district	• Provide technical backstopping support to field implementation of aspects of the project under their mandate (especially Component 3) • Periodically provide technical input to PMU for regular update of project implementing strategies and options. • Development of capacity building programs/modules for AEAs and Community Extension volunteers. • Submit to the PMU, timely input to annual plans and reports, semi-annual updates and quarterly financial reports according to formats provided. • Support farmer-based organizations and farmers with regular agricultural extension services for enhanced technology adoption and improvement in crop productivity • Train different interest groups on alternative livelihood options introduced by the project under component 3 (e.g., dry season gardening, tree nursery management, bee keeping, agro-processing, etc.)

No.	Institutions/ Persons	Remarks	Roles and responsibilities
			• Ensure sound management of project assets under its supervision (e.g., irrigation infrastructure in communities).
6.	Ministry of Finance (MoF)		• Be represented on the steering committee to provide technical backstopping in respect of budgeting, financing, procurement and expenditures on specific aspects of the project. • Have representation on the Project Validation committee which will be responsible for the review of technical reports and recommend to MESTI via the PMU approval of re-ports, evaluate technical and financial proposals of studies and other related documents
7.	Adaptation Committees	Regional, District and Community level Adaptation committee	• Serve the programme objectives but with a wider view of supporting the implementation of the development of a National Climate Change Adaptation Strategy
8.	Water Resources Commission (WRC)	Consultants in the revision of the baseline CC Impact and Vulnerability assessment; and development of the Back Volta and Oti Basin management plan	• Supervisory role in components related to water use planning and management (com-ponent 1) • To support developing TOR for various technical assignments in areas within their mandate • To support the organization of workshops & meetings in project areas within their domain/mandate • To review all documents produced by technical experts and consultants in their man-date areas under the project • To adapt documents generated from the project for their use as an institution • To support other institutions with technical advice during implementation of their sub-components of the project.
9.	Water Research Institute under CSIR	Engaged in the Fish Farming livelihood project implementation.	• To provide technical backstopping for the project in respect of all research activities in the areas of water quality for aquaculture, water levels and impact of climate change on river basins and water resources in project communities.

No.	Institutions/ Persons	Remarks	Roles and responsibilities
10	Ghana Irrigation Development Authority (GIDA)	The Regional GIDA Offices who conducted the baseline evaluation of the dams and dug-outs; partnered the PMU as supervising and monitoring unit for the dam rehabilitation and construction	• Support in the design, construction and installation of all irrigation infrastructure in target communities. • To provide technical support to communities and other project implementing partners such as MoFA in the use and maintenance of the reservoirs and installed irrigation systems
11	Community Water and Sanitation Agency (CWSA)	The national CWSA in Accra involved in the borehole water system project implementation	• Support the project in the construction of boreholes, repair and rehabilitation of existing dams and dugouts, construction of sand dams and rain harvesting systems as well as training of WATSAN committees, water boards and water users' associations in proper management of community water resources and systems. • Train local artisans to support communities with periodic and timely maintenance of boreholes and dams/dugouts,
12	Fisheries Commission	Partnered as monitoring and supervision of the fish farming livelihood intervention project	• Support the project in establishing viable fish farms as alternative livelihood option for project communities. • The identification of communities with prospects for sustainable aquaculture enterprises. • To be responsible for capacity building in the areas of cage/pond construction and management for improved productivity on sustainable basis. • To work closely with MoFA to explore the possibility of integrated aquaculture-vegetable enterprises to ensure optimum use of water resources.
13	National Fire Service (NFS)		• Support the project in the creation of buffer zones and fire belts as well as periodic training of community groups in fire prevention and management in forests and wood-lots • Support in forming or reviving existing yet weak fire volunteer squads to protect established woodlots.

No	Institutions/ Persons	Remarks	Roles and responsibilities
14	Forestry Commission (FC)		• Manage project activities through its Forest Services (FS) and Wildlife Divisions in the regions and districts of the project. • Preparation and review of Activity and Management Plans relating to tree nursery establishment, woodlot establishment and creation of the riparian buffer zones. • Undertake awareness creation about woodlot establishment, biodiversity conservation and control of firewood and charcoal production. • Assist in capacity building local community members in the establishment of tree nurseries, woodlots and riparian buffer zones. • Support districts and communities to undertake enrichment planting in degraded areas along watercourses. • Support districts and communities to establish and manage green firebreaks. • Ensure that safeguards provisions are followed in management plans, in particular those related to access restriction in the buffer zones
15	District Assemblies (DA)		• Be responsible for monitoring and overseeing project activities being undertaken in all communities in the respective districts
16	SADA		• To play a supporting role in the implementation of agricultural and aquaculture as well as irrigation projects in project districts and communities.
17	NADMO	Responsible for the Disaster Risk reduction of the periodic impact of flooding of the Bagre Dam, Burkina Faso on communities in the project area during periodic spill of excess water from the Dam.	• Supports NFS in preventing and managing disasters in buffer zones and other protected areas in project communities. • Training in flood prevention and management

Annex D. List of interviewed stakeholders to-date

Organization	Individual	Role	Date
Independent	Antonio Arenas Romero	Lead Evaluator for Final Evaluation	13 January 2026
UNDP	Stephen Kansuk	Project Director	14 January 2026
MEST	Mohammed Gyimah	Deputy Director of Environment	29 January 2026
UNDP	Paolo Dalla Stella	Cluster Head	4 February 2026
University of Ghana	Sadow Mark Yidana	Professor of Hydrogeology and Provost	4 February 2026

Annex E. Project results framework

Indicator	Baseline	Target	Sources of verification
Outcome 1: Improved basin level management and planning of water resources taking into account climate change impacts on surface and groundwater sources			
Existence of historical and downscaled climate projections	No downscaled climate projections are in place	Downscaled and historical climate projections available for the White Volta, Black Volta and Oti Basins	Programme progress and technical reports
Revised White Volta management plan	Current plan does not address climate change impacts nor link clearly to community level	Revised White Volta Plan completed and adopted at inter-ministerial level	Programme progress and technical reports
Management plans in the Black Volta and five sub-basins in the White Volta and the Oti basins at ministerial level	No plans are in place	Black Volta and 5 sub-basin plans in the White Volta and the Oti Basins adopted at inter-ministerial level	Programme progress and technical reports
Three regional Climate Change Adaptation Monitoring Committees	There is no committee in place	Regional Climate Change Adaptation Monitoring Committees established in the three target regions	Programme progress and technical reports
Outcome 2: Climate resilient management of water resources by 50 communities in northern Ghana			
Number of communities in which management plans have been developed and are being implemented	Management plans are not in place. Lack of coherent and planned water management activities in communities.	50 community water management plans implemented by community institutions with at least 50% representation by women in place by end of programme year 2.	Programme progress and technical reports
Number of operational boreholes, dugouts/dams and rainwater harvesting systems	Communities have limited infrastructure in place for supply and storage of water	100 operational boreholes, benefitting at least 30,000 people (50% of whom should be women) Rainwater harvesting systems in place, providing water supplies to 50 community facilities	Programme progress and technical reports
Number of operational community scale irrigation systems installed	Very few communities have effective irrigation systems in place	50 operational irrigation systems, benefitting at least 2,500 farmers	Programme progress and technical reports
Outcome 3: Enhanced diversification of livelihoods by 50 communities in northern Ghana			
Number of operational community fish farms established	Few communities benefit from community fish farms	20 community fish farms established, benefitting at least 10,000 people (50% of whom should be women)	Programme progress and technical reports
Number of tree nurseries/wood lots established	Few communities benefit from community managed tree nurseries and wood lots, nor from bee keeping activities	40 community tree nurseries and wood lots, incorporating bee keeping, established	Programme progress and technical reports
Number of dry season gardening schemes for women established	Few communities benefit from effective dry season gardening	50 dry season gardening schemes for women established, directly benefitting at least 1,000 women	Programme progress and technical reports
Number of women led agricultural product processing schemes established	Few communities benefit from agricultural product processing	40 community level women led agricultural product (shea butter or honey) processing schemes	Programme progress and technical reports

Indicator	Baseline	Target	Sources of verification
		established, directly benefitting at least 1,200 women	
Household income	More than 50% of the households in the target communities have income levels below the poverty line	At least 50% of the households in the target communities increase their income by 30% by the end of the project	Monitoring reports

Annex F. Documents and data available and consulted

Project Design and Progress Documentation

Project Document (Project/Programme Proposal), 2015.

Project Performance Report 1, 2017

Mid-Term Evaluation, 2018

Project Performance Report 2, 2018

Project Performance Report 3, 2019

Final Evaluation, 2021

Project-Related Documents Provided by Stakeholders

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Other Documents of Interest

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Annex G. Preliminary data collection tools

Online Survey Instrument

Introduction

You are receiving this short survey because your NGO/CSO partnered with the Government of Ghana and the United Nations Development Programme (UNDP) to implement livelihood activities in Northern Ghana between 2018 and 2020. That work was funded by the Adaptation Fund as part of a project called *Increased Resilience to Climate Change in Northern Ghana through the Management of Water Resources and Diversification of Livelihoods*.

Five years after the project has ended, the Adaptation Fund wants to learn about what results were sustained and how they may have contributed to local climate resilience. This is an important opportunity to improve future climate resilience programming in Ghana and around the world.

As someone knowledgeable in local communities in Northern Ghana, **your input is invaluable**.

Completing the survey will take no more than 15 minutes. All respondents will remain anonymous unless you would like to be contacted for more information. No responses will be accessed or shared outside the evaluation team and Adaptation Fund Technical Evaluation Reference Group. Please contact the evaluation director, Jessica Kyle (Jessica.kyle@icf.com), with any questions or concerns.

Questions

Section 1 – Communities

1. To begin, select one community in which you implemented livelihood activities for the project. Please choose the one you are most familiar with.
 - Adaboya
 - Aliba
 - Bechinteng
 - Bhemshi
 - Bihinaayili
 - Bugubelle
 - Chache
 - Dabagteng
 - Dabateng
 - Dagunga
 - Dinga
 - Dua
 - Farik
 - Gengekpe
 - Gengekpe–Venne–Sone

- Gentiga I
- Gentiga II
- Goli
- Goringo-Aliba
- Guri
- Jang
- Kasiesa
- Ketuo
- Kiape
- Kolikolini
- Kong
- Ko-Bukom
- Kpaliwega
- Kukobila
- Kukobila-Tamaligu
- Kuka
- Kuka-Natinga
- Kunkua
- Lamboya
- Libga
- Libga-Zaazi
- Mognegu I
- Mognegu II
- Nabugaun
- Nabugangn
- Nagdigu
- Nanvilli
- Natinga
- Nyoglo
- Sabare I
- Sabare II
- Seripe
- Sugtampia

- Sonne
- Sonyor
- Tamaligu
- Tambalugu
- Tasor-Kulfor
- Takpo
- Tilli-Azupunpugu
- Timonde
- Tumu
- Wallembele
- Wiesi
- Yidongo
- Zabugu
- Zaazi
- Zieng
- Zogpielle-Guri-Bechinteng-Ketuo-Dabagteng-Naapaal
- Zukpiri /

Section 1 – Livelihoods

2. Since 2020, have community members continued the livelihood activities introduced by the project?

Livelihood	Community did not receive	Livelihood not continued by most participants	Livelihood continued among most participants	Livelihood has grown among more community members	Do not know
Dry season gardening					
Fish farming					
Agro processing					
Bee keeping					
Tree seedlings					
Irrigation					

3. What are the major barriers to sustaining the project-introduced livelihoods since 2020 (such as land access or tenure, electricity, water, transport to market, or something else)? [OPEN ENDED]
4. Compared to men in these communities, have women's livelihoods been especially improved by the project?
- Yes

- No
- Do not know

5. If not, why not? [OPEN ENDED]

6. Were the successful livelihoods supported by improved water resources from the project, such as boreholes, dams/dugouts, or irrigation systems?

- Yes
- No
- Do not know

7. If yes, how did the improved water lead to success? Please specify [OPEN ENDED]

8. If not, was the lack of improved water a barrier to livelihoods? Please explain. [OPEN ENDED]

9. Compared to 2020, has youth outmigration changed?

- Yes
- No
- Do not know

10. If yes, have project-supported livelihoods such as dry season gardening influenced outmigration? How? [OPEN ENDED]

11. What else would you like to tell us about the sustainability of project results and local community climate resilience since the project closed? [OPEN ENDED]

Section 2 – Water Sources and Access

12. Did the communities that you supported or know about receive a dam/dugout, borehole, or irrigation system from the project between 2016–2020? And if so, is it still functional?

Water source	Community did not receive	Not functional	Somewhat functional	Fully functional	Do not know
Dam / dugout					
Borehole					
Irrigation system					

13. If the water source is no longer functional, please explain what happened. [OPEN ENDED]

14. Since 2020, how have the dams/dugouts, boreholes, or irrigation systems been maintained and/or repaired? If so, how? Select all that apply.

Water source	Not maintained / repaired	By my or other NGOs/CSOs	By local government	By community members	By private sector partners	By other development partners

Dam / dugout						
Borehole						
Irrigation system						

15. Since 2020, has the water source provided or improved by the project provided sufficient water to meet the user's needs throughout the year (e.g. for dry season gardening, for fish farming, drinking water, etc.)?

Water asset	Community did not receive	Not enough water	Enough water	Do not know
Dam / dugout				
Borehole				
Irrigation system				

16. If the water source has not provided enough water, please explain why not. [OPEN ENDED]

17. If women have not had sufficient access to the water sources, please explain why not. [OPEN ENDED]

18. In general, considering all water sources, does the community generally have sufficient access to water for their household and livelihood throughout the year, compared to 2020?

- Yes
- No
- Do not know

19. Are planted trees, buffer zones vegetation, fences, fire breaks, or other natural ways to sustain water assets still in place since 2020?

Natural resilience	Community did not receive	Yes	No	Do not know
Trees				
Buffer zones				
Fire Breaks				
Fences				

Section 3 – Climate-Smart Water Management

20. Did you train community members on water management and conservation before or since 2020?

- Yes
- No
- Do not know

21. If yes, what topics did you train community members on? [OPEN ENDED]

22. Compared to 2020, do you think local communities are more aware of how to manage and conserve water in light of climate risks?

- Yes
- No
- Do not know

23. Have community-level climate change adaptation monitoring committees (set up by the project) continued to meet since 2020?

- Yes
- No
- Do not know

24. Is there anything else you would like to tell us about this community? [OPEN ENDED]

25. Is there another community with which you are familiar and would like to answer these questions?

- Yes
- No

[Respondents who check “Yes” are re-routed to Question 1 and rest of question. Respondents who check “No” are directed to Question 26.]

Section 4 – Final Question

26. If you would like to be contacted by the evaluation team to provide more information about sustainability and resilience, please provide your name, mobile number and email address. This is completely optional.
[OPEN ENDED]

Focus Group Discussions

This will be the first activities in Communities with many members (mixed gender, age, wealth). Techniques to be used include:

- Seasonal calendar – to teach us about seasons, how livelihoods have been practiced (planting, harvesting, water access from what sources) and climate shocks from 2020 to date – photographic evidence supplements notes
- Rankings – on sustainability of livelihoods, possibly on water sources (if more than one, prioritizing importance of water source for livelihoods and other household needs, triangulating the survey) – using 10 sticks for proportions, typical in Ghana – photographic evidence supplements notes
- Other Government and donor support – unlikely given preliminary research, but if there were other donors or government agencies from 2016–2020 that supported similar programming activities, rank them in terms of affecting adaptive sustainability and resilience – photographic evidence supplements notes
- Other use of learning tools – such as a “past and present” resource matrix to identify changes in livelihoods and water resources.

KII Guide for Communities

This are likely to be used in small groups of women and men, possibly with key individuals, possibly topics covered in informal discussions on transect walks to project assets. Where percentages are mentioned in the guide, this question will be implemented in practice using sticks, as described in Section 4.2. Data collection methods and tools.

Interview intro:

- **Give an intro to the evaluation:** The Adaptation Fund Technical Evaluation Reference Group (AF-TERG) has commissioned an ex-post evaluation of the UNDP/MEST project “Increased Resilience to Climate Change in Northern Ghana through the Management of Water Resources and Diversification of Livelihoods” to understand the sustainability and resilience of project effects. I’m part of the consultancy team conducting this independent evaluation. As part of this evaluation, we’re visiting different communities reached by the project through its support for water resource management and livelihood diversification to collect experiences of benefitting from the project and learn about how well those benefits have been sustained since the project closed in 2020 and how well they have continued to withstand climate and other shocks (e.g. price inflation). This is not an evaluation of [COMMUNITY] performance within the project and is not tied to your ability to benefit from future projects. Rather it is an opportunity to learn from your experience and draw lessons for better climate resilience solutions in the future. We will share what we learn with you at the end of our visit and ask for confirmation.
- **Obtain informed consent:** We will not attribute your responses to you, so please feel free to speak openly. If you feel you are not able to respond to any of our questions, just let us know, and we can skip to more relevant topics. You can also choose to stop the interview at any time. Is that all clear and OK with you?
- **Remind interviewees of which project activities** we’re talking about and some key details for memory refresh (when was it implemented, where, what were the main activities)

Background:

Please tell us how you were engaged with the project? When and how were you involved?

Questions:**SUSTAINABILITY**

1. If your community received a WATER ASSET: BOREHOLE OR DUGOUT/DAM OR IRRIGATION SYSTEM from the project between 2016–2020:

- a. what was it: Borehole __, Dugout/Dam __, Irrigation pipe, canal or watering cans __)
- b. Is it still working?
- c. Who was it built by?
- d. If not, why not? (What is missing?)
- e. Has the water infrastructure been maintained and/or repaired since it was constructed (since 2020)?
- f. If yes, how and by whom?
- g. Who paid for repairs or maintenance? (probe for water user fees, or other donors or GoG agencies)
- h. Have natural measures like planted trees and vegetated embankments stayed intact and are they helping with water retention?

2. How has your ACCESS TO WATER throughout the year changed since the project ended in 2020 to today?

- a. Has your access to water during the dry season improved because of the new water infrastructure?
- b. By 70% or more __, between 40% and 60% __. or 30% or less __? ³⁴
- c. Are the project's assets providing enough water in both dry seasons and rainy ones for community needs?
- d. Do women, youth, and poorer households have sufficient access to the new water assets?
- e. Why or why not? –
- f. Have there been any complaints about unequal access to water?
- g. If yes, who has complained and why?
- h. For what purposes have you most used the water for in the last 5 years (e.g., agriculture, livestock, agro-processing, drinking water, household use or something else)?
- i. How has your improved access to water helped your family? For example, increased ability to farm in the dry season, access to water for animals, better health, reduced water collection time by women/girls, or something else?

3. Which LIVELIHOOD PRACTICES introduced during the project are still being used in your community? For example, agro-processing, dry season farming, bee keeping, fish farming, tree seedlings or something else.

³⁴ In practice, this question may be asked using 10 tally sticks.

- a. If not, why not?
- b. How much did the water assets provided by the project help the sustainability of the livelihood activities (By 70% or more __, between 40% and 60% __. or 30% or less __?)
- c. If your community's water resources were not improved or constructed, did this harm your livelihood (e.g., too little (less than 50%) water to support dry season farming or fish farming)? Or did changes to water supply have no effect?
- d. How much have women continued to benefit from the livelihood activities, compared to men since the project ended in 2020? (By 70% or more __, between 40% and 60% __. or 30% or less __?)

4. Last year if you benefitted from DRY SEASON GARDENING, what percent of your family's food comes from the garden: (0-30% __ 40-60% __ or 70-100% __)?

- a. What percent do you eat of your garden's harvested crops: (0-30% __ 40-60% __ or 70-100% __)?
- b. What percent do you sell? (0-30% __ 40-60% __ or 70-100% __)?
- c. If you sold any crops, have you invested the cash into improving your home, paying school fees, trading, or something else?
- d. How has that changed since the project helped start or improve the garden? (By 70% or more __, between 40% and 60% __. or 30% or less __?)

5. Last year if you benefitted from FISH FARMING, what percent of your family's food comes from the fish: (0-30% __ 40-60% __ or 70-100% __)?

- a. What percent do you eat of your fish harvest: (0-30% __ 40-60% __ or 70-100% __)?
- b. What percent do you sell? (0-30% __ 40-60% __ or 70-100% __)?
- c. If you sold any fish, have you invested the cash into improving your home, paying school fees, trading, or something else?
- d. How has that changed since the project helped start or improve the fishing? (By 70% or more __, between 40% and 60% __. or 30% or less __?)

OTHER LIVELIHOODS:

6. What about OTHER LIVELIHOODS (like agro-processing, bees, trees) that may not be so dependent on water?

7. Last year if you benefitted from other livelihoods, what percent of your family's food comes from the other livelihood: (0-30% __ 40-60% __ or 70-100% __)?

CLIMATE SHOCKS and SCALE UP:

8. How much has the income you've earned from your new livelihood activities helped your family cope with climate shocks and uncertainty (By 70% or more __, between 40% and 60% __. or 30% or less __?)

- a. How have you used your livelihood practices in response to droughts, floods or other shocks?
- b. How else have new livelihood practices helped your family or community (for example, reduced youth outmigration, reduced sales of livestock during the hungry season)?

- c. Have any community members or other communities started practicing the improved livelihoods even if they were not part of the original project, based on your successful experience?
- d. If yes, who has used them/ where?
- e. Have any new livelihood opportunities emerged since the project, that you've been able to do based on what you learned through the project?

9. What else affected the sustainability of project adaptation outcomes over time?

- a. Were there any climate or other shocks since 2020 that affected the sustainability of project results (For example, rainfall, drought, flooding, water pollution from illegal mining).
- b. Which ones and how did they affect you?
- c. Did other changes affect sustainability (For example, changes in migration patterns, land use patterns, livelihood patterns, political changes)? Which ones?

10. Did you get trained on WATER MANAGEMENT AND CONSERVATION before or, since 2020? If yes, do you feel you have good knowledge of how to manage local water resources given greater climate shocks like droughts or floods or irregular rainfall?

- a. If yes, how are you using it?
- b. Do you know about the water management plans that your community or district should have and use?
- c. Have the plans been used in your community?
- d. Do you continue to use them to manage water resources?

11. How much do you think that the project's investments in nature, for example TREES TO PROTECT DAMS, BUFFER ZONES, FIRE BREAKS have protected WATER SOURCES or your LIVELIHOODS? (b. By 70% or more __, between 40% and 60% __. or 30% or less?)

12. What else would you like to tell us about sustainability and climate resilience since the project closed?

KII Guide for Government and NGO/CSO Partners

To be used at District level by translators visiting while planning logistics

Interview intro:

Give an intro to the evaluation: The Adaptation Fund Technical Evaluation Reference Group (AF-TERG) has commissioned an ex-post evaluation of the UNDP/MEST project “Increased Resilience to Climate Change in Northern Ghana through the Management of Water Resources and Diversification of Livelihoods” to understand the sustainability and resilience of project effects. I’m part of the consultancy team conducting this independent evaluation. Five years after the project has ended, the Adaptation Fund wants to learn about what results were sustained and how they may have contributed to local climate resilience, especially focused on BLACK VOLTA and OTI BASIN AND SUB-BASIN WATER MANAGEMENT and WATER RESOURCES and LIVELIHOODS. This is an important opportunity to improve future climate resilience programming in Ghana and around the world.

We are visiting your [DISTRICT] and will be visiting [COMMUNITY 1] and [COMMUNITY2] to learn about how well those benefits have continued since the project closed in 2020. This is not an evaluation of your [DISTRICT'S] performance within the project and is not tied to your ability to benefit from future projects. Rather it is an opportunity to learn from experience and draw lessons for better climate resilience solutions in the future.

- **Obtain informed consent:** We will not attribute your responses to you, so please feel free to speak openly. If you feel you are not able to respond to any of our questions, just let us know, and we can skip to more relevant topics. You can also choose to stop the interview at any time. Is that all clear and OK with you?
- **Remind interviewees of which project activities** we’re talking about and some key details for memory refresh (when was it implemented, where, what were the main activities)

Background:

Please tell us how you were engaged with the project? When and how were you involved?

Questions:

WATER BASIN MANAGEMENT:

1. Have the Water Resources Commission and/or the Climate Change Adaptation committees and/or Regional Climate Change Adaptation Monitoring Committees continued to meet about managing the Black Volta and Oti Basins?
 - a) if yes, which one?
 - b) Have there been new resources committed to water management in the basins and sub basins?
 - c) If yes, from where?

2. Did the management committees continue to consult local districts and communities to shape water policy and planning since 2020?
3. Did you get trained to take into account climate change impacts on surface and groundwater sources since 2020?
4. If yes, how well do you feel you are able to use this knowledge to improve district water management?
5. Is there anything you would like to tell us about your access to water from Ghana's water management and response to climate shocks in the last five years?

WATER RESOURCES AND LIVELIHOODS:

6. Has your [DISTRICT] been involved in maintaining repairing any of the water infrastructure or livelihood activities since project close?
 - a) If not, who is responsible?
7. Have any of the activities supported by the project been continued under flagship government programs, like 1V1D or the new 24-HOUR ECONOMY?
 - a) Which ones?
8. Has your [DISTRICT] collected any data on water use in the project communities since project closure?
 - a. If yes, does data show an increase in water availability?
9. Has your [DISTRICT] collected any data on household food availability or Youth outmigration in the project communities since project closure?
 - a) If yes, what does it show?

Annex H. Ethical considerations for this evaluation

The evaluation team will take a serious approach to evaluation ethics that aligns with the Adaptation Fund's Evaluation Policy. The evaluation will comply with core principles of evaluation ethics, including integrity, accountability, respect, beneficence, and do no harm.³⁵ The evaluation team will conduct ourselves with professional integrity, in accordance with professional and ethical guidelines and codes of conduct for individual evaluators. We will be sensitive to differences in culture, customs, gender roles, ethnicity, ability, age, sexual orientation, language, religious beliefs, and practices of stakeholders. The evaluation will also respect participants' autonomy and right to provide information in confidence, aligned with the principles of respect and "doing no harm." Evaluators will explicitly seek stakeholders' voluntary, informed consent for participation for all data collection tools, including interviews with an opportunity to refuse or opt out, at any point in the process. Anonymity of participants will be ensured for all relevant data collection.

³⁵ United Nations Evaluation Group. 2020. Ethical Guidelines for Evaluation.

Annex I. Asset information

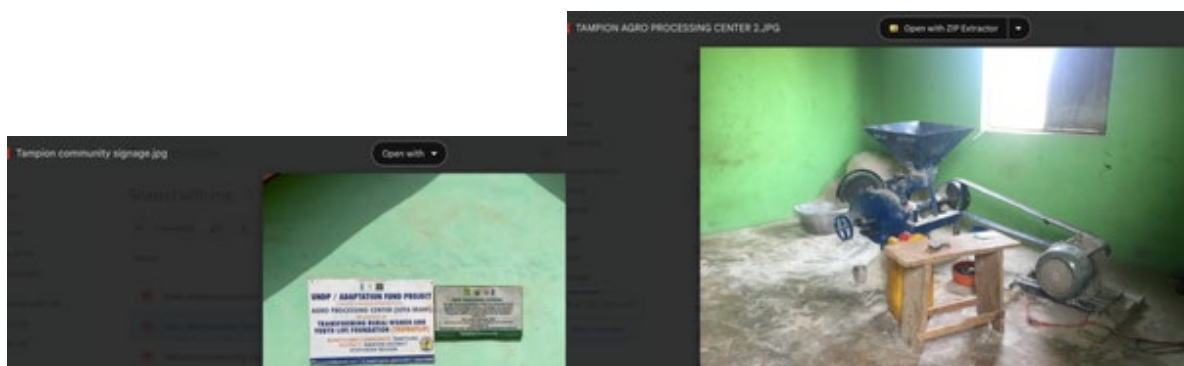
Dam Locations

Lot No.	Community / Dam Site	District / Region	GPS Location
1.	Tamalugu	Bawku Municipal (Upper East)	Lat: 9°50'40.83"N Lon: 0°43'30.68"W
2.	Adaboya	Bongo District (Upper East)	Lat: 10°54'21.67"N Lon: 0°43'49.51"W
3.	Lamboya	Bawku West (Upper East)	Lat: 10°55'12.37"N Lon: 0°31'35.98"W
4.	Kasiesa	Builsa (Upper East)	Lat: 10°30'3.87"N Lon: 1°18'40.90"W
5.	Tampion	Savelugu-Nanton (Northern)	Lat: 9°34'33.28"N Lon: 0°41'3.13"W
6.	Ko-Gbafio	Nandom (Upper West)	
7.	Goli	Nadowli (Upper West)	Lat: 10°18'43.69"N Lon: 2°38'25.40"W
8.	Kakease	Bole (Northern)	Lat: 9°13'42.71"N Lon: 2°27'21.42"W
9.	Takpo	Nadowli (Upper West)	Lat: 10°11'34.21"N Lon: 2°40'7.88"W
10.	Bugubelle	Sissala East (Upper West)	Lat: 10°34'12.74"N Lon: 1°58'58.68"W
11.	Tarso-Kulfour	Sissala East (Upper West)	Lat: 10°35'11.21"N Lon: 1°56'51.14"W
12.	Kpelewega	Bawku Municipal	Lat: 11° 2'18.84"N Lon: 0°16'30.30"W
13.	Wellembelle	Sissala East (Northern)	Lat: 10°30'54.60"N Lon: 1°57'26.94"W
14.	Ko-Bukom	Nandom (Upper West)	
15.	Zeong/Libga	Savelugu (Northern)	Lat: 9°30'25.31"N Lon: 0°44'29.44"W
16.	Dua		Lat: 10°53'24.68"N Lon: 0°46'50.18"W

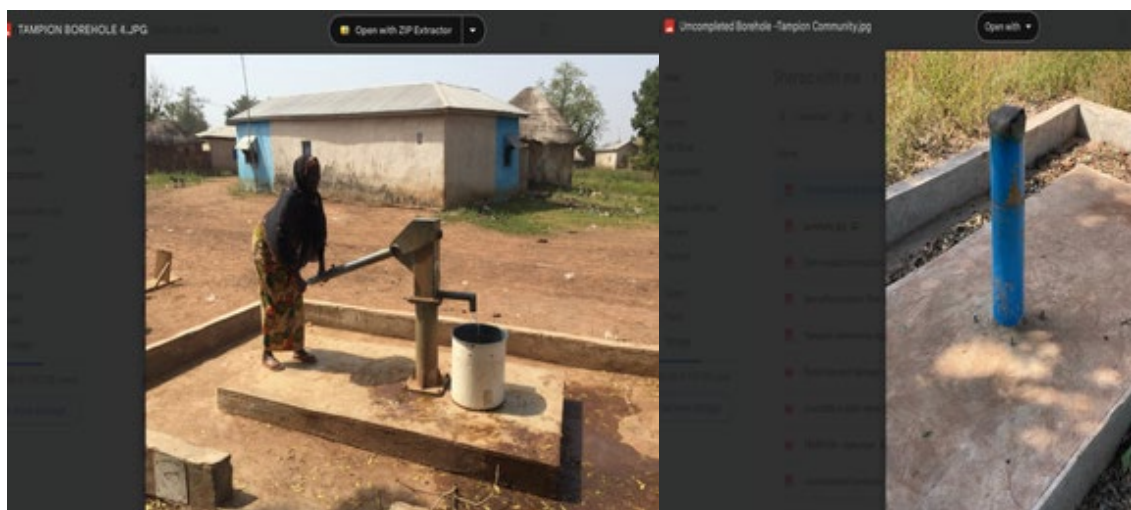
Photos of Fieldwork Sites

1) NORTHERN

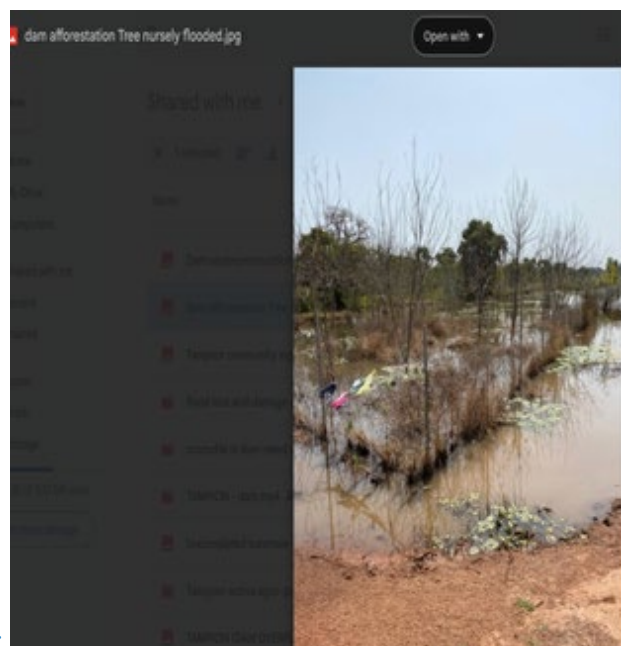
TAMPION: AGRO-PROCESSING



BOREHOLES Tampion: (1 complete, 1 uncomplete)



TAMPION: 1 flooded tree nursery & TAMPION DAM



The dam built by the project



The dam with water



Embankment concreted



Vegetable farming ongoing around dam

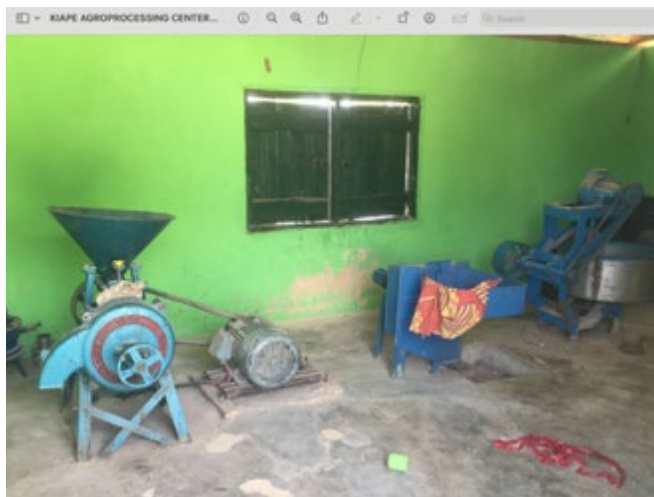
► **Mognegu I**

NO PHOTOS OF ASSETS except sign listing activities



2) SAVANNAH

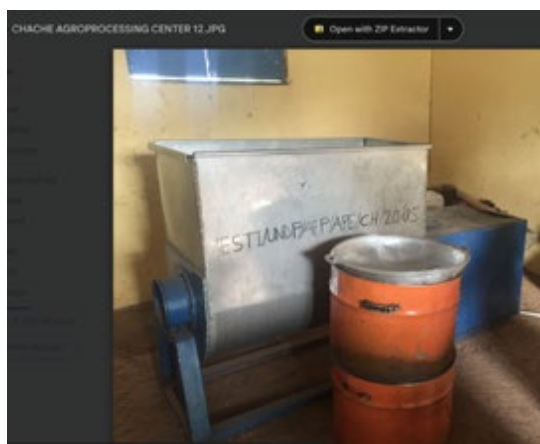
Kiape (Chiape), Agro-processing, water storage and a borehole



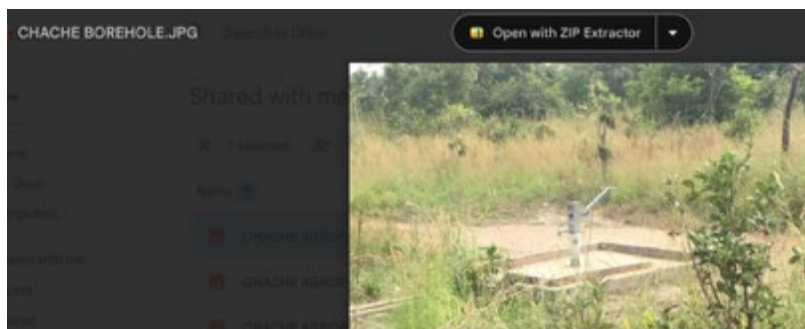
For Chache (sign Cheche) agro-processing center



More agro-processing equipment and one concrete beehive in Cheche



Plus a borehole



3) UPPER WEST

- Tumu Agro-processing facility



Back view of facility



Functional facility

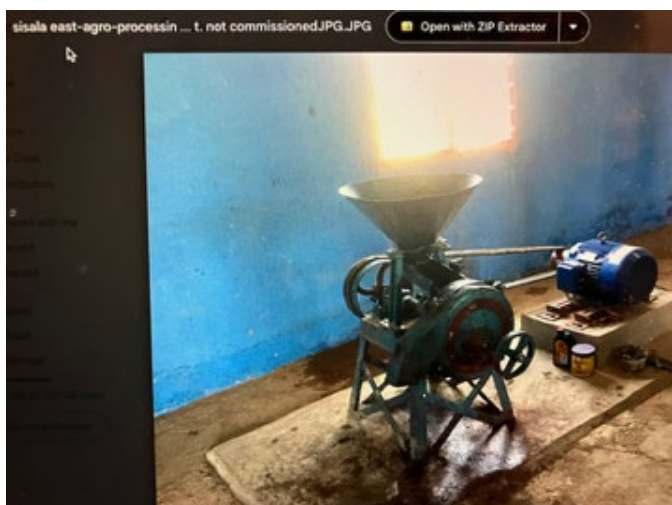


Expanded drying platform

Empty facility at Tumu (follow up)



Tumu-Agroprocessing equipment



Goli: Breached Dam

