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The World Bank

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Report No: PAD1717

INTERNATIONAL BANK FOR RECONSTRUCTION AND DEVELOPMENT

PROJECT PAPER

ON A

PROPOSED ADDITIONAL GRANT

IN THE AMOUNT OF US\$12,768,832 MILLION
FROM THE GLOBAL ENVIRONMENT FACILITY

TO THE

REPUBLIC OF GHANA

FOR A

SUSTAINABLE LAND AND WATER MANAGEMENT PROJECT

MAY 4, 2016

Environment and Natural Resources Global Practice
Africa Region

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CURRENCY EQUIVALENTS

(Exchange Rate Effective April 15, 2016)

Currency Unit = Ghana Cedi (GHS)
Ghana Cedi GHS3.82 = US\$1

FISCAL YEAR

January 1 – December 31

ABBREVIATIONS AND ACRONYMS

| | |
|--------|-------------------------------------------------------------|
| AF | Additional Financing |
| AGC | Above Ground Carbon |
| BGC | Below Ground Carbon |
| CEC | CREMA Executive Committee |
| CREMA | Community Resource Management Area |
| CRMC | Community Resource Management Committee |
| CSO | Community Service Organization |
| CWMT | Community Watershed Management Team |
| DDoA | District Department of Agriculture |
| EOP | End of Project |
| EPA | Environmental Protection Agency |
| EX-ACT | Ex-Ante Carbon-balance Tool |
| FC | Forestry Commission |
| FM | Financial Management |
| FSD | Forest Services Division [of the Forestry Commission] |
| GEF | Global Environment Facility |
| GEO | Global Environment Objective |
| GIS | Geographic Information System |
| GHG | Greenhouse Gas |
| GRR | Gbele Resource Reserve |
| GRS | Grievance Redress Service |
| IAP | Integrated Approach Pilot |
| LSC | Local Steering Committee |
| M&E | Monitoring and Evaluation |
| MESTI | Ministry of Environment, Science, Technology and Innovation |
| METT | Management Effectiveness Tracking Tool |
| MIST | Management Information System and Tracking |
| MoFA | Ministry of Food and Agriculture |
| NCB | National Competitive Bidding |
| NDVI | Normalized Difference Vegetation Index |
| NPV | Net Present Value |
| NSLMC | National Sustainable Land Management Committee |
| NSZ | Northern Savannah Zone |
| NTFP | Non-Timber Forest Product |

| | |
|------------------|-------------------------------------------------------|
| PCU | Project Coordination Unit |
| PDO | Project Development Objective |
| PES | Payment for Environmental Services |
| PIM | Project Implementation Manual |
| RPF | Resettlement Process Framework |
| SADA | Savannah Accelerated Development Authority |
| SKGK | Sanyiga Kasena Gavara Kara (CREMA) |
| SLM | Sustainable Land Management |
| SLWM | Sustainable Land and Water Management |
| SLWMP | Sustainable Land and Water Management Project |
| TCO | Technical Coordination Office |
| tCO ₂ | Tons of Carbon Dioxide |
| UNFCCC | United Nations Framework Convention on Climate Change |
| VSLA | Village Savings and Loans Association |
| WD | Wildlife Division [of the Forestry Commission] |

| | |
|----------------------------------|------------------------------|
| Regional Vice President: | Makhtar Diop |
| Country Director: | Henry G.R. Kerali |
| Senior Global Practice Director: | Paula Caballero |
| Practice Manager: | Magda Lovei |
| Task Team Leader: | Martin Fodor/Gayatri Kanungo |

GHANA
SECOND ADDITIONAL FINANCING FOR SUSTAINABLE LAND AND
WATER MANAGEMENT PROJECT

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ADDITIONAL FINANCING DATA SHEET

Ghana

*Ghana: Second Additional Financing for Sustainable Land and Water Management Project
(P157595)*

AFRICA

Environment and Natural Resources Global Practice

| Basic Information – Parent | | | | | | | |
|------------------------------------------------------------------------------------------------------------|-------------------------------|--------------------------------------------|---------------|---------------------------------------|------------------------|-----------------------|----------------------|
| Parent Project ID: | P098538 | | | Original EA Category: | B - Partial Assessment | | |
| Current Closing Date: | 28-Feb-2018 | | | | | | |
| Basic Information – Additional Financing (AF) | | | | | | | |
| Project ID: | P157595 | | | Additional Financing Type (from AUS): | Scale Up Restructuring | | |
| Regional Vice President: | Makhtar Diop | | | Proposed EA Category: | B – Partial Assessment | | |
| Country Director: | Henry G. R. Kerali | | | Expected Effectiveness Date: | 01-Jul-2016 | | |
| Senior Global Practice Director: | Paula Caballero | | | Expected Closing Date: | 30-Nov-2020 | | |
| Practice Manager/Manager: | Magda Lovei | | | Report No: | PAD1717 | | |
| Team Leader(s): | Martin Fodor, Gayatri Kanungo | | | | | | |
| Borrower | | | | | | | |
| Organization Name | Contact | Title | Telephone | Email | | | |
| Ministry of Finance | Emmanuel Adjetey | Head, World Bank Unit, Ministry of Finance | 233-244973278 | EAdjetey@mofep.gov.gh | | | |
| Project Financing Data - Parent (Sustainable Land and Water Management-P098538) (in US\$, millions) | | | | | | | |
| Key Dates | | | | | | | |
| Project | Ln/Cr/TF | Status | Approval Date | Signing Date | Effectiveness Date | Original Closing Date | Revised Closing Date |
| P098538 | TF-17090 | Effective | 17-Jun-2014 | 03-Nov-2014 | 03-Nov-2014 | 28-Feb-2018 | 28-Feb-2018 |

| P098538 | TF-95451 | Closed | 22-Feb-2010 ¹ | 09-Mar-2010 | 09-Mar-2010 | 14-Oct-2010 | 14-Oct-2011 | | |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------|-------------------------------------|--------------------------|--------------------------|-----------------------|-------------|-------------|---------------|-------------|
| P098538 | TF-97579 | Effective | 30-Nov-2010 | 20-Jan-2011 | 08-Feb-2011 | 15-Feb-2016 | 28-Feb-2018 | | |
| Disbursements | | | | | | | | | |
| Project | Ln/Cr/TF | Status | Currency | Original | Revised | Cancelled | Disbursed | Undisbursed | % Disbursed |
| P098538 | TF-17090 | Effective | US\$ | 8.75 | 8.75 | 0.00 | 2.96 | 5.79 | 33.84 |
| P098538 | TF-95451 | Closed | US\$ | 0.20 | 0.20 | 0.00 | 0.20 | 0.00 | 100.00 |
| P098538 | TF-97579 | Effective | US\$ | 8.15 | 8.15 | 0.00 | 7.98 | 0.17 | 97.95 |
| Project Financing Data - Additional Financing Ghana: Second Additional Financing for Sustainable Land and Water Management Project (P157595) (in US\$, millions) | | | | | | | | | |
| <input type="checkbox"/> | Loan | <input checked="" type="checkbox"/> | Grant | <input type="checkbox"/> | IDA Grant | | | | |
| <input type="checkbox"/> | Credit | <input type="checkbox"/> | Guarantee | <input type="checkbox"/> | Other | | | | |
| Total Project Cost: | | 14.77 | | | Total Bank Financing: | | 0.00 | | |
| Financing Gap: | | 0.00 | | | | | | | |
| Financing Source – Additional Financing (AF) | | | | | | | | Amount | |
| Borrower | | | | | | | | 2.00 | |
| Global Environment Facility (GEF) | | | | | | | | 12.77 | |
| Total | | | | | | | | 14.77 | |
| Policy Waivers | | | | | | | | | |
| Does the project depart from the CAS in content or in other significant respects? | | | | | | | No | | |
| Explanation | | | | | | | | | |
| Does the project require any policy waiver(s)? | | | | | | | No | | |
| Explanation | | | | | | | | | |
| Team Composition | | | | | | | | | |
| Bank Staff | | | | | | | | | |
| Name | Role | Title | Specialization | Unit | | | | | |
| Martin Fodor | Team Leader (ADM Responsible) | Senior Environmental Specialist | Team Leader | GEN01 | | | | | |
| Gayatri Kanungo | Team Leader | Senior Environmental Specialist | Team Leader | GEN01 | | | | | |

¹ Preparatory grant.

| | | | | |
|-------------------------------------------|------------------------------------------|-------------------------------------------|--------------------------------------|-------|
| Charles John Aryee Ashong | Procurement Specialist (ADM Responsible) | Senior Procurement Specialist | Procurement Specialist | GGO01 |
| Robert Wallace DeGraft-Hanson | Financial Management Specialist | Sr Financial Management Specialist | Financial Management Specialist | GGO31 |
| Ana Isabel Dos Reis E Sousa Piedade Abreu | Safeguards Specialist | Consultant | Environmental Safeguards Specialist | GEN01 |
| Anders Jensen | Team Member | Senior Monitoring & Evaluation Specialist | Monitoring and Evaluation Specialist | GEN05 |
| Ayishetu Terewina | Team Member | Program Assistant | Program Assistant | AFCW1 |
| Charity Boafo-Portuphy | Team Member | Program Assistant | Program Assistant | AFCW1 |
| Edith Ruguru Mwenda | Counsel | Senior Counsel | Country Lawyer | LEGAM |
| Gloria Malia Mahama | Safeguards Specialist | Social Development Specialist | Social Safeguards Specialist | GSU01 |
| Johannes Georges Pius Jansen | Team Member | Senior Agriculture Economist | Agriculture Specialist | GFA01 |
| Lesya Verheijen | Team Member | Consultant | Operations Officer | GENDR |
| Luis M. Schwarz | Team Member | Sr. Finance Officer | Sr. Finance Officer | WFALA |
| Lydia Sam | Team Member | Procurement Assistant | Procurement Assistant | AFCW1 |
| Maiada Mahmoud Abdel Fattah Kassem | Team Member | Finance Officer | Finance Officer | WFALA |
| Paul J. Christian | Team Member | Economist | Impact Evaluation Specialist | DECIE |
| Stefano P. Pagiola | Team Member | Senior Environmental Specialist | PES Specialist | GENGE |
| Yesmeana N. Butler | Team Member | Program Assistant | Program Assistant | GEN01 |

Extended Team

| Name | Title | Location |
|------|-------|----------|
|------|-------|----------|

Locations

| Country | First Administrative Division | Location | Planned | Actual | Comments |
|---------|-------------------------------|-------------------|---------|--------|-------------------------------|
| Ghana | Upper West | Upper West Region | X | X | Sissala West District |
| Ghana | Upper West | Upper West Region | X | X | Daffiama Bussie Issa District |
| Ghana | Upper East | Upper East Region | X | X | Talensi District |

| | | | | | |
|---------------------------------------------------------------|---------------------------------------------------------|-------------------|--------------------------|--------------------------|-------------------------------|
| Ghana | Upper East | Upper East Region | X | X | Kassena Nankana West District |
| Ghana | Northern | Northern Region | X | X | Mamprugu Moaduri District |
| Ghana | Northern | Northern Region | X | | Sawla-Tuna-Kalba District |
| Ghana | Northern | Northern Region | X | | West Gonja District |
| Ghana | Upper West Region | Wa East | X | X | |
| Ghana | Upper West Region | Sissala East | X | X | |
| Ghana | Upper East Region | Builsa | X | X | Builsa South District |
| Ghana | Upper East Region | Bawku West | X | X | |
| Ghana | Northern Region | West Mamprusi | X | X | |
| Institutional Data | | | | | |
| Parent (Sustainable Land and Water Management-P098538) | | | | | |
| Practice Area (Lead) | | | | | |
| Environment & Natural Resources | | | | | |
| Contributing Practice Areas | | | | | |
| | | | | | |
| Cross Cutting Topics | | | | | |
| [] Climate Change | | | | | |
| [] Fragile, Conflict & Violence | | | | | |
| [] Gender | | | | | |
| [X] Jobs | | | | | |
| [] Public Private Partnership | | | | | |
| Sectors / Climate Change | | | | | |
| Sector (Maximum 5 and total % must equal 100) | | | | | |
| Major Sector | Sector | % | Adaptation Co-benefits % | Mitigation Co-benefits % | |
| Agriculture, fishing, and forestry | Agricultural extension and research | 35 | | | |
| Agriculture, fishing, and forestry | General agriculture, fishing and forestry sector | 26 | | | |
| Public Administration, Law, and Justice | Public administration-Agriculture, fishing and forestry | 20 | | | |
| Public Administration, Law, and | Public administration- | 13 | | | |

| | | | | |
|--------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------|-----|--------------------------|--------------------------|
| Justice | Water, sanitation and flood protection | | | |
| Information and communications | Information technology | 6 | | |
| Total | | 100 | | |
| Themes | | | | |
| Theme (Maximum 5 and total % must equal 100) | | | | |
| Major theme | Theme | % | | |
| Environment and natural resources management | Land administration and management | 54 | | |
| Environment and natural resources management | Water resource management | 35 | | |
| Environment and natural resources management | Biodiversity | 11 | | |
| Total | | 100 | | |
| Additional Financing Ghana: Second Additional Financing for Sustainable Land and Water Management Project (P157595) | | | | |
| Practice Area (Lead) | | | | |
| Environment & Natural Resources | | | | |
| Contributing Practice Areas | | | | |
| Cross Cutting Topics | | | | |
| [X] Climate Change | | | | |
| [] Fragile, Conflict & Violence | | | | |
| [] Gender | | | | |
| [X] Jobs | | | | |
| [] Public Private Partnership | | | | |
| Sectors / Climate Change | | | | |
| Sector (Maximum 5 and total % must equal 100) | | | | |
| Major Sector | Sector | % | Adaptation Co-benefits % | Mitigation Co-benefits % |
| Agriculture, fishing, and forestry | Agricultural extension and research | 50 | 100 | |
| Agriculture, fishing, and forestry | General agriculture, fishing and forestry sector | 40 | 100 | |
| Public Administration, Law, and Justice | Public administration- Water, sanitation and flood protection | 10 | 100 | |
| Total | | 100 | | |
| <input type="checkbox"/> I certify that there is no Adaptation and Mitigation Climate Change Co-benefits information applicable to this project. | | | | |

| Green House Gas Accounting | | | |
|---------------------------------------------------------------------------|-----------------|------------------------------------|----------------|
| Net Emissions | -45,411,1360.00 | Gross Emissions | -13,939,612.00 |
| Themes | | | |
| Theme (Maximum 5 and total % must equal 100) | | | |
| Major theme | | Theme | % |
| Environment and natural resources management | | Land administration and management | 60 |
| Environment and natural resources management | | Water resource management | 25 |
| Environment and natural resources management | | Biodiversity | 15 |
| Total | | | 100 |
| Consultants (Will be disclosed in the Monthly Operational Summary) | | | |
| Consultants Required? Consultants will be required | | | |

I. Introduction

1. This Project Paper seeks the approval of the Executive Directors (a) to provide an additional grant in an amount of US\$12,768,832 from the Global Environment Facility (GEF) under Ghana's GEF-6 allocation to the Ghana Sustainable Land and Water Management Project (SLWMP) P098538, TF0A2276 and (b) to restructure the project to revise the Results Framework. The project closing date will be extended by 2 years and 9 months (to November 30, 2020), bringing the total project duration to 10 years.

2. The proposed Additional Financing (AF) grant will help finance the costs associated with scaled-up activities to enhance the impact of a well-performing project, in particular with implementation on a larger geographic scale and expanding the range of sustainable land and water management (SLWM) interventions through the following activities: (a) scaling up the area under the SLWM² interventions from the original 6,000 ha to 15,000 ha;³ (b) extend project activities to two new districts in the Northern Region,⁴ with a focus on root and tuber cultivation, in addition to expanding the scope of project activities in the current 10 districts; (c) promote various components of the agricultural value chain through postharvest management and marketing support; (d) promote community riparian vegetation restoration; (e) support use of non-timber forest products (NTFPs); and (f) scale up biodiversity management in production landscapes in the Western Wildlife Corridor by supporting implementation of management plans in Community Resource Management Areas (CREMAs) and providing support to the Gbele Resource Reserve (GRR). The activities are based on the landscape approach in Upper Ghana's savannah, which is characterized by vulnerability, low climate resilience, and high poverty. They will contribute to enhanced food security, carbon sequestration, and increased resilience of the beneficiary communities to climatic variability.

3. **Partnership arrangements.** Under the current GEF-6 replenishment, Ghana is participating in a GEF Integrated Approach Pilot (IAP) program on Fostering Sustainability and Resilience for Food Security in Sub-Saharan Africa (coordinated by the International Fund for Agricultural Development in 12 countries) that seeks to leverage existing investments in smallholder agriculture to safeguard ecosystem services in the production systems. This IAP is a regional umbrella program under which the proposed AF is one of the child projects. The goal of the IAP-Food Security is to increase the sustainability and resilience of food production systems and enhance food security in Sub-Saharan Africa. The IAP objective is to support countries in target geographies for integrating priorities to safeguard and maintain ecosystem services into investments improving smallholder agriculture and food value chains. A regional knowledge hub will be established under the IAP for providing technical assistance and capacity support to

² The definition of SLWM is based on TerrAfrica's definition: the adoption of land use systems that, through appropriate management practices, enables land users to maximize the economic and social benefits from the land while maintaining or enhancing the ecological support functions of the land resources.

³ This is higher than the originally envisaged target for AF2 (10,000 ha).

⁴ West Gonja District and Sawla-Tuna-Kalba District, expanding the number of beneficiary districts from 10 to 12.

country teams—it is expected that the SLWMP team will benefit from this hub’s support. In addition, partnering with the Japanese Social Development Fund is under consideration to mobilize grant resources to support innovative community-based activities on the fringes of the Mole National Park.

II. Background and Rationale for Additional Financing in the amount of US\$12,768,832

4. **Background.** The SWLMP is currently financed by the GEF grants⁵ of US\$16.9 million and in-kind contribution by the Government of Ghana equivalent to US\$12.3 million. The original grant became effective on February 8, 2011; the first AF grant became effective on November 3, 2014. The current closing date is February 28, 2018.

5. **Project Development Objective (PDO)/Global Environment Objective (GEO) and components.** The PDO/GEO is to expand the area under the SLWM practices in selected watersheds. The project has three components: (a) Capacity Building for Integrated Spatial Planning (US\$0.94 million); (b) Land and Water Management (US\$14.46 million); and (c) Project Management and Coordination (US\$1.49 million).

6. **Key PDO indicators.** Current key PDO indicators are (a) land area where sustainable land and water management practices have been adopted as a result of the project; (b) land users adopting sustainable land management (SLM) practices as a result of the project; (c) management effectiveness according to the Management Effectiveness Tracking Tool (METT)⁶ score in the Gbele Resource Reserve and Wuru Kayero, Sumboru Bechausa, Wahabu Wiasi⁷, and Gbele Mole Corridor Sites; and (d) direct project beneficiaries.

7. **Performance.** Progress toward achievement of the PDO is rated Satisfactory. Implementation progress is rated Moderately Satisfactory overall based on the satisfactory progress in the key areas with delays in others, including moderate shortcomings in financial management (FM) and procurement.

8. **Key achievements.** The project achievements (under PDO indicators) include a total of 9,388 land users adopting the SLWM practices covering an area of 3,090 ha; improved management effectiveness in the GRR and CREMA Site 1; and a total of 24,224 persons benefitting from the project interventions (of which 40 percent women) (see annex 7 for detailed information on project achievements to date).

⁵ Original grant of US\$8.15 million approved on November 30, 2010 and the first AF grant of US\$8.75 million approved on June 17, 2014.

⁶ The METT score is widely used by the World Bank, GEF, and other organizations to assess how effectively protected areas are being managed. It was designed as one of a series of management effectiveness assessment tools around the World Commission on Protected Areas Framework. It comprises a detailed questionnaire (30 questions) that covers a broad range of management effectiveness issues, with the total score for each protected area ranging from 0 to about 100.

⁷ Split into two CREMA sites, as per revised Results Framework, see annex 1.

9. **Rationale for AF.** The AF grant will help capture the efficiencies and economies of scale, by expanding the SLWM in the Northern Savannah Zone (NSZ) of Ghana under a landscape approach and enriching the original menu of SLWM interventions within the agricultural landscape and the corridor areas. It will expand the implementation of biodiversity-friendly activities in the CREMA areas within the Western Wildlife Corridor. This expansion through integrating the various land uses will improve contiguity of communities along the target sub-watershed rivers (Kulpawn, Sisilli, and Red Volta); amplify benefits from rangeland management; and optimize project impacts and benefits to communities within the NSZ landscape. The AF grant will enhance resilient agricultural systems through crop diversification and food value chain upgrading to include postharvest management activities.

10. **Building on successful implementation.** The proposed AF will build upon the existing systems, structures, and capacity developed under the SLWMP to improve food security using the integrated landscape/ecosystems approach. The proposed AF aims to expand the SLWM practices for enhanced environmental benefits and improved food security and scale up the target area coverage that will provide adequate scale to demonstrate transformative impacts at the watershed level. Under the biodiversity window, the proposed AF will finance implementation of CREMA management plans, developed with the current project support.

11. **Mainstreamed implementation.** The project's implementation is fully mainstreamed into the government system, with the project managed and implemented by the existing government structures coordinated by the Ministry of Environment, Science, Technology and Innovation (MESTI). The mainstreamed arrangements are favorable with regard to cost-effectiveness and sustainability, compared to the temporary project implementation units. Under the AF, further devolution of implementation responsibilities to the lower levels, that is, regional and district, will be supported.

12. **High demand and absorptive capacity.** Notably, there is high demand for project support to the SLWM and CREMA activities among project beneficiary communities. Demand exceeds currently available funding about twofold, demonstrating both the ownership and high absorptive capacity. The AF will help address these issues by funding scaling-up activities in the beneficiary communities.

13. **Key AF outcomes.** Key outcomes for the proposed AF include expanded adoption of integrated land and water management practices by target communities, improved sustained flow of environmental services in agroecosystems, and improved management of existing protected areas and of areas outside protected estate in the Western Wildlife Corridor. The AF activities are mostly expanding the scale of the ongoing activities with an increased focus on the food value chain. These activities will help reverse land degradation, enhance maintenance of biodiversity, increase resilience and food security of rural livelihoods in target watersheds, and contribute towards achievement of the land degradation neutrality targets (as stated in the Sustainable Development Goal 15.3) in the intervention areas. In addition, the environmental services provided by the project communities through watershed management, soil and water

conservation, good farming practices, and biodiversity conservation contribute to environmental sustainability and improve natural capital assets at the local level.

14. **Consistency with World Bank Group Goals and Country Partnership Strategy.** This proposed operation is fully consistent with the World Bank Group's corporate goals – to end extreme poverty and to promote shared prosperity with environmental, social, and fiscal sustainability. The project activities are also fully consistent with the current Country Partnership Strategy 2013–2016 as they specifically respond to the priorities under the Country Partnership Strategy Pillar 1 on natural resource management and environmental governance, which highlights the importance of addressing environmental and land degradation due to its negative impact on economic growth, as well as Pillar 2 on improving competitiveness and job creation, to which the project contributes through improved community-driven management of natural resource-based livelihoods. The project complements poverty reduction efforts supported by other Bank-financed projects in Northern Ghana, the poorest and least resilient part of the country.

15. **Consistency with government priorities.** The project's priorities are aligned with Ghana's vision of modernizing its agricultural sector to improve food security in an environmentally sustainable manner with a focus on smallholder farmers, particularly in the most fragile ecosystems. The project is also consistent with the Government of Ghana Strategic Investment Framework for Sustainable Land Management 2011–2025, supported through TerrAfrica. The project activities are fully consistent with the country-determined adaptation and mitigation actions included in Ghana's Third National Communication to the United Nations Framework Convention on Climate Change (UNFCCC) (July 2015); Ghana Technology Action Plan (dated February 2013); and Ghana's commitments under its Intended Nationally Determined Contributions submitted to the UNFCCC in October 2015. Project support will also contribute to Ghana's progress on the 2020 Aichi Biodiversity targets⁸ under Strategic Goal A (Address the underlying causes of biodiversity loss by mainstreaming biodiversity across government and society); Strategic Goal B (Reduce the direct pressures on biodiversity and promote sustainable use); and Strategic Goal D (Enhance the benefits to all from biodiversity and ecosystem services).

16. **Consistency with IAP design principles.** The proposed AF is fully consistent with the IAP design and focus on resilience, knowledge, and gender.

- **Resilience.** The project support will contribute greatly to strengthening resilience of participating households—this will be achieved, among others, through strengthening the asset base of rural farmers (including natural capital through improved soil fertility and financial capital through increased gains as a result of enhanced yields and value addition); increasing the diversity of smallholder farming systems (through the promotion of mixed cropping-livestock systems and diversification of crops including a focus on

⁸ Under the Convention on Biological Diversity.

root and tuber crops); promoting equity and inclusion of vulnerable and marginal groups (especially women); enhancing local institutions (through establishment of community watershed management teams (CWMTs) and support to Village Savings and Loans Association (VSLA); and improving the availability of and smallholder access to climate information (through awareness and training/demonstration activities and knowledge exchanges).

- **Knowledge management.** Effective knowledge management is a lynchpin of the project to achieving sustainable scale-up of integrated natural resources management approaches at the community level. Lessons and experiences of implementation are being and will continue to be disseminated and shared through regular events (in country) and through South-South knowledge exchanges (with other countries under the IAP); knowledge exchange will also happen through a feedback loop to the regional knowledge hub under the IAP.
- **Gender.** The project’s approach to mainstreaming gender consideration is fully consistent with the GEF Policy on Gender Mainstreaming and the World Bank Group’s Gender Strategy⁹. The project places particular emphasis on greater involvement of women in participation in the planning and decision-making structures at community level (CWMTs and Community Resource Management Committees (CRMC) and in implementation of subprojects. The PDO indicator on direct project beneficiaries is disaggregated to track percentage of women; the same applies to two Intermediate Results indicators in the project’s results framework.

17. **Strong multi-stakeholder platforms.** Establishment of robust multi-stakeholder platforms at the national, district, and community levels is a key to the project’s sustainability. This approach helps engage all stakeholders through strengthening of institutional frameworks for sustainability and resilience. At the national level, the project will engage the National Sustainable Land Management Committee (NSLMC), which is responsible for providing overall guidance for implementation of the Ghana Strategic Investment Framework [for SLM].¹⁰ The NSLMC also ensures synergies with other programs, initiatives, institutions, and partners on the ground to enhance participation in the consultative process. At the district level, the project support will help establish District Watershed Management Committees in the two new target districts, in addition

⁹ World Bank Group. 2015. “World Bank Group Gender Strategy (FY2016–23): Gender Equality, Poverty Reduction, and Inclusive Growth.”

¹⁰ The NSLMC was established in 2007 to promote the SLWM agenda at the policy and strategic level. The Committee is chaired by the Environment Protection Agency and includes representation from MoFA, Forestry Commission (FC), Water Resources Commission, Energy Commission, National Development Planning Commission, Ministry of Finance and Economic Planning, and Friends of the Nation, Ghana. It prepared the Ghana Strategic Investment Framework [for SLM] through support from the TerrAfrica partnership and has actively engaged with other regional partners and institutions contributing to the SLM agenda.

to providing further support and capacity to the existing 10 District Watershed Management Committees. At the community level, CWMTs will be established and strengthened to empower communities to make informed choices on sustainable land and natural resources. In the CREMA communities, similar structures will be supported for community-level decision making on common resource pools (CRMCs), in addition to the CREMA Executive Committees (CECs) (one for each CREMA). Establishment of community-level governance structures will be tracked through a new indicator under the project results framework.

18. **Project risks.** The overall project risk is Moderate (see table 1). Implementation risks are mitigated by the existing well-established institutional implementation structures under the SLWMP.

19. **Political and governance.** The government’s vision for reform and improved management of the sector is sound but complex and involves multiple levels of government and society which need to work together to address key priorities. The project will need to continue to deliver tangible results to communities to sustain support for the overall change process. There is a risk of attempts to politicize natural resource use and allocation of project resources at the local level, especially with the upcoming presidential elections in November 2016.

- *Mitigation measures.* The issues of governance, vested interests, and distorted incentives will be addressed by using technical criteria and technically sound established institutional frameworks for making decisions on allocation of project support at the community level.

Table 1. Systematic Operations Risk-Rating Tool

| Risk Category | Rating |
|--------------------------------------------------------------|-----------------|
| Political and Governance | Substantial |
| Macroeconomic | Substantial |
| Sector Strategies and Policies | Low |
| Technical Design of Project or Program | Moderate |
| Institutional Capacity for Implementation and Sustainability | Moderate |
| Fiduciary | Substantial |
| Environment and Social | Low |
| Stakeholders | Moderate |
| Other | – |
| Overall | Moderate |

20. **Macroeconomic.** Ghana is one of the most stable economies in West Africa but it suffers from budget deficit ballooning during electoral cycles. Macroeconomic shocks and challenges continue to weigh on economic growth, which has slowed down

significantly since 2013. Inflation remains high and may affect prices of inputs provided by the project.

- *Mitigation measures.* No mitigation measures for macroeconomic risks are proposed under the project as risks are external to the project and beyond its scope. The macroeconomic situation will, however, be monitored for possible effects on the project.

21. **Fiduciary - procurement.** The procurement risk is rated Substantial due to (a) poor records keeping, with lack of regular update and reporting on procurement planning; (b) delays in procurement implementation, processing, and submitting procurement documents to Bank—slow turnaround; and (c) poor concentration and insufficient experience in the use of Bank procurement procedures and systems. In addition, the risk rating is heightened due to involvement of a number of different agencies in implementation (at different levels—both national and subnational) as well as a significant increase in financing.

- *Mitigation measures.* The following measures will be in place to mitigate the procurement risk: (a) the Bank will regularly monitor implementation of the post procurement review recommended actions on records keeping, with regular update of the Procurement Plan until project closure and insistence of quarterly procurement progress reporting to the Bank; (b) the project coordination unit (PCU) / Implementing Agencies should ensure prompt submission of procurement documents and response to Bank comments to the Bank and the PCU to apply due diligence and effort in ensuring documents of very good quality are sent to the Bank to reduce review time; (c) the PCU / Implementing Agency will put into practice the knowledge acquired through capacity building offered by the Bank procurement team through the monthly procurement clinics as well as the hands-on and face-to-face discussions on procurement issues; (d) the PCU will engage a short-term procurement advisor to provide on-the-job training and support to PCU/Implementing Agency procurement personnel; and (e) the project will support Bank-specific procurement training at a recognized learning institution. The project must ensure dedication and concentration of the project procurement officer to be in full compliance with the Grant Agreement and the Bank Procurement Guidelines.

III. Proposed Changes

Summary of Proposed Changes

The proposed changes are principally related to addition of financing for significant scaling-up of project activities in the expanded project area (including two new districts).

The proposed changes relate to (a) updating the results framework - updating target values for existing indicators, introducing new indicators to capture new AF2 activities and to meet reporting requirements under the IAP, and adding a project-appropriate citizen engagement indicator; (b) increasing component costs commensurate with the AF; and (c) extending the project closing date by 2 years and 9 months, to November

| | |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------|
| 30, 2020 (extending total project duration to 10 years), including extension of the first AF grant. | |
| Change in Implementing Agency | Yes [] No [X] |
| Change in Project's Development Objectives | Yes [] No [X] |
| Change in Results Framework | Yes [X] No [] |
| Change in Safeguard Policies Triggered | Yes [] No [X] |
| Change of EA category | Yes [] No [X] |
| Other Changes to Safeguards | Yes [] No [X] |
| Change in Legal Covenants | Yes [] No [X] |
| Change in Loan Closing Date(s) | Yes [X] No [] |
| Cancellations Proposed | Yes [] No [X] |
| Change in Disbursement Arrangements | Yes [] No [X] |
| Reallocation between Disbursement Categories | Yes [] No [X] |
| Change in Disbursement Estimates | Yes [X] No [] |
| Change to Components and Cost | Yes [X] No [] |
| Change in Institutional Arrangements | Yes [] No [X] |
| Change in Financial Management | Yes [] No [X] |
| Change in Procurement | Yes [] No [X] |
| Change in Implementation Schedule | Yes [X] No [] |
| Other Change(s) | Yes [] No [X] |
| Development Objective/Results | |
| Project's Development Objectives | |
| Original PDO The PDO is to (a) demonstrate improved sustainable land and water management practices aimed at reducing land degradation and enhancing maintenance of biodiversity in selected micro-watersheds and (b) strengthen spatial planning for identification of linked watershed investments in the Northern Savannah region of Ghana. | |
| Current PDO ¹¹ To expand the area under sustainable land and water management practices in selected watersheds. | |
| Change in Results Framework | |
| Explanation: The existing key performance indicators that measure the achievement of the PDOs are mostly retained; | |

¹¹ Approved as part of Level I Restructuring in June 2014.

however, some of their target values are revised (increased) to reflect scale-up of activities. Several new indicators are introduced to capture new AF2 activities and to meet reporting requirements under the IAP. In addition, a project-appropriate citizen engagement indicator is added to the results framework. In total, eight indicators are revised (changes in target values), one indicator is dropped, and five new indicators are added.

| Risk | |
|-----------------------------------------------------------------|----------------------------|
| Risk Category | Rating (H, S, M, L) |
| 1. Political and Governance | Substantial |
| 2. Macroeconomic | Substantial |
| 3. Sector Strategies and Policies | Low |
| 4. Technical Design of Project or Program | Moderate |
| 5. Institutional Capacity for Implementation and Sustainability | Moderate |
| 6. Fiduciary | Substantial |
| 7. Environment and Social | Low |
| 8. Stakeholders | Moderate |
| 9. Other | |
| OVERALL | Moderate |

| Finance | |
|--------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------|
| Loan Closing Date - Additional Financing (Ghana: Second Additional Financing for Sustainable Land and Water Management Project - P157595) | |
| Source of Funds | Proposed Additional Financing Loan Closing Date |
| Global Environment Facility (GEF) | 30-Nov-2020 |

Loan Closing Date(s) - Parent (Sustainable Land and Water Management - P098538)

Explanation:

The closing date of the first AF grant (TF17090) is extended by 2 years and 9 months, to November 30, 2020, to synchronize it with the second AF closing date. The closing date of the original grant (TF97579) remains unchanged.

| Ln/Cr/TF | Status | Original Closing Date | Current Closing Date | Proposed Closing Date | Previous Closing Date(s) |
|-----------------|---------------|------------------------------|-----------------------------|------------------------------|---------------------------------|
| TF-17090 | Effective | 28-Feb-2018 | 28-Feb-2018 | 30-Nov-2020 | 28-Feb-2018 |
| TF-95451 | Closed | 14-Oct-2010 | 14-Oct-2011 | | 14-Oct-2011, 03-Feb-2012 |
| TF-97579 | Effective | 15-Feb-2016 | 28-Feb-2018 | 28-Feb-2018 | 15-Feb-2016, 28-Feb-2018 |

Change in Disbursement Estimates (including all sources of Financing)

Explanation:

The disbursement schedule is revised to reflect implementation of activities under the second AF (rounded up to US\$12.77 million) and a change in disbursements for the AF1 grant (US\$8.75 million) (detailed breakdown in annex 4). The first grant (TF97579) is 97 percent disbursed and is not included in the revised disbursement schedule.

| Expected Disbursements (in US\$, millions) (including all Sources of Financing) | | | | | | |
|----------------------------------------------------------------------------------------|------|------|------|-------|-------|-------|
| Fiscal Year | 2016 | 2017 | 2018 | 2019 | 2020 | 2021 |
| Annual | 1.8 | 3.48 | 1.71 | 3.09 | 3.90 | 4.78 |
| Cumulative | 1.8 | 5.28 | 6.99 | 10.08 | 13.98 | 18.76 |

Allocations - Additional Financing (Ghana: Second Additional Financing for Sustainable Land and Water Management Project - P157595)

| Source of Fund | Currency | Category of Expenditure | Allocation | Disbursement % (Type Total) |
|----------------|----------|--------------------------------------------------------------------------------------------------------------------------|---------------|-----------------------------|
| | | | Proposed | Proposed |
| GEFU | US\$ | Category 1 - Goods, Consultant Services, Training, Incremental Operating Costs - Part A | 0.00 | 100.00 |
| GEFU | US\$ | Category 2 - Goods, Works, Consultant and Non-Consultant Services, Training, Incremental Operating Costs - Part B1, 3, 4 | 5,649,397.00 | 100.00 |
| GEFU | US\$ | Category 3 - Goods and Works - Part B2 | 6,479,435.00 | 100.00 |
| GEFU | US\$ | Category 4 - Goods, Consultant Services, Incremental Operating Costs - Part C | 640,000.00 | 100.00 |
| Total | | | 12,768,832.00 | |

Components

Change to Components and Cost

| Explanation: The original components remain; changes pertain to increase in financing to Components 2 and 3. | | | | |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------|-------------------------------|--------------------------------|-----------|
| Current Component Name | Proposed Component Name | Current Cost (US\$, millions) | Proposed Cost (US\$, millions) | Action |
| Capacity Building for Integrated Spatial Planning | | 0.94 | 0.94 | No Change |
| Land and Water Management | | 14.46 | 26.59 | Revised |
| Project Management and Coordination | | 1.49 | 2.14 | Revised |
| | Total | 16.90 | 29.67 | |
| Change in Implementation Schedule | | | | |
| Explanation: The revised implementation schedule reflects the time needed to implement proposed additional and scaled-up activities under the AF2 through November 30, 2020. | | | | |
| IV. Appraisal Summary | | | | |
| Economic and Financial Analysis | | | | |
| Explanation: AF2 interventions are the same as in the original project, with addition of postharvest support and new tuber and root crops; therefore, the economic analysis follows similar terms. The economic analysis was done for the original project in 2010, including calculating the internal rates of returns (which were found to be mostly positive). In addition, the project commissioned a study on 'Feasibility of Sustaining SLWM Activities through PES Market Mechanism (October 2015)', which also included a cost and benefit analysis for seven common SLWM technologies for desired ESs in both the short and long term. The SLWM technologies with potential ES in the short term include composting and crop rotation, and those with potential ES in the long term include tree growing (for example, cassia) and agroforestry (for example, mango with arable crops). Rationale for Public Sector Financing. The Government has undertaken measures to combat desertification and poverty and improve food security in Northern Ghana over the latest period. The project will strengthen the enabling environment (including systems and institutional capacities) for improved sustainable land management. Moreover, the project investment will result in public goods of global, national and local importance that justify the allocation of public services and financing. The World Bank's Comparative Advantage and Value Added. The World Bank has been supporting environmental projects in the Northern Savannah for over a decade. During these years, the Bank has provided technical and policy assistance through the Northern Savannah Biodiversity Project and the original SLWMP engagement since 2010. The World Bank has supported the Government of Ghana's long standing commitment to poverty alleviation in Northern Ghana through a multitude of projects in different sectors. For this project in particular, a multi sector task team with specialists from the agriculture and environment sectors has been assisting the Government at various stages of the project cycle. The project has been receiving targeted support from the Bank's team on PES and on impact evaluation. Considering that the project follows a framework approach, with few specific investments identified in | | | | |

advance, a full ex ante economic analysis is not considered practical. However,

- International experience suggests that the SLWM technologies bring substantial long-term productivity gains;
- Investments in capacity building will be particularly cost-effective if the project continues catalyzing larger SLWM investments and broader uptake in Northern Ghana; and
- AF2 interventions will rely on capacity-building efforts from the earlier phase of the project to reach scale and greater development targets.

With regard to the agricultural productivity increases, results from demonstrations and farmer fields show increases of, on average, between 20 and 30 percent from the ongoing SLWM interventions. Some technologies such as intercropping and use of compost and bunding have resulted in productivity increases as much as 30 to 50 percent in the project districts. Experience from the Canada-funded Ghana Environmental Management Project SLWM interventions in the Northern Savannah show similar results.

While CREMAs initiated under the previous phase are still, as anticipated, at the development phase, previous studies suggest that in the corridor areas they will eventually be financially viable under a variety of small-scale sustainable commercial hunting and fishing uses. Hence, estimates of potential annual revenues for two corridor areas ranged from US\$12,000 to US\$18,000 per village, compared to annual patrolling and management costs of around US\$1,000 per village. These are long-term projections based on restoration of wildlife populations and establishment of well-managed sport hunting enterprises. These levels of income will not be achieved during the life-span of the project, but milestones toward eventual full sustainability can still be set for the project itself.

Additionally, an independent impact evaluation (IE) is supported to, among others, assess the achievement of the full package of SLWMP interventions on household outcomes (socioeconomic well-being and food security).

Technical Analysis

Explanation:

The technical design is appropriate to the setting. The SLWM technologies employed, including the new-to-project tuber and root crops, are largely tested and well understood in Ghana. The project design places more emphasis on innovation and experimentation in incentives and extension systems for supporting the implementation of the technologies. Further focus of the AF2 is specifically on ensuring better sustainability (by supporting postharvest management improvements as part of the value chain work) and further reducing pressures on common pool resources (by providing additional support to nondestructive uses of forests, including through use of the NTFPs). The design of the proposed activities in the Western Wildlife Corridor areas has benefited from earlier work carried out under the Northern Savannah Biodiversity Conservation Project as well as from experience gained to date under the ongoing SLWMP. The SLWMP to date supported CREMA communities in developing CREMA management plans, and AF2 is designed to support the implementation of these management plans. Payment for Environmental Services (PES) approaches have been successful elsewhere in the world, and here a conceptual framework based on PES is adapted to local conditions and combined with support to overcome capacity limitations of both farmers and government extension services.

In addition, the IE will test mechanisms to enhance the long-run sustainability of the SLWMP and optimal implementation of PES.

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| |
| Social Analysis |
| <p>Explanation:</p> <p>The project is expected to positively affect target farming and CREMA communities through improved agricultural productivity, expanded livelihood opportunities, increased resilience to climate change, and enhanced flow of ESs (for example, through improved water or carbon sequestration services). Participatory, consensus-based, and community-driven approach to activities on the ground mitigates against potential social risks since decisions on land use in a community are arrived at by an entire community as part of the micro-watershed planning process. Participation of women will be given emphasis to ensure the gender dimension particularly at the local community level. Potential for involuntary resettlement is low; however, a Resettlement Process Framework (RPF) prepared, consulted upon, and disclosed for use by the original project will continue to be applied to manage potential resettlement. The project activities' focus on food security will enhance social capital in participating communities.</p> |
| Environmental Analysis |
| <p>Explanation:</p> <p>The project's principal motivation is improved sustainability of land and water management, enhanced biodiversity, and contribution to climate change resilience. The project is expected to lead to measurable biophysical improvements in the target Kulpawn-Sissili-Red Volta landscape through improved vegetative cover, reduced soil erosion, reduced siltation and sedimentation, enhanced biological diversity, and improved landscape connectivity. The environmental impacts of the project will likely be overwhelmingly positive, with potential for only minor and temporary local adverse environmental impacts from activities such as tree planting, stone bunding, and other small on-farm earthworks related to soil conservation measures. The Environmental Analysis and Management Plan prepared, consulted upon, and disclosed for use by the original project will continue to be applied as a framework document to manage environmental risks.</p> |
| Risk |
| <p>Explanation:</p> <p>Introduction of changes in the project design raises the design risk rating to Moderate. The risk rating is also increased due to the emerging macroeconomic risks which are beyond the scope of the project. See the SORT for assessment of detailed risks.</p> |

V. World Bank Grievance Redress

22. Communities and individuals who believe that they are adversely affected by a World Bank (WB) supported project may submit complaints to existing project-level grievance redress mechanisms or the WB's Grievance Redress Service (GRS). The GRS ensures that complaints received are promptly reviewed in order to address project-related concerns. Project affected communities and individuals may submit their complaint to the WB's independent Inspection Panel which determines whether harm occurred, or could occur, as a result of WB non-compliance with its policies and procedures. Complaints may be submitted at any time after concerns have been brought directly to the World Bank's attention, and Bank Management has been given an opportunity to respond. For information on how to submit complaints to the World

Bank's corporate Grievance Redress Service (GRS), please visit <http://www.worldbank.org/GRS>. For information on how to submit complaints to the World Bank Inspection Panel, please visit www.inspectionpanel.org.¹²

¹² This paragraph is standard text pertaining to Bank projects.

ANNEX 1. Revised Results Framework

Project Development Objective: To expand the area under sustainable land and water management practices in selected watersheds.

| Indicator | Core | Unit of Measure | Baseline | Current Progress | Target Values (Cumulative) | | | | | Frequency | Data Source/ Methodology | Responsibility for Data Collection |
|-----------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------|-----------------|----------|------------------|----------------------------|--------|--------|--------|--------|-----------------------------|------------------------------------------------------------|------------------------------------------------------|
| | | | 2010 | Jan 2016 | 2016 | 2017 | 2018 | 2019 | 2020 | | | |
| PDO Level Results Indicators | | | | | | | | | | | | |
| PDO Indicator 1: Land area where sustainable land and water management practices have been adopted as a result of the project | <input checked="" type="checkbox"/> | Ha | 0 | 3,090 | 4,000 | 7,000 | 10,000 | 14,000 | 15,000 | Semi-Annual | Review and summary of sub-project agreements | MoFA M&E function |
| PDO Indicator 2: Land users adopting sustainable land management practices as a result of the project | <input checked="" type="checkbox"/> | Number | 0 | 9,388 | 10,500 | 14,000 | 20,000 | 28,000 | 30,000 | Semi-Annual | Review of and summary of sub-project agreements | MoFA M&E function |
| PDO Indicator 3: Management Effectiveness according to the | <input type="checkbox"/> | Score 0 – 100 | 45 | | | | | | | Mid-Term and End of Project | Management Effectiveness Tracking Tool (METT) scores, i.e. | Forestry Commission – Wildlife Division M&E function |

| | | | | | | | | | | | | |
|---------------------------------------------------------------|-------------------------------------|--------|----|--------|--------|--------|--------|--------|--------|-------------|-----------------------------------------------------|-------------------|
| Management Effectiveness Tracking Tool score in: | | | | | | | | | | | rapid assessment based on a scorecard questionnaire | |
| - Gbele Resource Reserve | | | 45 | 74 | - | - | 77 | - | 80 | | | |
| - Sanyiga Kasena Gavara Kara Corridor Site (CREMA Site 1) | | | 28 | 42 | - | - | 44 | - | 47 | | | |
| - Sumboru Bechausa Corridor Site (CREMA Site 2) | | | 21 | 18 | - | - | 22 | - | 30 | | | |
| - Moagduri Wuntanluri Kuwesaasi Corridor Site (CREMA Site 3a) | | | 21 | 19 | - | - | 24 | - | 30 | | | |
| - Balsa Yening Corridor Site (CREMA Site 3b) | | | 21 | 19 | - | - | 24 | - | 30 | | | |
| - Gbele-Mole Corridor Site (CREMA Site 4) | | | 21 | 18 | - | - | 22 | - | 30 | | | |
| Indicator Four: Direct project beneficiaries | <input checked="" type="checkbox"/> | Number | 0 | 24,224 | 30,000 | 36,000 | 45,000 | 52,000 | 60,000 | Semi-Annual | Activity and project records | MoFA M&E function |

| | | | | | | | | | | | | |
|---------------------------------------------------------------------------------------------------------------------------|--------------------------|-----------|----|-----|-----|-----|-----|-----|-----|-------------|----------------------------------------------------------------------------------------------------|-------------------|
| of which female | | (Percent) | 0 | 40 | 40 | 40 | 40 | 40 | 40 | | | |
| Intermediate Results Indicators | | | | | | | | | | | | |
| <i>Component 1: Capacity Building for Integrated Spatial Planning</i> | | | | | | | | | | | | |
| IR Indicator 1.1: Integrated spatial development framework produced for Northern Savannah zone | <input type="checkbox"/> | Yes / No | No | Yes | Yes | Yes | Yes | - | - | Semi-Annual | Review of framework | SADA M&E function |
| IR Indicator 1.2: Pre-feasibility studies conducted for new large-scale multi-purpose water storage investments | <input type="checkbox"/> | Number | 0 | 0 | 2 | 2 | 2 | - | - | Semi-Annual | Review and count of the studies | SADA M&E function |
| <i>Component 2: Land and Water Management</i> | | | | | | | | | | | | |
| IR Indicator 2.1: Communities with Community Watershed Development Plans consistent with the | <input type="checkbox"/> | Number | 0 | 72 | 118 | 172 | 208 | 244 | 244 | Semi-Annual | Review of community watershed development plans and count of communities for which these plans are | MoFA M&E function |

| | | | | | | | | | | | | |
|------------------------------------------------------------------------------------------------------------------------------------|--------------------------|--------|----|-----|-----|-----|-----|-------|-------|-------------|-------------------------------------------------|-------------------|
| Watershed Development Planning Manual | | | | | | | | | | | consistent with the watershed development plans | |
| IR Indicator 2.2: Demonstration plots established in the target watersheds | <input type="checkbox"/> | Number | 0 | 98 | 144 | 194 | 238 | 282 | 282 | Semi-Annual | Activity and project records | MoFA M&E function |
| IR Indicator 2.3: Targeted CREMA communities adopting management plans according to criteria defined in CREMA agreements | <input type="checkbox"/> | Number | 0 | 9 | 54 | 70 | 98 | 98 | 98 | Semi-Annual | Review and count of management plans | FC M&E function |
| IR Indicator 2.4: A study on feasibility of sustaining SLWM activities through PES market mechanism | <input type="checkbox"/> | Yes/No | No | Yes | Yes | Yes | Yes | - | - | Semi-Annual | Review of study | EPA M&E function |
| IR Indicator 2.5: Area reforested [within target | <input type="checkbox"/> | Ha | 0 | 449 | 840 | 890 | 990 | 1,060 | 1,060 | Semi-Annual | Project and activity reports | FC M&E function |

| | | | | | | | | | | | | |
|--------------------------------------------------------------------------------------------------|-------------------------------------|--------|-----|--------|--------|--------|--------|--------|--------|---------------------------|----------------------------------------------------------|----------------------------|
| forest reserves] | | | | | | | | | | | | |
| IR Indicator 2.6: Forest area brought under management plans ¹³ | <input checked="" type="checkbox"/> | Ha | 0 | 42,844 | 72,716 | 72,716 | 72,716 | 72,716 | 72,716 | Semi-Annual | Review of management plans and calculation of total area | FC M&E function |
| IR Indicator 2.7: Normalized Difference Vegetation Index (NDVI) in target areas | <input type="checkbox"/> | Index | n/a | -0.13 | n/a | n/a | n/a | n/a | -0.13 | End of Project Evaluation | NDVI measurement index data report | EPA M&E function |
| IR Indicator 2.8: Community governance structures established, trained and operational | <input type="checkbox"/> | Number | 0 | 115 | 161 | 275 | 311 | 347 | 347 | Semi-Annual | Project and activity reports | MESTI and PCU M&E function |
| - CREMA Executive Committees | | Number | | 3 | 3 | 5 | 5 | 5 | 5 | | | |
| - Community Watershed Management Teams | | Number | | 72 | 118 | 172 | 208 | 244 | 244 | | | |
| - CREMA Resource Management Committees | | Number | | 40 | 40 | 98 | 98 | 98 | 98 | | | |

North, and Sissili Central planned for 2016 to be completed by year end.

| | | | | | | | | | | | | |
|------------------------------------------------------------------------------------------------------------------------------|-------------------------------------|------------|---|---|---|-----|--------|-----|--------|------------------------------|-------------------------------------|----------------------------|
| IR Indicator 2.9: Forest users trained | <input checked="" type="checkbox"/> | Number | 0 | 0 | 0 | 410 | 450 | 660 | 660 | | Review of training providers report | FC M&E function |
| - Forest users trained - Female | <input checked="" type="checkbox"/> | Number | | 0 | 0 | 205 | 425 | 330 | 330 | | | |
| IR Indicator 2.10: Beneficiaries ¹⁴ that feel project investments reflected their needs – breakdown by: | <input checked="" type="checkbox"/> | Percentage | 0 | 0 | - | - | 50 | - | 70 | Mid-point and End of Project | Extrapolations based on surveys | MESTI and PCU M&E function |
| - Beneficiaries that feel project investments reflected their needs - female | <input checked="" type="checkbox"/> | Number | | 0 | - | - | 5,200 | - | 8,540 | | | |
| - Beneficiaries that feel project investments reflected their needs – male | <input checked="" type="checkbox"/> | Number | | 0 | - | - | 7,800 | - | 12,810 | | | |
| - Total beneficiaries | <input checked="" type="checkbox"/> | Number | | 0 | - | - | 10,400 | - | 12,200 | | | |

¹⁴ Calculations for this indicator are based on the following data: 208 target communities at mid-term point and 244 target communities at EOP, with an average of 125 beneficiaries per communities (of which 40% - 50 beneficiaries – are female)

| | | | | | | | | | | | | |
|-----------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------|--------|----|--------|---------|---------|---------|---------|---------|-------------|-----------------------------------|-----------------------------|
| - female | | er | | | | | | | | | | |
| - Total beneficiaries – male | <input checked="" type="checkbox"/> | Number | | 0 | - | - | 15,600 | - | 18,300 | | | |
| IR Indicator 2.11. New areas outside protected areas managed as biodiversity-friendly ¹⁵ | <input checked="" type="checkbox"/> | Ha | 0 | 39,107 | 187,422 | 187,422 | 266,134 | 417,299 | 417,299 | Semi-Annual | Review of CREMA management status | FC M&E function |
| IR Indicator 2.12. Smallholder households supported in coping with the effects of climate change [in 76 communities covered under AF2] | | Number | 0 | 0 | 0 | 1,200 | 2,200 | 2,600 | 3,000 | Annual | Activity reports | MESTI and MoFA M&E function |
| Component 3. Project Management and Coordination | | | | | | | | | | | | |
| IR Indicator 3.1: Project M&E system providing required reports and data in a timely manner | | Yes/No | No | Yes | Yes | Yes | Yes | Yes | Yes | Annual | Project Reports | MESTI PCU |

¹⁵ Site 1 – current status; Site 3 – by end of 2016; Site 2 – by end of 2018; Site 4 – by end of 2019.

Note: EPA = Environmental Protection Agency; M&E = Monitoring and Evaluation; MoFA = Ministry of Food and Agriculture; SADA = Savannah Accelerated Development Authority; WD = Wildlife Division; EOP = End of project.

Annex 2. Summary of Changes in Results Framework

SLWMP Restructuring and Additional Financing - P098538 and P157595

| Original PDO | Revision to PDO | Rationale/remarks |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| To expand the area under sustainable land and water management practices in selected watersheds | Continued | |
| Original indicator | Revision to indicators | Rationale |
| PDO Indicator 1. Land area where sustainable land and water management practices have been adopted as a result of the project (hectare) | Revised - change in target values | EOP target value revised upwards, to reflect scale-up of activities under AF (additional 9,000 ha) |
| PDO Indicator 2. Land users adopting sustainable land management practices as a result of the project (number) | Revised - change in target values | EOP target value revised upwards, to reflect scale-up of activities under AF (additional 18,000 land users) |
| PDO Indicator 3. Management effectiveness according to the Management Effectiveness Tracking Tool score: Gbele Resource Reserve and Wuru Kayero, Wahabu Wiasi, Sumboru Bechausa and Gbele-Mole corridor sites (number) | Revised – reflects a split in original Site 3 and change in target values Management Effectiveness Tracking Tool score: Gbele Resource Reserve and Sanyiga Kasena Gavara Kara (SKGK), Sumboru Bechausa, Moagduri Wuntanluri Kuwesaasi, Bulsa Yening, Wahabu Wiasi, and Gbele-Mole corridor sites (number) Change in target value | Names of CREMA sites covered under this indicator changed as one of the original CREMAs (Site 3, Wahabu Wiasi) split into two sites, Moagduri Wuntanluri Kuwesaasi and Bulsa Yening; thus, there are now six sub-indicators under this PDO indicator. EOP target values readjusted downwards to reflect realities on the ground and the recalculation of the METT scoring matrix. |
| PDO Indicator 4. Direct project beneficiaries (number), of which female (percentage) | Revised - change in target values | EOP target value revised upwards from the current 20,000 to 60,000 to reflect scale-up of activities under AF and, correspondingly, the number of direct beneficiaries (40,000 additional direct beneficiaries) |
| Intermediate indicators | | |
| Component 1: Capacity Building for Integrated Spatial Planning | | |
| IR Indicator 1.1. Integrated spatial development framework produced for Northern Savannah zone | Continued | No additional support through AF |
| IR Indicator 1.2. Prefeasibility studies conducted for new large-scale multipurpose water | Continued | No additional support through AF |

| | | |
|-------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| storage investments (number) | | |
| Component 2: Land and Water Management | | |
| IR Indicator 2.1. Communities with Community Watershed Development Plans consistent with the Watershed Development Planning Manual (number) | Revised - change in target values | EOP target value revised upwards, to reflect scale-up of activities under AF (additional 76 communities under AF) |
| IR Indicator 2.2. Demonstration plots established in target watersheds (number) | Revised - change in target values | EOP target value revised upwards, to reflect scale-up of activities under AF (additional 152 demonstration plots under AF) |
| IR Indicator 2.3. Targeted CREMA communities adopting management plans according to criteria defined in CREMA agreements (number) | Continued | 98 communities will continue to benefit under the AF2 |
| IR Indicator 2.4. A study on feasibility of sustaining SLWM activities through PES market mechanism (yes/no) | Continued | No additional support through the AF2 |
| IR Indicator 2.5. Area reforested [within target forest reserves] (hectare) | Revised - change in target values | The project adopted different spacing for reforestation planting; thus, the target increased from 600 ha to 800 ha for activities under AF1; in addition, the project-supported (under AF1 and AF2) additional planting of a total area of 240 ha in a forest reserve buffer zone is added to EOP target (20 ha under AF1 and 220 ha under AF2). |
| Carbon stored in forest ecosystems and emissions avoided from deforestation and forest degradation | Dropped | GHG accounting is mandatory and, as such, ex ante estimates are already reported in the Project Paper, making this results framework indicator redundant. |
| IR Indicator 2.6. Forest area brought under management plans (hectare) | Revised - change in target values | Values corrected. No additional area under AF2. |
| IR Indicator 2.7. Normalized Difference Vegetation Index (NDVI) in target areas | Continued | No change under AF2. |
| | New - IR Indicator 2.8. Community governance structures established, trained, | Reflects focus of IAP support on establishment of strong functioning local institutions in (a) agricultural |

| | | |
|---------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| | and operational (number) | landscapes (CWMT, a total of 244 by EOP, including additional 76 under AF2) and (b) wildlife corridor (CRMC, a total of 98 by EOP, all under original and AF1 financing) and CECs, a total of 5 by EOP) |
| | New - IR Indicator 2.9. Forest users trained (number), including female (number) | An applicable core sector indicator for forestry, added with introduction of relevant activities under AF2 and disaggregated by gender, also reflects focus on providing forest users with better skills on sustainable use of resources (660 users targeted under AF2). |
| | New - IR Indicator 2.10. Beneficiaries that feel project investments reflected their needs (percentage), disaggregated by (a) beneficiaries that feel project investments reflected their needs - female (number); (b) Beneficiaries that feel project investments reflected their needs - male (number); (c) Total beneficiaries - female (number); (d) Total beneficiaries - male (number) | Introduced as a citizen engagement indicator; a sample survey in random communities for determining the EOP target value achievement will be included as part of the project IE midline survey (for MTR results) and endline survey (for EOP results). This indicator also captures interventions that are not measured by a specific indicator in the results framework (for example, value chains activities). |
| | New - IR Indicator 2.11. New areas outside protected areas managed as biodiversity-friendly (ha) | A core sector indicator for biodiversity, introduced to measure the impact of CREMA work supported by the project; EOP target includes total areas of the 5 target CREMAs (417,299 ha). ¹⁶ |
| | New - IR Indicator 2.12. Smallholder households supported in coping with the effects of climate change (number) | Introduced to measure household-level support to climate-smart agriculture; also accepted as an indicator for measuring resilience (according to the International Fund for Agricultural Development guidelines on measuring resilience) |
| Component 3: Project Management and Coordination | | |

¹⁶ Standard definition for this indicator: An area defined as biodiversity-friendly complies with social and environmental standards in a way that respects civil and indigenous rights, maintains or enhances social and environmental conservation values, prohibits highly hazardous pesticides and invasive planting, and harvesting must meet national laws and international treaties on biodiversity signed by the country in which the site is located. For the project, biodiversity-friendly areas are defined as areas under CREMA agreements.

| | | |
|-------------------------------------------------------------------------------------------------------------|-----------|---------------------------------------------------------------|
| IR Indicator 3.1. Project M&E system providing required reports and data in a timely manner (yes/no) | Continued | No change in definition; target date changed to new EOP date. |
|-------------------------------------------------------------------------------------------------------------|-----------|---------------------------------------------------------------|

Note: MTR = midterm review; GHG = greenhouse gas.

ANNEX 3. Detailed Description of Project Activities

SLWMP Restructuring and Additional Financing - P098538 and P157595

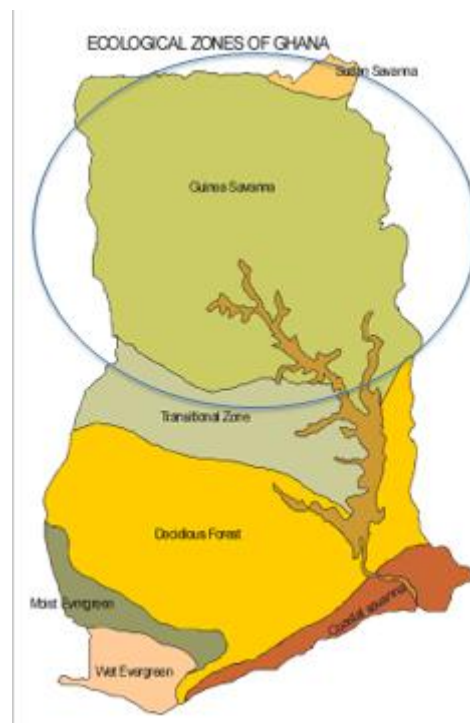
Background Context

- 1. Focus on Northern Ghana.** In Ghana, there is a visible developmental gap across the north and south of the country where the southern coastal and forest zones (both urban and rural) have been the epicenter of rapid poverty reduction, in contrast to the north which remains underdeveloped. The Northern region is landlocked and in comparison with the south, its geographic locale brings less rainfall, greater land and soil degradation, and a predisposition to droughts and floods. This forces agricultural households to adopt low-risk and low-input strategies, creating a virtual cycle of poverty. Despite attempts to remedy the situation, the decline in poverty still has not been equally spread geographically, and the poor in Ghana, therefore, continue to be concentrated in the NSZ. According to the Ghana Poverty Mapping Report (Ghana Statistical Services 2015), the poverty rate in the Upper West Region stands at 70.7 percent; in the Upper East Region, at 45.9 percent; and in the Northern Region, at 44.2 percent (as compared to the national average of approximately 30 percent).
- 2. Agriculture.** Ghana's agriculture sector contributed 22 percent to the country's gross domestic product in 2013 and employs over 41 percent of the economically active population. About 45 percent of all Ghanaian households are engaged in agriculture and contribute to over 90 percent of the country's food needs.
- 3.** Agriculture is predominantly practiced on smallholder, family-operated farms (mostly under 2 ha), using rudimentary technology. It is estimated that only 0.04 percent of cultivated land was under irrigation in 2013, with the remainder being rainfall dependent. Increased agricultural production through the expansion of cultivated lands, traditional bush fallow systems, grazing practices, and rising demands for water are becoming increasingly unsustainable. Achieving transformational changes of agricultural practices is further hampered by difficulties of scaling up due to the large number of smallholders whose access to agricultural inputs and markets is limited.
- 4. Land degradation.** Current agricultural practices adversely affect not only agricultural lands but also water bodies, forests, and natural habitats leading to land degradation and, thereby, increase the degradation of environmental quality. According to the government's National Action Program to Combat Drought and Desertification, the land area prone to desertification has almost doubled in the last decades. Past studies estimate that 69 percent of the total land surface is prone to severe or very severe soil erosion, the main manifestation of land degradation in Ghana. Soil erosion not only affects the soil carbon content and vegetation cover but also results in increasing open new / set aside land by farmers to compensate for the loss of crop / grazing land potential.
- 5. Climate variability and vulnerability.** Climatic conditions in the country are changing. Drought and floods in parts of the three northern regions of Ghana have become a recurring phenomenon. As a result, agriculture and livelihoods are highly vulnerable to changes in climate variability, seasonal shifts, and precipitation patterns. Notably, the root and tuber crops (such as

cassava, yam, and cocoyam) yield response to climate change is known to vary widely. The overdependence of agricultural households on nature means that such households are more likely to bear the impacts of climate change through changes in natural resources availability, ecosystems, water cycles, and food systems, with a resulting need to cope with a changing regime of weather extremes. The area's harsh and deteriorating climatic conditions combined with its high demographic growth rate jeopardize the impact of initiatives to reduce poverty; they also endanger food security and accelerate environmental degradation.

6. **Natural resources base.** Ghana serves as an important area for faunal migration. While several endemic species remain, species such as roan antelope, hartebeest, side striped jackal, buffalo, and black and white colobus monkeys remain threatened. Ghana has several national parks and reserves, including the GRR, Mole National Park, Bia National Park, Bui National Park, Digya National Park, Kakum National Park, Kyabobo National Park, Ankasa Conservation Area, Shai Hills Resource Reserve, and Boabeng-Fiema Monkey Sanctuary. Forests in Northern Ghana are representative of the dry forests of Africa. They make up part of the Guineo-Congolese phytoecological region. The condition of Ghana's forests has been in decline for many years, particularly since the 1970s. Many forest reserves are heavily encroached and degraded, and the off-reserve stocks are being rapidly depleted. By and large, countrywide the problem is one of gradual degradation rather than deforestation.

Figure 3.1 Ecological Zones of Ghana



7. **Integrated landscapes management.** The interrelationship among agriculture, biodiversity conservation, and forestry calls for a holistic integrated landscape approach to provide ecosystem services. Smallholder farmers' access to finance also needs to be improved and critical supply chain bottlenecks removed in the value chains by focusing on improved storage and prestorage processing. Therefore, a win-win vision for the environment and regional

economy is exploiting green drivers of growth compatible with improved watershed management, supported by appropriate commercial and social infrastructure. Tree crops are identified as a key economic driver, and thus the potential for additional agricultural diversification, use of NTFPs, and nature-based tourism need to be recognized for better management at the landscapes level.

8. Regional initiatives, such as the Sahel and West Africa Programme in Support of the Great Green Wall Initiative under TerrAfrica, where Ghana is one of the participating countries, have opened up opportunities for drylands populations in Africa to develop and implement innovative and more effective SLWM partnerships and programs.

9. **Resilience and food security.** Ghana started implementation of the SLWMP in 2011 to promote the adoption of SLWM practices in the NSZ. This area has the highest incidence of poverty and food insecurity and is the least climate resilient. In this area, the target agrosystems are the cereal-root crop mixed and the agro-pastoral millet sorghum farming. Food insecurity in Northern Ghana is highly associated with poverty. The means by which households obtain their diet may vary, but generally, irrespective of whether households are farmers or living in urban areas, as wealth improves, so does diet. Smallholder farmers, defined as cultivating five acres or less, represent 62 percent of farming households in Northern Ghana. They primarily or partly depend on farming for their livelihood by producing food both for their own consumption and as a source of income. Nearly half (49 percent) of smallholder farmers are poor (belonging to the two poorest wealth quintiles) and they disproportionately face various constraints such as the cost of agricultural inputs, limiting their ability to invest in agricultural production and resulting in a lower output, and placing them in a food insecure state. The World Food Programme's Comprehensive Food Security & Vulnerability Analysis (2012)¹⁷ concludes that more than 21 percent of smallholders were found to be either severely or moderately food insecure at the time of the survey.

10. **Incremental reasoning.** The SLWMP, therefore, aims at reducing land degradation and enhancing maintenance of biodiversity in selected micro-watersheds in the NSZ of Ghana. The project uses an integrated approach that combines soft and hard investments at the community level with planning activities which feed into a much larger program of water and flood management infrastructure across the Northern Savannah eco-agricultural zone.

11. The AF support under the GEF IAP will build on the successes and experiences gained through the implementation of the current SLWMP being implemented in the NSZ, which is characterized by vulnerability, low climate resilience, and high poverty incidence. The GEF resources will be incremental to the baseline funding from the Ghana Commercial Agricultural Project and synergize the activities on the ground.

12. The proposed activities will promote efficient soil and water management practices in the farming systems and empower smallholder farmers to diversify their farms through integration of trees and value-addition through postharvest management support. Rangeland management and

¹⁷ World Food Programme. 2012. *Ghana Comprehensive Food Security & Vulnerability Analysis, Focus on Northern Ghana*.

best animal husbandry practices will be promoted to ensure sustainable supply and access to livestock feed and organic manure for achieving food security. These will contribute to carbon sequestration, biodiversity conservation, and increased resilience of the beneficiary communities to climatic variability and ensure food security.

13. Best SLWM practices and general multiple global environmental and socioeconomic benefits will be taken to scale, linking sustainable management of ecosystems at the landscape level with improved food security and poverty reduction at community level. This is expected to generate triple-win situations that combine agricultural productive increase with enhancement of ecosystem services, such as regulation of generic diversity; water and sediment flows and carbon sequestration; and improvements of livelihoods, incomes, and food security.

14. In general, Northern Ghana is highly vulnerable to changes in climate variability, seasonal shifts, and precipitation patterns. More specifically, key climatic shocks in the target landscape are related to erratic rain patterns, including delayed and unpredictable start of the rainy season, droughts, and flooding. The resulting losses of crops lead to food price increases and seasonal food shortages ('hunger gap'). The project will offer support to strategies to strengthen the resilience of smallholder farmers.

Detailed Project Description

15. **The SLWMP** is designed around three components: (a) Capacity Building for Integrated Spatial Planning; (b) Land and Water Management; and (c) Project Management and Coordination. The project supports a comprehensive landscape approach to sustainable land and watershed management at the community level with planning activities at the regional and district levels. AF to the project is available through GEF-6 resources under the IAP, which will scale up and expand activities within the same component structure to maintain the momentum generated and ensure efficient use of the robust systems that are set up and functioning on the ground.

16. **Rationale for expanding the current project through AF.** The AF grant will help capture the efficiencies and economies of scale by expanding the SLWM in the NSZ of Ghana. In particular, it will provide financing to an additional geographic area (two additional districts of West Gonja and Sawla-Tuna-Kalba), new communities within the existing target districts, new SLWM technologies (based on root and tuber cropping systems), and additional cohorts of SLWM subprojects and related landscape management activities (for example, implementation of CREMA management plans and activities around Ambalara and Kulpawn Tributaries Forest Reserves), which are not financed under the original GEF grant and the first GEF AF. The AF through GEF-6 resources will offer a unique opportunity to tackle environmental degradation with multiplying impacts on poverty reduction in project communities and surrounding areas. The increase in project coverage with AF will allow contiguity of the communities along the target sub-watershed rivers (Kulpawn, Sisilli, and Red Volta) and further contribute to demonstrating improved SLWM practices and consequent reduction of land degradation, thus increasing the project's impacts. These developments are expected to result in greater generation of global environment benefits, including improvement in the provision of ecosystem services associated with broader watershed management interventions.

17. **Theory of change.** The project support will aim at causing broad landscape change through targeting the following key outcomes:

- (a) Farmers maintain plant cover and incorporate more perennials (riverbank vegetation strips, shelterbelts, shade trees, contour hedgerows) to:
 - (i) Protect riparian zone contamination with sediments, nutrients (and pesticides, where applicable);
 - (ii) Provide habitat for predators and parasitoids of crop pests; and
 - (iii) Provide bioconnectivity for local biodiversity.
- (b) Farmers plant multiple crops rather than monocrops and integrate value added processes with livestock (beef, dairy, poultry); the result is the following:
 - (i) Intercropping or crop rotations (cereal-legumes) are more complex than managing monocultures but can yield significant benefits of biological nitrogen fixation, thereby reducing the need for synthetic nitrogen fertilizers. Improper use of chemical fertilizers can cause negative economic and environmental impacts.
 - (ii) Legume-cereal rotations can have significant positive benefits for soil health by reducing soil pathogen populations that tend to increase dramatically in monocultures.
 - (iii) Forage trees and shrubs, especially leguminous species in agroforestry (silvopastoral) systems, can improve not only animal nutrition and productivity but also enhance soil fertility via soil organic matter build-up and biological nitrogen fixation.
- (c) Farmers recycle crop residues and livestock manure:
 - (i) Builds (rather than depletes) soil organic matter, which is very important for improved nutrient and water use efficiency on croplands;
 - (ii) Soil organic matter improves nutrient and water holding capacity and therefore reduces fertilizer and irrigation needs; and
 - (iii) Increased recycling of crop residues and animal manure reduces need to import nutrients and/or to export waste.

18. The revised costs by component are presented in table 3.1.

Table 3.1. Revised Costs by Component, in US\$

| Component | Original Financing | Additional Financing | Total Financing |
|-----------------------------------------------------------------------|---------------------------|-----------------------------|------------------------|
| Component 1. Capacity Building for Integrated Spatial Planning | 944,000 | 0 | 944,000 |

| | | | |
|---------------------------------------------------------------------------------------------|-------------------|-------------------|-------------------|
| Component 2. Land and Water Management | | | |
| 2.1. Systems, Capacity, and Monitoring for Sustainable Land and Water Management | 3,058,348 | 2,229,500 | 5,287,848 |
| 2.2. Implementation of SLWM in Micro-watersheds (subprojects) | 6,012,090 | 6,479,435 | 12,491,525 |
| 2.3. National Sustainable Land Management and Payment for Environmental Services Monitoring | 959,344 | 1,866,000 | 2,825,344 |
| 2.4. Management of Riparian and other Biological Corridors | 4,426,736 | 1,553,897 | 5,980,633 |
| Total for Component 2 | 14,456,518 | 12,128,832 | 26,585,350 |
| Component 3. Project Management and Coordination | 1,499,482 | 640,000 | 2,139,482 |
| Total | 16,900,000 | 12,768,832 | 29,668,832 |

19. Table 3.2 shows the correspondence between project components and subcomponents and IAP components (including project management cost).

Table 3.2. SLWMP Components and IAP Components, in US\$

| Project Component | Additional Financing | IAP Component 1. Institutional Frameworks | IAP Component 2. Scaling Up Integrated Approaches | IAP Component 3. Monitoring and Assessment | Project Management Cost |
|----------------------------------------------------------------------------------|-----------------------------|--------------------------------------------------|----------------------------------------------------------|---------------------------------------------------|--------------------------------|
| Component 1. Capacity building for Integrated Spatial Planning | 0 | n.a | n.a | n.a | n.a |
| Component 2. Land and Water Management | | | | | |
| 2.1. Systems, Capacity, and Monitoring for Sustainable Land and Water Management | 2,229,500 | 2,229,500 | – | – | – |
| 2.2. Implementation of SLWM in Micro-watersheds (subprojects) | 6,479,435 | – | 6,479,435 | – | – |
| 2.3. National Sustainable Land Management and | 1,866,000 | – | – | 1,866,000 | – |

| Project Component | Additional Financing | IAP Component 1. Institutional Frameworks | IAP Component 2. Scaling Up Integrated Approaches | IAP Component 3. Monitoring and Assessment | Project Management Cost |
|------------------------------------------------------------|-----------------------------|--------------------------------------------------|----------------------------------------------------------|---------------------------------------------------|--------------------------------|
| Payment for Environmental Services Monitoring | | | | | |
| 2.4: Management of Riparian and other Biological Corridors | 1,553,897 | 316,000 | 1,162,897 | 75,000 | – |
| Component 3. Project Management and Coordination | 640,000 | – | – | – | 640,000 |
| Total | 12,768,832 | 2,545,500 | 7,642,332 | 1,941,000 | 640,000 |

Component 1. Capacity Building for Integrated Spatial Planning (US\$944,000 from the GEF, all from the original project)

20. Implemented by the Savannah Accelerated Development Authority (SADA), this component provides integrated spatial planning tools (for mapping, analysis, and M&E) to strengthen the capacity of SADA to guide and undertake decision making for land- and water-related investments across the Northern Savannah region. Spatial planning takes into account ecological units such as watershed and is expected to result in the identification of both large-scale water and flood management infrastructure investments. The component finances establishment of a small spatial planning unit within SADA, development of a spatial development framework for the SADA zone, and two prefeasibility studies of investments identified in the Integrated Water Resources and Flood Management Plan (at the Jambito river basin located on the northern banks of the Black Volta, east of Buipe, in the Central Gonja District of the Northern Region and at the Koulbi river basin located on the banks of the Black Volta, west of Wa, the regional capital of the Upper West Region). The outputs of Component 1 will guide future water investments in Northern Ghana.

21. Activities under Component 1 will receive no AF.

Component 2. Land and Water Management (Total GEF: US\$26,585,350, including GEF AF: US\$12,128,832)

22. Implemented by the Ministry of Food and Agriculture (MoFA), Environmental Protection Agency (EPA), and Forestry Commission (FC), under coordination by the MESTI, this component will scale up support for community flood and land management at the micro-watershed level, including both management of agricultural land and ecological infrastructure. The project will support the SLWM implementation in two new districts (West Gonja and Sawla-Tuna-Kalba), in addition to expanding activities within 10 current districts (Builsa South,

Talensi, Bawku West, Kassena-Nankana West, Wa East, Sissala East, Sissala West, West Mamprusi, Daffiama-Bussie-Issa, and Mamprugu Moaduri). The SLWM support will be expanded to 76 more communities (as part of AF), to the total coverage of 12 districts and 244 communities, with stronger focus on implementation of sustainable root and tuber cropping systems as one set of SLWM options. This component will also include support for natural resource-based livelihood activities and fire management in the communities. It will also support provision of water management systems within agricultural landscapes to provide for a comprehensive approach to reverse land degradation and enhanced agricultural productivity and maintenance of biodiversity in watersheds.

23. The component also includes activities related to monitoring and assessment of the SLWM implementation, through vegetation and carbon stock monitoring, through support to the Geographic Information System (GIS) M&E system and the Management Information System and Tracking (MIST), and support to learning events.

24. The activities on management of riparian and other biological corridors will extend support to the implementation of CREMA management plans (developed with current financing), to tourism and wildlife infrastructure in the GRR and Mole National Park, and continued establishment of green firebreaks around Kulpawn and Ambalara Forest Reserves jointly with neighboring communities.

25. The major portion of GEF resources under this AF support Component 2, as described below. Additionally, table 3.4 provides a detailed list of activities by subcomponents for clarity and justification of the incremental GEF support.

Subcomponent 2.1. Systems, Capacity, and Monitoring for Sustainable Land and Water Management (Total GEF: US\$5,287,848, including GEF AF: US\$2,229,500; contributing to Component 1 of IAP (Institutional Frameworks))

26. This subcomponent supports strengthening capacities of districts, community service organizations (CSOs), and rural communities for micro-watershed and land use planning aimed at achieving better management of natural resources and enhanced food security; strengthening capacity for promotion of SLWM practices; support to local knowledge sharing; strengthening multi-stakeholder platforms to foster broad participation in SLWM; performance monitoring and verification of SLWM activities under subproject agreements; and capacity building and support to communities on financial resource mobilization for ensuring better financial security of the communities (as part of food security) and sustainability of SLWM. The subcomponent supports four subsets of activities under this proposed AF.

27. **2.1.A. Sustainable Land Management Planning.** This involves strengthening capacities of districts and rural communities for micro-watershed and land use planning and promotion of SLWM practices—the main thrust of activities will be in the two new districts (West Gonja and Sawla-Tuna-Kalba) and some activities will include districts that are already participating in the project, as needed. This set of activities will also include support to the CSOs/nongovernmental organization (NGOs) that will be involved in the micro-watershed planning at community level, to help smallholder farmers scale up good SLWM practices. Project experience to date demonstrates that local CSOs/NGOs may be lacking knowledge on the most suitable SLWM

technologies; thus, training and enabling them to support communities is an important activity. Support to participatory micro-watershed planning will include the provision of technical assistance, training, and support to strengthen (in the current 10 districts) and build (in two new districts) capacities in micro-watershed management techniques and specifically to conduct participatory micro-watershed planning exercises at the community level. This, in turn, will build the organizational and planning capacity of the new communities and local government agents to identify watershed issues and needs. The training program will be delivered to staff of agriculture, water resources, forestry, and planning units, among other staff in the new districts and additional staff in the current districts, to account for expansion of activities within those.

28. The micro-watershed plans will represent the following: (a) broad-scale and informal consensus on the location of major categories of land type and existing land use; (b) mapping of water and flood management issues; (c) identification of community-level water and flood infrastructure investments; (d) identification of management needs for new and existing infrastructure; and (e) suitability of different land zones for application of the various SLWM technology options. It is important to note that micro-watershed plans have proven world over, and with project support to date in Northern Ghana, to be a positive tool for creating local ownership. It is a step in the process that is critical to the long-term success of the adoption of SLWM practices.

29. In addition, the community planning exercise will provide for:

- (a) An entry point for awareness raising of SLWM approaches and technologies. The project rationale will be explained to communities with regard to short-term external assistance being provided for the adoption of improved SLWM technologies in line with the external benefits these provide, but emphasis will be given to the long-term benefits of these technologies to farmers and their households, especially in the face of the likely impacts of climate change;
- (b) Establishment of detailed baselines for each community of existing implementation of SLWM technologies and agricultural productivity, against which these will be monitored over the project life-span;
- (c) A forum for discussion of requirements and incentives for successful introduction of SLWM technologies; and
- (d) Identification of any land use issues, uncertainties, or disputes germane to the project, which may need the intervention or support of the District Assembly to resolve.

30. As part of the knowledge management activities under the IAP, this subcomponent will support participation of the SLWMP team in capacity-building activities under the regional IAP knowledge hub.

31. **2.1.B. Capacity to Support SLWM.** This involves support to development of district extension approaches based on incentive structures established for supporting and promoting SLWM. Awareness of the best SLWM technology options is a pre-condition for spreading SLWM. However, creating an enabling environment to promote the adoption of these practices

on the ground has some major challenges. Capacity of new extension agents will be built through training in appropriate SLWM technologies and current extension approaches. In addition, extension agents in all project districts will be trained on best technologies for root and tuber crops. Overall, the SLWM training program will be implemented to cater for new extension staff in current project districts (to compensate for turnover of staff due to transfers, resignation, and retirement) and new project districts. A set of existing training materials for extension service providers will be revised, based on the updated menu of SLWM technologies, taking into account lessons learned during previous project support and including detailed methodologies for root and tuber crops. An incentive system for extension staff based on performance assessment will be developed and implemented, to promote excellence in extension support. In line with the IAP knowledge management approaches, study tours to countries with relevant SLWM experiences and local study tours to best SLWM practice sites will be supported.

32. The key elements of the extension approach will be (a) establishment of demonstration plots for selected SLWM technologies in target communities and (b) supporting creation of farmer groups or individuals interested in applying similar technologies.

33. **2.1.C. Monitoring Performance under SLWM Subproject Agreements.** This involves support to specific M&E activities on the performance of the implementation of subproject agreements. These activities will be supported by training, services, and operational expenditures outside of the subprojects themselves. District Departments of Agriculture (DDoAs) will be responsible for signing and monitoring subproject agreements (as well as the subsequent provision of extension and inputs) with beneficiaries under agricultural support subprojects and related extension support. District forest offices will be responsible for signing and monitoring subproject agreements for subprojects related to implementation of riparian vegetation activities, silvopastoral activities, fire management activities, and implementation of natural resource-based livelihood activities. Support will be provided to annual review and planning meetings for field activities implementation and for monitoring by the multi-stakeholder platforms. Verification of subproject proposals received from the districts will be carried out to identify proponents and availability of land for subproject implementation.

34. **2.1.D. Financial Resource Mobilization for Sustaining SLWM Activities in Communities.** This involves support to enhancing financial security of farmers and communities, to ensure better benefits and sustainability of SLWM beyond project lifetime. In particular, communities will be trained on and supported in establishment of the VSLAs. The groups will be trained on FM basics, such as bookkeeping, and will be provided with VSLA saving boxes and other attendant facilities and equipment for each of the groups. The VSLA support, mainly targeted toward women farmers, is expected to result in increased access to credit facilities by the beneficiaries, increased investment of women in agriculture, improved diversification of livelihood activities in the communities, increased social cohesion among the beneficiaries, and improved position of women in their communities. It is expected that all participating communities will receive capacity support on VSLA, with an anticipated adoption rate of approximately 60 percent. In addition, communities adjacent to protected areas (mainly in the 13 communities adjacent to GRR) will be trained on commercial use of NTFPs.

Subcomponent 2.2. Implementation of SLWM in Micro-watersheds (Total GEF: US\$12,491,525, including GEF AF: US\$6,479,435; contributing to Component 2 of IAP

(Scaling up of Integrated Approaches)

35. This subcomponent will finance the SLWM subprojects in agricultural lands and rangelands (implementation of watershed management plans), including up-front expenditures on provision of inputs and payment of output incentives based on the developed environmental indices linking the SLWM technologies; it will also finance establishment of riparian vegetation, provision of water management systems, implementation of natural resource-based livelihood activities, implementation of postharvest management activities, and implementation of fire management activities in project districts. The subcomponent includes the activities as detailed below.

36. Direct inputs to farmers will be provided through subprojects contracts (based principally on the SLWM menu of options - annex 5). The up-front subprojects' inputs to farmers will facilitate the implementation of improved SLWM technologies on a sustainable basis.

37. Farmer groups will be supported to undertake improved land management practices that produce local or global environmental services (for example, biodiversity conservation, improved carbon sequestration, reduced siltation, and so on), based on the project supported technologies as described in 'Specific Guidelines for the Implementation of Sustainable Land and Water Management Subprojects'. Up-front support, such as extension, and provision of critical inputs, for example, new seed varieties, tree seedlings, and basic equipment will be provided to allow farmers to implement the technologies. All individual subprojects will be based on the community micro-watershed plans (as developed under Subcomponent 2.1) that will determine most suitable types of interventions. Individual subprojects will also include silvopastoral activities such as the farmer-managed natural regeneration, establishment of woodlots, and planting of shade trees.

38. The subcomponent will draw upon and advance the work on a PES-based incentive system to farmers adopting the SLWM. The environmental index takes into account specific ecological and economic factors that reflect benefits and costs of adopting SLWM technologies and reflects the costs of needed inputs that the landholder demands as compensation for the conservation services. Subsequent output-based payments will be determined through the Project Environmental Index,¹⁸ depending on the SLWM technology used by a specific subproject. Subsequent inputs will be performance based according to implementation criteria specified in subproject agreements. These may take different forms, for example, cash payments; or necessary items to implement subsequent stages of the SLWM technology (maintenance or expansion of area under the technology); and/or linked livelihood support inputs such as equipment for processing agricultural products, carts, bicycles, beehives, small livestock, and so on.

¹⁸ The Project Environmental Index defines the methods of incentive provision to farmers to include various options based on (a) incentives required for adoption of promising technologies based upon a Benefit Cost Ratio (BCR) of 1.5 (GHS/ha) and (b) payment levels for individual and composite ES (GHS50/point) looking at various farming scenarios.

39. Under the AF, more focus will be dedicated support to tuber and root crops (such as yam and cassava) as appropriate to specific communities - as a set of SLWM technology options supported by the project to ensure sustainability, both economically and ecologically.
40. Specific support will be in the context of livestock grazing and multiple uses of rangelands and include activities such as establishment of community rangelands, including provision of veterinary services and watering points and development of fodder banks for dry season feeding of livestock.
41. This component will also continue supporting establishment of riparian vegetation by communities, to prevent riverbank soil erosion and resulting siltation of water bodies.
42. Project support will be provided to enhancing water management systems within target landscapes, for example, small earthworks (weirs and hand dug wells), in-field structures such as bunding and ridging, and water harvesting structures—the project will draw on the technical expertise of the Ghana Irrigation Development Authority (as the specialized government agency for irrigation and water management technologies) and its staff in the project area for this work.
43. A new set of activities under AF, targeting specifically improved security and resilience of farmers, will focus on value-addition for crops, through implementation of postharvest management activities, such as support to improved crop processing, improved storage, and group marketing of farm produce.
44. In addition, this component will support implementation of fire management activities and provide support to community implementation of alternative natural resource-based livelihoods activities, such as improved livestock rearing, shea nut butter and baobab processing, bee keeping, and soap making, to enhance livelihoods and food security.

Subcomponent 2.3. National Sustainable Land Management and Payment for Environmental Services Monitoring (Total GEF: US\$2,825,344, GEF AF: US\$1,866,000 contributing to Component 3 of IAP (Monitoring and Assessment))

45. Under this subcomponent the project will continue to finance M&E of programs that link local activities to national SLWM objectives, to strengthen their broader impact and replicability. This includes the monitoring of ESs generated in the project area, including vegetation, soil carbon, and surface and ground water. The subcomponent will continue supporting operation of the GIS-based M&E system and building capacity on data collection and management. The subcomponent will also finance monitoring activities by the IAs and project governance structures (Local Steering Committee (LSC) and District Watershed Planning Teams). In addition, the subcomponent will continue supporting regular learning events (held annually in the project area) to enable project participants from all project districts exchange experiences and lessons learned in implementation of the SLWMP. A documentary on project activities will be developed to better promote achievements and lessons that will be useful beyond the project.
46. The subcomponent also supports development of a PES Strategy (completed with the original financing).

47. Finally, this subcomponent also includes design and implementation of a project impact evaluation to assess impacts of implementation of the SLWM interventions attributable to the project support and effectiveness of the incentive mechanism, including variants. The impact evaluation will be conducted based on the accepted IE methodology and will use data collected as part of activities under Subcomponent 2.1 as one of the data sources. Baseline studies are being supported with current financing, and the AF will complete midpoint and endpoint analysis. In addition, sensitization of communities on impact evaluation will be included under this subcomponent.

Subcomponent 2.4. Management of Riparian and Other Biological Corridors (Total GEF: US\$5,980,633, including GEF AF US\$1,553,897; contributing US\$316,000 under IAP Component 1, US\$1,162,897 under IAP Component 2, and US\$75,000 under IAP Component 3)

48. This subcomponent supports natural habitat, wildlife, and forest reserve management activities focused on maintaining and enhancing key habitat values as part of the broader approach to watershed management in the Western Wildlife Corridor (see annex 8). Specific project support is aimed toward establishment of the CREMAs in the Western Wildlife Corridor, covering an estimated area of over 490,015 ha (see table 3.3) to devolve resource management rights and responsibilities to the local level and preparation and implementation of CREMA management plans and for sustainable management of protected forest estate within target forest reserves (covering an area of 72,716 ha). The subcomponent will continue supporting operation and maintenance of the MIST for monitoring of wildlife stock in protected areas and ecological monitoring. The AF will enhance the scope of CREMA work by providing support to implementation of the CREMA management plans, to alternative natural resource-based livelihood activities, and fire management in the CREMA areas, thus enabling an increase in area of production landscapes that integrate conservation and sustainable use of biodiversity. The project supports reduction of pressures on the forest reserves and creation of a contiguous management zone of the forests between the GRR and Mole National Park.

Table 3.3. Supported CREMAs in the Western Wildlife Corridor

| Site name | Area (ha) | Name CREMA | No. of Villages | Forest Reserves (ha) | Area of Forest Reserves (ha) | Actual CREMA Area (ha) | Remark |
|---------------------------|-----------|------------|-----------------|----------------------|------------------------------|------------------------|---------------------------------------------------------------------------------------|
| Site 1 - Wuru-Kayoro | 55,000 | SKGK | 9 | Pudo | 5,413 | 39,107 | Area confirmed from GIS mapping; CREMA officially launched |
| | | | | Chiana Hills | 4,359 | | |
| | | | | Sissili North | 6,121 | | |
| Total | | | | | 15,893 | | |
| Site 2 - Sumboru-Bechawsa | 110,000 | — | 26 | Sissili Central | 12,163 | 78,712 | It is anticipated that participating communities will adopt a new name for the CREMA. |
| | | | | Mawbia | 12,950 | | |
| | | | | Bepona | 6,175 | | |
| Total | | | | | 31,288 | | |
| Site 3 - | 105,330 | Moagduri | 21 | | | 148,315 | CREMAs emerged |

| Site name | Area (ha) | Name CREMA | No. of Villages | Forest Reserves (ha) | Area of Forest Reserves (ha) | Actual CREMA Area (ha) | Remark |
|---------------------|----------------|----------------------|-----------------|----------------------|------------------------------|------------------------|---------------------------------------------------------------------------------------|
| Wahabu-Wiasi | | Wuntanluri Kuwesaasi | | | | | from originally proposed Site 3. Area (ha) confirmed by GIS mapping. |
| | 42,985 | Bulsa Yening | 10 | | | | |
| Site 4 - Gbele-Mole | 176,700 | — | 32 | Kulpawn headwaters | 15,540 | 151,165 | It is anticipated that participating communities will adopt a new name for the CREMA. |
| | | | | Ambarala | 9,995 | | |
| Total | | | | | 25,535 | | |
| Grand Total | 490,015 | | 98 | | 72,716 | 417,299 | |

49. The subcomponent also supports implementation of selected activities of an ecotourism strategy for the Western Wildlife Corridor (completed with the original financing).

Table 3.4. Detailed Activities for Component 2 under this AF

| Subcomponent 2.1. Systems, Capacity, and Monitoring for Sustainable Land and Water Management | |
|------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 2.1.A. Sustainable Land Management Planning | <ul style="list-style-type: none"> • Formation and training of district-level planning teams for the two new districts • Scaling up integrated watershed management planning for watershed conservation and agricultural productivity (preparation of watershed management plans in additional 76 communities) • Operational backstopping for watershed planning exercise • Technical assistance to CSOs/NGOs to support micro-watershed planning • Feasibility studies to support provision of community water management systems within agricultural landscapes |
| 2.1.B. Capacity to Support SLWM | <ul style="list-style-type: none"> • Training programs for extension service providers of the implementing agencies based on their training needs • Development of guidelines for accessing the performance of extension service providers for the purpose of incentivizing them • Performance-based incentives for extension service providers • Technical support for project implementation by community-level structures • Environmental safeguards, climate change education, and awareness creation • Training for selected tractor owners, operators, farmers, and CWMTs on best land tillage practices in the project area • International study tours (for district and central-level staff of implementing agencies) • Local study tours for farmers, extension service providers, and SLWMP governance structures on best SLWM practice and community-based conservation sites • Revision of the SLWM Technology Manual, Participatory Watershed Manual, |

| | |
|-----------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| | <p>Subprojects Guidelines and Ghana Strategic Investment Framework for SLM and their publication</p> <ul style="list-style-type: none"> • Provision of logistics and equipment to strengthen implementing agencies for coordination, capacity building, and extension services • Operational backstopping • Establishment and maintenance of demonstrations fields • Extension support |
| 2.1.C. Monitoring Performance under SLWM Subproject Agreements | <ul style="list-style-type: none"> • Support to national multi-stakeholder platforms, that is, the NSLMC • Annual review and planning meeting of field-level activities implementation • Subproject proposal field verification |
| 2.1.D. Financial Resource Mobilization for Sustaining SLWM Activities in Communities | <ul style="list-style-type: none"> • Support to and training on VSLA • Training communities on commercial use of NTFPs |
| Subcomponent 2.2. Implementation of SLWM in Micro-watersheds | |
| | <ul style="list-style-type: none"> • Support under the SLWM subproject agreements (including input and output incentives) • Implementation of sustainable root and tuber cropping systems • Implementation of rangeland management and best animal husbandry practices • Establishment of riparian vegetation and riverbank soil erosion control measures • Provision of water management systems within agricultural landscapes (weirs, hand dug wells, rainwater harvesting, and so on) • Implementation of postharvest management activities • Implementation of natural resource-based livelihood activities in target the SLWM communities • Implementation of fire management activities and provision of fire suppression equipment in the project districts |
| Subcomponent 2.3. National Sustainable Land Management and Payment for Environmental Services Monitoring | |
| | <ul style="list-style-type: none"> • Conducting a regional learning workshop each year of AF implementation after current funding streams end (2018–2020) to discuss project implementation and lessons learned with regional and national stakeholders • Vegetation, carbon stock, and water quality monitoring • Training for key stakeholders on data management and dissemination • Maintenance of the GIS-based M&E system and the SLWMP website at the EPA • Independent verification of the SLWM subproject agreements • Support to monitoring meetings of the LSC and District Watershed Planning Teams • Project impact evaluation and related community sensitization • Development of a documentary on project activities • Installation of project sign posts in target communities, to improve outreach and project visibility • Incremental monitoring costs |

| Subcomponent 2.4. Management of Riparian and Other Biological Corridors | |
|--------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| | <ul style="list-style-type: none"> • Implementation of natural resource-based livelihood activities in the CREMA communities (including training on beekeeping and provision of beehives) • Implementation of fire management activities and provision of fire suppression equipment in the CREMA communities • Implementation of CREMA management plans and strategies on human-wildlife conflicts reduction • Establishment of Green firebreaks around Ambalara and Kulpawn Tributaries Forest Reserves, jointly with neighboring communities (green firebreaks will incorporate food crops planted by the communities until the tree canopy closes) • Provision of tourism infrastructure/equipment for the GRR • Rehabilitation of existing watering points in Mole National Park • Ecological monitoring (MIST) • Incremental monitoring and operating costs |

Component 3. Project Management and Coordination (Total GEF: US\$2,139,482, including GEF AF: US\$640,000, contributing to Project Management Cost under the IAP)

50. This component supports project management and coordination activities, including budgeting and planning, procurement and financial management, capacity building for the PCU staff including on Bank-specific procurement, the costs of annual audits, annual and quarterly progress reports, the consultancy costs for the technical officer, procurement officer, a short-term procurement advisor, external audit, and production of the Project Completion Report.

51. **AF-specific subcomponent activities will include** the project officer and the project procurement officer consultancies; cost of annual external audit; production of the completion report; support to capacity building for the project management team for efficient project implementation (in project management, procurement, financial management, and auditing); cost of field supervision by the PCU (including financial and procurement supervision); project Steering Committee coordination and field costs, and operating and administrative costs of the PCU.

Annex 4: Implementation Arrangements (including M&E, FM, Procurement, and Safeguards)

SLWMP Restructuring and Additional Financing - P098538 and P157595

IMPLEMENTATION ARRANGEMENTS

- 1. Institutional arrangements.** The institutional and implementation arrangements remain largely as originally established, with the MESTI remaining a project implementing agency, providing overall project management and coordination leadership. Other beneficiary agencies under the project are: SADA leading spatial development activities under Component 1; the EPA leading the PES and monitoring aspects of SLWM; the MoFA leading the watershed planning and implementation of actual SLWM activities in agricultural landscape; and the FC (Wildlife Division (WD) and Forest Services Division (FSD) leading planning and implementation of SLWM through biodiversity management in the Western Wildlife Corridor and the protected areas (Forest Reserves, GRR, and Mole National Park).
- 2. Project management and oversight.** Project management is under the leadership of the MESTI with oversight and guidance provided by a project Steering Committee. The MESTI is responsible for the overall coordination, implementation, FM, procurement, monitoring, evaluation, reporting, and communication of project activities. To ensure local ownership and coordination of activities between project districts, an LSC has been established, including district coordinating directors and representatives of regional coordinating councils. The role of the LSC in guiding implementation of the AF2 activities will be strengthened.
- 3. PCU.** A fully mainstreamed PCU, which also serves as a secretariat to the project Steering Committee, is established within the MESTI under the Environment Directorate. Fiduciary management is carried out within the Finance and Administration Directorate of the MESTI, and fiduciary capacity has been built to support the project and to enhance the broader project management capacity of the ministry. Project procurement is done by the MESTI senior procurement officer, supported by the procurement officer (consultant) and procurement assistant.
- 4. Project Implementation Manual (PIM).** The PIM describes detailed implementation, FM, procurement, and M&E arrangements for the project.
- 5. The MESTI,** the Implementing Agency under the project, implements Component 2 of the project in collaboration with the MoFA, EPA, and FC.
- 6. SADA,** a beneficiary agency under the project, is responsible for the implementation of Component 1. The MESTI has fiduciary responsibility under the signed Memorandum of Understanding with SADA in accordance with the PIM. To advance implementation of spatial planning activities, SADA, in collaboration with the MESTI, proposed an alternative implementation arrangement, drawing on the expertise of the Town and Country Planning Department. The Town and Country Planning Department is an autonomous Government agency that is responsible for spatial

planning. Under the arrangement, the Town and Country Planning Department has delivered the planned Spatial Planning Framework through a Memorandum of Understanding with SADA. SADA is implementing all other activities under Component 1.

7. **The MoFA** (as the lead institution in the implementation of the participatory micro-watershed planning and subproject agreements within each district under Subcomponents 2.1 and 2.2), in particular its Directorate of Crop Services, collaborates with relevant stakeholders to (a) facilitate the implementation of SLWM activities in agricultural lands through the Department of Agriculture within the respective District Assemblies and extension officers; (b) undertake capacity-strengthening programs (awareness raising, extension worker to farmer visits, training of trainer farmer extension, and so on) under Subcomponent 2.1; (c) facilitate, monitor, and support subproject agreements under Subcomponent 2.2; and (d) implement the SLWM performance verification mechanism under Subcomponent 2.1. The Directorate of Crop Services through its Environment, Land, and Water Management Unit has oversight responsibility of these activities at the national level, including technical backstopping. The capacity of the District Watershed Planning Teams and CWMTs will be strengthened.

8. **The EPA** (a) coordinates the micro-watershed planning exercise which is a cross-sectoral activity jointly done by the EPA and MoFA, under Subcomponent 2.1; (b) leads national policy monitoring and development of the PES Strategy under Subcomponent 2.3; (c) develops and will operationalize the ESs index and related incentive system, (d) provides technical input in the coordination of cross-sectoral activities under Component 2; (e) hosts at its regional EPA office, in Bolgatanga, a Project Technical Coordination Office (TCO) acting as secretariat to the LSC and implementing ES monitoring activities under Subcomponent 2.3; (f) maintains the GIS unit at the EPA Bolgatanga office to collate field data on the SLWM and CREMA activities and provide basic mapping services for the project; and (g) delivers GIS-based M&E services to the project through the EPA head office database interface and backbone of the M&E system serving as a hub for populating primary data, storage unit, aid in data manipulation, and retrieval and visualization.

9. **The WD** of the FC of the Ministry of Lands and Natural Resources, through its head office and the regional office in Bolgatanga, coordinates and manages activities in the GRR, Mole NP, and Wildlife Corridors. The WD Bolgatanga office and GRR are responsible for producing operational plans, budgets, and reports, under supervision of the WD head office.

10. **The FSD** of the FC of the Ministry of Lands and Natural Resources will, under the AF, coordinate and manage activities in the degraded forest reserves and off-reserve areas within the corridor, under Subcomponent 2.4, through its head office and regional offices in Bolgatanga and Wa. Under the current project support, the FSD coordinates and manages activities in the forest reserves.

11. **The DDoAs** in respective districts will have the responsibility for signing and monitoring subproject agreements (as well as the subsequent provision of extension and inputs) with beneficiaries under agricultural support subprojects and related extension support.

12. **District forest offices** in respective districts will provide technical support to forestry subprojects in districts alongside the FSD (similarly to the role of DDoAs for farming subprojects) and enter into subproject agreements with communities for forestry subprojects, for example, riparian vegetation restoration.

13. **Relevant local NGOs and CSOs** will be mobilized to support community engagement in both corridors and agricultural lands, specifically to (a) provide extra capacity for community planning and institutional development exercises, including watershed management planning and discussion and drafting of the SLWM agreements with farmer groups; (b) complement the technical expertise of district and regional staff; (c) provide independent verification of performance under the SLWM contracts on a contractual basis; and (d) provide trainings for the local village communities on areas such as management of wildfires, simple ecological monitoring methods, management of bird hunting zones, wildlife - livestock conflicts, dry season gardening, and tree planting.

Monitoring and Evaluation of Outcomes / Results

14. **Overall Responsibility for M&E.** The MESTI will have overall responsibility for M&E, collating outputs and data from all project beneficiary agencies for a consolidated M&E report as part of the annual progress reports. Some M&E data (especially activities and outputs as well as updates on all project indicators according to the results framework) will also be included in biannual progress reports. Specific monitoring responsibilities will include the following:

- All beneficiary agencies will be required to keep detailed records of activities, outputs and expenditures against agreed work plans and following standard formats, including robust financial monitoring.
- The MoFA, FSD, and EPA will be responsible for the data collection on the climate change and land degradation GEF tracking tools. The WD will be responsible for the data collection on the biodiversity GEF tracking tool. These will be collated at baseline, midterm, and end of project.
- The DDoAs of the respective districts will be responsible for collecting primary data on the SLWM contracts signed and the implementation of agricultural SLWM technologies on the ground.
- The district forest offices of the respective districts will be responsible for collecting primary data on forestry sub-projects signed and the implementation of forestry-related sub-projects on the ground.

- An independent verification system will be established by the NSLMC (subcommittee) to cross-check recorded performance under SLWM contracts, based on a sampling approach. Specialized monitoring of vegetation cover and soil carbon in the project implementation areas will be outsourced under the joint supervision of EPA and FC.
- The CRMC will be responsible for simple community wildlife and natural resource monitoring systems in CREMAs. The WD will collate information and monitor management effectiveness via the METT tool.
- The FSD will undertake the assessment and diagnostic studies of community protected areas, sacred groves, and agricultural landscape within the corridor.
- The EPA/TCO will be responsible for collating and management of data through its GIS-based M&E system at its head office and GIS unit at Bolgatanga.

15. In addition, the project will seek to encourage partners to engage in complementary monitoring activities for efficiency and effectiveness in projects implementation, in particular other projects implementing the SLWM technologies as required in the case of projects being coordinated by the MESTI.

16. The WD operates a computer-based MIST for monitoring of wildlife stock in protected areas. The GRR has been supported under the SLWMP with the requisite software and computer for data collection and biodiversity monitoring for management purposes.

17. The MIST allows trained patrol staff to gather Global Positioning System data, including observations of numbers and types of animal species, different classes of illegal activities, locations of all observations and encounters, patrol duration, and so on into a standard patrol sheet. The data is uploaded into an MIST software and analyzed to create various reports, including charts and maps. The information is used for management decisions and, depending on the type of results obtained, patrol strategies and tactics may be varied to respond to any challenges or gaps identified.

18. **Mid-Term Review point.** The project had its formal Mid-Term Review in January 2014. However, for the IAP and GEF reporting for the AF (under GEF-6), the midterm point is set around December 2018–January 2019 (which will be a middle point of AF implementation).

19. **The project impact evaluation** will assess impacts of implementation of SLWM interventions attributable to the project support. Impact evaluation will be conducted based on the accepted impact assessment methodology and will assess the overall achievement of expected project results with a particular focus on testing the effectiveness of ESs generated from the pilot PES schemes on the ground.

20. The IE will include three randomized control trials, one looking at the impact of the integrated package of SLWMP interventions and the other two testing mechanisms to enhance long-run sustainability. The research questions are as follows:

- (a) What is the general impact of the full package of SLWMP interventions on environmental outcomes and farmer livelihoods?
- (b) What is the impact of conditional PES, implemented by means of a procurement auction, on both the adoption and implementation of SLWM practices?
- (c) What is the impact of public recognition for environmentally friendly farming practices on farmers' long-run maintenance of the soil and water conservation technologies?

21. The AF will support two follow-up data collection activities, a midline survey to assess short-term impacts of the interventions and an endline survey to examine the longer-term impacts. At midline, the impact evaluation will compare villages that begin project activities in 2016 to villages that will begin project activities later and a group of control communities (that will not receive SLWMP support at this time). Eligible communities were randomly assigned into these three categories (early phase-in, later phase-in, and pure control). At endline, the impact evaluation will compare both early and late phase-in communities (all will have completed SLWMP activities) to the control; this will examine whether impacts are sustained beyond the initial project support.

22. The project will also employ a feedback mechanism to monitor farmers' perceptions of performance and satisfaction under the introduced SLWM technologies. A specific survey to measure farmers' satisfaction with the way the project interventions reflected their needs will form a part of the endline project impact evaluation survey.

Procurement Arrangements

23. Procurement will be carried out in accordance with the Bank's (a) 'Guidelines: Procurement of Goods, Works, and Non-Consulting Services under IBRD Loans and IDA Credits and Grants by World Bank Borrowers', dated January 2011, revised July 2014; (b) 'Guidelines: Selection and Employment of Consultants under IBRD Loans and IDA Credits and Grants by World Bank Borrowers', dated January 2011, revised July 2014, and the provisions stipulated in the Legal Agreement; and (c) 'Guidelines on Preventing and Combating Fraud and Corruption in Projects Financed by IBRD Loans and IDA Credits and Grants', dated October 15, 2006, and revised in January 2011 and the provisions stipulated in the Grant Agreement. For each contract to be financed by the grant, the different procurement methods, or consultant selection methods, the need for prequalification, estimated costs, prior review and methods requirements, and time frame are agreed between the borrower and the Bank in the Procurement Plan. The Procurement Plan will be updated at least annually or as required to reflect the actual project implementation needs and improvements in institutional capacity. In preparing the Procurement Plan, the prior review and methods threshold associated with a risk rating of

Substantial is applicable. In undertaking procurement activities under the project, the following key objectives of procurement enumerated below and in line with the Bank’s procurement guidelines should be adhered to at all times: (a) economy; (b) efficiency; (c) nondiscrimination; (d) transparency; (e) reliability; (f) fairness; and (g) accountability. Thus, the most preferred procurement method is one that guarantees and enhances competition to get value for money.

24. The PCU in the MESTI will have sole responsibility for procurement management and oversight, including coordinating, consolidating, and reviewing implementation plans, budget, and reports, ensuring procurement complies with national and Bank procurement guidelines. All beneficiary agencies will provide inputs for preparation of relevant procurement documents for procurement related to their own activities and manage execution of contracts for those. The PCU currently has a procurement officer, who has been part of the project from the beginning and used to work under a procurement consultant, and so has gained some knowledge and experience in Bank procurement by doing and learning, coupled with attendance of trainings on Bank procurement. However for the additional value, complexity, and workload, the project needs a very experienced, knowledgeable, and competent procurement consultant proficient in Bank procurement requirements and processes to handle the project procurement to be supported by the procurement officers.

25. All beneficiary agencies such as the MoFA, WD, FSD, and EPA will not undertake procurement activities except purchasing basic items, such as fuel and so on, for their operations.

26. **Procurement Plan.** For each contract to be financed by the grant, the different procurement methods or consultant selection methods, the need for prequalification, estimated costs, prior review requirements, and time frame are agreed between the Recipient and the Bank in the Procurement Plan. In preparing the Procurement Plan, the current prior review and methods threshold for the existing project, as shown in table 4.1, is applicable. The Procurement Plan for the AF was prepared and cleared by the Bank on March 23, 2016. It will be updated at least annually or as required to reflect the actual project implementation needs.

27. **Thresholds for procurement methods and review** are presented in table 4.1. All Direct Contracting and Single-Source Selection shall be subject to prior review by the Bank.

**Table 4.1. Prior Review and Procurement Methods Thresholds
(Risk Rating – Substantial)**

| Prior Review Threshold | | | | | Procurement Method Threshold | | | | | | All-National Shortlist of Consultants |
|------------------------|-------|---------------------------|-------------|-------------|------------------------------|----------------------|-------|----------------------|----------|----------------------|---------------------------------------|
| Works | Goods | IT System s+Non Cons Serv | Consultants | | ICB | | NCB | | Shopping | | |
| | | | Firms | Individuals | Works | Goods +Non Cons Serv | Works | Goods+ Non Cons Serv | Works | Goods+ Non Cons Serv | |
| =\$10 | =\$1 | =\$1 | =\$0.5 | =\$0.2 | =\$15 | =\$3 | <\$15 | <\$3 mil | <\$0.2 | <\$0.1 | =\$0.3 mil |

| | | | | | | | | | | | |
|-----|-----|-----|-----|-----|-----|-----|-----|--|-----|-----|------------------------------------------------|
| mln | mln | mln | mln | mln | mln | mln | mil | | mil | mil | (All) =\$0.5 mil (Engr+Con tract Spn) |
|-----|-----|-----|-----|-----|-----|-----|-----|--|-----|-----|------------------------------------------------|

Additional Notes

28. Based on specific needs and circumstances, shopping thresholds for the purchase of vehicles and fuel may be increased up to US\$500,000 equivalent.

29. The threshold for shopping is defined under paragraph 3.5 of the Procurement Guidelines and should normally not exceed US\$100,000 equivalent for off-the-shelf goods and commodities; and US\$200,000 equivalent for simple civil works.

30. **Selection Based on Consultants' Qualifications threshold.** The threshold for the use of Selection Based on Consultants' Qualifications is determined on a case-by-case basis, taking into account the nature and complexity of the assignment but shall not exceed US\$300,000 equivalent other than in exceptional situations in accordance with paragraph 3.7 of the Guidelines: Selection and Employment of Consultants.

31. Operating expenditures are subject to neither the Procurement and Consultant Guidelines nor prior or post reviews. Operating expenditures are normally verified by the task team leader and FM specialists.

32. **Prior review contracts for the hiring of individual consultants.** Review of the selection process for all other individual consultants (technical experts) shall be by the task team leader, apart from legal work and procurement assignments, irrespective of the thresholds and category of risk, which shall respectively be reviewed by Bank's Legal vice presidential unit with the relevant expertise and the designated procurement specialist or regional practice manager as required. The selection of all consultants (firms or individuals) hired for legal work or for procurement activities, irrespective of the thresholds and category of risk, are respectively cleared by the Legal vice presidential unit of the Bank with the relevant expertise and the designated procurement specialist or regional practice manager, as required.

33. Contracts below the threshold but falling within an exception as defined in clause 5.4 of the Guidelines: Selection and Employment of Consultants are also subject to prior review or require the Bank's prior 'no objection'.

34. Special cases beyond the defined thresholds are allowed based on applicable market conditions.

35. For thresholds for which a short list may comprise only national consultants, the borrower does not need to publish/advertise in the United Nations Development Business online.

36. For procurement value less or equal to US\$0.3 million, the short lists of consultants can all be nationals. The value can increase up to US\$0.5 million in case of consultancy assignments for engineering design and contract supervision.

37. Single source (firms, individuals) and direct contracting of value greater than or equal to US\$0.1 million are subject to Bank prior review and ‘no objection’.

38. **Procurement of works.** The procurement will be done using the Bank’s Standard Bidding Documents for all International Competitive Bidding and National Standard Bidding Documents under National Competitive Bidding (NCB) agreed with or satisfactory to the Bank. According to the threshold guidelines above, shopping procedures may be used in accordance with Ghana Public Procurement Act 663 of 2003 and based on a model to be developed in the Public Procurement Act procurement manual. Contracts will be procured using shopping procedures based on a model request for quotations satisfactory to the Bank. Direct contracting may be used in exceptional circumstances, in accordance with paragraphs 3.6 and 3.7 of the Bank Procurement Guidelines, but it will be subject to the Bank’s ‘no objection’, depending on the threshold.

39. **Procurement of goods.** Goods orders shall be grouped into larger contracts wherever possible to achieve greater economy. The procurement will be done using the Bank’s Standard Bidding Documents for all International Competitive Bidding and National Standard Bidding Documents under NCB agreed with or satisfactory to the Bank. According to the threshold guidelines above, shopping procedures may be used in accordance with Ghana Public Procurement Act 663 of 2003 and based on a model to be developed in the Public Procurement Act procurement manual. Contracts will be procured using shopping procedures based on a model request for quotations satisfactory to the Bank. Direct contracting may be used in exceptional circumstances, in accordance with paragraphs 3.6 and 3.7 of the Bank’s Procurement Guidelines, but it will be subject to the Bank’s ‘no objection’, depending on the threshold.

40. **Procurement of non-consulting Services.** Procurement of non-consulting services will follow procurement procedures similar to those stipulated for the procurement of goods, depending on their nature. The applicable methods shall include NCB and shopping. The Bank’s Standard Bidding Documents to use for bidding is the Procurement of Non-Consulting Services and User Guide, December 2002, revised April 2007, and further revised March 2010, found at the Bank website www.worldbank.org/procure.

41. **Selection of consultants.** Consultancy services will be provided under the project and include the following categories: financial, technical and procurement audits, economic and technical feasibility and design studies, supervision of construction works, institutional studies, M&E studies, and technical assistance to the implementing ministries. In accordance with the threshold, methods of procurement will include Quality- and Cost-Based Selection and Selection based on Consultants’ Qualification while selection under the Quality-Based Selection, Selection under a Fixed Budget, and Least-Cost Selection methods will be applied in the circumstances as respectively described under paragraphs 3.5 and 3.6 of the Consultant Guidelines. For all contracts to be awarded following Quality- and Cost-Based Selection, Least-Cost Selection, and Selection under a Fixed Budget, the Bank’s Standard Request for Proposals will be used. Procedures of selection of individual consultants will be followed for assignments that

meet the requirements of paragraphs 5.1 and 5.3 of the Consultant Guidelines. Least-Cost Selection procedures will be used for assignments for selecting the auditors. Single-Source Selection procedures will be followed for assignments that meet the requirements of paragraphs 3.10 to 3.12 of the Consultant Guidelines and will require the Bank's prior review and 'no objection'.

42. Assignments estimated to cost the equivalent of US\$300,000 or more will be advertised for expressions of interest in the United Nations Development Business, dgMarket, and at least one newspaper of wide national circulation. In addition, requests for Expression of Interest for specialized assignments may be advertised in an international newspaper or magazine. Foreign consultants who wish to participate in national section should not be excluded from consideration.

43. Regardless of the need for prior or post procurement review, all consultant terms of reference will be cleared by the Bank.

44. **Exceptions to competitive bidding.** For NCB for goods and works and the selection of consultants, national procedures that are governed by Ghana Public Procurement Act 663 of 2003 may be followed, with the following exceptions: (a) foreign bidders shall be allowed to participate in NCB procedures; (b) bidders shall be given at least one month to submit bids from the date of the invitation to bid or the date of availability of bidding documents, whichever is later; (c) no domestic preference shall be given for domestic bidders and for works; and (d) in accordance with paragraph 1.16(e) of the Procurement Guidelines, each bidding document and contract financed out of the proceeds of the grant shall provide that (i) the bidders, suppliers, contractors, and subcontractors shall permit the Bank, at its request, to inspect their accounts and records relating to the bid submission and performance of the contract and to have these accounts and records audited by auditors appointed by the Bank and (ii) the deliberate and material violation by the bidder, supplier, contractor, or subcontractor of such provision may amount to an obstructive practice as defined in paragraph 1.16 (a)(v) of the Procurement Guidelines, as well as adhering to the Bank Policy on Fraud and Corruption.

45. **Capacity building and training programs, seminars, conferences, workshops, etc.** All training and workshops will be carried out on the basis of the project's Annual Work Plans and Budget, which will have to be approved by the Bank on a yearly basis and which will, among others, identify (a) the envisaged training and workshops; (b) the personnel to be trained; (c) the institutions which will conduct the training and selection methods of institutions or individuals conducting such training; (d) the justification for the training, how it will lead to effective performance and implementation of the project and/or sector; (e) the duration of the proposed training; and (f) the cost estimate of the training.

46. **Operating costs.** Items related to project operating costs will be procured using the implementing agencies' administrative procedures, which have been reviewed and found acceptable to the Bank.

47. **Capacity assessment of the PCU-MESTI.** As part of the Bank's fiduciary requirements to ensure that the implementing agencies continue to have systems, structures, and capacity to administer procurement in compliance with the Bank's Procurement and Consultant Guidelines under the project and consequently the AF, a procurement assessment was conducted on the PCU for the project at the MESTI. It concludes that the MESTI is in compliance with the procurement law, has experience in implementing Bank-financed projects, and gained particular experience from the currently ongoing Bank-funded project, having run it for the first half of the project life. It continues to have an entity tender committee and review board in its permanent organization as final decision-making authorities in addition to adequate internal technical and administrative controls and anticorruption procedures. The review also notes the existence of satisfactory appeals mechanisms for bidders. It is also noted that the procurements undertaken are in the approved Procurement Plans, but these must be regularly updated. It was also noted that records keeping and procurement filing will need some attention and improvement.

48. The project has a procurement officer - a consultant who has been with the project since its inception and had worked under a previously recruited experienced procurement consultant (resigned now) at the PCU. The procurement officer, therefore, gained some experience and knowledge to conduct procurement under the project; however, given the nature of the project, increased value, volume, and complexity and the fact that all procurement will be undertaken at the PCU, the project procurement may pose some challenge to the existing procurement officer; thus the MESTI elevated the handling of procurement to its senior procurement officer. The overall procurement risk assessment is rated Substantial. The key risks for procurement are (a) the challenge to handle the high volume of procurement actions of projects on behalf of the ministry and the other beneficiary agencies; (b) possible delays in preparation of technical inputs to procurement documents, evaluation of bids, and technical proposals, and (c) complexity associated to the project.

49. To address the above risk areas, the following actions are envisaged: (a) immediate recruitment of a highly experienced and knowledgeable short-term procurement advisor—a consultant who is conversant with the Bank procurement requirements to provide both on-the-job training and capacity development of the existing procurement personnel (and systems) and to support the actual handling of upcoming procurements in collaboration with the existing procurement personnel; (b) close monitoring of procurement plans and quality assurance on all aspects of the procurement process, including evaluation, selection and award, and monitoring of contract implementation to completion, and continuous updating of the procurement plan at all times; (c) full inclusion of the specialized agencies in the preparation of relevant procurement documents – terms of reference, specifications, technical inputs, and so on; and (d) short training courses for project procurement personnel on Bank-specific procurement at a recognized learning institution.

50. **Monitoring of contract implementation to successful completion.** While the respective beneficiary agencies are managing contract execution and implementation, with backstopping from the PCU, procurement will monitor all contract implementations

to ensure that the timelines as indicated in the Procurement Plan are adhered to so the procurement can be complete to achieve the expected results¹⁹.

51. **Frequency of procurement supervision.** In addition to the prior review supervision which will be carried out by the Bank, the procurement capacity assessment has recommended one supervision mission each year to visit the field to carry out post review of procurement actions and technical review. The procurement post reviews and technical reviews should cover at least 15 percent of contracts subject to post review, as the risk rating is Substantial. In addition, post reviews of in-country training will be conducted periodically to review the selection of institutions/facilitators/course contents of training and justifications thereof and costs incurred. Post review consists of reviewing technical, financial, and procurement reports carried out by the borrower's executing agencies and / or consultants selected and hired under the Bank project according to procedures acceptable to the Bank.

52. **Contract management and expenditure reports.** As part of the procurement management report, the MESTI will submit contract management and expenditure information in quarterly reports to the Bank. The procurement management report will consist of information on procurement of goods, works, and consultants' services and compliance with agreed procurement methods. The report will compare procurement performance against the plan agreed at negotiation and updated at the end of each quarter, as appropriate. The report will also provide information on complaints by bidders, unsatisfactory performance by contractors and suppliers, and any information on contractual disputes. The agreed format for the procurement management report will constitute a part of the PIM.

53. **Publications of awards and debriefing.** Publication of contract awards of the bidding process and debriefing for all International Competitive Bidding procurements, and for all consultants' contract for hiring firms, will be carried out in accordance with the Bank's 'Guidelines: Procurement of Goods, Works, and Non-Consulting Services under IBRD Loans and IDA Credits and Grants by World Bank Borrowers', dated January 2011, revised July 2014, and 'Guidelines: Selection and Employment of Consultants under IBRD Loans and IDA Credits and Grants by World Bank Borrowers', dated January 2011, revised July 2014. Publication of results of other procurement activities, including debriefing, shall be subject to the stipulations in Ghana Public Procurement Act 663 of 2003.

54. **Fraud and corruption.** All procuring entities as well as bidders and service providers, that is, suppliers, contractors, and consultants shall observe the highest standard of ethics during the procurement and execution of contracts financed under the

¹⁹ Procurement officers shall not be tasked with contract management and supervision because of the specialized nature of the contracts. Contract management and supervision requires multifaceted discipline and therefore the PCU shall work together with the various IAs and form a team with the requisite qualification, experience, including user and beneficiary agencies and relevant stakeholders to manage, supervise, and monitor actual contract execution and delivery.

project in accordance with paragraph 1.14 of the Procurement Guidelines and paragraph 1.22 of the Consultant Guidelines. The ‘Guidelines on Preventing and Combating Fraud and Corruption in Projects Financed by IBRD Loans and IDA Credits and Grants’, dated October 15, 2006, and revised in January 2011, shall apply to the project, in addition to the relevant Articles of the Ghana Public Procurement Act and other national legislation which refers to corrupt practices.

55. **Documentation and filing System.** The PCU shall maintain full records of procurement, including minutes of any evaluations or negotiations, documentation, and a competent filing system that delivers a complete audit trail in their procurement activities. The Bank’s annual post procurement reviews of the project shall be a combination of both documentary and physical procurement auditing. The records of procurement activities and the associated filing system are expected to facilitate the post procurement review.

56. **Strengthening procurement capacity.** To provide an appropriate level of delivery and oversight to other implementing agencies, the MESTI will immediately recruit a highly experienced and knowledgeable short-term procurement advisor—a consultant who is conversant with the Bank procurement requirements to provide both on-the-job training and capacity development of the existing procurement personnel (and systems) and to support the actual handling of upcoming procurements in collaboration with the existing procurement personnel

57. **The PIM** includes detailed sections on procurement objectives, use of Bank guidelines, Procurement Plan, thresholds for procurement method and prior review, procurement tasks and responsibilities, strengthening procurement capacity, procurement categories, thresholds and methods, procurement steps, contract management and expenditure reports, publications of awards and debriefing, fraud, corruption, and documentation and filing system. The PIM is considered a live document, expected to be updated from time to time as agreed, to reflect agreed refinements to project procedures.

Financial Management Arrangements

58. Under the AF, it is understood that there will be no changes in the existing FM, funds flow, and disbursement arrangements and as such the focus is to provide an overview of the existing system and also the extent of compliance with the Bank’s financial covenants. Based on supervision missions of existing projects being implemented by the MESTI and reviews of financial statements and annual audit reports, the conclusion is that FM arrangements reviewed are adequate and satisfactory and meet the minimum requirement.

59. As part of the original Grant facility, in line with the use of some aspects of the country systems, the overall FM responsibility of the project has been under the direct supervision of the director of accounts of the MESTI. The responsibility of the director has been to ensure that throughout implementation there are adequate FM systems in place to report on the use of project funds. In addition, as envisaged under the implementation arrangement, the routine transactional processing, accounting recording,

and reporting has been handled by the project accountant, together with a team of officers who are all staff of the Controller and Accountant General's Department. Under the oversight of the director of accounts, the project accountant ensures that all fiduciary aspects of the project are complied with in accordance with the government regulations and Bank policies and procedures.

60. The proposed arrangement is to open and use a single designated account (denominated in U.S. dollars) under the direct responsibility of the national project coordinator but managed and operated by the director of accounts. The designated account will be specific to the second AF Grant and segregated from the existing designated accounts for the original GEF Grant and first AF to the SLWMP. This arrangement to use a centrally located account is important to ensure that the MESTI has oversight responsibilities over all the transfers and payments related to the implementation of project activities.

61. With regard to FM performance, generally the project has had challenges particularly in the quality of financial reporting (quality, content, and details of lack of narrative reports to support the financials) and slow documentation or retirement of advances from beneficiary agencies. These challenges have adversely affected the risk rating of the project. Periodic FM reviews of the original Grant indicate that even though as a government agency there are adequate FM systems in place, that is, budgeting, accounting, internal controls, and so on, these systems have not been effectively used to support implementation.

62. The most recent FM review of the project conducted in June 2015 rated the FM performance as Moderately Satisfactory. This rating implies that there are shortcomings in FM arrangements, which jeopardize the capacity to provide timely and reliable information (quality, content, and details of their reports) required in managing and monitoring the implementation of the project; however, these weaknesses can be easily addressed. The shortcomings stem mainly from inadequate supervision and oversight of the accounting function. To address these lapses, the Bank recommended the strengthening of the oversight role of fiduciary function by the director of accounts and the internal audit unit. In addition, project funds under Component 3 will be used for additional continuous professional development of key staff in fiduciary functions. It must be noted, that as part of the risk mitigation measures agreed upon, the ministry has recently appointed a director of accounts who has been tasked with ensuring that FM systems are effective and functional. It is on the basis of such risk mitigation measure that the overall residual FM risk is rated as Moderate.

63. With regard to compliance with the financial covenants, including regular submission of acceptable interim financial statements and annual audited financial reports, the project has satisfactorily complied with the financial covenants according to the Financing Agreement, albeit, with occasional delays in meeting the stated timelines. Reviews of the audit reports have not highlighted any material misstatements of figures or significant lapses in internal controls nor adverse opinions.

Disbursements

64. The proposed additional funding is for an amount of US\$12,768,832 to be disbursed over a four-year period. The agreed arrangement is to open and use a segregated designated account (denominated in U.S. dollars) under the direct responsibility of the MESTI director of accounts who also oversees the two designated accounts for the original GEF Grant and the first AF. Based on the assessment of FM systems, the proceeds of the Grant will be administered using the Statement of Expenditure reporting on the uses of project funds.

65. In terms of categories, to ensure effective monitoring on project expenditure, it has been proposed to use four disbursement categories aligned to the respective components of the project, according to table 4.2.

Table 4.2. Allocation of the Proceeds of the Grant by Disbursement Category, in US\$

| Category of Expenditure | Allocation | Disbursement %(Type Total) |
|--------------------------------------------------------------------------------------------------------------------------|--------------|-------------------------------|
| | Proposed | Proposed |
| Category 1 - Goods, Consultant Services, Training, Incremental Operating Costs - Part A | 0.00 | 100.00 |
| Category 2 - Goods, Works, Consultant and Non-Consultant Services, Training, Incremental Operating Costs - Part B1, 3, 4 | 5,649,397.00 | 100.00 |
| Category 3 - Goods and Works - Part B2 | 6,479,435.00 | 100.00 |
| Category 4 - Goods, Consultant Services, Training, Incremental Operating Costs - Part C | 640,000.00 | 100.00 |

66. The following disbursement methods may be used under the grant: (a) advance; (b) direct payment; (c) reimbursement; and (d) special commitment. The ceiling of the designated account is set at US\$2,000,000. The minimum value of applications for advances and direct payments is set at US\$200,000.

67. Additional instructions for disbursements are provided in a Disbursement Letter issued for this project.

68. The closing date of the first AF grant is extended by 2 years and 9 months, to November 30, 2020, to synchronize it with the Second AF closing date.. The closing date of the original grant remains unchanged and there are no changes to disbursements under this grant.

Environmental and Social Safeguards

69. The project’s Environmental Analysis and Management Plan and RPF are key safeguards documents guiding environmental and social due diligence under the project. Negative social and environmental impacts of project activities are expected to be minor. In general, impacts should be positive as the overall aim is to improve land, water, and natural habitat management through technologies which also benefit participating

communities and individuals. To be included in the menu of options for application during the project, an SLWM technology will first need to be judged to have a clear (and potentially quantifiable) environmental benefit, which is denoted by its score on an ESs index. The menu of SLWM options has been revised to include lessons learned from previous phases of the projects as well as new complementary activities such as traditional grain storage silos and provision of crop processing equipment such as manual grain mills, however, not having new safeguards implications (due to size, location, and technology in question). Agricultural lands required for SLM activities are self-selected by communities and individual farmers willing to adopt SLWM technologies. Forest Management Plans (and mini plans for some of the target forest reserves) guide safeguards treatment of activities within target forest reserves, including on aspects of collaborative forest management and access rights for the fringe communities.

70. An Environmental Analysis and Management Plan was prepared and disclosed in 2010 (and redisclosed on March 9, 2016, as part of this AF preparation) and is in place to guide mitigation of potential identified risks; it will continue to be applied to the scale-up activities.

71. Expected social benefits include, but are not limited to, enhancement of livelihood sources, job creation, induced development, and the strengthening of local community ownership of SLM investments. The project will promote female participation in each of the activities to be financed and data will be disaggregated to allow for assessment according to gender. No land acquisition or involuntary resettlement is envisaged. Agricultural lands required for SLM activities are self-selected by communities and individual farmers willing to adopt SLWM technologies. No new government protected areas are being established and watershed management activities in CREMAs will be community driven. OP 4.12 (Involuntary Resettlement) has been triggered as a precautionary measure to address potential cases where individual access to land resources would be restricted as the result of community-level choices to engage in certain natural resource management and SLWM activities under Component 2, especially for tenant farmers. An RPF was prepared and disclosed in 2010 (and redisclosed on March 9, 2016, as part of this AF preparation) for use by the original project; it will continue to be applied to manage potential resettlement issues.

72. The PIM includes detailed sections on safeguards, including positive environmental and social impacts, potential negative impacts, mitigation of potential negative environmental impacts, and mitigation of potential resource access restriction and implementation responsibilities.

73. **Safeguards performance to date.** Safeguards performance under the current SLWMP financing has been satisfactory (see satisfactory findings/safeguards ratings of the implementation support missions, last in January 2016). The annually proposed subprojects are screened using a list of approved SLWM technology options consistently with the provision of the Environmental Analysis and Management Plan and PIM; this positive list of supported interventions is an integral part of the Subprojects Guidelines. The supported SLWM options are considered to have positive overall environmental benefits when implemented according to the agreed project procedures. To ensure

safeguards compliance, the TCO at the EPA office in Bolgatanga has been screening all subproject proposals for their compliance with the approved list, consistency with the approved watershed management plans, and overall compliance with the project's safeguards risk management approach and the national regulations. Subprojects found to be inconsistent with these are rejected (not funded).

74. During subproject implementation, DDoAs will collect data on implementation of agricultural SLM subprojects and report on safeguards issues related to implementation of agricultural subprojects; district forest offices will collect the same data on forestry-related subprojects; the Ghana EPA monitors agricultural chemical use and provides requisite training and awareness and periodically inspects subproject implementation in the field; and the regional WD staff ensures that safeguards provisions are followed in CREMA management, establishment of watering points, dugouts and access tracks. The FSD ensures that safeguards provisions are followed in forest management plans and sustainable forest management activities.

75. For the forest reserves where the project has been supporting enrichment planting with indigenous species or establishment of green firebreaks with acacia, the existing forest management plans were disclosed in 2014. For the planned one-off activities such as establishment of wildlife watering points or community dugouts which will be planned and implemented as additional to the project's main subproject modality, it is envisaged that self-standing assessments/management plans will be prepared, consulted upon, and disclosed.

76. For the planned prefeasibility studies for water retention infrastructure on Volta tributaries, environmental and social due diligence work is envisaged to be carried out alongside the prefeasibility studies.

Annex 5. Appropriate Sustainable Land and Water Management Options for Northern Ghana

SLWMP Restructuring and Additional Financing - P098538 and P157595

1. Appropriate SLWM options for Northern Ghana presented in this annex were determined through a participatory process involving local stakeholders and were based on local conditions and socioeconomic context, including farm size and assets. The common technical elements that underpin most of the ‘win-win’ SLWM options include maintenance of good ground cover, restoration of soil organic matter and soil fertility, conservation and management of water, improved management of farm components, and control of pests and diseases. The SLWM options are presented according to farming system and land type. Benefits to be derived by farmers and associated social and environmental issues as well as minimum requirements are also highlighted. Many of these options include consideration of climate change mitigation benefits, given that Ghana’s agricultural sector has the potential to contribute to global efforts to reduce GHG emissions and sequester carbon.

2. Each technology included in the list of SLWM options has a fact sheet that details technical, social, environmental feasibility (ecological and socioeconomic conditions), and environmental benefits (production and economic benefits, off-site benefits, and sociocultural benefits). It also provides the establishment and maintenance activities to be undertaken to achieve the goals of the technology, constraints, and suggested solutions. This information helps establish the link between the SLWM options and safeguards due diligence.

3. The SLWM technologies are organized into four categories. Within each category, a large number of specific techniques may be included, but for the sake of devising a manageable menu of options and assigning ESs indices to these, techniques will be grouped into a small number of models. Each model will be associated with a specific environmental index value that will determine the relative magnitude of the support that can be offered for implementation of that model, within the PES framework. Each model may, therefore, include a range of specific techniques, with some flexibility as to which is applied in a particular case but will be defined by a set of minimum standards, with some techniques obligatory, others interchangeable, and others optional.

Table 5.1. SLWM Options by Farming System

| Technology | Technical/Social/Environmental Feasibility | Environmental Benefits |
|--------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Agricultural land (rainfed farming) | | |
| 1. Crop rotation | <ul style="list-style-type: none"> • Use crops of different effective rooting depths • Balance crops with high nutrient requirement with nitrogen fixing crops • Use crops with different susceptibilities to pests and diseases | <ul style="list-style-type: none"> • Improves soil physical condition for water intake • Reduces runoff, erosion, and soil compaction • Restores soil fertility and adds organic matter to the soil |

| Technology | Technical/Social/Environmental Feasibility | Environmental Benefits |
|-----------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| | | <ul style="list-style-type: none"> • Controls Striga infestation • Improves crop yield |
| 2. Integrated nutrient management | <ul style="list-style-type: none"> • Availability and affordability of mineral fertilizers • Technical know-how in application rates • Availability of organic sources of nutrients • Labor and transport costs for carting organic material | <ul style="list-style-type: none"> • Provides favorable environment for rapid growth of crop to cover soil for erosion control • Maintains soil fertility and enhances soil productivity • Cuts down the amount of mineral fertilizers to apply and reduces potential agrochemical pollution of the environment • Stimulates the activity of microorganisms for enhanced maintenance of soil fertility • Improves infiltration, soil structure and reduces erosion and runoff • Enhances crop yield • Soil carbon improvement |
| 3. Composting | <ul style="list-style-type: none"> • Availability of raw material and water for compositing • Quality of compost • Labor and transport cost in carting and spreading compost | <ul style="list-style-type: none"> • Releases nutrients slowly and reduces risk of nutrients leaching to pollute groundwater • Enhances soil physical properties for enhanced infiltration, reduced runoff and erosion • Conserves soil moisture • Recycles waste and contributes to waste management |
| 4. Cover cropping | <ul style="list-style-type: none"> • In dry areas, cover crops compete for available moisture • Availability of planting material is a major constraint • Initial establishment is not compatible with extensive livestock grazing | <ul style="list-style-type: none"> • Reduces soil erosion, soil compaction, and sealing • Protects the soil from excessive heat and leaching of nutrients • Creates a good environment for microorganisms • Restores degraded land • Sequesters carbon and adds organic matter to soil • Improves soil fertility • Reduces sediment pollutants into streams |

| Technology | Technical/Social/Environmental Feasibility | Environmental Benefits |
|-----------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| | | <ul style="list-style-type: none"> • Enhances infiltration of water and soil moisture storage, reduces runoff, and contributes to groundwater recharge |
| 5. Mulching | <ul style="list-style-type: none"> • Availability of mulching material • Not compatible with bushfires • Competing uses of vegetation resources | <ul style="list-style-type: none"> • Reduces evaporation • Regulates soil temperature • Protects the soil from compaction of rainfall and animal trampling • Controls erosion and enhances infiltration and soil moisture conservation • Adds organic matter and nutrients to the soil • Enhances soil productivity • Reduces nutrient losses through erosion and leaching • Recycles crop residues |
| 6. Agroforestry | <ul style="list-style-type: none"> • Water and nutrient competition between trees and crops leading to reduced crop yields • Compatibility of crops with regard to morphology and rooting system • Tree component—reduced land for arable crops • Exclusion of land from other uses for example, grazing creating conflicts • May interfere with mechanized farming, for example, ridging • High initial labor input • Land tenure issues may adversely affect tree planting thereby limiting adoption | <ul style="list-style-type: none"> • Reduced pressure in natural vegetation for wood products and fodder • Links erosion control practices with production • Provides biodiversity corridors on farms • Improved microclimate in farms • Recovery of native vegetation and species • Creates favorable microclimate sites for on-farm biodiversity • Protects the environment against extremes of climatic elements (rainfall, temperature, windstorms, and so on) • Sequesters carbon above ground and in soil • Climate mitigation potential (Smith and Martino, 2007); 0.33 and 0.72 tCO₂/ha/year in warm-dry and warm-moist areas, respectively. The respective values for |

| Technology | Technical/Social/Environmental Feasibility | Environmental Benefits |
|-----------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| | | all GHGs are 0.35 and 0.72 tCO ₂ e/ha/year. |
| 7. Afforestation and revegetation | <ul style="list-style-type: none"> • Not compatible with extensive animal husbandry system • Fencing may be necessary in such areas • Availability of plant species mix • Labor availability | <ul style="list-style-type: none"> • Controls erosion • Adds organic matter to soil through litter fall • Recycles nutrients and improves soil fertility • Creates suitable environment for soil microbial activity • Enhances infiltration and conserves soil moisture • Regulates soil and ambient temperature • Sequesters carbon • Promotes rapid growth of plants and rehabilitates degraded and marginal lands |
| 8. Multiple cropping | <ul style="list-style-type: none"> • A common cropping system in all agro-ecologies • Practiced by all smallholder farmers | <ul style="list-style-type: none"> • Multi-canopy protects the soil from raindrop impact and reduces erosion • Reduction in sediment and nutrient transport into streams • Enhances infiltration of water • Provides all-year cover • Sequesters carbon above ground • Strategy for food security • Improves soil carbon |
| 9. Minimum tillage | <ul style="list-style-type: none"> • Availability of appropriate machinery • Cloddy surface constrains seeding and germination • Farming of planted seeds necessary | <ul style="list-style-type: none"> • Reduces compaction, maintains high infiltration rates, and increases aggregate sizes • Controls erosion and conserves soil moisture • Reduces runoff |
| 10. Zero tillage | <ul style="list-style-type: none"> • Availability and affordability of herbicides • Availability of enough vegetative cover • Soils with low susceptibility to compaction and crusting and good internal drainage • Less suitable for severely degraded | <ul style="list-style-type: none"> • Creates favorable soil temperature for growth of crops and microbial activity • Improves soil structure and reduces runoff and erosion • Provides organic matter and nutrients to soil • Improves soil carbon |

| Technology | Technical/Social/Environmental Feasibility | Environmental Benefits |
|------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| | soils | |
| 11. Zai pits | <ul style="list-style-type: none"> • Suitable on most degraded gentle slopes (less than 5%) • Rehabilitation of crusted, hard, compacted and poorly structured soils and barren land • Suitable for arid and semiarid areas (200–750 mm/year) • Require organic amendments (manure, compost) to be effective • Suitable for fairly deep soils; on very shallow soils, plant on top of the ridge or excavated soil • It is labor intensive but suitable in areas where there is shortage of cropland and labor is available (Number of Zai pits/ha is 33,000 maximum to 16,000 minimum) • Work norm is 50 pits/day | <ul style="list-style-type: none"> • Improves soil structure and enhances soil hydrological properties • Improves soil organic matter content, microorganisms activity, aeration, and nutrient cycling • Enhances water infiltration and reduces runoff and erosion • Conserves soil water nutrients |
| 12. Semicircular bunds | <ul style="list-style-type: none"> • Applicable mainly in areas with sandy and sandy loam soils, crusted soils • Rainfall ranging from 200–750 mm/year • Uneven terrain • For slopes less than 5% steep • Mainly for arid and semiarid areas • Needs maintenance if not stabilized • Requires organic amendments to be effective (manure, compost) | <ul style="list-style-type: none"> • Effective technology for reclamation and rehabilitation of shallow crusted sandy areas • Captures runoff and reduces erosion significantly • Enhances water and nutrients storage and nutrient cycling |
| 13. Animal manure | <ul style="list-style-type: none"> • Availability of amount and quality manure • Labor and transport costs in collection, casting, and spreading organic material • Appropriate storage of manure | <ul style="list-style-type: none"> • Enhances soil fertility for early cover production for erosion control • Improves the productivity of soil • Enhances crop yield • Improves soil structure, infiltration, and soil moisture conservation • Improves soil carbon |
| 14. Contour farming | <ul style="list-style-type: none"> • Ability to set contours | <ul style="list-style-type: none"> • Conserves soil moisture on the hillside • Reduces erosion and nutrient losses • Maintains the fertility of the soil • Reduces the risk of |

| Technology | Technical/Social/Environmental Feasibility | Environmental Benefits |
|-----------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| | | sediment transport into streams and rivers <ul style="list-style-type: none"> • Makes a saving on fertilizer use and cost |
| 15. Contour bunds | <ul style="list-style-type: none"> • Suitable for slopes (1° to 7°) • Labor cost in digging the bunds | <ul style="list-style-type: none"> • Conserves water and soil by reducing runoff and erosion • Increases groundwater level • Reduces sediment flow into streams and rivers |
| 16. Stone bunds | <ul style="list-style-type: none"> • Availability of stones as raw materials • Labor availability and cost in digging, collecting, carting, and aligning stones • Ability to set contours using simple surveying equipment such as A-Frame or line level | <ul style="list-style-type: none"> • Enhances infiltration, reduces runoff, and conserves water • Reduces soil erosion and improves soil productivity |
| 17. Vegetative barriers | <ul style="list-style-type: none"> • Availability of suitable grasses such as vetiver • Labor availability and cost in digging, carting in planting | <ul style="list-style-type: none"> • Enhances infiltration of water into the soil • Conserves water and soil through erosion control |
| 18. Compound farming system | <ul style="list-style-type: none"> • It is an indigenous practice • Sustainability of the system is tested • Socially acceptable • Economically viable | <ul style="list-style-type: none"> • Recycling of nutrients in manure • Improves soil physical conditions for enhanced water infiltration and storage • Contributes significantly to food security • Grain yield is higher • Recycles household degradable organic waste for productive purposes • Contributes to environmental health |
| 19. Mixed farming | <ul style="list-style-type: none"> • It is indigenous in livestock production areas • It is a common practice with tested sustainability • Practicing farmers have the requisite skills | <ul style="list-style-type: none"> • Recycling of crop residues and manure for soil fertility and productivity improvement • Closes the nutrient cycling loop from soil-crop-livestock-soil • Contributes to environmental health • Enhanced grain yield and livelihood |
| 20. Conservation | <ul style="list-style-type: none"> • Improved management of soil and | <ul style="list-style-type: none"> • Crop pest and disease |

| Technology | Technical/Social/Environmental Feasibility | Environmental Benefits |
|------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| agriculture | <p>water resources from farm to watershed levels:</p> <ul style="list-style-type: none"> ○ Less flooding ○ Less erosion and desertification ○ More constant flow in rivers ○ Better recharge of groundwater resources ○ Improved water quality (less pollution) and reduced siltation effects downstream <ul style="list-style-type: none"> ● Increased carbon sequestration and less carbon release (less fuel used, less organic matter degradation) ● Mitigation of climate change ● Improved water use efficiency ● Increased biodiversity through diversification ● Reduction in shifting cultivation and reduced land degradation ● Improved soil chemicals and physical properties ● Enhanced biodiversity | <p>problems can increase due to the residues left in the field</p> <ul style="list-style-type: none"> ● Social and cultural attachment to bush burning as a means of land preparation ● Requires higher management skills and may be labor intensive at the start ● Attractive where land (rather than labor) is limiting ● Difficulty in getting the requisite amounts of crop residues for maintaining continuous cover due to competing uses of crop residues and extensive grazing livestock |
| 21. Fodder banks | <ul style="list-style-type: none"> ● Needed in livestock production areas ● Rainfall/moisture availability may constrain establishment ● Availability of drought-tolerant grass/legume species and planting material | <ul style="list-style-type: none"> ● Provides cover to control erosion and enhance moisture conservation ● Improves soil structure by fibrous roots of grass ● Reduces sedimentation into streams ● Provides a buffer for livestock in the dry season |
| 22. Grazing land improvement | <ul style="list-style-type: none"> ● Annual rainfall: 1,000–1,500mm ● Soil: Good drainage, medium organic matter ● Slope: moderate (5–8%) to rolling (8–10%) partly hilly (16–30%) ● Population density: 200–500 persons/km² ● Areas with available land ● Size of land/household: <1 ha ● Individual land use rights ● Available communal land for community-based grazing land improvement ● Type of land users: mostly smallholder farmers ● Hay preparation is an essential | <ul style="list-style-type: none"> ● Improved soil cover ● Increased soil fertility ● Reduced soil losses, transported sediments and downstream flooding ● Increased soil moisture ● Enhanced biodiversity |

| Technology | Technical/Social/Environmental Feasibility | Environmental Benefits |
|---------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| | component of the system | |
| 23. Rotational grazing | <ul style="list-style-type: none"> • Climate: mainly semiarid, partly sub-humid • Annual rainfall: 500–1,500mm • Soil: shallow soils, medium soil organic matter, good to medium drainage/infiltration • Slope: 0–8% • Areas with vast land availability • Size of land/household: 100–500 ha • Type of land user: mainly large scale commercial livestock farmers • Population density <10–200 per/km² • Land ownership: mainly individual, partly communal village ownership • Availability of mechanization | <ul style="list-style-type: none"> • Increased soil moisture • Reduced surface runoff, soil loss, and sedimentation • Reduced evaporation • Improved soil cover • Increased biomass/above ground carbon (AGC) sequestration • Increased plant diversity and maintained habitat diversity • Reduced hazards by adverse events such as floods and drought • Reduced ground water and river pollution • Increased water availability (groundwater, spring) |
| 24. Ridge and furrow system | <ul style="list-style-type: none"> • Need to align ridges on the contour • More effective on gentle slopes • Structurally unstable soils not suitable | <ul style="list-style-type: none"> • Effective water conservation and erosion control measure |
| 25. Tied ridges | <ul style="list-style-type: none"> • Not suitable in high rainfall zones • Effective on soils with stable structure for slopes up to 7% | <ul style="list-style-type: none"> • Enhances infiltration and conserves soil moisture in dry areas • Reduces runoff |
| 26. Broad bed and furrow | <ul style="list-style-type: none"> • Suitable for heavy clay soils with drainage problems | <ul style="list-style-type: none"> • Enhances infiltration and surface drainage |
| 27. Strip cropping | <ul style="list-style-type: none"> • Best suited to well-drained soils • Waterlogging may occur on poorly drained soils • Slope-strip width relationship may not be compatible with mechanized agriculture • Effective on slopes between 5 and 10% | <ul style="list-style-type: none"> • Reduces erosion • Conserves soil and water • Reduces sediment flow into rivers • Legumes fix nitrogen • Increases water storage on the hillside |
| Along rivers and dams (dry season farming) | | |
| 28. Dry season gardening | <ul style="list-style-type: none"> • Creates incentive for riverbank (buffer zone) protection • Permanent vegetation cover along rivers for carbon sequestration • Reduced erosion and sediment load in rivers • Regulated river flow | <ul style="list-style-type: none"> • Potential occurrence of salinity • Potential conflicts between upstream and downstream water users • May result in pollution of rivers due to increased use of agrochemicals (misuse) • Highly labor and capital |

| Technology | Technical/Social/Environmental Feasibility | Environmental Benefits |
|------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| | | intensive (fencing, irrigation, guarding, and so on) <ul style="list-style-type: none"> • Social exclusion for farmers without land along rivers • Communities may become unwilling to protect riverbanks due to shortage of land |
| Communal land (dry season) | | |
| 29. Fire management in agricultural landscapes | <ul style="list-style-type: none"> • Recovery of native vegetation and annual species in landscapes • Reduction in wind erosion • Reduction of soil erosion at the start of rains • Increased carbon sequestration in farms and pastures • Protection of sacred groves • Increased growing of annual crops, for example, cassava | <ul style="list-style-type: none"> • Herder and hunters may favor annual burns (conflict) • Traditional beliefs regarding bushfires • Suppression may be expensive or dangerous—limited ability to suppress fires • Effectiveness of early burning not well demonstrated • Difficulty in establishing bylaws and enforcing them • Challenges in setting up appropriate incentives for fire management • Limited authority of traditional institutions (chiefs) in enforcing bushfire law • Indiscriminate bush burning |
| 30. Land rotation/improved fallow system | <ul style="list-style-type: none"> • Areas with availability of land • Low population: land ratio • Requires long natural fallow period (8–15 years) • Appropriate availability of herbaceous leguminous plants and trees for improved fallow • Absence of extensive grazing • No bush burning zone • Farmers already practice it | <ul style="list-style-type: none"> • Mainly during vegetative fallow period • Recycling of nutrients, soil fertility restoration • Erosion control • Prevention of nutrient and sediment transport into streams • Enhanced infiltration of water and recharge of groundwater • Carbon sequestration (above ground and soil) • Increase fertility through nitrogen fixation and |

| Technology | Technical/Social/Environmental Feasibility | Environmental Benefits |
|------------|--------------------------------------------|-------------------------|
| | | organic matter addition |

Note: tCO₂ = tons of carbon dioxide.

Table 5.2. Specification of SLWM Options by Land Type

| SLWM | Flat Land | Sloping Land (additional) |
|-------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1. Conservation agriculture | <ul style="list-style-type: none"> • Minimal burning • Slashing and mulching • Minimum tillage and direct planting • Ridging and furrowing • Crop rotation and intercropping • High-quality seed (right variety, high yielding, pest and disease resistant) • Manure/compost • Optimal chemical fertilizer use • Integrated pest management | <ul style="list-style-type: none"> • Contour ridging • Strip cropping • Contour bunds or stone lines • Vegetative barriers (trash-lines/grass strips) |
| 2. Agroforestry | <ul style="list-style-type: none"> • Scattered and boundary planting • Woodlots • Woody fallow • Fodder banks • Live fences • High value fruits | <ul style="list-style-type: none"> • Planting pits and semicircular bunds • Contour bunds with trees |
| 3. Dry season gardening and protection of river banks | <ul style="list-style-type: none"> • Canals and/or water pumping equipment • Earth basins/retention ditches • Furrows • Efficient water use • High-value crops, especially vegetables • High-quality seed (right variety, high yielding, pest and disease resistant) • Improved crop rotation • Integrated nutrient and pest management | Same |
| 4. Fire management in agricultural landscapes | <ul style="list-style-type: none"> • Minimum/or spot burning (cropland) • Early burning/prescribed (parklands or grazing lands) • Community land zoning and management • Bush burning plans • Fire volunteers (fire management teams) | Same |

Annex 6. Economic and Financial Analysis

SLWMP Restructuring and Additional Financing - P098538 and P157595

Economic Analysis

1. The interventions that are being proposed under the AF follow the same approach and are essentially of the same type as under the earlier phase of the SLWMP (Component 2). Therefore, an economic analysis follows similar terms. In particular, the project has adopted a framework approach, rather than a blueprint project approach, with few specific investments identified up front. Given the demand-driven nature of the investments, and the difficulty of quantifying key marginal benefits in the form of watershed services, biodiversity conservation and capacity building, a full economic analysis is not available ex ante. International experience, however, suggests that SLWM technologies bring substantial long-term productivity gains.

2. Benefits from capacity-building investments depend very much on the degree to which that capacity is utilized subsequent to the project. However, the capacity built under the earlier phase of the project should generate economies of scale such that a similar capacity building allocation contributes higher impact as reflected in the revised project targets (for example, an additional 94,000 ha under improved SLWM and under the AF, that is, against 62,000 ha in the initial project area).

Project Cost-Effectiveness

3. The project is focused on maximizing the efficiency of ES delivery, and improving understanding of the economics and potential market values of those services. In addition, the initial phase has confirmed the pilot and iterative nature of the project for both support services and the communities as they implement innovative approaches and adjust technologies to specific local contexts. On the one hand, most benefits should therefore be expected beyond the project time frame through subsequent, broader uptake and fine-tuned PES-related incentives. On the other hand, although there can now be an increased emphasis on implementation at community level as compared to the initial phase of the project, some investment in experimentation and monitoring will continue to add to project costs, but also provide a basis for evaluating future investments.

Table 6.1. Summary of Benefits of Project Activities

| Activity | Expected Benefits | Remarks |
|-----------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------|
| Component 2: Land and Water Management | | |
| Participatory micro-watershed planning | <ul style="list-style-type: none"> • Enhance shared understanding of watershed management issues and planning capacity between new communities and districts • Identify at community level hard and soft land and water investments | <ul style="list-style-type: none"> • Need to identify key grassroots concerns and empower communities to begin to address them |

| Activity | Expected Benefits | Remarks |
|-------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| | <ul style="list-style-type: none"> • Identify efficient pattern of land uses at community level | |
| Improvement or adaptation of the menu of options and related incentive system | <ul style="list-style-type: none"> • Diversify the menu to include sustainable rangeland and forest management • Provide for sustainable scaling up of soft investments in watershed management • Increase efficiency of ES provision • Provide model for exploiting ES markets more widely | <ul style="list-style-type: none"> • Need to scale up numerous small-scale SLWM activities • Need to efficiently aggregate diffuse investments to access ES markets • Need for farmers and support services to progressively adjust some options to a variety of local contexts |
| Implementation of SLWM technologies | <ul style="list-style-type: none"> • Increase medium- and long-term agricultural productivity • Increase effective life-span of hard water infrastructure investments • Contribute to improvements in stabilizing water flows for downstream users • Increase resilience of agricultural systems to climate change • Increase carbon sequestration | <ul style="list-style-type: none"> • Many SLWM technologies have been demonstrated to be beneficial to farmers and the environment in the medium or long term, but several short-term barriers to uptake need to be overcome (including initial high costs for which PES offers a compensation mechanism) |
| Riparian natural habitat conservation | <ul style="list-style-type: none"> • Maintain regional biodiversity • Maintain ecological infrastructure for flood protection and stabilization of hydrological flows • Secure long-term access to key natural resources • Increase economic opportunities from ecotourism and other environmentally friendly livelihoods | <ul style="list-style-type: none"> • CREMAs have functioned successfully in many areas in Africa • Ecological infrastructure is often cheaper and more resilient • Nature conservation and ecotourism need to be integrated into landscape level approach to be sustainable |

Financial Analysis

4. The project has been designed as a modest pilot aimed at leveraging much more substantial programs of investment in Northern Ghana. As such, government contributions are not expected to have any significant impact on state finances.

5. Typical gross margins for rainfed cultivation of staple crops in Northern Ghana are in the range GHS300–500 per ha.²⁰ Hence, relatively modest inputs with values in the order of GHS100 per ha per year could potentially have a significant effect on farm economics.

²⁰ CSIR draft report: *Economic Analysis of DTMA Varieties vis-a-vis Farmers Variety, 2009.*

6. The rationale of the project is to provide incentives to farmers to overcome the barriers to introduction stemming from start-up costs (or low returns) and high rates of discounting. It will also generate a more reliable understanding of the type and size of those incentives needed, and how they compare to the marginal social benefits derived from improved environmental services. The higher than anticipated start-up costs can be explained by the need for initially high investments in providing the needed inputs for the adoption of various SLWM technologies, farmer trainings, and demonstrations. However, these costs are expected to stabilize over the duration of the project as it is expected that farmer-to-farmer transfer of knowledge will increase, maintenance cost of the adopted technologies will be lower, and there will be a better understanding of the SLWM options that work on the ground, thus reducing the costs on trial and error. For example, the cost of interventions involving tree planting is quite high because of the need for provision of protective material (fencing and so on) along with seeds and seedlings to ensure success of tree-planting activities. Eventually however, such additional costs will be eliminated, since the fencing material can be shifted around and reused.

Cost and Benefit Analysis

7. The project commissioned a study on ‘Feasibility of Sustaining SLWM Activities through PES Market Mechanism (October 2015)’, which also included a cost and benefit analysis for seven common SLWM technologies for desired environmental services in both the short and long term. The SLWM technologies with potential environmental services in the short term include composting and crop rotation, and those with potential environmental services in the long term include tree growing (for example, cassia) and agroforestry (for example, mango with arable crops). A summary of this cost and benefit analysis is included in the following paragraphs.

Assumptions for Assessing the Viability of SLWM Technologies

8. The following assumptions were made in the assessment of the feasibility (costs and benefits) of land use change through SLWM technologies for desired ESs in the study area.

- **Exchange rate.** The prevailing exchange rate of US\$1.00 to GHS 3.50 was used in the calculation of the costs of items priced in terms of foreign exchange.
- **Prices of inputs and outputs.** All prices were expressed at the going market rate. Based on the rate of inflation over the past years and to cater for any uncertainty, prices were adjusted to reflect current conditions. The appraisal assumed prices of inputs to increase by 10 percent per year. Prices of outputs were assumed to increase by 5 percent per year.
- **Discount rate.** For the financial analysis, a real discount rate of 30 percent was used for present value calculations on the basis that farmers can be expected to have high real personal rates and also in comparison with the going market rates. For the economic analysis, a lower discount rate of 18 percent which is based on the Bank of Ghana’s prime rate for capital was used. This rate is assumed to reflect the

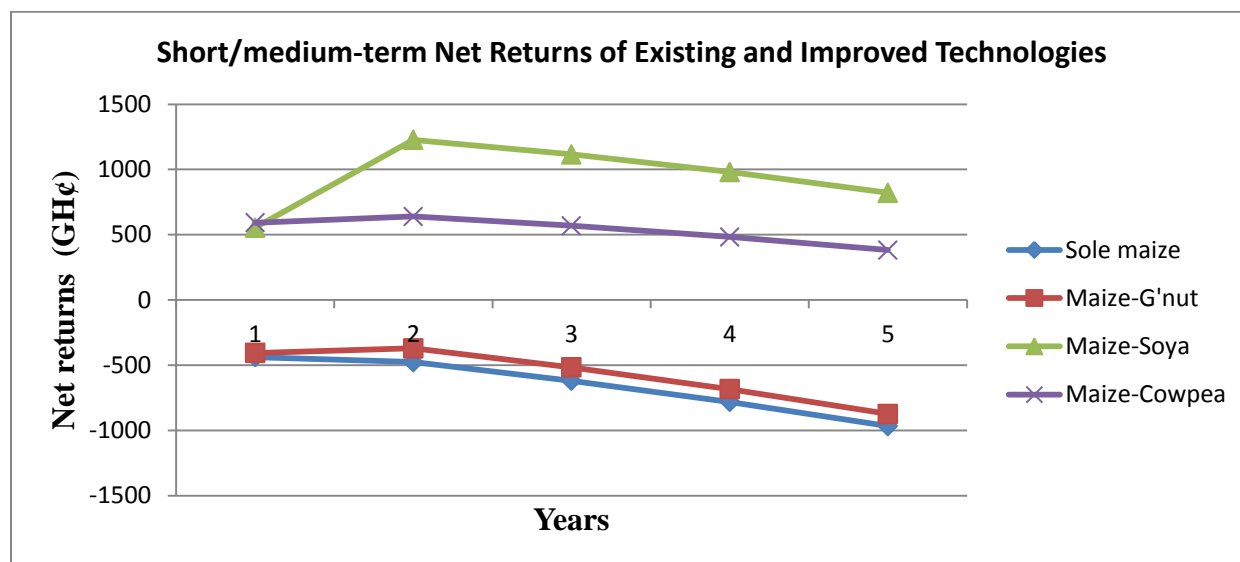
opportunity cost of capital or the social rate of discount. The rate is however, higher than the standard 10 percent discount rate suggested for use in environmental projects in developing countries.

- **Production level.** The estimated outputs of crops in the use of improved technologies are expected to increase by 25–40 percent depending on a particular technology or combination of technologies.
- **Carbon stock and price for selected tree species.** A carbon factor of 0.30 (30 percent) of total tree volume was used to estimate the total carbon stock for selected tree species such as teak. Based on a review of literature, an estimated wood volume of 14.2 m³ per ha per year was used to estimate the carbon stock for teak over a 15-year period. The carbon stock for mango was estimated at 1.6–1.8 Mg per ha per year incremental for year 1–7 and 22 Mg per ha per year for year 8 and beyond. The carbon stock of cassia was estimated at 27.5 Mg per ha per year (25 kg per tree per year from year 4) over a 15-year period. (Boateng 2005; Sools et al. 2013; Nogo and Owens 2002; Vonada et al. 2011; Oraon et al. 2014). The carbon stock was converted to carbon dioxide equivalents (CO₂e) using the molar mass ratios of CO₂ (44) to carbon (C=12) to reflect the carbon credit market requirement. The price of CO₂e was estimated at US\$5.80 per Mg CO₂e (Hamrick and Goldstein 2015).

Financial and Economic Viability of Short/Medium-term SLWM Technologies

9. In the short or the medium term (1–5 years), the emerging and most common land use of continuous maize cultivation was found not viable, both financially and economically, relative to improved land use practices such as composting, bunding, and rotation (Figure 6.1). Continuous sole maize production yields negative returns over a 5-year period likewise maize-groundnut rotation, though the latter was found better than the current practice of sole maize production. Maize-soya intercrop and maize-cowpea rotation yielded positive returns over the period with the former being more attractive.

Figure 6.1. Comparison of Net Returns of Land Use in the Short/Medium Term



10. With the improved technologies, compost maize-soya intercrop with bunding was found to be viable with positive net present value (NPV) and BCR greater than unity, both financial and economic. Farmers will be better-off by GHS 9,478 per ha over a 5-year period if they consider a switch from the current land use of continuous maize production to the improved practice of compost maize-soya intercrop with bunding (Tables 26, Appendices IXa-c in the original report). A consideration of crop rotation as an improved land use will also lead to an improvement in yield relative to the traditional land use. Maize-groundnut rotation with bunding, for instance, will result in a savings of GHS 430 per ha over a 5-year period, though not financially and economically viable due to the negative NPV and BCR less than unity over the period. However, maize-cowpea rotation with bunding is viable with positive NPV and BCR greater than unity. A consideration of this technology will make producers better off by GHS 5,948 per ha over a 5-year period.

Table 6.2. Viability of Short/Medium-term Land Uses

| Technology | Costs and Benefits | Total Amount (GHS) (5 years) | Initial Investment (GHS) | NPV (GHS) | | BCR | | Remark |
|--------------------------------------------------|--------------------|------------------------------|--------------------------|-----------|----------|-----------|----------|------------|
| | | | | Financial | Economic | Financial | Economic | |
| Compost Maize-Soya Intercrop with Bunding | | | | | | | | |
| Compost maize-soya intercrop | Cost | 19,968 | 3,910 | 794 | 1,042 | 1.08 | 1.09 | Viable |
| | Benefit | 24,666 | | | | | | |
| | Net Return | 4,699 | | | | | | |
| Sole maize | Cost | 15,831 | 2,593 | (2,091) | (2,793) | 0.72 | 0.71 | Not Viable |
| | Benefit | 11,051 | | | | | | |
| | Net Return | (4,779) | | | | | | |
| Change (Net Return) | | 9,478 | | | | | | |

| Maize-Groundnut Rotation with Bunding | | | | | | | | |
|----------------------------------------------|-------------------|--------------|-------|---------|---------|------|------|------------|
| Maize-groundnut rotation with bunding | Cost | 14,508 | 2,602 | (1,242) | (1,660) | 0.82 | 0.81 | Not Viable |
| | Benefit | 11,656 | | | | | | |
| | Net Return | (2,852) | | | | | | |
| Sole maize | Cost | 13,558 | 2,438 | (1,435) | (2,017) | 0.77 | 0.76 | Not Viable |
| | Benefit | 10,275 | | | | | | |
| | Net Return | (3,282) | | | | | | |
| Change (Net Return) | | 430 | | | | | | |
| Maize-Cowpea Rotation with Bunding | | | | | | | | |
| Maize cowpea rotation with bunding | Cost | 11,698 | 2,113 | 1,365 | 1,723 | 1.25 | 1.24 | Viable |
| | Benefit | 14,364 | | | | | | |
| | Net Return | 2,665 | | | | | | |
| Sole maize | Cost | 13,558 | 2,438 | (1,435) | (1,916) | 0.77 | 0.77 | Not Viable |
| | Benefit | 10,275 | | | | | | |
| | Net Return | (3,282) | | | | | | |
| Change (Net Return) | | 5,948 | | | | | | |

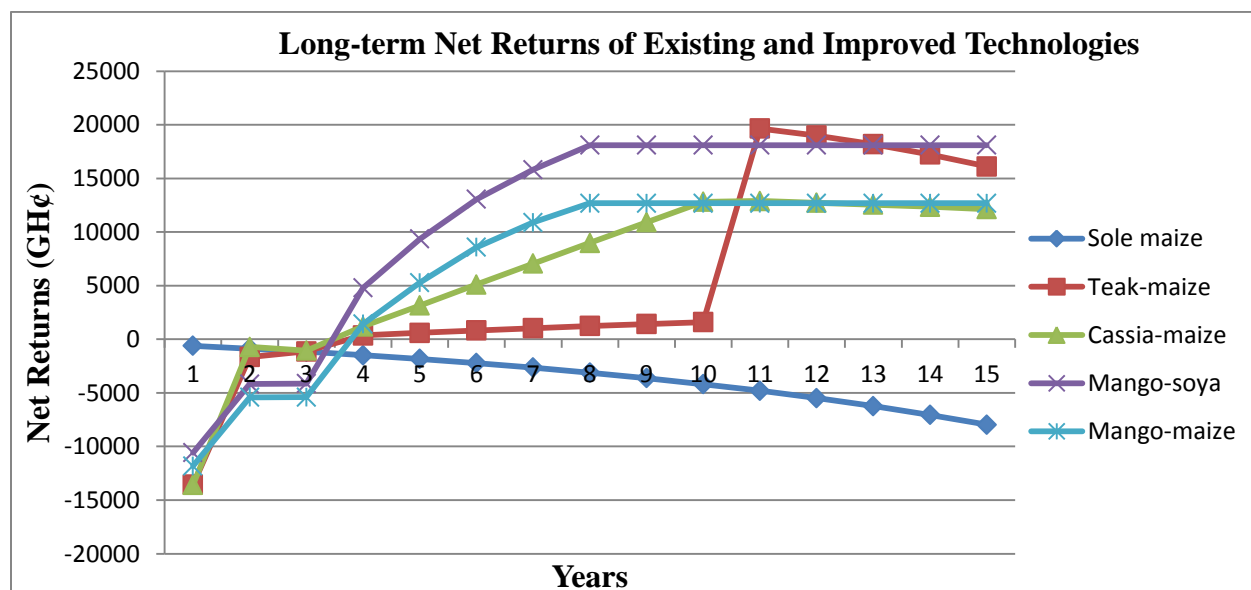
Financial and Economic Viability of Long-term SLWM Technologies

11. In the long term (10 years and beyond), as shown in Figure 6.2, the current land use of continuous maize cultivation is not viable, both financially and economically. However, the improved technologies such as tree crops and agroforestry with maize and soya bean relative to continuous sole maize production are more viable and attractive, especially with the inclusion of carbon benefits. All the long-term SLWM technologies show negative returns in the short term (first four years), but improve in the medium to long term, compared to the current land use. In the first years, the net returns are negative and substantially lower than that of the existing practice because of the upfront investment cost and the time lag before the trees grow sufficiently to provide benefits. Mango-soya shows the highest return relative to cassia and teak, in the long term. The results suggest the need to support farmers through PES, especially in the establishment of trees, as this can serve as an incentive for the adoption of those SLWM technologies for the production of the desired environmental services, such as carbon sequestration, watershed protection, and improvement in biodiversity.

12. With the long-term SLWM technologies, teak plantation intercropped with maize in the first three years, farmers will be better off by GHS133,229 per ha and will also sequester a total of 1,390 Mg CO₂e per ha valued at GHS28,221 over a 15-year period, though the practice is not viable financially and economically over the period. The expected CO₂e value is about twice the initial investment for this technology, implying the need to incentivize farmers to adopt this technology. Likewise, with the establishment of cassia plantation intercropped with maize, relative to continuous sole maize production, farmers will be better off by GHS149,286 per ha

and will also sequester a total of 6,353 Mg CO₂e per ha valued at GHS128,937 over a 15-year period, though the technology is not viable financially over the period. The expected CO₂e benefit is about eightfold the initial investment for this technology, which suggests the need to incentivize farmers to adopt the technology.

Figure 6.2. Comparison of Net Returns of Land Use in the Long Term



13. The establishment of mango plantation intercropped with soya bean in the first three years, relative to sole maize production, is financially and economically viable with positive NPV and BCR greater than unity. With the adoption of this technology, producers will be better off by GHS484,471 per ha and will capture a total of 2,020 Mg CO₂e per ha valued at GHS41,013 over a 30-year period. The expected CO₂e benefit is more than threefold the initial investment required for this technology. Similarly, with the establishment of mango plantation intercropped with maize in the first three years, relative to sole maize production, producers will be better off by GHS 376,652 per ha and will also capture a total of 2,020 Mg CO₂e per ha valued at GHS41,013 over a 30-year period. The expected carbon benefit is also about threefold the initial investment required for this technology. This suggests the need to incentivize farmers to adopt these technologies for the production of the desired environmental services.

14. Studies under the Northern Savannah Biodiversity Conservation Project suggested that CREMAs in the corridor areas will eventually be financially viable under a variety of small-scale, sustainable commercial hunting and fishing uses. Evidence from Nazinga and elsewhere suggests that under an appropriate rental or management contract with the community, sustainable professional management, cropping according to ecological parameters at potential wildlife densities, the annual benefits for every 100 km² could be about US\$20,000 for the local communities; US\$20,000 for the state; and about US\$85,000 for local businessmen supplying the sites and retailing the meat and fish products (gross sales). This is in addition to potential

benefits from specialized bird-hunting schemes, as operated in Burkina Faso, and organization of NTFP production chains. Estimates of potential annual revenues for the two selected corridor areas north of Mole National Park ranged from US\$12,000–18,000 per village, compared to annual patrolling and management costs of around US\$1,000 per village area. These are long-term projections based on restoration of wildlife populations and establishment of well-managed sport hunting enterprises, which require long-term support. These levels of income will not be achieved during the life-span of the project, but milestones toward eventual full sustainability can still be set for the project itself.

15. Similarly, with regard to activities implemented by the WD in the GRR for the maintenance of firebreaks and opening up of access routes (and other activities), the project financing will support critical needs in fixing access routes across wet grounds, which tend to require some concrete works and, therefore, relatively higher investments through the project. Once these are done, the WD will resort to the government and internally generated funds from the FC to sustain these activities, essentially using staff labor, as has been done in the past years to ensure maintenance and sustainability in the longer term.

16. Sustainability is central to the design of this project. Overall, the project's exit strategy is based on its current design of mainstreaming project implementation into existing government structures (for example, DDoAs within the MoFA, WD, and FSD in the FC, and so on) on the ground so that relevant staff gain the capacities to improve their efficiency in the delivery of the services and ownership of the activities to continue support in the longer term, particularly to scale up the subprojects in other districts including through use of the tested PES approach as seen relevant at the end of the project. Further at the local level, the participation of traditional authorities in the project is also a critical element for sustainability given their role as custodians of ancestral and community land, responsibility for the maintenance of law and order and conflict resolution and most importantly, as initiators and champions of development activities in their respective areas of jurisdiction. In addition, through the use of farmer-to-farmer extension approaches and relevant expertise from NGO's on the ground, the project aims to sustain its efforts for future scale-up and replication.

Table 6.3. Viability of Long-term Land Uses and Associated Environmental Services

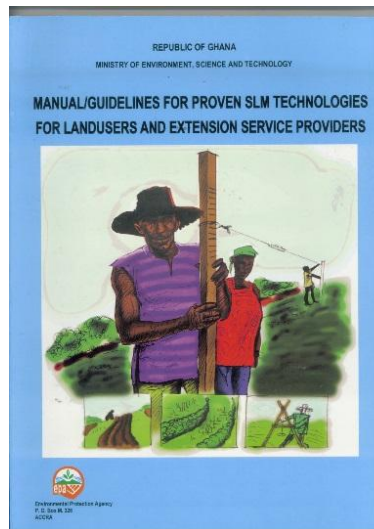
| Technology | Costs and Benefits | Total Amount (GH¢) | Initial Investment (GH¢) | NPV (GH¢) | | BCR | | Remark | Total CO ₂ e (Mg/ha) | Carbon Benefit (GH¢) |
|-----------------------------------------------|--------------------|--------------------|--------------------------|-----------|----------|-----------|----------|---------------------|---------------------------------|----------------------|
| | | | | Financial | Economic | Financial | Economic | | | |
| Teak with Maize Intercrop (15 years) | | | | | | | | | | |
| Teak-maize intercrop | Cost | 43,270 | 15,382 | (7,648) | (4,085) | 0.56 | 0.84 | Not Viable | 1,390 | 28,221 |
| | Benefit | 124,153 | | | | | | | | |
| | Net Return | 80,882 | | | | | | | | |
| Sole maize | Cost | 82,227 | 2,588 | (5,597) | (10,987) | 0.55 | 0.48 | Not Viable | | |
| | Benefit | 29,481 | | | | | | | | |
| | Net Return | (52,747) | | | | | | | | |
| Change (Net Return) | | 133,229 | | | | | | | | |
| Cassia with Maize Intercrop (15 years) | | | | | | | | | | |
| Cassia-maize intercrop | Cost | 38,686 | 15,387 | (2604) | (8,266) | 0.84 | 0.41 | Viable Economically | 6,353 | 128,937 |
| | Benefit | 135,225 | | | | | | | | |
| | Net Return | 96,540 | | | | | | | | |
| Sole maize | Cost | 82,227 | 2,588 | (5,397) | (10,987) | 0.55 | 0.48 | Not Viable | | |
| | Benefit | 29,481 | | | | | | | | |
| | Net Return | (52,747) | | | | | | | | |
| Change (Net Return) | | 149,286 | | | | | | | | |
| Mango with Soya Intercrop (30 years) | | | | | | | | | | |
| Mango-soya intercrop | Cost | 357,056 | 12,885 | 6,521 | 20,395 | 1.23 | 1.50 | Viable | 2,020 | 41,013 |
| | Benefit | 797,434 | | | | | | | | |
| | Net Return | 440,377 | | | | | | | | |
| Sole soya | Cost | 138,647 | 2553 | (849) | (2,138) | 0.93 | 0.56 | Not Viable | | |
| | Benefit | 94,554 | | | | | | | | |
| | Net Return | (44,093) | | | | | | | | |
| Change (Net Return) | | 484,471 | | | | | | | | |
| Mango with Maize Intercrop (30 years,) | | | | | | | | | | |
| Mango-maize intercrop | Cost | 501,262 | 13,622 | (2,593) | 5,422 | 0.93 | 1.10 | Viable (Economic) | 2,020 | 41,013 |
| | Benefit | 796,463 | | | | | | | | |
| | Net Return | 295,200 | | | | | | | | |
| Sole maize | Cost | 140,548 | 2,588 | (4976) | (81321) | 0.57 | 0.54 | Not Viable | | |
| | Benefit | 59,096 | | | | | | | | |
| | Net Return | (81,452) | | | | | | | | |
| Change (Net Return) | | 376,652 | | | | | | | | |

Annex 7. Summary of Project Achievements to Date

SLWMP Restructuring and Additional Financing - P098538 and P157595

1. The SLWMP was approved in November 2010 and became effective in February 2011. Project implementation started in May 2011. The project received the first AF in May 2014. Over 24,000 people directly benefitted under the project.
2. **Under Component 1**, a spatial planning unit was established within SADA and fully equipped for implementation of activities on integrated spatial planning. Through project support, a spatial development framework for Northern Ghana was developed to help guide government development efforts in the Northern Ghana (SADA) zone. Two pre-feasibility studies for multi-use water infrastructure are under procurement.
3. **Under Component 2**, a Watershed Planning Manual, Guidelines for Proven SLWM Technologies, and CREMA educational materials were produced to facilitate awareness and education.

Figure 7.1. Manual/Guidelines for Proven SLWM Technologies



4. The project supports conducting of National SLWM Roundtables, which serve as an important forum for sharing lessons on SLWM, with the latest one taking place in December 2015 in Tamale. The coordination structures at the local level include a TCO in Bolgatanga (in the Upper East Region), district watershed management teams in every target district, and CWMTs in every community supported by the project. The micro-watershed planning process, which underpins the implementation of SLM activities is rolled out to new micro-watersheds every year. To date, community mobilization and planning consultations for SLWM took place in 72 communities. For the 2016 farming season, 72 micro-watershed plans have been developed with additional 46 under preparation, which are key to the long-term success of the adoption of SLWM practices.

5. A total of 2,484 subprojects covering an area of 3,090 ha have been supported in 72 target communities to date and planning for the 2016 farming season is ongoing. In addition, 98 SLWM technology demonstration sites were established. A total of 9,388 land users have adopted SLWM practices as a result of the project, covering the area of 3,090 ha in the current 10 target districts (72 communities).
6. A GIS-based M&E system was established in the EPA. A total of 40 management information system officers (DDoA officers responsible for monitoring) were trained in data collection for the GIS-based M&E system. Baseline data for vegetation monitoring was collected in the wet season and the dry season—this allowed the establishment a baseline for the NDVI. Environmental indices were developed to link SLWM interventions to payment for ESs (these will be used for determining output-based payments in 2016).
7. Baseline studies for the project IE are ongoing—the IE will assess (a) the impact of the overall program and (b) differentiated impacts of various types of support. Early findings from the IE once available can also help adjust project interventions to achieve maximum impacts.
8. The CREMA creation activities implemented by the WD follow a step-wise approach, with sensitization followed by preparation of CREMA management plans and formation of CREMAs. The final step is the inauguration of CREMAs and devolution of management powers to the CEC. CREMA educational materials have been produced to facilitate awareness and education. In the Western Wildlife Corridor, 43 communities were mobilized to establish CREMAs, one CREMA (SKGK) was inaugurated, and power devolution to the CREMA Management Committee took place. Preparation of management plans for Sites 2 and 4 is ongoing.
9. The training and management activities in the GRR were implemented on schedule, yet start of the small civil works was delayed, due to contracting issues (construction of water holes and bird and game viewing platforms commenced and is expected to be completed by June 2016). Forest management plans for four target reserves were produced (Ambalara, Kulpawn Tributaries, Chiana Hills, and Mawbia FRs) and 449 ha were reforested in Ambalara and Kalpawm Tributaries FRs.
10. An ecotourism strategy for the Western Wildlife Corridor was prepared—the strategy is expected to guide the development and implementation of viable income-generating ventures that could stimulate sustainable socioeconomic development in the savannah woodlands.

Annex 8. Biodiversity Profile of Target Areas

SLWMP Restructuring and Additional Financing - P098538 and P157595

A. Western Wildlife Corridor

1. The Western Wildlife Corridor covers the area of savannah woodland extending from Nazinga Game Ranch in Burkina Faso southwards to the Mole National Park in Ghana. With regard to the first component, the SLWMP is focusing on the north-western part of Ghana, with a greater part occurring within the jurisdiction of the Sissala East and West District Assemblies in the Upper West Region of Ghana. The area falls within latitude 9°48'0" to 11°4'0" N and longitude 1°4'0" W to 2°32'0" W, with the eastern portions extending into the Kasena Nankana East and Builsa Districts, respectively, both of which are within the Upper East Region.

2. **Vegetation.** The vegetation of the area is dominated by Guinea Savannah Woodland consisting of grass-tree mosaic. The trees here are drought resistant and scattered. They include shea, the baobab, dawadawa, and neem trees. The heterogeneous collection of trees provides all domestic requirements for fuelwood and charcoal, construction of houses, cattle kraals, and fencing of gardens. The shrubs and grass provide fodder for livestock as well as roofing material for the local houses.

3. **Climate.** The area has two distinct seasons namely the dry and the wet seasons. The wet season commences from early April and ends in October. The dry season commences in November and is characterized by the cold and hazy harmattan winds, and ends in the latter part of March when the hot weather begins with intensity and ends only with the onset of the early rainfall in April. The temperature is between a low of 15°C at night time during the harmattan season and a high of 40°C in the day during the hot season. Although a number of measures such as agroforestry, tree planting, and extensive education against wildfires have been introduced to curtail the existing environmental challenges, the chronic and prevalent land degradation and loss of biological resources persists. The 'anti-bushfire' policies instituted over the past four years have however resulted in a slight reduction in wildfires. This notwithstanding, the situation is still uncontrolled and therefore calls for very serious and pragmatic measures to protect the area against desertification in the near future. The new National Wildfire Policy advocates for the management of wildfires in place of absolute prevention, which the districts have adopted. Education and awareness creation however, need to be intensified to ensure that the local communities manage fire in a responsible manner to reduce the devastating effects.

4. **Topography and drainage.** The study site is relatively flat with isolated hills rising up to 150 m above sea level. The Sissili and Kulpawn Rivers and their tributaries form the main drainage of the area. However, there are natural ponds and dugouts such as the Gwollu and Jitog Crocodile Ponds dotted around the area, which provide critical sources of water to livestock and wildlife. The ponds and dugout are sometimes used for dry-season vegetable farming.

5. Communities in the corridor areas are among the poorest in Ghana both geographically and in terms of occupations because most of the inhabitants are food crop producers in rural areas. These communities derive their main source of livelihood from agriculture (food crop cultivation). Apart from the Sissili River basin, suitable farming land is a major constraint to agriculture and livelihoods. As a result, game hunting and charcoal burning (especially in the Sissili River basin) have become important sources of livelihoods. Destructive activities of wildlife, particularly elephants, are a frequent occurrence in the area. The result is a threatened livelihood. The implication is that unless farmers see very clear and tangible benefits from corridor development, it will be difficult to convince them to participate in corridor activities. The project will support implementation of activities in the four sites as described below (Table 8.1), through the implementation of CREMA management plans.

Table 8.1. Corridor Sites

| Sites | Region | District | Capital Town | Cumulative Number of District Assemblies | Project Support |
|-----------------------------------------------------------------------|-------------------|--------------------------------------|-----------------|------------------------------------------|-----------------------------------|
| Site 1 | Upper East Region | Kassena-Nankana West | Paga | 2 | Support through the SLWMP project |
| | Upper West Region | Sissala East | Tumu | | |
| Site 2 | Upper East Region | Kassena-Nankana West Builsa South | Paga Fumbisi | 3 | Support through the SLWMP project |
| | Upper West Region | Sissala East | Tumu | | |
| Site 3 (a) Moagduri Wuntanluri Kuwesaasi (b) Balsa Yening | Upper East Region | Builsa South | Fumbisi | 4 | Support through the SLWMP project |
| | Upper West Region | Sissala East Wa East | Tumu Fungsi | | |
| | Northern Region | Mamprugu Moaduri | Yagaba | | |
| Site 4 | Upper West Region | Wa East | Fungsi | 2 | Support through the SLWMP project |
| | | Daffiama-Bussie-Issa | Issa | | |

Description of Site 1 - Sanyiga Kasena Gavara Kara (earlier Wuru-Kayero) Collaborative Wildlife Management Area

6. The site covering an approximate area of about 55,000 ha lies south of the Nazinga Game Ranch in Burkina Faso and is bounded by the villages of Kayero, Katiu, Nakong, Bassisan, New Pudu, Banu, Kunchogu, Kwapun, and Wuru. It is situated between two main political districts namely Kassena-Nankana West District in the Upper East Region and Sissala East District in the Upper West Region of Ghana. Although each village has a unique origin, beliefs, and values, they speak a common language: Kasem.

Over 90 percent of the population of the 9 surrounding communities are Kasenas and the remaining 10 percent comprise minority tribes such as Sissala, Kantosi, and few Fulanis.

7. The established boundaries of this Site 1 include forest reserves of the Pudo Hills, Sissili North, and the Chiana Hills. These forest reserves, primarily established to protect the Sissili River, are under the direct management and control of the Forestry Services Division.

8. The natural vegetation is Southern Sudan Savannah giving way to Guinea Savannah Woodland. The site harbors all the species typical to this savannah biome, although in reduced densities. These include the buffalo, elephant, hyena, leopard, lions, korrigum, the red-fronted gazelle, roan, hartebeest, and waterbuck.

9. The area is identified as being part of one of the few remaining elephant ranges in Ghana and is significant in that it is adjacent to the Nazinga Game Ranch situated just across the border between Ghana and Burkina Faso where the elephant herd currently numbers about 600. The wildlife population, including the elephant, has however been declining for quite a number of years, due to poaching and habitat loss because of deforestation from the activities of farm expansion, fuelwood collection and more recently, because of an annual invasion by migrant herdsman and zebu, and so on

Description of Site 2: Sumboru-Bechausa Collaborative Wildlife Management Area

10. The site covering an approximate area of about 110,000 ha cuts across three political districts, namely: Kassena-Nankana, Builsa, and Sissala East District Assemblies. It lies south of the boundaries for the SKGK CREMA and Nazinga Game Ranch in Burkina Faso. It is also situated north of two other collaborative wildlife management areas that, if adopted by the communities, will provide connectivity with the GRR and Mole National Park. The site is surrounded by 26 villages, with different origins, beliefs, traditions, and cultural values.

11. The site is located within the Sissili River basin, with several important tributaries such as Pukuru, Pogawna, Takurefou, and Hagefou-Mogbie on the western side of the Sissili, and Bonaponi and Afoembele on the eastern side.

12. The Sissili River runs through the NSZ at this site, which will be important for a rapid development of the wildlife, for the annual production that can be taken and thus for the economics of the site.

13. The natural vegetation is Guinea Savannah Woodland, enclosing areas of scrub savannah, wooded savannah, savannah woodland, and riparian forests along the Sissili River. The site currently harbors a variety of species of large wild ungulate and small- to mid-sized carnivores; in fact, probably most the species typical to this savannah biome are present, although certainly in reduced densities, wandering out of the Nazinga Game Ranch, GRR, and Mole National Park.

Description of Site 3 - Wahabu-Wiasi Collaborative Wildlife Management Area

14. Site 3 covering an approximate area of about 105,330 ha is situated between four districts, namely Mamprugu Moagduri, Builsa, Wa East, and Sissala East and is bounded by 31 villages. The site is now split into two CREMAs - Moagduri Wutanlueri Kuwesaasi and Balsa Yening. On the north, the site is adjacent to the Sumboru-Bechansa CREMAs (Site 2), and further north again is the SKGK CREMA. On the south, it is adjacent to the Gbele-Mole CREMA that will link it to the Mole National Park. This site will provide connectivity with the GRR and Mole National Park to the Nazinga Game Ranch.

15. There are no gazetted forests or wildlife areas within the boundaries of this proposed CWMA and relatively few farms, so the greatest part of the site is covered by extensive areas of natural vegetation. Guinea Savannah Woodland gives way to flood plains along the Sissili River, where relatively dense woodland and forest formations are found along the river valley. The site harbors a variety of species of large wild ungulate and small- to mid-sized carnivores, although in reduced densities. These include the buffalo, elephant, hyena, leopard, lion, korrigum, the red-fronted gazelle, roan, hartebeest, and waterbuck.

Description of Site 4 - Gbele-Mole Collaborative Wildlife Management Area

16. This site covers an estimated area of about 176,700 ha and is situated in only one political district, namely, Wa East, located in the southwestern part of the Upper West Region, about 115 km from Wa, the regional capital. The district is relatively remote, although the site is accessible through several routes. On the north, the site is adjacent to the Wahabu-Wiasi Collaborative Wildlife Management Area (Moagduri Wutanlueri Kuwesaasi and Balsa Yening CREMAs), and further north again is the Sumboru-Bechansa Collaborative Wildlife Management Area and the Wuru-Kayero Collaborative Wildlife Management Area (SKGK CREMA). Looking southward, it is adjacent to the Mole National Park and the Chasia. Thus this site will provide connectivity with the GRR and Mole National Park to the Nazinga Game Ranch. The site is surrounded by 32 villages.

17. There are two gazetted forests within the boundaries proposed for this CWMA. Local communities intensively exploit the available natural resources for their basic needs, to the point where poaching and other pressures have resulted in significantly reduced wildlife populations.

18. The site still harbors a variety of species of large wild ungulate and small- to mid-sized carnivores. Probably most of the small- to mid-sized species typical to this savannah biome are present, although in reduced densities, wandering out of the Gbele Resource Reserve and Mole National Park.

B. The Gbele Resource Reserve

19. The GRR is one of the eighteen wildlife reserves (protected areas) in Ghana. It is the only gazetted wildlife protected area in the Upper West Region and a representative sample of the Guinea Savannah Woodland Vegetation. The GRR was established under

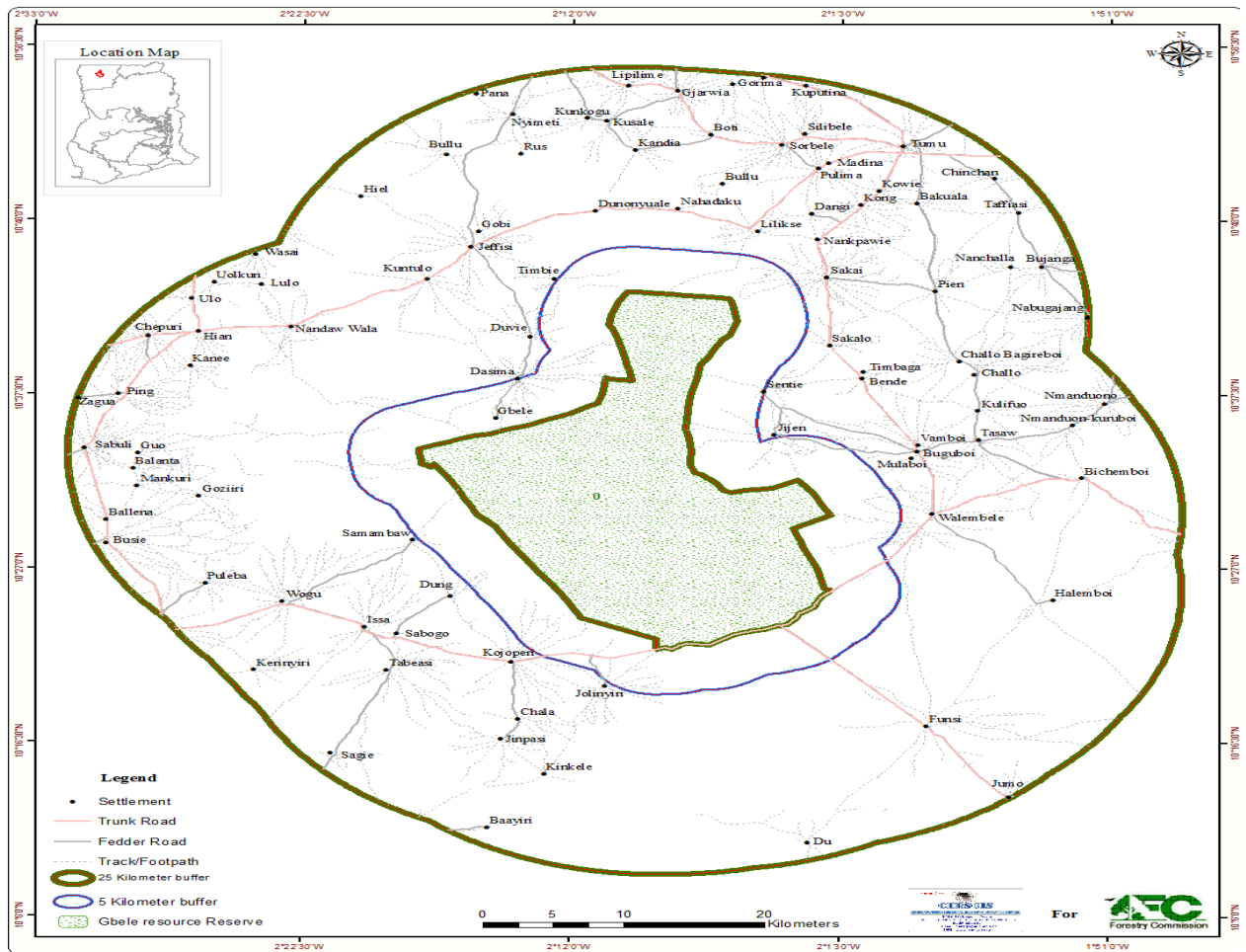
the Wildlife Reserves (Amendment) Regulation of 1975 (L.I. 1022). The management authority of the GRR has, since its creation, been the WD of the FC. Geographically, the reserve is located between latitude 10° 22' and 10°44'N and longitude 2°03'and 2°12'W and covers a total area of about 565 km² with a perimeter of about 125 km. It is about the third largest protected area in the country after Mole and Digya National Parks in Ghana.

20. The GRR administratively lies between three districts: Sissala East, Sissala West, and Nadowli. It is however, strategically and approximately centrally located between the administrative capitals of these districts: Tumu, 26 km north, Gwollu, 40 km northwest, and Nadowli, 50 km, respectively. The GRR headquarters is located at Tumu, the district capital of the Sissala East District.

21. **Topography.** The topography is relatively flat and low lying between 210 and 310 m above sea level. There is a gentle slope that drains the area into the Kulpawn River. A few rock outcrops are dotted around the reserve. In some areas these rock outcrops are spread over 1 km radius with varying shapes and sizes. The Kulpawn River has many tributaries that form a network of seasonal streams in the reserve and is a major source of water for wildlife and livestock in the area. The river flows from the west of the reserve southward to the White Volta dividing the reserve into two parts.

22. **Vegetation.** The GRR lies in the Guinea Savannah Zone, which stretches across the whole of West Africa. It represents a fairly undisturbed ecosystem with dominant vegetation of the savannah woodland with a grass layer 3 m tall during the rainy season. A recently conducted survey, although not detailed enough, reveals a large number and variety of woody and other species. The reserve is uniquely still pristine, with unmodified vegetative cover all over the reserve, with the only modified area being around the Gbele village. Many plants in the reserve have commercial value. The fruits of sheanut and dawadawa trees are harvested and processed into edible oils and condiments. Many species of grasses, *Andropogon gayanus*, *Hyperhenia rufa*, *Ctenium species*, are used for thatch, brooms, and mats. Other plants produce edible wild fruits that are eaten for food. The vegetation is sustained by the annual burning during the dry season.

Figure 8.1. Communities and Road Network around GRR

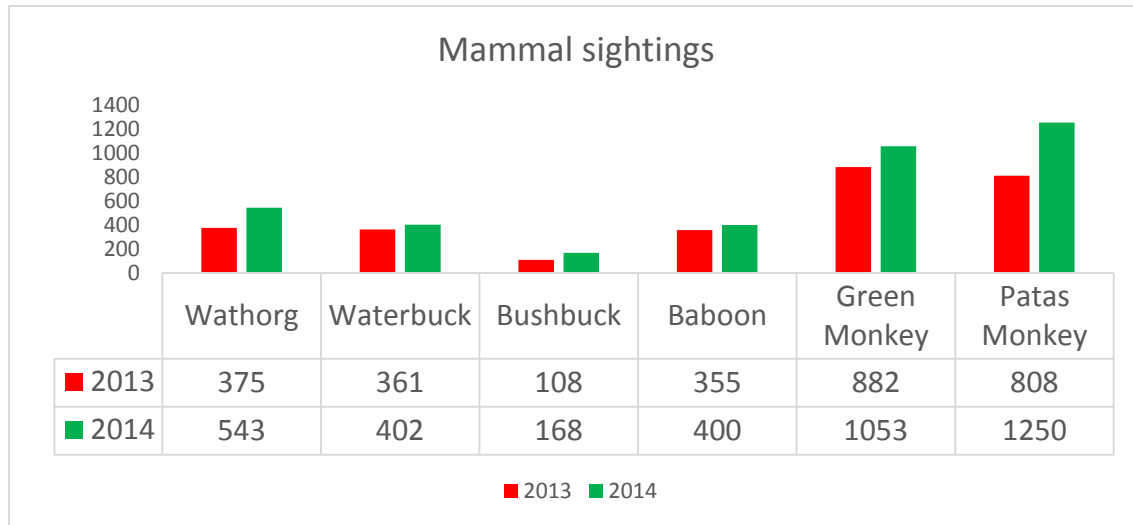


23. **Fauna.** The animals are distributed all over the reserve in different proportions. There is also a rich bird life in the reserve; a study in 2005 showed that there are about 194 species of birds (including waterfowl). There are about 20 fish species in the reserve, which are often illegally harvested by the fringe communities.

24. **Threats.** Ghana's environment and environmental resources have come under intense pressure and threat of utter degradation in recent decades. Increased population growth leading to human activities (such as farming, mining, poaching, bushfires, and logging), pressures of poverty, application of low technologies in natural resource exploitation and utilization and unsustainable farming practices, domestic animals in the reserve during dry season for watering, poor law enforcement, lack of surveillance strategy for the reserve, bushfires in the reserve every year, and lack of support by law enforcement agencies are some of the key factors accounting for the rapid rate of environmental degradation. Once-lush forest areas are being reduced into grasslands in several parts of the country and are threatened with desertification. These events have led to biodiversity loss, destruction of habitats of wildlife, and species extinction across the various ecological zones. The northern sector of the reserve has fewer animals than the southern area, especially around the Kulpawn River. Many species of animals once

reported to exist in the reserve are now extinct. Among them are the buffalo, lion, and other animals; leopard, hyena, and wild dog are highly endangered in the area. The number of wild animals has been reduced due to poaching and the mingling of domestic animals (livestock) in the reserve, especially during the dry season.

Table 8.2. Annual Sightings of Six Most Common Mammal Species in GRR (2013 and 2014)



C. Mole National Park

25. Mole National Park is Ghana's largest wildlife refuge with an area of 484,000 ha. The park is located in northwest Ghana on grassland savannah and riparian ecosystems at an elevation of 150 m, with sharp escarpment forming the southern boundary of the park. The park's entrance is accessible through the nearby town of Larabanga. The Lovi and Mole Rivers are ephemeral rivers flowing through the park, leaving behind only drinking holes during the long dry season. This area of Ghana receives over 1,000 mm per year of rainfall.

26. The park's lands were set aside as a wildlife refuge in 1958. In 1971 the small human population of the area was relocated and the lands were designated a national park.

27. **Flora.** Tree species of the park include *Burkea africana*, *Isoberlinia doka*, and *Terminalia macroptera*. The savannah grasses are somewhat low in diversity but known species include a spike sedge, *Kyllinga echinata*, an aneilema, *Aneilema setiferum var. pallidiciliatum*, and two endemic members of the *Asclepiadaceae* subfamily, the vine, *Gongronema obscurum*, and the edible geophyte, *Raphionacme vignei*.

28. **Fauna.** The park is home to over 93 mammal species, and the large mammals of the park include an elephant population, hippos, buffalo, and warthogs. The park is considered a primary African preserve for antelope species including kob, defassa waterbuck, roan, hartebeest, oribi, the bushbuck, and two duikers, the red duiker and yellow-backed duiker. Olive baboons, black-and-white colobus monkeys, the green velvet, and patas monkeys are the known species of monkeys resident in the park. Of the 33 known species of reptiles in Ghana, a slender-snouted and dwarf crocodile are found

in the park. Sightings of hyenas, lions, and leopards are unusual, but these carnivores were once more common in the park. Among the 344 listed bird species are the martial eagle, the white-headed and palm-nut vultures, saddle-billed storks, herons, egrets, the Abyssinian roller, the violet turaco, various shrikes, and the red-throated bee-eater.

Annex 9. Greenhouse Gas Accounting and Forest Carbon Stock Monitoring

SLWMP Restructuring and Additional Financing - P098538 and P157595

Background and Methodology

1. In its 2012 Environment Strategy, the Bank has adopted a corporate mandate to conduct GHG emissions accounting for investment lending. The quantification of GHG emissions is an important step in managing and ultimately reducing GHG emissions, and is becoming a common practice for many international financial institutions.

2. To estimate the impact of agricultural investment lending on GHG emissions and carbon sequestration, the Bank uses the Ex-Ante Carbon-balance Tool (EX-ACT) developed by the Food and Agriculture Organization of the United Nations in 2010. EX-ACT allows the assessment of a project's net carbon balance, defined as the net balance of CO₂e GHG that was emitted or sequestered as a result of project implementation compared to a without-project scenario. EX-ACT estimates the carbon stock changes (emissions or sinks), expressed in equivalent tons of CO₂ per hectare and year.

Application of EX-ACT

3. **Data source.** The project team provided data for the GHG accounting analysis.

4. **Basic assumptions.** The project area in Ghana has a tropical climate with a dry moisture regime. The dominant soil type is low activity clay. The project implementation phase is 4 years and the capitalization phase is assumed to be 16 years. The 20-year implementation period is standard in the use of EX-ACT.²¹ The 'without-project scenario' is assumed not to differ from the 'initial scenario' except the use of pesticides. The analysis further assumes the dynamics of change to be linear over the duration of the project.

5. **Land use change.** With this project, 570 ha of degraded land will be reforested (this includes 250 ha under restoration in agricultural landscapes, 100 ha of riparian vegetation, and 220 ha in green firebreaks around Ambalara and Kulpawm Tributaries Forest Reserves).

6. **Crop production.** A total of 8,030 ha of cultivated land is annual crops and 100 ha of land is mango trees. 'Improved agronomic practices', 'residues management and no burning', 'water management', and 'manure application' will be applied to annual crops. Monocropping will be replaced by intercropping with this project. The project will also stop residue or biomass burning.

7. **Grassland and livestock.** With regard to project support, 150 ha of traditional rangeland will be improved from a severely degraded state. Inputs will be improved and

²¹ Note that project teams may have a good reason for extending analysis beyond 20 years by changing the capitalization phase.

fire use will be stopped. Livestock management (including sheep and goats) will be improved with the project. Technical mitigation options of the project include feeding practices for sheep. Changes in numbers of livestock are included in the ‘Livestock’ module in EX-ACT.

8. **Land degradation.** Currently, 129,216 ha of tropical dry forest and 417,299 ha of tropical shrub land are degraded. Within this degraded area, 72,716 ha of forest (in target forest reserves) and 417,299 ha of shrub land (in target CREMAs) are moderately degraded; while 56,500 ha of forest is slowly degraded. The project will rehabilitate the degraded forest area by reducing the impact of forest fire.

9. **Agricultural inputs.** The project will increase the use of chemical nitrogen fertilizers from 20 to 450 tons of nitrogen per year and compost use from 0 to 20 tons per year. In addition, there will be a small increase in the use of insecticides up to 0.03 tons of active ingredients per year.

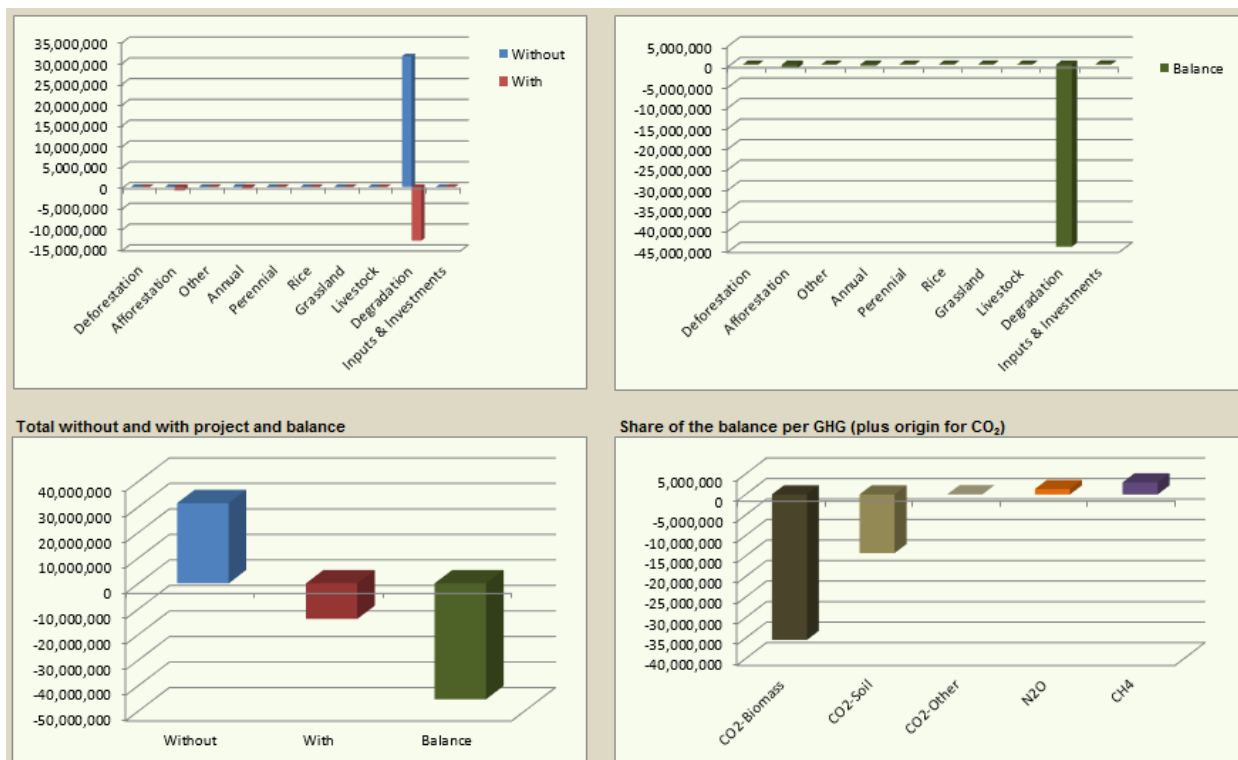
Results

10. **Net carbon balance.** The net carbon balance quantifies GHGs emitted or sequestered as a result of the project compared to the without project scenario. Over the project duration of 20 years, the project constitutes a carbon sink of 45,411,136 tCO₂eq (table 9.1). The carbon sink is largely due to avoided emissions from the rehabilitation of degraded land. The project provides a sink of 82 tCO₂eq per ha, equivalent to 4.1 tCO₂eq per ha per year.

Table 9.1. Results of the Ex ante GHG Analysis in tCO₂eq

| Components of the Project | Gross Fluxes | | Balance |
|------------------------------------------------------------------------|-------------------|--------------------|--------------------|
| | Without | With | |
| All GHG in tCO₂eq, Positive = source/negative = sink | | | |
| Land use change | | | |
| Afforestation | 0 | -866,861 | -866,861 |
| Agriculture | | | |
| Annual | 58,972 | -216,694 | -275,667 |
| Perennial | 1,154 | -479 | -1,633 |
| Grassland and livestock | | | |
| Grassland | 120 | -10,180 | -10,301 |
| Livestock | 0 | 1,465 | 1,465 |
| Management of degraded land | 31,407,414 | -12,927,080 | -44,334,495 |
| Agricultural inputs | 3,862 | 80,218 | 76,356 |
| TOTAL | 31,471,524 | -13,939,612 | -45,411,136 |
| Per hectare | 57 | -25 | -82 |
| Per hectare per year | 2.8 | -1.3 | -4.1 |

Figure 9. 1. GHG Emission and Carbon Sequestration in tCO₂eq, as Well as Net Carbon Balance per Project Activity and the Entire Project as well as the Share of Emission Sources and Carbon Sinks in tCO₂e for the Entire Project



Forest Carbon Stock Monitoring

11. In addition to calculating and reporting overall ex ante carbon projections, the project will monitor carbon stocks in target forest reserves. A baseline was established in late 2015 by the Resource Management Support Center and the FC and mean values for AGC and Below Ground Carbon (BGC) were established (table 9.2). An EOP assessment will evaluate the impact of project support on mean carbon values as compared to this established baseline.

Table 9.2. AGC and BGC Mean Values, in all Forest Cover Types/Categories within the Eight Reserves of the Savannah Woodland of Ghana, in tCO₂e per ha²²

| Forest Reserve | AGC(tCO ₂ e)/ha | | BGC(tCO ₂ e)/ha | | Remarks on AGC and BGC Stocks |
|----------------|----------------------------|----------------|----------------------------|----------------|-------------------------------------------------------|
| | Mean | Standard Error | Mean | Standard Error | |
| Ambalara | 25.926 | 4.329 | 7.778 | 1.2988 | Relatively poor (total <35 tCO ₂ e per ha) |
| Bepona | 16.189 | 2.936 | 4.857 | 0.8809 | Relatively poor (total <35 tCO ₂ e per ha) |

²² Based on ForestConsult. 2016. *Carbon Stock Estimation in Eight (8) Forest Reserves in the Savannah Zone of Ghana* (draft report produced under the SLWMP)

| Forest Reserve | AGC(tCO ₂ e)/ha | | BGC(tCO ₂ e)/ha | | Remarks on AGC and BGC Stocks |
|------------------------|----------------------------|----------------|----------------------------|----------------|-------------------------------------------------------|
| | Mean | Standard Error | Mean | Standard Error | |
| Chiana | 37.713 | 8.830 | 11.314 | 2.6489 | Comparatively high (>35 tCO ₂ e per ha) |
| Kulpawn | 11.437 | 3.806 | 3.431 | 1.1418 | Relatively poor (total <35 tCO ₂ e per ha) |
| Mawbia | 14.845 | 3.473 | 4.453 | 1.0418 | Relatively poor (total <35 tCO ₂ e per ha) |
| Pudo Hills | 15.041 | 4.851 | 4.512 | 1.4553 | Relatively poor (total <35 tCO ₂ e per ha) |
| Sissili Central | 28.944 | 10.168 | 8.683 | 3.0504 | Comparatively high |
| Sissili North | 38.678 | 8.546 | 11.603 | 2.5639 | Comparatively high (>35 tCO ₂ e per ha) |

Annex 10. Detailed Activity Costs for AF2

SLWMP Restructuring and Additional Financing - P098538 and P157595

| Activity no | LEAD IAs | Focal area | ACTIVITIES | DETAILED DESCRIPTION | 2017 | 2018 | 2019 | 2020 | TOTAL |
|----------------------------------------------------------------------------------------------------------------------------------------------|-------------|----------------|----------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------|--------|--------|------|---------|
| | | | | | US\$ | | | | |
| Component 2.1. Systems, capacity and monitoring for sustainable land and water management (IAP Component 1: Institutional Frameworks) | | | | | | | | | |
| A. Sustainable Land and Water Management Planning | | | | | | | | | |
| SLWMP AF2 001 | EPA, HQ | LD | Formation and training of district level planning teams for the two new districts | Formation of the District Watershed Teams: Training of District Watershed Teams using the participatory watershed manual; Hands on Preparation of one community Watershed plan | 40,000 | | | | 40,000 |
| SLWMP AF2 002 | MoFA, DDoAs | LD | Upscale integrated watershed management planning using landscape approach for watershed conservation and agricultural productivity | To develop community watershed management plans to direct the implementation of on the ground sub-project activities. | 61,200 | 61,200 | - | - | 125,800 |
| SLWMP AF2 003 | TCO | LD, CC | Provide operational backstopping for watershed planning exercise | Support sensitizing and development of the community watershed management plans; Review and finalization of the community watershed plans | 20,000 | 20,000 | | | 40,000 |
| SLWMP AF2 004 | EPA, HQ | LD | Provide Technical Assistance to CSOs /NGO to support micro watershed planning | Organize training workshops on the use of the participatory watershed training manual and will train 40 NGOs | 20,000 | 20,000 | | | 40,000 |
| SLWMP AF2 005 | | | Conduct feasibility studies to support provision of community water management systems within agricultural landscapes | Feasibility studies and reconnaissance for weirs, hand dug wells etc. to support livestock watering, household use and dry season gardening. | 15,000 | 15,000 | 15,000 | | 45,000 |
| B. Capacity to support SLWM | | | | | | | | | |
| SLWMP AF2 006 | TCO | BD, CC, LD, IN | Facilitate and coordinate training programs for extension service providers of the implementing agencies based on their training needs | <ul style="list-style-type: none"> • Collate information on training needs for extension service providers from implementing agencies • Identify resource persons in a specific field for the training • Organize training program on the training needs & other relevant needs • Participatory Scenario planning | 45,000 | 40,000 | 35,000 | | 120,000 |

| Activity no | LEAD IAs | Focal area | ACTIVITIES | DETAILED DESCRIPTION | 2017 | 2018 | 2019 | 2020 | TOTAL |
|---------------|--------------------------|----------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------|--------|--------|--------|---------|
| | | | | | US\$ | | | | |
| SLWMP AF2 007 | EPA, HQ | BD, CC, LD, IN | Develop guidelines for accessing the performance of extension service providers for the purpose of incentivizing them | Organize a stakeholder forum to solicit relevant information for the development of the guidelines and identification of type incentives | 10,000 | | | | 10,000 |
| SLWMP AF2 008 | EPA, HQ | BD, CC, LD, IN | Provide performance based incentives for extension service providers | Provide incentives to motivate selected extension service providers in project areas | 10,000 | 10,000 | 10,000 | 10,000 | 40,000 |
| SLWMP AF2 009 | MoFA, HQ | LD | Enhance Capacity of Community Level Structures to provide technical support for project implementation | Training of CWMTs and farmers to provide farmer to farmer extension and demonstrations to support project implementation | 20,000 | 20,000 | 20,000 | | 60,000 |
| SLWMP AF2 010 | WD Bolga Regional office | BD | | Train CRMCs in the 5 CREMAs on patrol techniques and ecological monitoring in respective CREMAs for community law enforcement and bushfire prevention. | 10,000 | | | | 10,000 |
| SLWMP AF2 011 | EPA, Regional offices | CC | Coordinate and undertake environmental safeguards, climate change education and awareness creation | <ul style="list-style-type: none"> Organize forum, radio programs on climate change policies, & conventions Development of education materials, e.g. flyers & posters, billboards, etc. Awareness raising on CC and its impact on natural resource use in the area of agriculture to beneficiary communities. | 20,000 | 20,000 | 20,000 | 10,000 | 70,000 |
| SLWMP AF2 012 | MoFA, HQ | LD | Train selected tractor owners, operators, farmers and CWMTs on best land tillage practices in the project area | This involves training tractor operators, farmers and CWMTs on good land preparation practices to reduce land degradation due to the improper land preparation of agricultural lands. | 30,000 | | 30,000 | | 60,000 |
| SLWMP AF2 013 | EPA, HQ | BD, CC, LD | Support international study tours | PES, SLM activities/technologies | 80,000 | 20,000 | 20,000 | | 120,000 |
| SLWMP AF2 014 | MoFA, HQ | LD, CC | Undertake local study tours for farmers, extension service providers and SLWMP Governance Structures to best SLWMP practice and community based conservation sites | Local study tour for farmers, CWMT members and extension service providers to SLWM fields within and outside project communities | 20,000 | 20,000 | 20,000 | | 60,000 |
| SLWMP AF2 015 | FSD, HQ | BD, CC | | Local study tour will be organized for selected field staff and FVS in the project districts to enable them to learn the best practices from other communities on fire management | 30,000 | | 30,000 | | 60,000 |

| Activity no | LEAD IAs | Focal area | ACTIVITIES | DETAILED DESCRIPTION | 2017 | 2018 | 2019 | 2020 | TOTAL |
|---------------------------------------------|-----------------------------|----------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------|--------|--------|--------|---------|
| | | | | | US\$ | | | | |
| SLWMP AF2 016 | WD, Bolga Reg. office & GRR | BD, CC | | Undertake study tours for CRMCs executives and CEPA units to learn best practices of other community initiatives. | 10,000 | | 10,000 | | 20,000 |
| SLWMP AF2 017 | EPA, HQ | LD, CC | Revision of the SLWM Technology Manual, Participatory Watershed Manual, Subprojects Guidelines and Ghana Strategic Investment Framework for Sustainable Land Management and their publication | Revision and publication of documents | 35,000 | 35,000 | | | 70,000 |
| SLWMP AF2 018 | MoFA, FSD, EPA, WD | BD, CC, LD, IN | Provision of logistics and equipment to strengthen implementing agencies for coordination, capacity building and extension services | Provision of office and field equipment, motor bikes and Station Wagon (as per procurement plan) | 313,500 | | | | 313,500 |
| SLWMP AF2 019 | TCO | BD, CC, LD, IN | Provision of operational backstopping | Extension support and supervision for upscaling of integrated SLWM technologies; Implementation of CREMA corridor management plans; Fire management activities; Alternative livelihood activities including NTFPs | 25,000 | 25,000 | 25,000 | 25,000 | 100,000 |
| SLWMP AF2 020 | MoFA | CC, LD | Establishment and maintenance of demonstrations fields | Establish new demonstrations (CSA etc.) and maintain old demonstrations in project communities | 20,000 | 50,000 | 50,000 | | 120,000 |
| SLWMP AF2 021 | MoFA, DDoAs | CC, LD, IN | Extension support | Provision of extension support by DDoAs for sub-project preparation in project communities | 20,000 | 20,000 | 20,000 | 0 | 60,000 |
| SLWMP AF2 022 | FSD, Districts | | | Provision of extension support by FSD for sub-project preparation in project communities in the area of tree growing | 5,000 | 5,000 | 5,000 | 0 | 15,000 |
| C. Monitoring Performance under SLWM | | | | | | | | | |

| Activity no | LEAD IAs | Focal area | ACTIVITIES | DETAILED DESCRIPTION | 2017 | 2018 | 2019 | 2020 | TOTAL |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------|----------------|------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------|---------|---------|--------|------------------|
| | | | | | US\$ | | | | |
| SLWMP AF2 023 | EPA, HQ | BD, CC, LD, IN | Support and coordinate the multi-stakeholder platforms i.e. the National Sustainable Land Management Committee (NSLMC) | Organize meetings, retreats, workshops to discuss issues concerning SLWM practices, policies, peer review of documents & dissemination of information. | 20,000 | 20,000 | 20,000 | | 60,000 |
| SLWMP AF2 024 | MoFA, HQ | BD, CC, LD, IN | Annual review and planning meeting of field level activities implementation | Annual review and planning meeting for implementing agencies to review previous year's activities and use lessons learnt to inform decisions on the ensuing year's project activities. | 45,000 | 45,000 | 45,000 | - | 135,000 |
| SLWMP AF2 025 | MoFA, HQ | CC, LD, IN | Sub-project proposal field verification | Verification of sub-projects proposals received from the districts to identify proponents and availability of land for sub-project implementation. | 20,000 | 20,000 | 20,000 | - | 60,000 |
| D. Financial Resource Mobilisation for Sustaining SLWM Activities in Communities (improved access to finance) | | | | | | | | | |
| SLWMP AF2 026 | EPA | LD | Coordinate and train project beneficiaries on financial management systems such as VLSA, Book keeping | Establishment of community VSLA in the beneficiaries communities; Training of members in group dynamics and book-keeping; Provision of metallic saving box and accessories; To ensure the sustainability of the project | 40,000 | 50,000 | 45,000 | 30,000 | 165,000 |
| SLWMP AF2 027 | GRR | BD | Train communities on commercial use of NTFPs | Provide training on commercial viability of NTFPs in GRR to promote agri-business in the fringe communities | 30,000 | | | | 30,000 |
| Contingency (to be used for capacity building under IAP hub as needed) | | | | | | | | | 180,200 |
| Sub-Total Sub-Component 2.1 | | | | | | | | | 2,229,500 |
| Sub-Component 2.2: Implementation of sustainable land and water management in micro-watersheds (subprojects) (IAP Component 2: Scaling up of integrated approaches) | | | | | | | | | |
| SLWMP AF2 028 | EPA, TCO | LD, CC | Establishment of riparian vegetation and river bank soil erosion control measures | Implementation of the agreed control measures and riparian vegetation establishment with land owners and communities | 80,000 | 120,000 | 120,000 | 30,000 | 350,000 |

| Activity no | LEAD IAs | Focal area | ACTIVITIES | DETAILED DESCRIPTION | 2017 | 2018 | 2019 | 2020 | TOTAL |
|---------------|----------------|----------------|---------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------|-----------|-----------|---------|-----------|
| | | | | | US\$ | | | | |
| SLWMP AF2 029 | EPA, HQ | BD, CC, LD, IN | Implementation of PES incentives (SLWM sub-projects: Construction of the Takoriyari Bridge = US\$25000 – to be confirmed) | PES payment | 40,000 | 40,000 | 80,000 | 80,000 | 240,000 |
| SLWMP AF2 030 | MoFA, HQ | CC, LD | Provision of water management systems within agricultural landscapes (weirs, hand dug wells, rain water harvesting, etc.) | Construction cost for weirs, hand dug wells etc. to support livestock watering, household use and dry season gardening. | 80,000 | 100,000 | 100,000 | - | 280,000 |
| SLWMP AF2 031 | MoFA, HQ | CC, LD | Implementation of rangeland management and best animal husbandry practices | Establishment of community rangelands and promotion of improved livestock housing, veterinary service collection and use of animal manure for composting and utilization on agricultural fields to ensure sustainable supply and access to livestock feed and organic manure for achieving food security. | - | 100,000 | 100,000 | - | 200,000 |
| SLWMP AF2 032 | MoFA | CC, LD, IN | Implementation of watershed management plans | Provision of input incentive to support SLWM sub-project implementation including | 350,000 | 1,200,000 | 1,200,000 | 250,000 | 3,000,000 |
| SLWMP AF2 033 | FSD | | | Restoration of degraded areas within the agricultural landscape and the corridor through woodlots, agroforestry, natural regeneration in the project districts | 131,250 | 175,000 | 175,000 | 43,750 | 750,000 |
| SLWMP AF2 034 | MoFA, GRR, TCO | CC, LD, IN | Implementation of natural resource based livelihood activities | Provide support to livelihood activities such as improved livestock rearing, shea butter and baobab processing, bee keeping, soap making, training, marketing etc. to enhance livelihoods and food security | 80,000 | 100,000 | 100,000 | 60,000 | 340,000 |
| SLWMP AF2 035 | MoFA | IN | Implementation of post-harvest management activities | Provide support to improve crop processing and storage technologies and group marketing of farm produce as part of postharvest management systems. | 50,000 | 60,000 | 60,000 | 50,000 | 220,000 |
| SLWMP AF2 036 | TCO, DWMTs | BD, CC, LD, IN | Implementation of fire management activities and provision of fire suppression equipment in the project districts | Undertake fire management activities in selected communities in the agricultural landscapes This includes provision of fire suppression equipment to FVs | 50,000 | 50,000 | 50,000 | 50,000 | 200,000 |

| Activity no | LEAD IAs | Focal area | ACTIVITIES | DETAILED DESCRIPTION | 2017 | 2018 | 2019 | 2020 | TOTAL |
|-------------------------------------------------------------------------------------------------------|----------|------------|----------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------|---------|--------|---------|------------------|
| | | | | | US\$ | | | | |
| SLWMP AF2 037 | MoFA | IN | Implementation of sustainable root & tuber cropping systems | Provide support for cultivation of improved root and tuber crop varieties to improve food security in project communities. | 50,000 | 70,000 | 80,000 | - | 200,000 |
| Contingency | | | | | | | | | 699,435 |
| Sub-Total Sub-Component 2.2 | | | | | | | | | 6,479,435 |
| Subcomponent 2.3: National SLM and PES monitoring (IAP Component 3: Monitoring and Assessment) | | | | | | | | | |
| SLWMP AF2 038 | TCO | | Monitoring and operating cost | | 25,000 | 25,000 | 25,000 | 25,000 | 100,000 |
| SLWMP AF2 039 | EPA, HQ | | Undertake vegetation, carbon stock and water quality monitoring | | | | 80,000 | | 80,000 |
| SLWMP AF2 040 | EPA, HQ | | Project impact evaluation (including mid-line and end-line studies) | | 30,000 | 130,000 | 30,000 | 170,000 | 360,000 |
| SLWMP AF2 041 | EPA, HQ | | Train & build capacity of key stakeholders on data management and dissemination | Training of field staff on data collection and uploading unto the GIS M&E system training of Regional, TCO and national level project staff on data access and usage | 30,000 | 30,000 | | | 60,000 |
| SLWMP AF2 042 | EPA | | Procure a dedicated server for the GIS M&E | | 20,000 | | | | 20,000 |
| SLWMP AF2 043 | EPA, HQ | | Maintenance of GIS base data management system and SLWMP Website at the TCO Office and Head Office | | 5,000 | 5,000 | 10,000 | 10,000 | 30,000 |
| SLWMP AF2 044 | EPA, HQ | | Independent verification of contracts | Field verification by a subcommittee of the NSLMC for PES payment | 5,000 | 5,000 | 15,000 | 15,000 | 40,000 |
| SLWMP AF2 045 | EPA, HQ | | EPA Head Office Monitoring and operating cost | To monitor implementation of all project activities, verify data received from implementing agencies and operating cost made available (maintenance of office equipment, administrative cost and maintenance of office vehicle) | 35,000 | 35,000 | 35,000 | 35,000 | 140,000 |

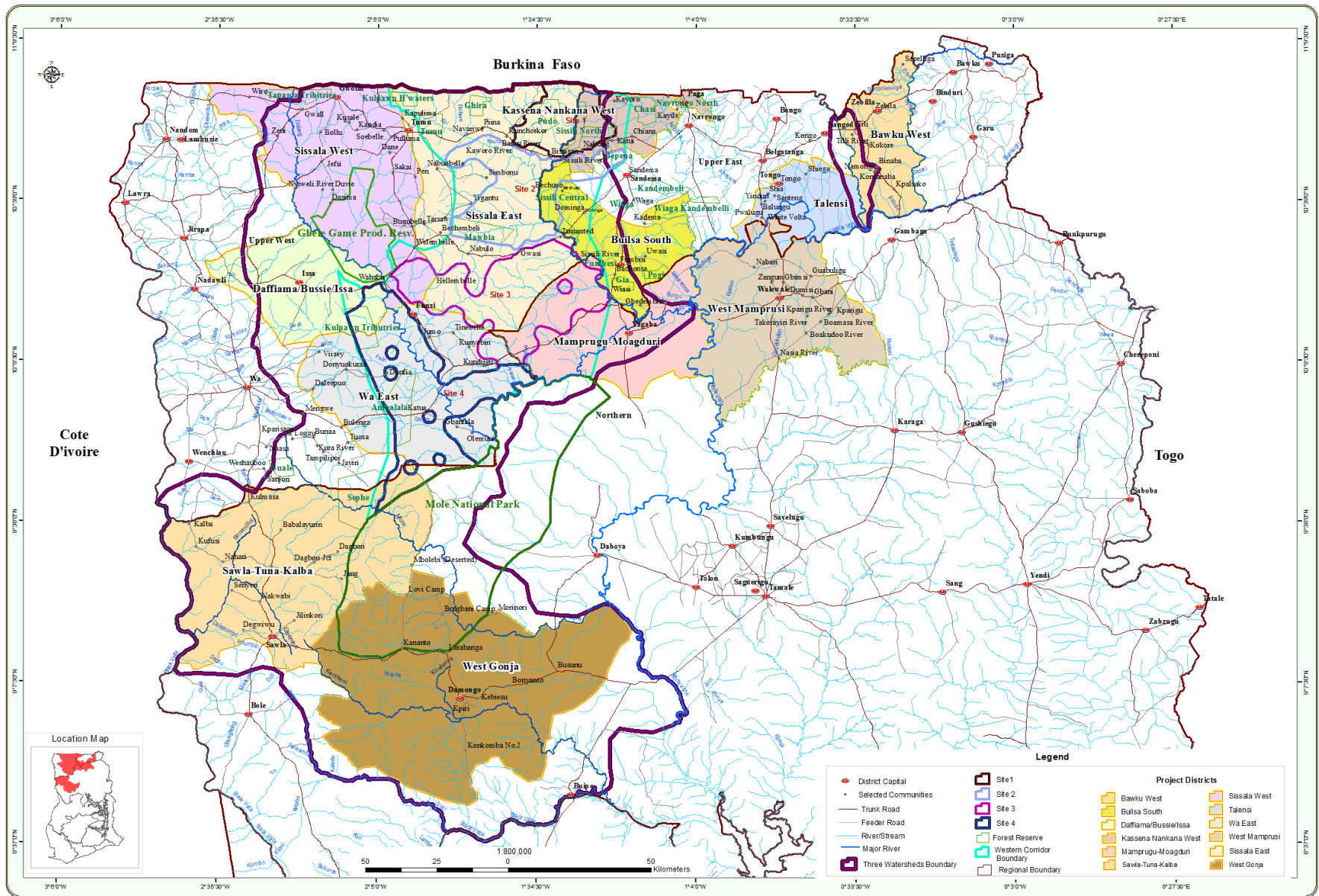
| Activity no | LEAD IAs | Focal area | ACTIVITIES | DETAILED DESCRIPTION | 2017 | 2018 | 2019 | 2020 | TOTAL |
|----------------------------------------------------------------------------------------------------------------------------|-------------|----------------|------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------|--------|--------|--------|------------------|
| | | | | | US\$ | | | | |
| SLWMP AF2 046 | MoFA-DCS | LD, CC | Monitoring and operating cost for MoFA DCS of sub-project implementation | To monitor the implementation of sub-projects and provide necessary policy support decisions to the districts and Operating Cost (maintenance of office equipment, administrative cost and maintenance of office vehicles). | 30,000 | 30,000 | 30,000 | 20,000 | 110,000 |
| SLWMP AF2 047 | FSD | | Monitoring and Operating costs for FSD (HQ and District office) | Monitor and Direct operating cost made available (maintenance of office equipment, administrative cost and maintenance of office vehicle) | | | 35,000 | 35,000 | 70,000 |
| SLWMP AF2 048 | WD | | Monitoring and Operating costs for WD (Head office, Bolga Regional Office and GRR) | Monitor and Direct operating cost made available (maintenance of office equipment, administrative cost and maintenance of office vehicle) | 10,000 | 10,000 | 45,000 | 45,000 | 110,000 |
| SLWMP AF2 049 | EPA, HQ | BD, CC, LD, IN | Regional Learning Workshop | To exchange knowledge on experiences, lessons and constraints affecting the implementation of SLWMP | 10,000 | 35,000 | 35,000 | 35,000 | 115,000 |
| SLWMP AF2 050 | TCO | | Organize local steering committee meeting | Organize at least 2 LSC meetings in a year | 20,000 | 20,000 | 20,000 | 20,000 | 80,000 |
| SLWMP AF2 051 | EPA, HQ | | Strengthen the supervisory role of project governance structures | Support to Regional Offices of the implementing agencies | 10,000 | 10,000 | 10,000 | 10,000 | 40,000 |
| SLWMP AF2 052 | | | | Support to District Watershed Planning Teams | 10,000 | 10,000 | 10,000 | 10,000 | 40,000 |
| SLWMP AF2 053 | MoFA, DDoAs | | Operating cost | Operating Cost (maintenance of office equipment, administrative cost and maintenance of office vehicle) for Districts | 20,000 | 60,000 | 60,000 | 50,000 | 190,000 |
| SLWMP AF2 054 | EPA, HQ | | Develop documentary on project implementation activities | Consultancy | 20,000 | 20,000 | 20,000 | 20,000 | 80,000 |
| SLWMP AF2 055 | TCO | BD, CC, LD, IN | Improve project visibility and identification | Development of Project sign post | 20,000 | 20,000 | 20,000 | | 60,000 |
| Contingency | | | | | | | | | 141,000 |
| Sub-Total Sub-Component 2.3 | | | | | | | | | 1,866,000 |
| Subcomponent 2.4: Management of riparian biological corridors (falls under IAP Components 1, 2, and 3 as indicated) | | | | | | | | | |

| Activity no | LEAD IAs | Focal area | ACTIVITIES | DETAILED DESCRIPTION | 2017 | 2018 | 2019 | 2020 | TOTAL |
|---------------|----------|---------------|-------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------|--------|---------|---------|---------|
| | | | | | US\$ | | | | |
| SLWMP AF2 056 | FSD | BD IAP 1 | Implementation of natural resource based livelihood activities | Selected community members will be trained in bee keeping techniques and provided with bee hives and equipment | 76,000 | | | | 76,000 |
| SLWMP AF2 057 | FSD | BD, CC, IAP 2 | Implementation of fire management activities and provision of fire suppression equipment in the project districts | Undertake fire management activities in selected communities in the biological corridors and protected areas. This includes provision of fire suppression equipment to FVs | 35,000 | 35,000 | 35,000 | 35,000 | 140,000 |
| SLWMP AF2 058 | FSD | BD, IAP 2 | Establishment of green firebreaks | Community members will be permitted to incorporate food crops in green fire breaks along the boundaries of Kulpawn and Ambalara forest reserves which is captured in the Management plan prepared under AF1 | 43,750 | 87,500 | 61,250 | | 192,500 |
| SLWMP AF2 059 | | IAP 2 | | Procurement of tree seedlings and rehabilitation of a borehole | 41,663 | 73,326 | 51,328 | | 164,317 |
| SLWMP AF2 060 | | IAP 2 | | Maintenance of green firebreaks to achieve the intended purpose | | 16,200 | 48,600 | 71,280 | 136,080 |
| SLWMP AF2 061 | WD | BD, IAP 1 | Implementation of corridor management plans | Continuous engagement and provision of support to established CREMA communities on wildfire prevention and control; ecological monitoring, community law enforcement, livelihood support activities and ecotourism development. Identify and train tour guides to promote ecotourism activities within the corridors. | | | 120,000 | 120,000 | 240,000 |
| SLWMP AF2 062 | WD | IAP 2 | | Design, supervision and construction of 2 community dug-outs in critical locations for livestock use. | 240,000 | | | | 240,000 |
| SLWMP AF2 063 | WD | BD, IAP 2 | Provision of Tourism infrastructure/equipment | Provision of ecotourism infrastructure (hiking trails, hides) and acquisition of equipment (binoculars, tents, sleeping pads, etc.) to facilitate tourist use of the Reserve. | 25,000 | 25,000 | | | 50,000 |
| SLWMP AF2 064 | WD | BD, IAP 2 | Implementation of infrastructure development programs in the Mole National Park | Rehabilitation of existing watering points in Mole National Park. | 100,000 | | | | 100,000 |
| SLWMP AF2 065 | WD, TCO | BD, IAP 2 | Implementation of strategies on human-wildlife conflicts reduction | Provision of support to small scale food crop farmers to implement appropriate strategies to minimize threat of the human-wildlife conflict for food security | 20,000 | 30,000 | 30,000 | | 80,000 |

| Activity no | LEAD IAs | Focal area | ACTIVITIES | DETAILED DESCRIPTION | 2017 | 2018 | 2019 | 2020 | TOTAL |
|----------------------------------------------------------------------------------------|----------|------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------|--------|--------|--------|--------|------------------|
| | | | | | US\$ | | | | |
| SLWMP AF2 066 | GRR | BD, IAP 3 | Ecological monitoring / MIST | Undertake ecological monitoring to control poaching and to promote ecological integrity of GRR. | 15,000 | 20,000 | 20,000 | 20,000 | 75,000 |
| SLWMP AF2 067 | GRR | BD, IAP 2 | Maintenance of GRR boundary/access routes for park protection and management | Maintain 174km (cumulative distance) boundary and internal access routes/tracks to enhance access and as a fire control measure. | 15,000 | 15,000 | 15,000 | 15,000 | 60,000 |
| Sub-Total Sub-Component 2.4 | | | | | | | | | 1,553,897 |
| Component 3 : Project management and coordination (IAP Project Management Cost) | | | | | | | | | |
| SLWMP AF2 068 | MESTI | | Engage a procurement officer | Continue to engage the procurement officer to assist the PCU in project procurement | | 8,000 | 9,600 | 9,600 | 27,200 |
| SLWMP AF2 069 | MESTI | | Engage a technical officer | Continue to engage the technical officer to assist the PCU in project implementation | | 15,000 | 18,000 | 18,000 | 51,000 |
| SLWMP AF2 070 | MESTI | | Engage services of an external audit | To audit project accounts | | | 25,000 | 30,000 | 55,000 |
| SLWMP AF2 071 | MESTI | | Engage consultant for final report | | | | 50,000 | | 50,000 |
| SLWMP AF2 072 | MESTI | | Support capacity building of project management team in project management, procurement, financial management and auditing for efficient project implementation | All project management team trained on FM, auditing, procurement and project management issues | 65,000 | | | | 65,000 |
| SLWMP AF2 073 | MESTI | | Cost of financial and procurement and audit supervision and field visits | Strengthen the FM, Audit and Procurement unit of MESTI | 20,000 | 20,000 | 20,000 | 20,000 | 80,000 |
| SLWMP AF2 074 | MESTI | | Field supervision by PCU | Strengthen PCU for effective project management and coordination | 10,000 | 10,000 | 23,000 | 23,000 | 66,000 |
| SLWMP AF2 075 | MESTI | | Project steering committee coordination and field costs | Project Steering Committee meetings and field visits to project areas | 45,000 | 10,000 | 45,000 | 10,000 | 110,000 |
| SLWMP AF2 076 | MESTI | | Project Management operating cost | Logistics support, vehicle maintenance, office equipment, administrative services costs | | | 25,000 | 25,000 | 50,000 |
| Contingency | | | | | | | | | 85,800 |

| Activity no | LEAD IAs | Focal area | ACTIVITIES | DETAILED DESCRIPTION | 2017 | 2018 | 2019 | 2020 | TOTAL |
|------------------------------|----------|------------|------------|----------------------|------------------|------------------|------------------|------------------|-------------------|
| | | | | | US\$ | | | | |
| Total for Component 3 | | | | | | | | | 640,000 |
| | | | | GRAND TOTAL | 2,821,163 | 3,225,026 | 3,516,778 | 1,585,630 | 12,768,832 |

Map of Project Area



Landscape Approach - Interconnecting Ecosystems in the Northern Savanna Zone of Ghana