SGP COUNTRY PROGRAMME STRATEGY FOR OP6

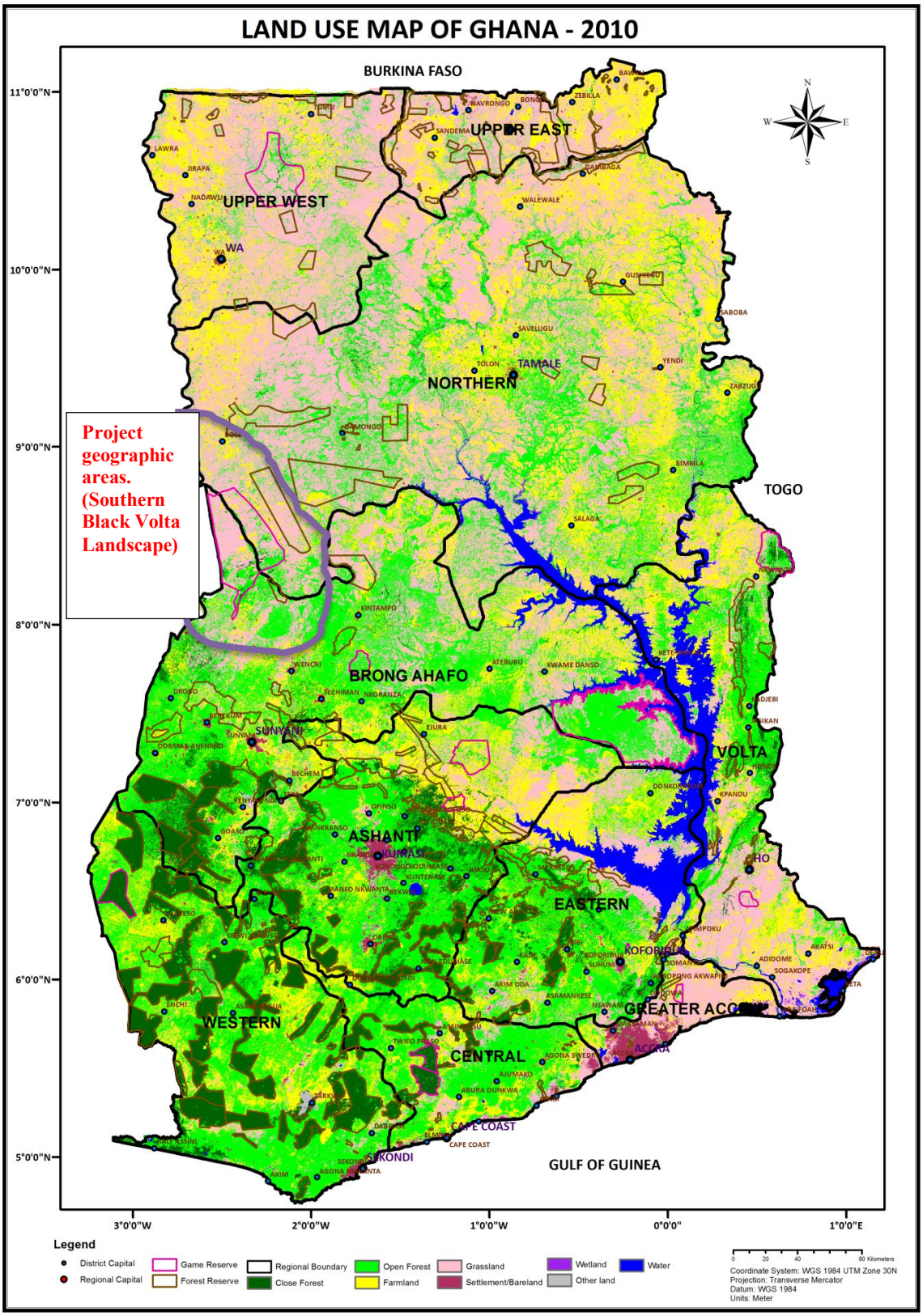
GHANA

OP6 RESOURCES (3.0 MILLION US$)

Core funds	**=US$ 600,000**
Other Funds to be mobilized:	**=US$ 250,000**
In-kind	**=US$ 2,150,000**

OPG

Figure 1: Spatial Location of Project Focal Area



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1. SGP COUNTRY PROGRAMME - SUMMARY BACKGROUND

1.1 Launched in 1992, Ghana's Global Environment Facility (GEF) Small Grants Programme (SGP) has successfully gone through five operational phases supporting community level initiatives that promote sustainable economic growth and social development within the GEF focal areas. The programme integrates poverty reduction as a critical entry point in environmental management and human development. Over the years, the programme has supported 301 projects and developed the capacities of 251 Civil Society Organizations (CSOs) and community groups.

1.2 Under the OP6, the programme has aligned its operational strategies to the GEF 20/20 Strategy, UNDP's Strategic Plan and the Sustainable Development Goals, the Ghana Shared Growth and Development Agenda (2014-2017), the 2013 Ghana National Climate Change Policy and Action Plan, the 2011 Forest and Wildlife Policy and Master Plan, National Climate-smart Agriculture and Food Security Action Plan and the National Strategic Energy Plan (2006-2020). This has been done with the view to translating the strategies into community and local level actions. Under OP6 therefore, the SGP Ghana will contribute to relevant transformational changes targeted by each of GEF's focal area strategies and Ghana's commitment to many international agreements.

1.2 Significant results and accomplishments achieved by the country programme under OP5

1.3 During the OP5, the SGP mobilized and disbursed US$**3.8** million grants in cash as follows (GEF Core /STAR = US$1.495 million; COMDEKS = US$480,000; Skill Development Fund = US$90,000; Japan Embassy = US$100,000; Sky Platform/Prathista = US$350,000; Grantees, District Assemblies, Traditional Authorities and local communities = US$1.2 million). The in-kind funds from communities, Philanthropists, CSOs, Grantees and the private sector were US$ 3.78 million. The most significant results and achievements made under OP5 from utilizing these funds included:

Biodiversity conservation

1.4 The programme improved the recognition, support, and overall effectiveness for biodiversity conservation within areas conserved by indigenous peoples and local communities (ICCAs)thus contributing to the achievements of Aichi Targets 11, 14 and 18 of the CBD 2020 Global Biodiversity Strategy. Working with local communities, 81 community-managed sacred landscapes (measuring 520 ha) in the transitional zone ecosystem were surveyed, mapped, inventoried, and digitized on the national map. Within the Black Volta basin, 2,300 ha of riverine forest were placed under CREMA (Community Resource Management Area). One landscape-level conservation initiative covering 50,000 ha was implemented to conserve globally significant biodiversity areas (GSBAs), in the marginal forests. Two new CREMAs within the biological corridors of Gbele Resource Reserve and Kulpawn tributaries forest reserve were created by applying sustainable landuse practices. 500 farm families were involved in the conservation of threatened native species within Fian and Tabease CREMA (250 ha). One ecotourism project was initiated to conserve the cultural heritage of the Fantis at Eguafo and linked to the Central region ecotourism circuit. Two bio-enterprises in organic honey production were established around the Togo-plateau Mountain. One million seedlings of shea were raised and planted in degraded savannah areas.

Chemical Persistent Organic Pesticides (PoP) management

1.5 Integrated pest management (IPM) and alternatives to the use of the pops pesticides for controlling pest was piloted on 10 ha integrated rice-fish-poultry farm in the northern savannah ecosystem. Two community waste compost enterprises employing 15 persons each was established at Osaekrodua (Central Region) and Forikrom (Brong Ahafo) to process domestic and farm waste into organic manure and manufacture pesticides from neem extracts. The products were sold to local farmers to invest in organic agriculture. Through the projects 500 tons of chemicals, pesticides, and chemical fertilizers have been avoided annually and incomes of farmers have increased by 200 percent.

Sustainable land management

1.6 Within the northern savannah ecosystem 250 ha of degraded agricultural lands were placed under sustainable land management that optimizes protection, use, and recycling of renewable resources while minimizing use of non-renewable resources and external inputs. The programme piloted the adoption of organic agriculture with a minimum dependency on agrochemical inputs, emphasizing interactions and synergisms among the many biological components of diversified farms. This led to enhanced nutrient and biomass recycling, biological pest control and stabilized yields, while improving the overall resilience, and ecological efficiency of the savannah ecosystem.

Transfer of low carbon technologies at the community level

1.7 The programme supported the upscaling of innovative low carbon technologies including the use of improved charcoal and wood stoves for domestic, institutional, and commercial use in the coastal and northern savanna areas. The programme manufactured and distributed 500 improved fish smoking stoves to fish smokers in the coastal savannah ecosystem, supplied 20 secondary institutions with institutional stoves and assisted 600 households to construct and use energy efficient cooking woodstoves. The programme initiated eco-charcoal certification in selected wood fuel producing areas in the transitional zone and the Afram Plains. Solar lights were supplied to one clinic in the Afram Plains and 50 households were solar electrified. Bamboo bicycle was piloted as low carbon transport system leading to the establishment of Ghana Bamboo enterprise which currently employs 20 youth mostly ladies. Biofuel from sunflowers was successfully piloted on farm machines. Currently the biofuel project is receiving recognition from the Ministry of Power.

International recognition

1.8 Three projects received two international recognitions and one was adjudged 2nd Runner up. The bamboo bicycle project received 2013 award by International Road Federation in A Road award on promoting innovative transportation system, it also received UN Habitat/Dubai International Best Practice Award and Dubai City Council/UN Habitat award for innovation and judicious use of natural resources in 2013. The Ghanaian bamboo bicycle was celebrated at COP19 in Warsaw in 2013. The biodiesel project won 2012 Seed Award whilst the Women in Dryland management project won the Equator 2014 Award.

1.3 Overall situation analysis for the SGP country programme in OP6

1.9 There is the need for more structured and systematic engagement of multiple stakeholders in policy dialogue and formulation. Not much is being done at the rural areas to mainstream gender in development planning and implementation. Thus, the impacts of climate change will be felt disproportionately by women, because it will put more pressure on women's household roles, while at the same time depleting the natural resources that women in particular depend upon. There is the need for a more inclusive and gender responsive approach that fits into the national development programme.

1.10 Much of the SGP innovative technologies are known in part and have not been mainstreamed into development intervention. It is important to document these best practices and to disseminate, upscale, and mainstream for broader adoption. The SGP has a unique role of working to bring the technical expertise from the government institutions into close collaboration with the NGO/CBO at community levels to address some of the environmental challenges. This needs to be consolidated in ways that will build the capacities of the CSOs to work towards achieving their developmental aspirations including improvement in their livelihoods while providing global environmental benefits.

1.11 The Black Volta basin has unique mosaic transitional vegetation of moist evergreen forest and well stocked guinea savannah woodland which make it rich in biodiversity and a priority conservation area for several important flora and fauna species including the white-breasted guinea fowl, the colobus monkey, chimpanzee, hippopotamus, African crocodiles and the honey badger. In spite of its relevance to

biodiversity conservation, most national investments and donor support has taken place within the White and Red Volta basins to the neglect of the Black Volta. With a new lake is being formed from the Bui dam, the landscape is rapidly changing. The habitats of most endangered and threatened wildlife are being inundated forcing the wildlife to migrate into vulnerable haven. This requires interventions to guide development.

2. SGP COUNTRY PROGRAMME NICHE

2.1 The Government through the various ministries and departments handle different aspects of the GEF focal areas activities. These institutions include: the Ministry of Environment Science, Technology and Innovation (Environmental Protection Agency, Council for Scientific and Industrial Research, Water Research Institute, Forest Research Institute of Ghana, Aquatic Biology); Ministry of Lands and Natural Resources (Forestry Commission); and the Ministry of Power (Energy Commission, and Renewable Energy Division). In keeping with its international obligations and international diplomacy, Ghana has ratified a number of Rio-conventions which jointly seek to bridge the gap between economic development and environmental conservation. (See table 1)

Table 1: List of relevant conventions Ghana has ratified

Rio Conventions + national planning frameworks	Date of ratification/completion
UN Convention on Biological Diversity (CBD)	August 29, 1994
CBD National Biodiversity Strategy and Action Plan (NBSAP)	August 29, 1994
UN Framework Convention on Climate Change (UNFCCC)	June 09, 1995
UNFCCC National Communications (1st, 2nd, 3rd)	May 1-2 2001
UNFCCC Nationally Appropriate Mitigation Actions (NAMA)	November 2010
UN Convention to Combat Desertification (UNCCD)	December 27, 1996
UNCCD National Action Programmes (NAP)	April 2002
Stockholm Convention (SC)	May 03, 2003
SC National Implementation Plan (NIP)	January 21, 2003
World Bank Poverty Reduction Strategy Paper (PRSP)	February 19, 2003 & November 2005
GEF National Capacity Self-Assessment (NCSA)	October 2005
GEF-6 National Portfolio Formulation Exercise (NPFE)	July 2015
Strategic Action Programmes (SAPs) for shared international water-bodies	November 2013
Minamata Convention on Mercury	September 24, 2014

2.2 As part of national efforts to meet the obligations of these conventions, the MESTI has taken a central role of coordinating and harmonizing the various initiatives and strategies operating under the different conventions. Under this arrangement, the SGP is a partner and mobilizes the CSOs to ensure better coordination and management of Ghana's environment and the natural resources. Through the GEF/NGO network, there are opportunities to promote community involvement in the implementation of the conventions.

2.3 A review of the implementations of the various conventions and the national policies identified gaps, issues and opportunities that support the activities of the SGP in the country. The main environmental issues identified are the continuous dwindling of the national forest cover; biodiversity degradation due to over exploitation of forest and wildlife resources; inconsistent and inadequate involvement of local communities and CSOs in forest management; excessive droughts and floods due to climate variability;

inadequate expertise at the locality levels to execute activities in the climate change and biodiversity conservation focal areas; unsustainable farming practices and increasing use of persistent organic pollutants chemicals in agricultural production and increasing pollution of the international waters.

2.4 The SGP has responded to these challenges by providing technical and financial support to local communities and CSOs in the GEF focal areas. The programme has also been working to connect technical expertise from the government institutions (policy, practitioners, academic and research) to local communities and CSOs to address some of the environmental challenges. In this way, the capacities of the CSOs are being built and communities are being assisted to work towards achieving their developmental aspirations including improvement in their livelihoods while providing global environmental benefits.

2.5 The contributions of SGP to national priorities and GEF-6 corporate results are presented in Table 2. The table discusses the country programme niche and its complementation with the UNDP country strategic programming.

Table 2: SGP contribution to national priorities / GEF-6 corporate results

1 SGP OP6 strategic initiatives	2 GEF-6 corporate results by focal area	3 Briefly describe the SGP Country Programme niche relevant to national priorities/other agencies	4 Briefly describe the complementation between the SGP Country Programme UNDP CO strategic programming
Community landscape/ seascape conservation	*Maintain globally significant biodiversity and the ecosystem goods and services that it provides to society.*	• Promoting ecosystems management through community landscape and waterscape (CLSC) strategies to conserve biodiversity, sustainably develop the ecosystem goods and services and enhancing their sustainable utilization based on the experiences obtained from the implementation of CREMA and COMDEKS. This will help achieve the Aichi CBD targets by 2020. • Designing the conservation, and governance of community-managed protected areas by tracking, mapping, documenting and monitoring terrestrial and marine ICCAs, to achieve the Aichi targets 11 (protected areas), 14 (ecosystem services) and 18 (traditional knowledge) and to national objectives of mainstreaming biodiversity conservation. • Supporting the sustainable management of coastal wetlands, mangrove conservation and sustainable utilization of resources within degraded RAMSAR sites.	Contributes to UNDP SDC Outcome 4: Biodiversity & Land Management which seeks to promote land use management practices for forest conservation and buffer zone area created (to take advantage of REDD).
Innovative climate-smart agro-ecology; Community landscape/ seascape conservation	*Sustainable land management in production systems (agriculture, rangelands, and forest landscapes)*	• The programme will develop climate-resilient agriculture and food systems, promote organic and agroecology farming within the buffer zones of critical ecosystems, within the Black Volta Basin. Much work has been done in promoting	Contributes to UNDP SDC Outcome 4: Biodiversity & Land Management which seeks to promote land use management practices for forest conservation and buffer zone area created (to take advantage

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		organic farming and on this SGP will innovate by integrating the elements of in-situ conservation of genetic resources, climate smart agriculture, agroecological innovative farming and land-based organic providers (i.e. bio-deposit) to reduce use of chemical based fertilizers while also reducing emission from ozone depleting substances such as nitrites and nitrates. • The programme will create major activity on forest corridors in sloping lands in danger from slash-and-burn cultivation with the dual purpose of preventing cover loss and erosion as well as forest fragmentation.	of REDD). It also contributes to UNDP SDC Outcome 5: Waste & Chemicals Management. It will build new partnership mechanisms with funding for sustainable management solutions of chemicals and waste at national and/or sub-national level.
Community landscape/seascape conservation	*Promotion of collective management of trans-boundary water systems and implementation of the full range of policy, legal, and institutional reforms and investments contributing to sustainable use and maintenance of ecosystem services*	• Develop the Black Volta basin as the main landscape target and waterscape conservation. The programme will focus attention on: - networking and strengthening community and civil society groups operating in the areas for constructive dialogue with government in national and district level environmental planning and policy development; - implementing proven working models for further scaling up, replication and mainstreaming of new innovative technologies - Increasing resource flow to communities and local CSOs through effective use of local assets and innovative environmental financing mechanisms.	This is part of the UNDP SDC Output 4 Outcome 1: Adaptation Climate Change.
Energy access co-benefits	*Support to transformational shifts towards a low-emission and resilient development path*	• Build on "bottom-up energy solutions" strategy within SE4ALL process, using an integrated approach wood carbonization and establishing wood fuel plantations aimed at increasing climate resilience and reducing poverty. • Focus on building more institutional and commercial woodfuel stoves,	Fits into UNDP SDC thematic outcome 2: Energy & mitigation. Addresses actions under 2013 National Climate change policy.

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		low carbon emission transport systems, solar drying and solar for irrigation.	
Local to global chemicals coalitions	*Increase in phase-out, disposal and reduction of releases of POPs, ODS, mercury and other chemicals of global concern*	• Focus support to communities in the forefront of chemical threats either as users or consumers by: - supporting sector-wide awareness raising linked to innovative, affordable and practical solutions to chemicals management in joint effort with - establishing partners with IPEN as well as new partnerships that will strongly include government agencies, research institutions, and international agencies such as UNIDO and WHO. - Establishing systems of local certification of organic producers in vegetable initially through producer-consumer agreements eventually graduating to national government policy that will influence markets. • In mercury management, at least one artisanal gold-mining community in hotspots within the Black Volta basin would be selected for implementation of community based activities along the provisions of the Minamata Convention.	Fits into UNDP SDC thematic Outcome 5: Waste & Chemicals Management. The theme seeks to reduce quantities of toxic chemicals and recycle wastes substances and/or disposed them off. It also seeks to organize training and capacity building on waste management and build recycling infrastructures.
CSO-Government dialogue platforms	*Enhance capacity of civil society to contribute to implementation of MEAs (multilateral environmental agreements) and national and sub-national policy, planning and legal frameworks*	• Assisting stakeholders especially communities and local CSOs to develop capacities as "*Barefoot Consultants*" to access non-GEF funds such as with bilateral and in the "*direct access*" modality of the Adaptation Fund and Green Climate Fund (present work, outside of helping raise co-financing, is mainly focused on access to GEF funds); • Assisting in the establishment of a "CSO-Government Policy and Planning Dialogue Platform" (which could be in partnership with the GEF NGO Network); one	Part of UNDP strategy to reach out to the wider society in environmental management.

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		transformational change that SGP had succeeded is in the trust-building that results from civil society and government joint work in NSCs and in projects such that there is increased acceptance by governments to civil society involvement. • establishing barefoot training institute to train local people and CSOs in best innovative practices in sustainable agriculture, low carbon technologies, biodiversity enterprise development etc.	
Social inclusion (gender, youth, indigenous peoples)	*GEF Gender Mainstreaming Policy and Gender Equality Action Plan and GEF Principles for Engagement with Indigenous Peoples*	• Expanding support for gender equality and women's empowerment through proactive promotion of women-led projects, mainstreaming gender in all relevant projects, • Networking of women grantee-leaders for knowledge-sharing and policy advocacy. Mainstreaming Policy and Gender Action Plan.	Fits into UNDP's strategy on gender mainstreaming and women's empowerment
Contribution to global knowledge management platforms	*Contribute to GEF KM efforts*	• The programme will set up a "Grassroots Reach" communication channel for use not only by SGP but also by the government, and other international donor agencies, and the private sector interested either as a business partner on marketing sustainable products • Maintain partnership with the press to sustain awareness creation on sensitive environmental issues.	Fits into UNDP knowledge management strategyto codify, manage, and share knowledge; Set up data and information management systems and coordination mechanisms; Communications strategy development; and partnership and resource mobilization and integration (including stakeholder analysis, value chain analysis, and investment mapping.

3. OP6 STRATEGIES

3.1 Cross-cutting OP6 grant-making strategies

3.1 Based on the environmental scoping of the focal area and the national stakeholder consultation process, the following priority programmes within GEF focal areas would be implemented under the GEF-6 for Core and STAR allocations within the Black Volta land scape and the other preferred areas:

i. **Biodiversity conservation** – promoting community conservation and mainstreaming biodiversity conservation and sustainable use into agroforest and production landscapes within the Black Volta Basin.
ii. **Climate Mitigation and Energy**– promoting Sustainable Energy for All – [Low Carbon-Energy Access and improved wood carbonization] and reduction of GHG emissions in agriculture through Climate Smart Innovative Agro-ecology in the deprived areas of the Black Volta basin ecosystem
iii. **Land degradation** - improving the flow and resilience of agro-ecological systems to sustain livelihoods of local communities with the basin.
iv. **Waste and Chemicals Management**- increasing awareness in phase-out, disposal and reduction of releases of POP chemicals, mercury and other chemicals of global concern.
v. **International Waters and Integrated wetland management** – supporting the rehabilitation of degraded mangroves within relevant RAMSAR sites.
vi. **Capacity development and knowledge management** - to share best practices and engage in capacity development for local communities through: improving the technological and other knowledge systems for Community Landscape Conservation, Climate Smart Innovative Agro-ecology, Low-Carbon Energy Access co-benefits, and soil, land and water management. All new and or reviewed policies, program/projects and plans related to SLM will be subjected to the "sustainability test" based on the procedures of strategic environmental assessment (SEA).

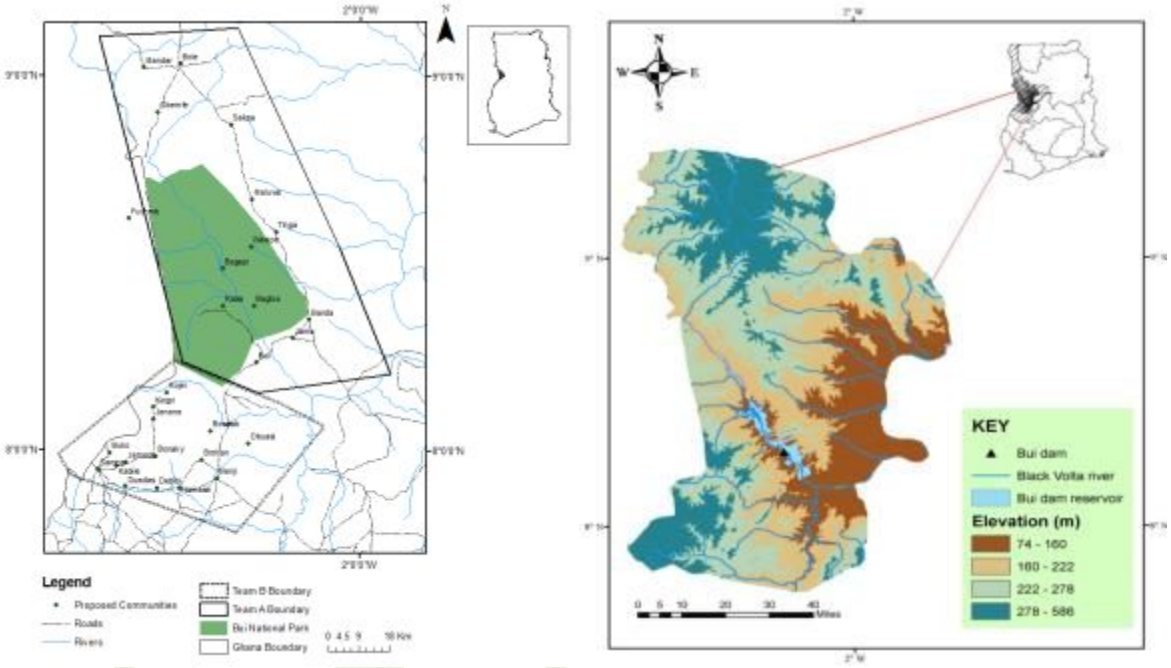
3.2 Accordingly, the following cross cutting activities are envisaged to be funded under OP6:

a) Enhancing sustainable forest and agroforest landscape management for biodiversity conservation
b) Community-based natural resources management (CREMA)
c) Innovative agro-ecology models and mechanisms for conservation of carbon stocks in the savannah land use
d) Promoting organic /climate resilient agriculture and food system for the savannah landscapes within the Black Volta basin.
e) Integrated Landscapes: Reduce pressures on natural resources from competing land uses in the wider landscape
f) Improving the governance of land management decisions and secured ecosystem
g) Reduction of GHG emissions in agriculture through Climate Smart Agriculture in the deprived areas of the northern savannah zone including Climate Smart Agriculture and food security in agroforest landscapes
h) Mainstreaming biodiversity conservation and sustainable use into production landscapes within the agroforestry and savannah landscapes in the Brong Ahafo and northern savannah areas
i) Wetland management and mangrove restoration within RAMSAR sites
j) Sustainable land and water management – water storage, conservation, environmental enhancement and usage
k) Local certification of organic producers in vegetable
l) Mercury management in artisanal gold-mining and e-waste whilst creating awareness on the provisions of the Minamata Convention
m) Building institutional and commercial woodfuel stoves,
n) Low carbon emission transport systems in rural agricultural areas
o) Decentralized solar management for drying and irrigation

3.2 Landscape/seascape-based OP6 grant-making strategies

3.3 The target socio-ecological production landscape for the OP6 is the southern portion of the Black Volta basin which covers an estimated area of about 18,384 km^2 (constituting 14 per cent of the entire Black Volta basin) as shown in figure 1. The targeted landscape spans over twelve traditional areas and four administrative districts in two regions namely Bole-Bamboi District (Northern region) and Banda, Jaman North and Tain Districts (Brong-Ahafo).

Figure 2: Southern Black Volta Basin as the targeted socio-ecological production landscape for OP6



Land cover and landuse

3.4 The Black Volta basin landscape is a dynamic transitional forest and guinea savannah ecosystem with scattered trees and shrubs, and a sparse ground cover of grasses. In the south most part is moist semi-deciduous and guineas savanna woodland forest types dominated by Khaya spp, Ceiba, Odum, wawa, oprono, emire, otie and onyina. There are diverse habitats and land uses including towns and villages; National Parks (Bui); farmlands with adjacent cashew mango plantations; natural forests, with shea tree plantations, sacred groves, fallow grasslands, wetlands; small scaling mining (illegal); and water bodies (streams, rivers, ponds and the Black Volta Lake). There are targeted 36 settlements within the landscape.

3.5 The landscape has been occupied for several centuries and has been shaped over the years by human and nature interactions in ways that has maintained biodiversity and provided humans with goods and services needed for their wellbeing. The people inhabiting the landscape have deep cultural beliefs which have guided the conservation of biodiversity and protection of highly ecological sensitive areas. The construction of the hydroelectric dam at Bui and the subsequent formation of the lake as well as the intensive surface mining are changing the landuse form and the settlement pattern. New settlements are springing up and commercial activities are growing at astronomical rates.

3.6 The landscape has a tropical climate, characterized by moderate temperature, 12ºC—25ºC for most of the year. Annual rainfall patterns vary from about 1043mm to 1270mm to the south. The minimum potential evaporation is about 1450mm/year to about 1800mm/year and average runoff is about 243m^3/year.

Community consultation and baseline assessment process

3.7 The Black Volta basin was selected as a target landscape after series of interactions and consultations with relevant stakeholders. Based on the GEF SGP strategic decision to adopt landscape approach to implementing GEF-6, the SGP secretariat presented three candidate landscapes/seascapes to the National Steering Committee (NSC) for consideration and selection. After much deliberations panning over two NSC technical meetings, the Black Volta basin was selected as the priority landscape/waterscape based on the following reasons:

- the landscape lies within two major National Parks namely, Bui, and Mole. It has a unique mosaic transitional vegetation of moist evergreen forest and well stocked guinea savannah woodland. It is rich in biodiversity being a priority conservation area for several important species of flora and fauna including the white-breasted guinea fowl, the colobus monkey, chimpanzee, hippopotamus, African crocodiles and the honey badger;
- most national investment and donor support to sustain the Volta River has taken place on the White and Red Volta to the neglect of the Black Volta in spite of its relevance to biodiversity conservation;
- the landscape is vulnerable to climate change and variability and constitute one of the most deprived areas in Ghana. Within the landscape are found some minority ethnic groups like the Lobis;
- within three years of the dam, a new lake is being formed which is gradually changing the landscape of the area. The habitats of the endangered and threatened wildlife are being inundated forcing the wildlife to migrate into vulnerable haven. This requires interventions to guide development;
- illegal mining activities has sprang out within the landscape leading to the wrong use of chemicals including mercury cyanide which are threats to the newly formed lake and the Black Volta as an international water. The emergence vigorous social and economic activities within the landscape and its attended social vices is likely to degrade land and biodiversity in the area;
- the landscape is the latest area in Ghana with rapidly changing land use and land cover classes. The Bui Reservoir has increased in size within a period of less than 3 years to cover an approximate area of 451.74 km^2 and a perimeter of 129.5 km.

3.8 Following the recommendations of the NSC, the NC held consultation meetings with the four District Assemblies and built consensus with opinion leaders, public servants and policy makers and the traditional rulers within the proposed landscape during the month June 2015. During the consultations process the concept of integrated management of socio-ecological production landscapes, based on the objectives of the OP6 implementation strategy was introduced. A consultant was competitively recruited to collect, ecological, economic, social and spatial baseline data of the landscape. The Consultant (resource persons from the University of Energy and Natural Resources, Sunyani) undertook reconnaissance survey and informal visits to 30 communities, and purposively selected key informants and relevant stakeholders. Utilizing the Public Participatory Geographic Information System (PPGIS), identified available natural resources in the communities and mapped them using Google Earth Pro.

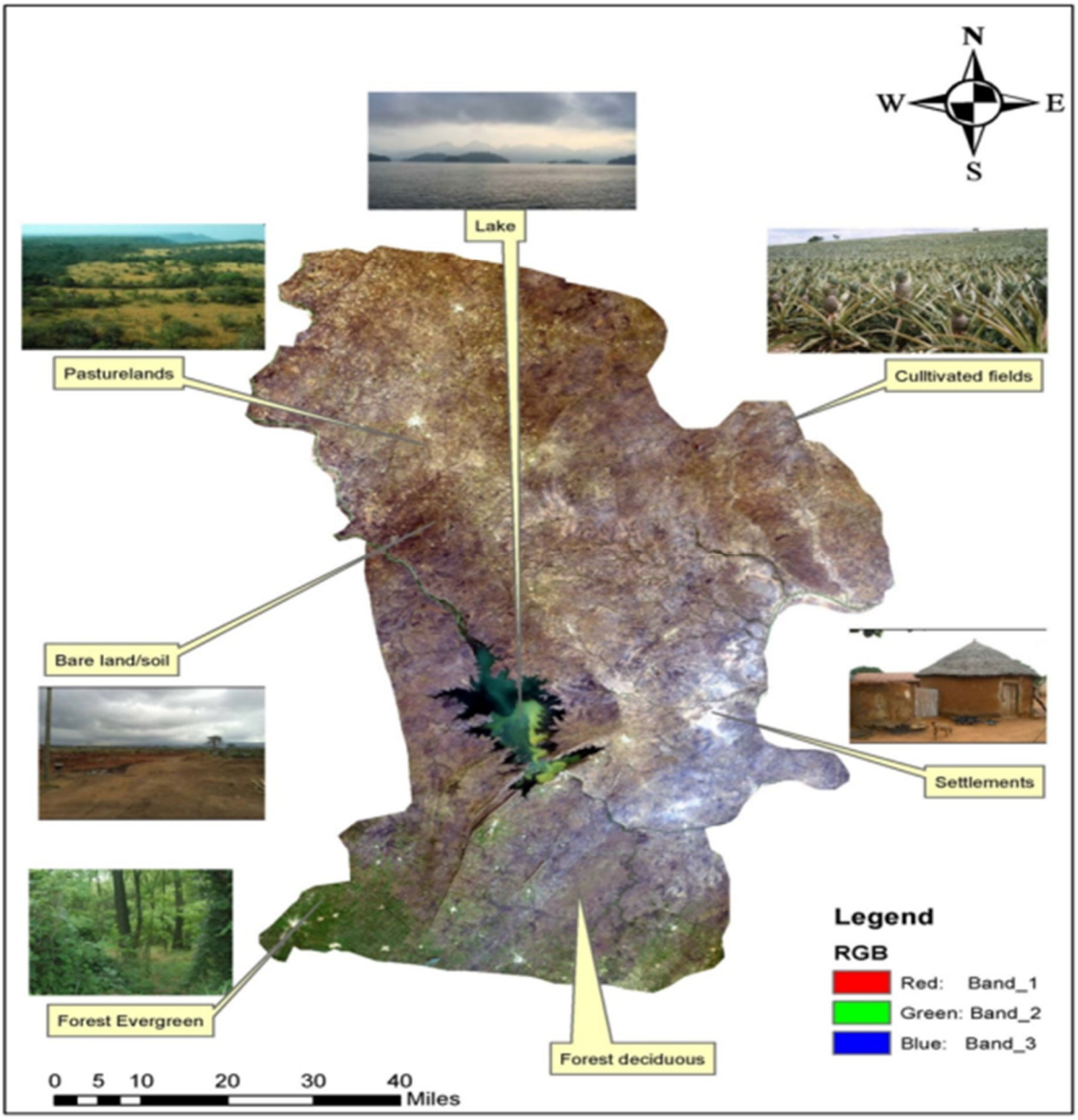
3.9 The Consultant undertook detailed identification of ecosystem protection and maintenance of biodiversity, within the landscape with special emphasis on forest cover (protected, unprotected, sacred site etc.); agricultural biodiversity, knowledge learning and innovation and social equity and infrastructure. Two participatory workshops were organized to validate the baseline data and to formulate resilience strategies for intervention in the landscape. The selection of the target landscape was validated with the community leaders, landowners and traditional authorities through the series of community meetings during which 36 communities were selected in the target landscape.

3.9 During the baseline assessment workshop, community resource mapping activities and a GIS map developed by the GEONETCast CENTRE, University of Energy and Natural Resources, was used to

facilitate discussions, identify community assets and assessed the current situation on the range. Stakeholders were also asked to identify potential community-based activities to manage the Weto Range towards the goal of landscape resilience. The community consultation process was conducted in the native language spoken in the target area, mainly Akan and Gonja, in order to encourage maximum participation, ensure good understanding of the issues, and allow for more meaningful discussions with the local communities. Stakeholders were selected to represent the variety of communities and regions within the larger landscape. A configuration of traditional areas, downstream and upstream communities, and adjacent and contiguous communities participated in the process.

3.10 The baseline conditions are summarized in figure 3.

Figure 3: Baseline conditions (September 2015)



3.3 Strategic Outlook for Ghana under OP6

3.11 The vision of SGP Ghana during OP-6 is to address the underlying drivers of environmental degradation in the northern savannah ecosystem and the coastal savannah wetlands through cost effective service delivery and innovative programmes to innovate and achieve global environmental benefits at community levels. Accordingly, the prioritized strategies to achieve this vision are to:

- minimize unsustainable land use practices (especially by poor farmers and herders lacking alternative livelihoods) through:
  - *enhanced resilience in agro-ecosystems*
  - *harnessing and maintaining ecosystem services for agro-ecological intensification*
  - *promoting integrated management of production landscapes*
  - *mainstreaming sustainable land management in sustainable development*

- promote a mix of pressure-focused and driver-focused approaches by reducing the use of POPs chemicals in vegetable production and mercury in surface mining production and supply chains through:
  - *deployment of alternatives to harmful chemicals;*
  - *giving continuous increase in the global demand for new chemicals, and focus research and development of chemicals and manufacturing of chemicals and products*

- Promote sustainable use of forest resources by addressing the drivers of deforestation to reduce the pressures on high conservation value forests. This will include
  - *Enhancing forest management to maintain flows of forest ecosystem services and improving resilience to climate change through sustainable forest management.*
  - *reversing the loss of ecosystem services within degraded forest landscapes through afforestation and natural regeneration; and*
  - *Maintaining forest resources enhance forest management and restore forest ecosystems through the transfer of international experience and know-how.*

- Work with CSOs to develop knowledge that will have impact on key drivers and jointly create a platform for actions. This requires building synergies with researchers to make science-based solutions developing partnership government service providers and other international CSOs.

- Integrate larger frameworks by linking the SGP work to identify niche in the development and implementation of national plans and strategies as well as national policy making. SGP scaling up will also be promoted through the use of SGP as a delivery mechanism for national or regional level FSPs where the programmes established structure and well proven systems can save on costs and time.

- create added value from GEF funds by being a catalyst for innovative environmental finance – augmentation of limited SGP funds through implementation of micro-lending or hybrid grant/micro-lending approaches to projects in partnership with established credit cooperatives and rural banks and also the private sector (for support in green investment, entrepreneurship and sustainable products marketing).

3.4 Grant-maker+ strategies

3.12 The objectives of developing capacities of SGP-Ghana as Grant maker + is to offer value-added activities to build capacity of communities and CSOs, foster greater impact, bridge gap between SGP projects and full size projects, facilitate dissemination and uptake of new technologies and approaches *and* communicate needs/trends and build social capital to increase resilience and impact. The strategic approach

of towards grant maker+ activities is to build a network of stakeholders by strengthening the capacities of GEF-NGO network beyond grant-making.

3.13 The additional services and value that SGP will provide as a "Grantmaker+" will include:

- assisting stakeholders especially communities and local CSOs to develop relevant proposals as "Barefoot Consultants" to access non-GEF funds especially with bilateral and in the "direct access" modality of the Adaptation Fund and Green Climate Fund (present work, outside of helping raise co-financing, is mainly focused on access to GEF funds);
- setting up a "Grassroots Reach" communication channel for use not only by SGP but also by the government, GEF, other international donor agencies, and the private sector interested either as a business partner on marketing sustainable products or in CSR partnership;
- assisting in the establishment of a "CSO-Government Policy and Planning Dialogue Platform" (which could be in partnership with the GEF NGO Network); one transformational change that SGP had succeeded is in the trust-building that results from civil society and government joint work in NSCs and in projects such that there is increased acceptance by governments to civil society involvement.
- Establishing a virtual barefoot training institute to train local people and CSOs in best innovative practices in sustainable agriculture, low carbon technologies, biodiversity enterprise development etc.
- Repositioning the SGP as a mechanism for delivery and to participate in Non-STAR focal areas as and when the opportunities for these arise. Such non-STAR focal areas include: Chemicals, International Waters, Persistent Organic Pollutants, Corporate budgets and international funds like the Green Climate fund. Already SGP Ghana in collaboration with some CSOs is engaged in chemical and waste (promoting innovative and sustainable financing, creating awareness on the elimination of harmful chemicals and waste chemical management (POP elimination) and efficient management of mercury in artisanal mining). SGP has been creating national awareness on Chemical and Waste-POPs and Minamata Convention on Mercuryas part of Ghana's obligation under the Stockholm Convention).

3.5 CSO-Government Dialogue Platform

3.14 The SGP Ghana has been supporting the GEF/NGO platform and intends to strengthen the capacity of the network under OP6. The strategic steps for the programme are:

- to build on the strengths and opportunities of the GEF/NGO network to develop a five year strategic plan to guide their operations in order to build on the trust and good working relations developed and to relay on existing mechanisms of CSOs involvement as well as GEF and SGP activities;
- to train GEF-NGO Network and other stakeholders on the use of different tools and methodologies available to manage and share information on relevant environmental conventions, create knowledge platform to share lessons learned among CBOs and CSOs. The target is to get CSOs to participate in major national dialogues and get represented in national and international Fora.

Policy influence

3.15 In the past the SGP has been an active partner of the Government in policy formulation. SGP will build on this partnership by assisting the government to document the achievement of GEF in Ghana. It will also submit position papers to Government on certain policy implications that will emanate from project interventions.

3.6 Promoting social inclusion

3.16 Recognising gender equality as an important goal and priority for the country, the SGP will mainstream gender issues in all GEF/SGP projects to advance the global environmental benefits as well as contributing to the goal of gender equality and equity, and social inclusion. Special grants would be given to projects that will a) empower vulnerable groups through gender sensitive livelihood that strengthen the adaptive capacities of women to climate change; b) create awareness and build capacities for mainstreaming gender and develop strategies and mechanisms for mainstreaming gender including financial, economic and policy aspects, c) promote gender responsiveness in the management of natural resources under changing climatic conditions; d) enhance the economic empowerment of women.

3.17 The programme will formulate guidelines and strategies for mainstreaming gender in community level projects. Within the landscape, the program will develop policy, coordinate, execute and monitor projects and activities that relate to the wellbeing of women and children. The overall programme monitoring plan will have specific indicators that ensure mainstreaming of gender equality in all interventions. The programme will encourage gender budgeting at activity level planning to ensure equity in resource allocation. The human resource capacities of the grantees would be developed to facilitate the integration of women issues into the project activities. As part of the capacity building training for grantees, integrated and specific gender initiatives would be promoted to enhance the livelihood condition of women in the project area.

3.7 Knowledge management plan

3.18 The SGP Ghana vision for OP6 is to become a major knowledge center for community-based initiatives that address environmental problems at the local level while achieving significant global environment impacts. The key strategies to achieving this vision are to:

- develop a web platform that allows better knowledge capture and sharing, monitoring and evaluation the use of new media;
- systematize processes and create templates that facilitate data collection and community level for publication;
- build capacity for knowledge management at the local level through training and learning;
- contribute to relevant knowledge bases and fora by increasingly forming a constituency of CSOs with capacity, motivation and systematic information flow;
- establish information exchange links with the national policy making bodies especially with Ministry of Environment Science, Technology and Innovation;
- establish partnerships to upscale and replicate successful projects and best practices;
- capture and disseminate the results, lessons learned and best practice from the SGP portfolio via different media by streamlining and strengthening the database, intranet and website to allow for knowledge exchange and sharing;
- provide guidance to the CSOs on how to capture and disseminate knowledge and conduct knowledge exchange at the local level to be aggregated at global level.

At local levels the strategy is to:

- standardize, capture and disseminate the results, lessons learned and best practice;
- organize consultations, training and knowledge exchange between communities and other key stakeholders;
- support demonstration sites and knowledge centers around successful projects;
- inform, contribute and influence local, regional and national policy with the best practices of SGP projects in the country;
- establish partnerships to upscale and replicate successful projects and best practices;
- participate in communities of practice;
- maintain database updated with the latest information on the projects

3.18 The knowledge management tools to be applied under OP6 are:

- **Knowledge need assessment, mapping and audits**: SGP will conduct a needs assessment to understand what information is the most valuable, how to capture it and how to disseminate it.
- **Best Practices**- the programme will continue to capture best practices at the local and global level, conduct case studies, and undertake publications and new media and sharing them at key national and international events and conferences.
- **Coaching, Mentorship and Peer assist Programme**- the programme will encourage mentorship as a way to capitalize on the knowledge of successful programmes to help train new grantees.
- **Peer-to-peer learning**-the programme will facilitate peer-to-peer learning between local communities and past grantees as an effective method to share knowledge, help communities learn from each other and as a tool for replication and up scaling of best practices.
- **Centers of knowledge**- the programme will set up technology and systems demonstration sites or centers of knowledge at project sites where SGP communities have demonstrated a technology or mastered a process and become a place where other communities, government officials, and development practitioners can learn about it.
- **Communities of Practice (CoPs)** - Communities of practice allows the organization to pool the collective ideas and knowledge of its staff to help build and institutionalize SGP's corporate memory.

3.8 Communications Strategy

3.19 The main objectives for communication during the OP6 are:

- To ensure that all the lessons learned from the implementation of the projects are captured, analyzed and shared with key stakeholders to promote learning within and across communities and countries.
- To help replicate and scale up its impact, as well as to inform policy.

3.20 The communication strategies are to

- To publish quarter e-magazines on the project activities and circulate them widely;
- Encourage CSOs to initiate weekly radio programmes on topical issues on the environment;
- Publish annual case studies of best practices

3.21 The information to be captured and shared are:

<u>Socio-economic impacts</u>

- Measurable impacts (change in average household income, job creation, revenues, livelihood diversification, livelihood/income diversification, market access etc.)
- Secondary benefits (investments into infrastructure, school fees, health care, disease control, etc.)
- positive change in socio-economic conditions since the project/initiative began
- participation of women and indigenous people
- the measurable change in local incomes and job opportunities

<u>Policy Impacts</u>

- impacts the community/project has had on policy-making at different governance levels
- inclusion of community members in steering committees, advisory bodies
- change in national, municipal and local laws because of community activity

4. Expected Programme Results Framework

4.1 The results framework expected from the OP6 is summarized in Table 3.

Table 3: Consistency with SGP OP6 global programme components

1 OP6 project components	2 CPS targets	3 Activities	4 Indicators	5 Means of verification
SGP OP6 Component 1: Community Landscape and Seascape Conservation:	• At least 3,000 ha of Black Volta basin landscape and waterscape to improve conservation and sustainable management and utilization • Two Coastal wetlands and other terrestrial coastal ecosystems around the Volta estuary and Ramsar site measuring at least 50 ha under community based landscape/seascape management approaches.	• At least 8 projects funded by GEF and non GEF grants covering: • Innovative agroecology practices and mechanisms for conservation of carbon stocks in selected forest and savannah land uses within the landscape. • Integrated landscapes management introduced to reduce pressures on natural resources from competing land uses in the wider landscape. • Improving the landscape-wide governance of natural resource management decisions. • Mainstreaming biodiversity conservation and sustainable use into production landscapes with traditional health practitioners within the agroforestry landscapes in the Brong Ahafo and northern savannah areas. • Wetland management and mangrove restoration within RAMSAR sites. • Innovative agro-ecological models and mechanism for conservation of carbon stocks.	• no. and type of projects within the landscapes supported • ha of degraded areas restored and maintained • No. of communities involved • No. of beneficiaries (gender disaggregated) • No. of natural resource and land management governance committees formed within the landscape • No. and ha of degraded wetlands rehabilitated and sustainably managed • No. and Ha of agroecology farms established and managed • No. of farmers involved in agroecology farming practices. • No. and ha of ICCA mapped, documented and digitized on national maps	• Individual quarterly project reporting by Grantees. • Annual Monitoring Report (AMR). • Field monitoring report by NC and NSC. • Annual Country Programme Strategy Review

1 OP6 project components	2 CPS targets	3 Activities	4 Indicators	5 Means of verification
SGP OP6 Component 2: Climate Smart Innovative Agro-ecology:	• At least 150 ha of degraded lands under sustainable land management utilizing organic agriculture and agroecology practices within the Black Volta production landscape (agriculture, rangelands, and forest landscapes) • 120 household farmers practicing climate-smart agriculture within agroforest landscapes in the cocoa and cashew growing areas within the Basin. • At least 1 excavated tank (farm dams) and 1 roaded catchment dam constructed to harvest surface water run-off for livestock, crop spraying, solar irrigation, and domestic use by six communities.	• At least 6 projects funded by GEF and non GEF grants covering: • Innovative agro-ecology models and mechanisms for conservation of carbon stocks in forest and savannah land use. • Organic agriculture and food security within the Black Volta Basin landscapes. • Climate smart agriculture in the degraded and deprived areas in the agroforest landscapes to reduce GHG emissions in agriculture. • Sustainable land and water management practices supported within the landscape.	• no. of projects ha of land within the landscapes supporting climate smart agricultural practices • No. of communities and beneficiaries (gender disaggregated) practicing organic agriculture and involved agroecology farming practices. • ha of land under sustainable management • No. of farmers practicing climate smart agriculture • No. of tons of CO2 emissions avoided	• Individual quarterly project reporting by Grantees. • Annual Monitoring Report (AMR). • Field monitoring report by NC and NSC. • Annual Country Programme Strategy Review • A review of socio-ecological resilience indicators for production landscapes (SEPLs)
SGP OP6 Component 3: Low Carbon Energy Access Co-benefits:	• Sustainable Energy for All – [Low Carbon-Energy Access], improved carbonization and reduction of GHG emissions in agriculture through Climate Smart Innovative Agro-ecology in 10 deprived areas within the land landscape. • At least 100 institutional and commercial wood fuel stoves manufactured and used by 2,000 beneficiaries. • At least 3 low carbon emission transport systems (bamboo bicycles ambulance) built and used by women. • 50 women vegetable producers supported with one integrated solar drying and irrigation facilities in the landscape	• At least 4 projects funded by GEF and non GEF grants covering: • : • decentralized solar management for irrigation under agroecology and organic farming practices within the Black Volta Basin • construction of institutional and commercial wood fuel stoves for secondary and tertiary institutions, prisons, commercial food vendors, Shea butter processors and pito brewers • Bamboo bicycles ambulance introduced to support rural women and in health delivery. • Solar drying and irrigation system introduced to women vegetable producers	• No. and ha of agroecology farms under solar irrigation • No. of institutional and commercial wood fuel stoves constructed and certified • No. of institutions with improved wood fuel stoves • No. of commercial operators by categories (chop bar, pito, brewers Shea butter etc.) using certified improved wood fuel stoves • No. of households using improved wood fuel cook stoves • No. of Youth involve in bamboo bike manufacturing; • No. of traditional health	• Individual quarterly project reporting by Grantees. • Annual Monitoring Report (AMR). • Field monitoring report by NC and NSC. • Annual Country Programme Strategy Review • A review of socio-ecological resilience indicators for production landscapes

1 OP6 project components	2 CPS targets	3 Activities	4 Indicators	5 Means of verification
			workers with bamboo bicycles.	(SEPLs)
SGP OP6 Component 4: Local to Global Chemical Management Coalitions:	• At least 200 farmers made aware in the phase-out, disposal and reduction of releases of POP chemicals, mercury and other chemicals of global concern.	• At least 2 projects supported by GEF/SGP in collaboration with IPEN concentrating on: • Establishing systems of local certification of organic vegetable through producer-consumer agreements eventually graduating to national government policy. • mercury management in artisanal gold-mining communities in hotspots within the Black Volta basin	• No. of vegetable farmers (aggregated by gender) managing harmful chemical in vegetable production • Ha of vegetable farms that have phased out pop chemicals • No. of artisanal gold mining enterprises managing mercury and applying proven alternatives. • No. of target beneficiaries (gender, youth, local peoples, disaggregated) reached with awareness creation programmes on harmful chemicals; • No. of target beneficiaries trained in the manufacture and use alternatives to chemicals in agriculture.	• Individual quarterly project reporting by Grantees. • Annual Monitoring Report (AMR). • Field monitoring report by NC and NSC. • Annual Country Programme Strategy Review • Tracking of hectares of PAs and CCAs supported through GEF-SGP database entries
SGP OP6 Component 5: CSO-Government Policy and Planning Dialogue Platforms (Grant-makers+)	• Enhanced capacity of civil society organizations and GEF/NGO network to contribute to implementation of multilateral environmental agreements and national policy, planning and legal frameworks	• At least 1 projects funded by SGP in partnership with regional GEF/NGO Network to: • develop capacities of CSOs as "Barefoot Consultants" to access non-GEF funds such as with bilateral and in the "direct access" modality of the Adaptation Fund and Green Climate Fund; • establish CSO-Government Policy and Planning Dialogue Platform" to get them involved in national policy, planning and legal framework; • establish barefoot training institute to train local people and CSOs in best innovative practices in sustainable agriculture, low carbon technologies, biodiversity enterprise development etc.	• At least one "CSO-Government Policy and Planning Dialogue Platforms initiated • No. of CSOs registered as members of the network • No. of CSOs operating as barefoot consultants • No. of policy dialogue that CSOs participated • At least one virtual training institute established	• Individual quarterly project reporting by Grantees • SGP Global Database • Annual Monitoring Report (AMR) • Country Programme Strategy Review

1 OP6 project components	2 CPS targets	3 Activities	4 Indicators	5 Means of verification
SGP OP6 Component 6: Promoting Social Inclusion (Grant-makers+):	• All projects approved by the National Steering Committee will promote social inclusion (gender mainstreaming and support for vulnerable and marginalized populations)	• Organise training to ensure equality, efficiency, sustainability and minimize the resistance to gender mainstreaming in development projects. • Advocate for mainstreaming gender in GEF projects to advance the global environmental benefits as well as contributing to the goal of gender equality and equity, and social inclusion.	• No of target beneficiaries (gender, youth, indigenous peoples, and disability disaggregated) trained and supported • No. of projects that mainstreamed gender into its implementation and management	• Individual project reporting by SGP country teams • SGP Global Database • Annual Monitoring Report (AMR) • Country Programme Strategy Review • Tracking of hectares of PAs and CCAs supported through GEF-SGP database entries
SGP OP6 Component 7: Global Reach for Citizen Practice-Based Knowledge program (Grant-makers+):	• Strengthen and widen south-south community innovation and exchange platform within ECOWAS.	• At least 2 projects funded by GEF and non GEF grants covering: • Conduct knowledge need assessment, mapping and audits to understand the information needs. • Capture best practices at the local and regional levels through case studies, and publications. • Develop coaching, mentorship and peer assist programme-. • Facilitate peer-to-peer learning between local communities and SGP grantees • Develop technology and systems demonstration sites or centers of knowledge. • Promote communities of practice	• No. of individuals and organizations accessing SGP knowledge products and networks • No. of visits to the website • No. of contributions to knowledge fairs, conferences, publications and research. • No. of standardized templates and systems to capture and disseminate information • No. of conferences, fairs, meetings, publications and research studies where SGP was present • No. of trainings and workshops • No. of leaders involved in civil society actions	• Individual project reporting by SGP country teams • SGP Global Database • Annual Monitoring Report (AMR) • Country Programme Strategy Review

5. Monitoring and Evaluation Plan

5.1. In order for progress to be monitored and for easier means to aggregate and compare outcomes from individual projects, the following attributes will be measured at least three times during the lifespan of the project: 1) Changes in land productivity, which can be measured on two key attributes: greenness (use of NDVI[1] for land cover changes) as a proxy indicator of improved productivity; 2) Improved livelihoods, measured through child nutrition surveys (QBS) as proxy indicator for better livelihoods at household levels that can be attributable to improved land productivity; and 3) Investments as indicated by amounts of co-financing that come into the community through other sources.

5.2 For the Black Volta socio-ecological productive landscapes (agricultural, rangelands and forests), a vegetative cover greater than 10 per cent of the land area is considered acceptable globally. This would also be supported by an increasing/expanding vegetation under effective land management practices which can be measured through number of natural regeneration areas established, hectares under CREMA that aims at improved forest cover, expansion in agriculture and or management of watersheds for water provision to the community

5.3 The SGP secretariat will be responsible for the coordination of all projects and activities under the CPS and will monitor the implementation through regular reporting by grantees, field visits, and peer review workshops. Each grantee will supervise its own work plan, monitor performance, whether by project inputs and outputs or policy measures, and will report on progress and problems at quarterly bases during project coordination meetings either on-line or during project visits. The regular reports will be analyzed and consolidated by the SGP secretariat as a routine function in preparation for annual reports and project reviews. The project and programme level monitoring and evaluation plan are shown in Tables 4 and 5.

Table 4: Monitoring and Evaluation Plan at project level

Indicators to monitor	Methods	Responsible Parties	Budget Source	Time frame
Component 1: ***Community Landscape and Seascape Conservation***				
• no. and type of projects within the landscapes supported • ha of degraded areas restored and maintained • No. of communities involved • No. of beneficiaries (gender disaggregated) • No. of natural resource and land management governance committees formed within the landscape • No. and ha of degraded wetlands rehabilitated and sustainably managed • No. and Ha of agroecology farms established and managed • No. of farmers involved in agroecology farming practices. • No. and ha of ICCA mapped, documented and digitized on national maps	• Field survey • Review of individual project reports • Spatial maps and satellite imageries • Use of photo stories and before and after pictures	• NC & NSC • Grantee	SGP Administrative budget	• At end of every disbursement. • Mid-term of the programme • End of programme completion

[1] *Normalized Difference Vegetation Index. Considerable variation can be found in the phenology of the bushlands as determined by the satellite NDVI, and is explained through the high spatial variability in the land productivity and distribution of rainfall resulting in green-up of the vegetation. This method will be applicable for rangeland production systems.*

Indicators to monitor	Methods	Responsible Parties	Budget Source	Time frame
Component 2: ***Climate Smart Innovative Agro-ecology:***				
• no. of projects ha of land within the landscapes supporting climate smart agricultural practices • No. of communities and beneficiaries (gender disaggregated) practicing organic agriculture and involved agroecology farming practices. • ha of land under sustainable management • No. of farmers practicing climate smart agriculture • No. of tons of CO_2 emissions avoided	• Field survey • Review of individual project reports • Spatial maps and satellite imageries • Estimated from quarterly and annual reports • Use of photo stories and before and after pictures	• NC & NSC • Grantee • Local consultant	• SGP Administrative budget • Covered under the grant amount & co-financing	• At end of every disbursement. • Mid-term of the programme • End of programme completion
Component 3: ***Low Carbon Energy Access Co-benefits***				
• No. and ha of agroecology farms under solar irrigation • No. of institutional and commercial woodfuel stoves constructed and certified • No. of groups involved in improved carbonization of wood • No. of institutions with improved woodfuel stoves • No. of commercial operators by categories (chop bar, pito, brewers shea butter etc) using certified improved woodfuel stoves • No. of households using improved woodfuel cook stoves • No. of Youth involve in bamboo bike manufacturing; • No. of traditional health workers with bamboo bicycles.	• Field survey • Review of individual project reports • Spatial maps and satellite imageries • Estimated from quarterly and annual reports • Use of photo stories and before and after pictures	NC, NSC and DPs	SGP Administrative budget	As appropriate but at least twice a year to coincide with 2nd and prior to last disbursement
Component 4: ***Local to Global Chemical Management Coalitions***				
• No. of vegetable farmers (aggregated by gender) managing harmful chemical in vegetable production • Ha of vegetable farms that have phased out pop chemicals • No. of artisanal gold mining enterprises managing mercury and applying proven alternatives. • No. of target beneficiaries (gender, youth, local peoples, disaggregated) reached with awareness creation programmes on harmful chemicals • No. of target beneficiaries trained in the manufacture and use alternatives to chemicals in agriculture.	• Field survey • Review of individual project reports • Spatial maps and satellite imageries • Estimated from quarterly and annual reports	• NC & NSC • Grantee • Local consultant	• SGP Administrative budget • Covered under the grant amount & co-financing	• At end of every disbursement. • Mid-term of the programme • End of programme completion
Component 5: ***CSO-Government Policy and Planning Dialogue Platforms (Grant-makers+)***				

Indicators to monitor	Methods	Responsible Parties	Budget Source	Time frame
• At least one "CSO-Government Policy and Planning Dialogue Platforms initiated • No. of CSOs registered as members of the network • No. of CSOs operating as barefoot consultants • No. of policy dialogue that CSOs participated • At least one virtual training institute established	• Field survey • Review of individual project reports • Spatial maps and satellite imageries • Estimated from quarterly and annual reports	• NC & NSC • Grantee • Local consultant	• SGP Administrative budget • Covered under the grant amount & co-financing	• At end of every disbursement. • Mid-term of the programme • End of programme completion

Table 5: Monitoring and Evaluation Plan at country level programming

PROGRAMME LEVEL MONITORING					
No	**Monitoring and Evaluation Activity**	**Purpose**	**Responsible Parties**	**Budget Source**	**Time frame**
2.1	Country programme strategy review	Part of adaptive management learning strategy.	NC, NSC, & CPMT	SGP Administrative budget	Beginning of OP6
2.2	Strategic country portfolio review	To identify best practices and assess the policy implications for national consideration	NSC	SGP Administrative budget	Once during the OP6
2.3	NSC Meetings	To discuss technical issues and approve projects based on the country strategy	NC, NSC, UNDP	SGP administrative and operating cost	Variable depending on projects approval cycle and emerging policy issues
2.4	Performance and results assessment (PRA) of NC performance	To assess the performance of the NC and PA	NC, NSC, UNDP CO. CPMT	SGP administrative and operating cost	Once per year
2.5	Country programme review for preparation of Annual Country Report	To assess the country programme performance	NC presenting to NSC and CPMT	SGP administrative and operating cost	Once per year
2.6	National stakeholders review of country programme	To allow the stakeholders to review the performance of the country programme	NC, NSC and Grantees	SGP administrative and operating cost	Once during the OP6
2.7	Annual Country Report (ACR)	Enable efficient reporting to NSC	NC presenting to NSC	Covered under country programme operating costs	Once per year in June
	Annual Monitoring Report (AMR) Survey (based on ACR)	Enable efficient reporting to CPMT and GEF; presentation of results to donor	NC submission to CPMT	Covered under country programme operating costs	Once per year in July
	Strategic Country Portfolio Review	Learning; adaptive management for strategic development	NSC	Covered under country programme	Once per operational phase

PROGRAMME LEVEL MONITORING					
No	**Monitoring and Evaluation Activity**	**Purpose**	**Responsible Parties**	**Budget Source**	**Time frame**
		of Country Programme		operating costs	
2.8	SGP capacity building and training in GEF thematic focal areas	To build capacities of CSOs in project management and policy dialogue	NC & Grantees	SGP administrative and operating cost	Once every year
2.9	Media encounter and training in reporting in GEF focal Areas	To communicate the best practices of the SGP to the general public.	NC, NSC and Media practitioners	Variable	Twice during OP6

6. RESOURCE MOBILISATION PLAN

6.1 Strategization and Resources Allocation

6.1 Following the lessons learnt during the implementation of OP5 and in line with the goal and objectives of GEF-6, the programme intends to implement 45 projects in the priority areas (Black Volta landscape, Coastal Wetlands and agroforest landscapes in the cocoa growing areas). Table 6 is a guide to the allocation of resources in the priority GEF focal areas during the operational phase six. Nonetheless, projects to be implemented may not be mutually exclusive to the focal areas. Most projects may be cross-cutting or cover multiple focal areas but will be identifiable with the GEF strategic priorities that they are supporting.

Table 6 Guide to Allocation of Resources in Priority Areas

ACTIVITY	Hands-on Activity	Research & Policy Analysis	Information Dissemination, Networking & Dialogue	Total
Community Landscape and Seascape Conservation	12	1	0	13
Climate Smart Innovative Agro-ecology	10	1	0	11
Local to Global Chemical Management Coalitions	3	0	1	4
CSO-Government Policy and Planning Dialogue Platforms (Grant-makers+)	0	1	1	2
Global Reach for Citizen Practice-Based Knowledge program (Grant-makers+):	0	1	0	1
Total GEF Focal Area	25	4	2	31

6.2. The following strategies will be put in place to expand the impact of the GEF/SGP in Ghana during the operational phase six:

i. Aggressively identify income generation, commercialization, and sustainable livelihood issues in line with the GEF/SGP focal areas and operational programmes.

ii. In as much as possible, include capacity building in all projects to ensure technical competence of NGO/SGP community. One standalone capacity building project will be implemented to build the capacities of the civil society in project management.
iii. Improve on the capacity of NGOs/CBOs to identify, design, implement, monitor and evaluate projects
iv. Assess existing and potential partnerships with donors, government, and the private sector implemented at country levels.
v. Strengthen membership of NSC with additional members (e.g. private sector, representative of Ministries of Finance/Economic Development) and the organization of resource mobilization units with National Focal Point
vi. Prepare new partnerships such as development of focused portfolios, conduct of due diligence reviews and preparation of appropriate communication materials
vii. Conduct of donors fora at country level to identify potential partners
viii. Train and prepare project portfolios designed to generate additional resources (e.g. micro-credits, blended loans, carbon finance, etc.)
ix. Intensify resource mobilization efforts particularly in country programme moving out of dependence on GEF grant funds with dedicated support from SGP CPMT and GEF SGP Steering Committee.

6.2 Resource Mobilization

6.3 The GEF CORE and STAR funding will continue to be the main sources of funding during the OP6. However, the programme will leverage funding from the UNDP, the Green Climate Fund, and the World Bank Dedicated Grant Mechanism. In addition, the programme will seek to liaise with other funding sources in-country to address the problems in the GEF focal areas. The programme will consolidate collaboration with Lakehead University, Canada for technical and financial support.

6.4 In the situation where the SGP funds are limited and must be used solely to reduce threats to the global environment, the SGP will identify strategic partners to co-finance activities and assist with the non-GEF or "baseline" components of the project. In seeking co-funding for non-GEF activities, SGP will use its available core funds to leverage new and additional funds so as to make the programme bigger and more effective.

6.3 Indicative funds to be mobilized

6.5 The NSC will continuously assess the need of the SGP to mobilize resources. By the end of each year, the NSC will estimate what proportion of non-GEF funds is needed by grantees so as to be able to forecast their needs into the future. This will help to define how much time and effort are needed to put into resource mobilization. Currently, at the average global level, the programme is targeting 1:1 ratio between GEF/SGP funding and co-financing from other sources at project levels.

6.6 The indicative funds to be mobilized for OP6 programme in Ghana based on initial agreement discussed so far is summarized in table 8. The target is based on the assumption that the project portfolio will be 17 projects annually for four years. Table 7 gives an indicative plan of how funds would be mobilized over years to support SGP activities in country.

Table 7: **Indicative funds to be mobilized.**

FUND SOURCES	OPERATIONAL YEAR				Total
	OP6 Yr. 1	OP6 Yr. 2	OP6 Yr. 3	OP6 Yr. 4	
Core GEF Funds	25,000	200,000	200,000	175,000	**600,000**
Cash to be mobilized from other sources (Global fund World Cocoa Foundation etc)	0	50,000	150,000	50,000	**250,000**
In-kind contribution from NGO and Communities	50,000.00	500,000.00	800,000	800,000	**2,150,000**
Total	**55,000**	**1,150,000**	**1,450,000**	**1,225,000**	**3,000,000**

6.4 Sources of Additional Funding

6.7 The programme hopes to get additional funds from Ghana's STAR allocation of US$ 1.0 million based on the GEF-6 national portfolio formulation exercise. The strategy to mobilize additional funding for the country programme will cover the following sources of funding:

6.4.1 Matching fund from Grantees

6.8 The programme will give priorities to community-based projects that have secured matching funds for implementation. The programme will develop joint proposals with the other donors and clearly identify which activities would be implemented by each donor. Most especially the programme will secure co-financing and technical assistance for projects complementation from the Central Government and District Assemblies. Currently, discussions had been held with a number of donors and MOU will be signed to confirm the agreements. The programme will seek to encourage the District Assemblies to stake part of their Common funds for environmental projects and develop linkages to be able to secure or augment SGP grants whenever possible. A memorandum of understanding for cooperation with the donor and NGO will be signed prior to project implementation.

6.9 There are government service providers that have expertise in the GEF focal areas at the district level. Often times, these institutions are resource starved and their interventions at the community level are low. On the other hand, the NGOs/CBOs that operate more cost effectively at the community level have a low technical capacity to implement activities in the focal areas. The SGP will work to bring the technical expertise from the government service providers into close collaboration with the NGO/CBO community. This way, the communities can be assisted to work towards achieving their developmental aspirations including improvement in their livelihoods while providing global environmental benefits.

6.4.2 In-kind contribution from applicants and other donors

6.10 All projects to be approved are expected to have in-kind contribution of not less than 50 percent of the total project cost. The in-kind contribution will cover direct labour, land, and use of office resources for the implementation of field activities. The man-hours that would be invested into the project will be carefully calculated and valued as part of the community contribution to the project implementation.

6.4.3 Using sustainable livelihood

6.11 The programme has learned that beneficial impact in the GEF focal areas comes about through using sustainable livelihood strategies. Thus, an essential part of SGP projects is often an income-generation component linked to one of the GEF focal areas. The projects to be implemented as much as possible will buy into the on-going poverty reduction programmes in the country. Using the sustainable livelihood approach, the programme will collaborate with the Global Mechanism to implement sustainable land management project in the three northern regions.
UNDP and other UN Agencies

6.12. Mainstreaming the SGP methodology and experience in other UNDP programmes and in the GEF system is a key goal of the sixth operational phase. The GEF/SGP country programmes will increase their links with other UNDP programmes and those involved in poverty alleviation, community development, gender issues, and indigenous peoples.
Dovetailing into GEF Macro and Medium-size grants

6.13. Country programmes would join forces with GEF projects and programmes in-country, especially the biodiversity project in the Savanna and High forest zones to achieve a greater impact in the GEF focal areas. Successful GEF/SGP projects can be replicated and expanded using the medium-sized GEF project mechanism. Country programmes will also seek to coordinate efforts with GEF projects, including providing support for successful community-based components to explore funding from medium and large-sized GEF.

6.4.4 Bilateral and multi-lateral donors

6.14. The various embassies of the developed countries in Ghana have small grants windows that provide funding in some GEF operational areas, particularly afforestation. For example, the French Embassy (FSD), Canadian Development Agency (CIDA), European Union, and World Bank have local grants for NGOs that includes support for activities in the forestry and energy sector (traditional energy and renewable energy). The SGP needs to tap actively into these sources of funding as well as linking up with multi-lateral agencies in the country. The programme proposes to develop memorandum of understanding with the SNV (Netherlands Development Organization) for technical assistance in project implementation countrywide.

6.4.5 Private Sector participation in SGP

6.15. The programme will strengthen cooperation with the private sector to provide financing for livelihood components in the form of "soft-soft" loans. It is hoped that NGO or donor partners would also look to the GEF/SGP when designing their projects to provide them the focus on global environmental concerns. The GEF/SGP could work with project participants to develop mechanisms for commercializing products yielded by project activities.

6.4.6 Marketing SGP

6.16. In order to effectively mobilize additional resources, SGP Ghana needs to market itself. In this regard, the SGP will produce brochures that will provide basic information on: who we are; what we do; how the NSC is structured and how it works. Case studies of some projects in retrospect will be outlined in the brochure. The brochure will provide information on the strengths of the SGP and the opportunities that it has for expanding its achievements.

.7 MANAGEMENT PLAN

7.1 A major activity under this programme is to clearly define the potential environmental and social issues and concerns, both positive and negative. As seen in the main components of the programme, the key activities envisaged are: local policy and reforms especially towards wildfires and wildlife; tree plantations on farms and as standalone; community restoration of degraded off-reserve forests and agricultural landscapes; enrichment planting in community protected landscapes; creation of ecological corridors under CREMA approach; community nurseries for native and exotic species; establishment of buffer zones around sacred groves; establishment of community dedicated forest reserves and promotion of agrorestry systems that climate smart and environmentally responsible; and construction of excavated tanks and roaded catchment dams for harvesting surface water.

7.2 In view of these activities, the Social and Environmental safeguards are to be addressed in the context of Safeguards Management Framework which essentially comprises: (i) national legislative framework; (ii) impact assessment matrix; and (iii) screening matrix. All projects would be subjected to the national Safeguard Policies. Impact assessment matrix to depict the impacts likely to occur and the associated mitigation measures thereof would be developed to guide the NSC to screen and evaluate the social and environmental aspects of a particular proposal.

7.3 The Environment Management Framework (EMF) will include a negative list of activities that will not be supported by the project. This includes (i) land acquisition; (ii) involuntary resettlement; (iii) activities within protected areas like reserve forest; (iv) use of pesticides prohibited under national legislation or internationals agreements to which Ghana is a party; and (v) any research involving Genetically Modified Organisms (GMOs) which have not been approved by an independent panel of internationally recognized experts, and cleared by the Ghana government.

7.4 Social safeguards will target project's interventions in new technology development and dissemination as well as establishing marketing chains; the impacts are expected to be mostly positive. None of the interventions should require land acquisition. It is mandatory for each prospective project proposal to comply with safeguard measures for agricultural technologies and generating technologies. The project design should ensure maximum direct participation of the benefiting communities and provide for representation of all the sub-group in a community identified based on gender, ethnicity, and endowments.

7.5 The projects would be funded with a broad understanding of the issues likely to coup up in the landscape. These are: (i) crop/cropping pattern changes leading to higher agro-chemical use and soil degradation; (ii) over exploitation of ground water resulting in salinity and arsenic contamination; (iii) loss of biodiversity and natural habitats; and bio-prospecting of biotic products, including genetic enhancement and transgenic products.

7.6 The key social development issues relating to project implementation are: (i) healthy competition coupled with transparency in transactions, (ii) participation by researchers, project functionaries, civil society and farming communities; (iii) inclusion, particularly of the poor and vulnerable sections; (iii) mechanisms to foster participatory planning as well as strengthening the related institutions (including farmer's institutions, Farmers Field School and Women Self Groups); (iv) improving linkages with Union, (v) NGO enlisting and their performance; (vi) gender - addressing women-specific Education and Communication (IEC) campaign to address these issues.

7.7 The potential risks associated with the programme are summarised in table 8, which describes the degree of the risk, probability of occurrence and risk mitigation measures.

Table 8: **Description of risks identified in OP6**

Describe identified risk	Degree of risk (low, medium, high)	Probability of risk (low, medium, high)	Risk mitigation measure foreseen
Social and environmental risks			
Failure to promote equitable sharing benefits of cultural heritage.	Low	Low	Benefit sharing would be documented and discussed before the start of every project
Failure to conserve the culture, knowledge, and practices of the local farmers	Medium	Low	Every project must be subject to social and environmental assessment to avoid cultural destruction.
Infringing on indigenous people human rights, dignity and aspiration with the introduction of modern agricultural practices	Medium	Medium	All projects must be planned and executed with the beneficiaries.
Mono specific exotic species may alter natural vegetation	Medium	Medium	Project will ensure that exotic species are restricted to highly degraded areas where the natural vegetation cannot regenerate
Plantation tree seedlings may invade adjacent forest	Low	Low	The project will promote agroforestry and limit pure stand plantation development.
Settlements and farms close to the lake will have to move away to avoid incessant flooding	Medium	High	The project will liaise with the resettlement authorities to avoid any conflict
Those engaged in the illegal gold mining may resist the project.	High	low	Adequate education to explain the project concept and benefits
Climate risks			
Rainfed agriculture likely to be affected by poor rainfall pattern	High	High	Small scale solar irrigation systems must be planned for the high risks areas
Flooding will destroy farms and inundate wildlife habitats.	High	medium	The project will avoid investing in areas close to the lake
Uncontrolled bushfires will destroy investments on land	High	High	Wildfire management training will be offered to equip farmers in fire management
Other possible risks			
Failure to understand who the project is for (beneficiaries reaction)	Medium	Low	Involve all beneficiaries in project planning and management
Failure to secure commitments from people who are needed to assist with the project	High	Medium	Every project will be subjected to pre-project assessment to obtain the commitment of the intended beneficiaries. The project will have to address some of the felt needs of the people.

Describe identified risk	Degree of risk (low, medium, high)	Probability of risk (low, medium, high)	Risk mitigation measure foreseen
Failure to tie in all the people involved in the project with contracts or Documents of Understanding	High	Medium	The participatory approach by the project will get all beneficiaries committed to the project

Mitigating risks.

7.1 Each project will have a built in system that will take whatever actions are possible in advance to reduce the effect of Risk. It is better to spend money on mitigation than to include contingency in the plan.

Plan for Emergencies.

7.2 For all projects with high risks which would be deemed as significant, emergency plans would be put in place before it happens.

Measures and Control.

7.3 The SGP will track the effects of the risks identified and manage them to a successful conclusion.

8. National Steering Committee Endorsement

We the under mentioned members of the National Steering Committee have been involved in the development of the OP6 CPS hereby ratify it for implementation during the GEF operational phase six.

NSC members involved in OP6 CPS development, review and endorsement	Signatures
Dr. James K. **ADOMAKO** (Chairman)	
Ms. Abibata **MAHAMA** (Vice Chairman)	
Mr. Fredua **AGYEMANG** (GEF OFP)	
Mr. Louis **KUUKPEN** (UNDP)	
Mrs. Gifty Delali **TETTEY**	
Mr. George **AHADZIE**	
Dr. King-David **AMOAH**	
Mr. Dickson **AGYEMAN**	
Mr. Mawuena **AGGEY**	

DATED …February 25, 2016 PLACE **ACCRA, GHANA**

Annex 1: PROGRAMME PERFORMANCE AND IMPACT ASSESSMENT (July 2015-June 2019)

Impacts	Outcome indicators	Unit of measurement	Data set	Method of data collection	Frequency of Reporting
1. Livelihood assets creation and capacity development	• Disposable incomes of targeted rural households • Food Security of project beneficiaries. • Alternative livelihood activities supported • Capacity of traditional health clinics practitioners • Gender participation in income generation activities. • Resource user groups founded or expanded • NGOs, CBOs and/or individuals trained annually in project formulation and management and focal areas of GEF	• Percentage change • Number • Number supported • Number supported • Number women • percent change • Number of groups • Number trained	Project Reports Government official poverty data - GLSS (for all poverty indicators) Socio-economic baseline study Household surveys	Compile from Reports. Field visits	At end of the year
2. Education and awareness	• Environmental educational programs • Natural resource assessment methods • Indigenous management practices documented and published. • Media events and press coverage • Schools reached with SGP-initiated educational materials • Awareness of technologies by CBOs, NGOs, private sector & government agencies.	• Number organized • No. of guides • No. documented and published • No. of articles • No. of schools and students • No. of programmes	Community records, project data, images Community records, project data, Images survey results Community records Survey records	Communities keep data, physical observations Community enumerators keep records, images PRA, interviews Interviews, observations	Annually
3. Community-based global biodiversity conservation	• Area (reserves, parks, other) under effective participatory management • Participatory resource management and land-use plans developed and implemented • Change in institutional arrangement for managing wildlife and forest protected areas • Plant gene banks established • Regeneration of vegetative cover • Change in area under compatible land use • Changes in key flora and fauna • Degraded areas rehabilitated	• Ha • Number of plans • Organogram • Number • Ha • Ha • Number • ha	Maps, project records, remote sensing data Gene bank records "passport data" Maps and vegetative cover records Project records of land use. Survey data, & community records	Area measurement GIS, mapping Interviews, physical observations Review of minutes of meetings, record of inauguration. Gene bank records, collect passport data Community	Annually Seasonally (dry and wet seasons) At suitable intervals Biennially

Impacts	Outcome indicators	Unit of measurement	Data set	Method of data collection	Frequency of Reporting
	and by communities • •			report on land use,	
4. Financing availability and mechanisms	• Income generated from alternative livelihood activities • Revolving funds created for communities • Additional funding or support obtained • Improved markets and/or distribution networks provided • Investment per area receiving SGP funding • Local or national government funds invested in programmes to improve waste disposal or to undertake remediation efforts • Local or national government funds invested in support of renewables & energy efficiency • Innovative financial support mechanisms developed	• Amount • Number set up • Amount/year • Number • Number • Amount • Amount • Amount	Project records, management plans, maps Community records, Records of oral testaments from practitioners Guideline document Practitioners' records Interview records	Review guidelines and record of official meetings Interviews, observations Community enumerators Collaborate with agricultural extension staff to collect data from farms	Annually Continuous Biennially
5. Reduced vulnerability to adverse climatic effects	• Diversity in livelihood options and sources of income based on range of natural & social assets • Range and scope of crop types for small-scale farmers • Percentage of vegetation cover • Portfolio in local livelihood strategies including food resources, income sources, health & education "options" • National measures to protect diverse livelihood strategies including innovations, knowledge, and practices of local & indigenous communities • Energy alternatives including household energy mix and the level of use of cleaner energy sources • Enhanced local government reporting of livelihood risks associated with ecological change	• Amount • Number • ha • Amount/year • • • Number • Number • Amount	Survey data Survey results	Structured surveys, interviews	Biennially Once in three years
6. Indirect environmental benefits	• Rate and type of land conversion in project area	• Ha • percent	Practitioners' accounts, project records	Interviews, collect data from	Biennially Annually Income

Impacts	Outcome indicators	Unit of measurement	Data set	Method of data collection	Frequency of Reporting
	• Percentage of area where local use of fuel-wood /harvesting/hunting/grazing/water extraction estimated to be sustainable • Increased population of a particular species • Level of community adoption and use of clean energy technologies, energy efficiency • Penetration of small-scale renewables in the market • Level of development and implementation of projects supporting renewable and energy efficiency by CBOs , NGOs, local & national authorities, and the private sector • local land use management plans influenced by projects	• Number • Number • Number • Number • Number	Interview records, community management records Survey records Progress Reports Special Studies	practitioners Interviews, review community records, surveys	assessment – biennially;
7. Barrier removal for sustainable land management (LD)	• Agricultural land recovered by improved tillage methods, agroforestry practices and suitable land uses • Improved fire management systems introduced • Rehabilitation of degraded forested areas • Eroded land stabilized through artificial restoration, tree-planting	• Ha • Number • Ha • Ha	Practitioners' accounts, project records Interview records, community management records Survey records	Interviews, collect data from practitioners Interviews, review community records, surveys	Biennially Annually
8. Threat reduction for biodiversity (BD)	• Local population estimates of arid and semi-arid zone species • Changes in extent of under graded arid and semi-arid habitat. • Changes in extent and quality of mangroves (patch size, maximum tree size). Forest: • Local population estimates of forest species • Changes in natural forest extent • Number of concessionaries in the formulation of timber extraction Mountain:	• Number • percent • Number • • percent • Number • Number • percent • • Number • •	Practitioners' accounts, project records Interview records, community management records Survey records Progress Reports Special Studies	Interviews, collect data from practitioners Interviews, review community records, surveys	Biennially Annually

Impacts	Outcome indicators	Unit of measurement	Data set	Method of data collection	Frequency of Reporting
	• Rate of deforestation on slopes >20percent in project areas • Agrobiodiversity: • Changes in number of local land races & domestic livestock breeds. • Changes in extent of agricultural area using low-input high diversity production methods • Incorporation of local land races and indigenous breeds in national breeding programmes • Certification standards for agricultural products	• Number • • percent • percent			
Barrier removal & reduction of green-house gases (CC)	• Energy production and/or savings and installed capacities (# equipment installed by beneficiaries). • Energy savings made by project beneficiaries as a result of energy efficiency measures (# tons of averted carbon). • Total capacity accrued in production and in savings as result of project activities. • Alternatives energy options currently in use by communities. • Number or level of implementation of similar or related activities by CBOs, NGOs, local & national authorities	• Ha • • percent • Number • Number • Number	Practitioners' accounts, project records Interview records, community management records Survey records	Interviews, collect data from practitioners Interviews, review community records, surveys	Biennially Annually;
Stress reduction for international waters	• Point source pollution' reduction projects which directly reduce waste loads entering a transboundary water system • 'Non-point source pollution' projects to train farmers in techniques to reduce the widespread use of pesticides (# kg pollutants) • Amount of estuaries, riverine or wetland areas placed under protected management (# hectares or other measurements) • Eroded land stabilized through artificial restoration, tree-planting, or other interventions	• Number kg • Number/ha • Number/ha • Number	Project records Interview records, community management records Survey records	Interviews, collect data from practitioners Interviews, review community records, surveys	Biennially Annually Income assessment – biennially;

Impacts	Outcome indicators	Unit of measurement	Data set	Method of data collection	Frequency of Reporting
	that reduce sedimentation • Uptake of alternative livelihood options				
Barrier removal for sustainable land management (LD)	• Agricultural land recovered by improved tillage methods, agroforestry practices and suitable land uses • Rangeland and pastures improved or restored through conflict resolution and strengthened land use systems • Improved fire management systems introduced • Ground water recharged in subterranean aquifers. • Rehabilitation of degraded forested areas • Introduction of fees for ecosystem services • Eroded land stabilized through artificial restoration, tree-planting • Uptake of alternative livelihood options	• Ha • Ha/Number • Number of hectare • Litres per year • ha • ha • No. of people.	Project records Interview records, community management records Survey records	Interviews, collect data from practitioners Interviews, review community records, surveys	Biennially Annually Income assessment – biennially;
Contribution to multi-focal GEF priority areas	• Species diversity in animal husbandry population (BD, LD) • Energy production as associated with the use to natural resources supplies land degradation and pollution (CC, IW, BD, LD) • Development of fisheries policies that explicitly address biodiversity issues (IW, BD) • Formulation of policy on watershed protection that recognizes the role of biodiversity (IW, BD) • Linkages of energy, transport, taxation or climate policy with environment and development policies (CC, IW, BD) • Biomass energy policy that links with forest conservation and watershed catchment policies (CC, IW, BD) • Hydropower policy that links with watershed management and erosion control policies • Species diversity in	• Number • Number • Number • Number • Number • Number • Number • Number • |Number	Practitioners' accounts, project records Interview records, community management records Survey records	Interviews, collect data from practitioners Interviews, review community records, surveys	Biennially Annually Income assessment – biennially;

Impacts	Outcome indicators	Unit of measurement	Data set	Method of data collection	Frequency of Reporting
	international water body (BD) • Use of renewable energy as an alternative to batteries to reduce water body pollution (CC, IW)				
Global Environmental Benefits (direct)	• Avoided greenhouse gas emissions (# tons of carbon) (CC) • Biodiversity conserved at ecosystem, species and genetic levels (BD) • Adequate protection of a habitat of an endangered or endemic species (# hectares in protected areas) (BD) • Direct reduction of pesticide run-off into a river shared by two countries • Improved transboundary water system health, including more sustainable fishing & reduced sedimentation (# kg of silt load reduced) (IW)	• Tons of carbon • percent • Ha • No. of kg pollutants • Kg of silt reduced	Practitioners' accounts, project records Interview records, community management records Survey records	Interviews, collect data from practitioners Interviews, review community records, surveys	Biennially Annually Income assessment – biennially;

Annex 2: CONSULTATIONS AND SCOPING EXERCISE FOR THE PREPARATION OF OP6 GHANA PROGRAMME

INTRODUCTION

The Global Environment Facility (GEF) was established to help tackle the numerous and most pressing environmental problems. It was established in 1992 on the eve of the Rio Earth Summit. GEF has since become an international partner for many developing countries, civil society groups and private sector actors to address major environmental challenges. In Ghana, the United Nations Development Programme (UNDP) is one of its implementing partners.
The GEF Small Grants Programme (SGP) initiated its 6th Operational Phase (OP6) which will be under implementation during 2015 to 2018. Ghana selected the landscape approach among the SGP's Strategic Initiative for the OP6. This report outlines the consultative processes that preceded the selection process of the landscape/waterscape as the project area.

Objectives of assignment

The CPS consultation and scoping process involved:

a. Communications, outreach and capacity development about OP6 and its strategic initiatives. This communications served to explain the need to focus SGP on landscape/seascape areas for achievement of greater strategic impact through clustering of projects and achievement of synergies.
b. Multi-stakeholder consultations. This consultation process include meeting the national Steering Committee (NSC), Technical Advisory Group (TAG) and other relevant partners from government, civil society, UNDP, partner agencies etc. in order to achieve a broad consensus on the country programme approach in OP6.
c. Selection of the landscape/seascape area(s) of focus, with consideration given to SGP's niche, opportunities, challenges, and potential for synergies.

PROJECT BACKGROUND AND CONTEXT

Geographic, Environmental, and Socioeconomic Context:

Environmental context

Located in Western Africa, Ghana is bordering the Gulf of Guinea, between Ivory Coast and Togo and by Burkina Faso in the north. Ghana falls between latitudes 4.5° N and 11.5° N and longitude 3.5°W and 1.3°E (Figure 1).The total land area is 239,460 km^2 and 8,520 km^2 of water. Ghana has extensive water bodies including the Lakes Volta and Bosomtwe with a surface area of 3,275m^2. There are other seasonally flooded lakes occupying over 23,350km^2. The terrain of Ghana is made up of mostly low plains with dissected plateau in the south-central areas. The elevation ranges between 0m from the Atlantic Ocean to Mount Afadjato (880m) as the highest point. The country is divided into five distinct geographical regions. There are the Coastal plains stretching across the southern portion of the country and featuring low sandy beaches interspersed with saltwater lagoons. There is a forested plateau region consisting of the Ashanti uplands and the Kwahu Plateau located inland in the southwest and south central Ghana. The remaining evergreen rainforest is located in the southwestern part of the country. The hilly Akwapim-Togo Ranges run north to south along the country's eastern border. The Volta Basin takes up most of central Ghana. Finally, the high plains characterize the northern third of the country.

Surface water covers 5% of the total area of the country. The three major river systems are the Volta River System, the South Western River System, and the Coastal River System. The entire Volta River Basin of 174,886 km^2 covers 70% of the country's land area and includes the whole interior savannah zone. Within Ghana the Volta River Basin comprise of the White and Red Volta Basin (hereafter referred to as the White Volta), the Black Volta Basin and the

Oti Basin. The Volta River and Lake provide water for industrial and domestic use, irrigation, as well as livelihoods for a number of people who are engaged in fishing along its banks and remains an important transportation link between southern and northern Ghana. The total annual runoff is estimated at 54 billion m^3 with 37 billion m^3 originating from within the country and 16.2 billion m^3 from outside.

All the major rivers in Ghana flow into the sea. The only area of internal drainage is found around Lake Bosomtwi, where only streams flow from the surrounding highlands into the lake. River valleys show diverse characteristics. The two main sources of water supply for the rivers are rainfall and spring. In areas with single rainfall maximum as in the north, the flow of rivers is intermittent. However, in areas with high and well-distributed rainfall within the year, the rivers flow throughout the year. Increasingly, water bodies are either dwindling or drying up across the country.

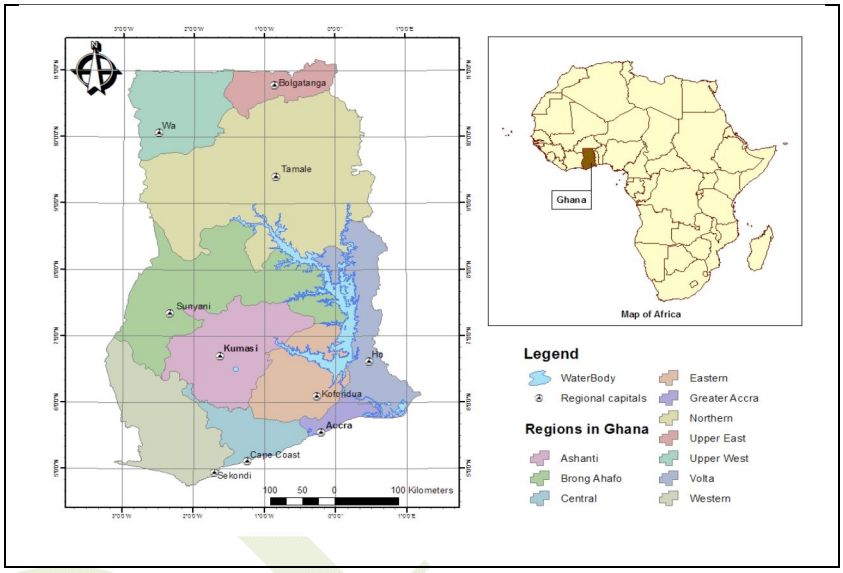


Figure 1 Map of Africa showing the location of Ghana

- *National socio-economic and development context*

Ghana has a population of about 22,409,572 with a population growth rate of about 2.07%[2]. In 2000, the urban population was estimated at about 44% and rural population at about 56%. The increase in population is resulting in an increase in the demand for more arable land, food, and biomass for energy as well as water resources for both livelihood and economic development. Current accessibility to water is limited. Agricultural production is mainly rainfed, such that increase in output is largely linked to the lateral expansion of cultivated lands not on productivity over a unit area, thus, at the expense of other ecosystems such as wetland. Agriculture contributed about 35.3% to Ghana's GDP between 2001-10. Both extensive cropping and increase in demand for biomass has contributed to some land degradation.

Climate Change and Variability in Ghana

Current climate variability

Ghana is highly exposed to climate change and variability due to its location in the tropics. About 35 percent of the land mass is desert and desertification is already currently proceeding at a high rate. Ghana's geographic location, bordering the Atlantic Ocean to the south is exposed to contrasting oceanic influence and atmospheric changes that result in extreme weather events. In addition, the country's weather and climate patterns are also influenced by

[2]Ghana Shared Growth and Development Agenda 2010-2013

regional changes in oceanic (e.g. warming sea surface temperature) and atmospheric (e.g. Inter-Tropical Convergence Zone[3]) circulation leading to important rainfall deficits, dry spells and climate variability.

In Ghana, temperatures throughout the country are generally high and models predict increases in temperature over the coming years. The mean annual temperature is generally above 24°C. The consequences of the low latitude position and the absence of high altitude areas have resulted in average temperature figures ranging between 24°C and 30°C. Extreme temperature conditions are experienced in some areas, for instance, temperatures ranging between 18°C and 40°C or more are common in the southern and northern parts of Ghana, respectively. Mean annual temperatures from 1960-2000 for the six major ecological zones (see Figure 2) revealed increasing surface air temperature for Ghana. Mean annual temperatures for two of the ecological zones (Sudan and Coastal Savannah) have increased greatly over the 40-year period with the Sudan Savannah experiencing an increase from 28.1°C in 1960 to 29.0°C in 2000 and the Coastal Savannah from 27.0°C in 1960 to 27.7°C in 2000. Even though such increases may appear negligible, a temperature increase of 0.1°C has serious implications for the survival of some plant species, animals, and cropping patterns.

Rainfall generally decreases from the south to the north. The wettest area is the extreme southwest where annual rainfall is about 2000 mm. In the extreme north, the annual rainfall is less than 1100 mm and the driest area is the wedge like strip from east of Sekondi-Takoradi, extending eastward up to 40 km where annual rainfall is about 750 mm. Both rainfall intensity and seasonal distribution has changed in many parts of the country. Annual totals of rainfall amount in Ghana have decreased over the years. Rainfall is not only decreasing in some areas but also becoming erratic.

Projected climate change impacts

Ghana's Second National Communication to the UNFCCC assessed the predicted climate change for the six eco-climatic zones shown in Figure 2 and discussed below:

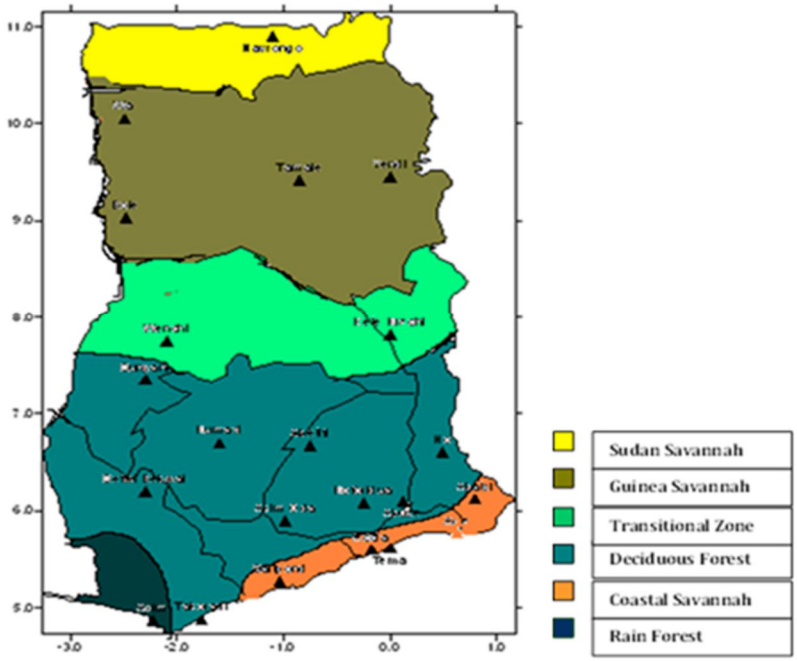


Figure 2: Areas on which climate change scenarios were developed

The Second National Communication provides a time series analysis of temperature and precipitation for these eco-climatic zones, as indicated in the Figures 3.1 – 3.5 below:

[3]Climate Change Adaptation_A Primer for Water Conservation, Flood Risk Reduction and Irrigation Strategy for Northern Ghana. WRC. 2011.

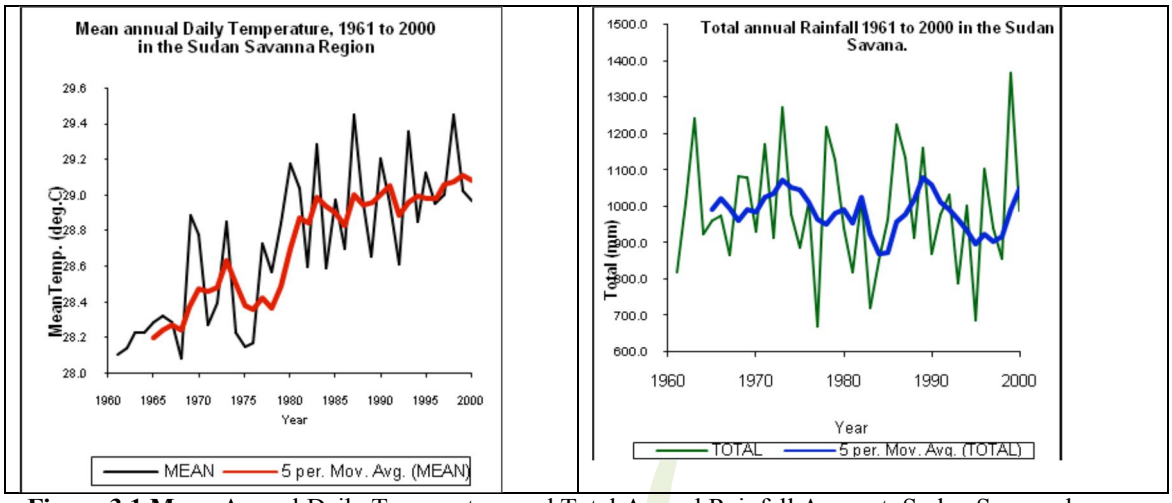


Figure 3.1 Mean Annual Daily Temperature and Total Annual Rainfall Amount: Sudan Savannah zone

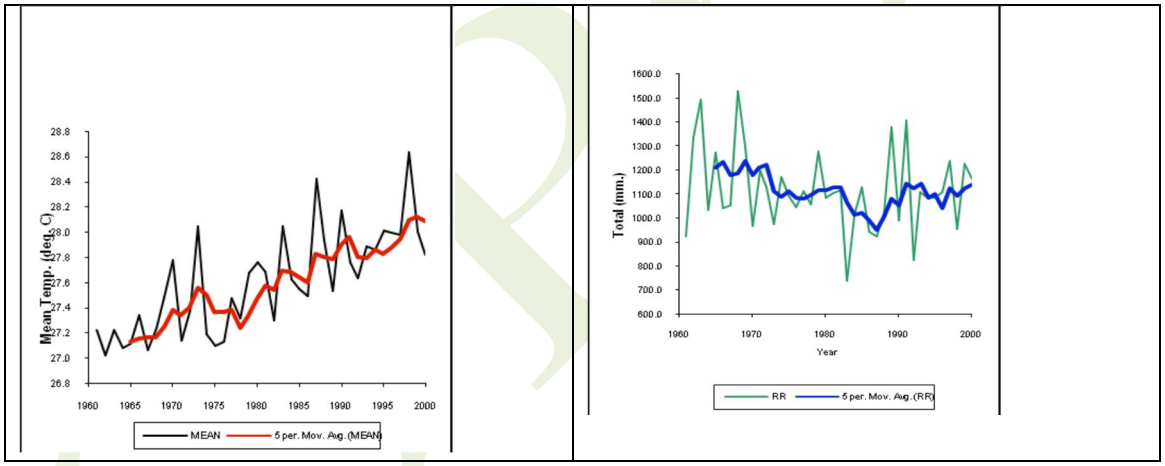


Figure 3.2 Mean Annual Daily Temperature and Total Annual Rainfall Amount: Guinea Savannah Zone

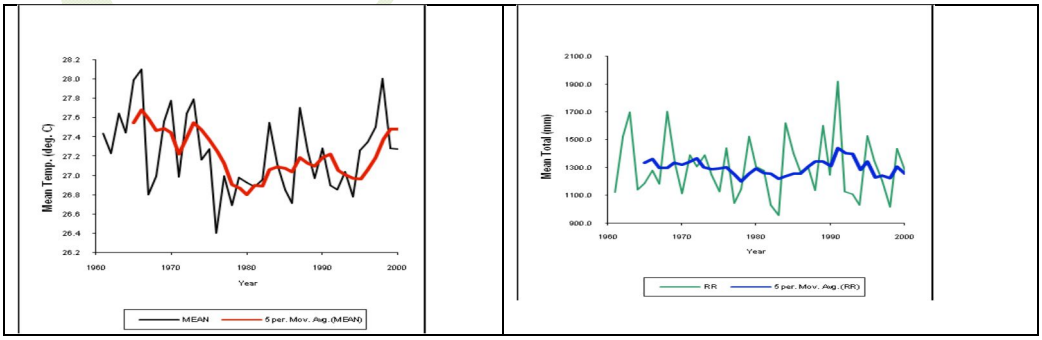


Figure 3.3 Mean Annual Daily Temperature and Total Annual Rainfall Amount: Transitional Zone

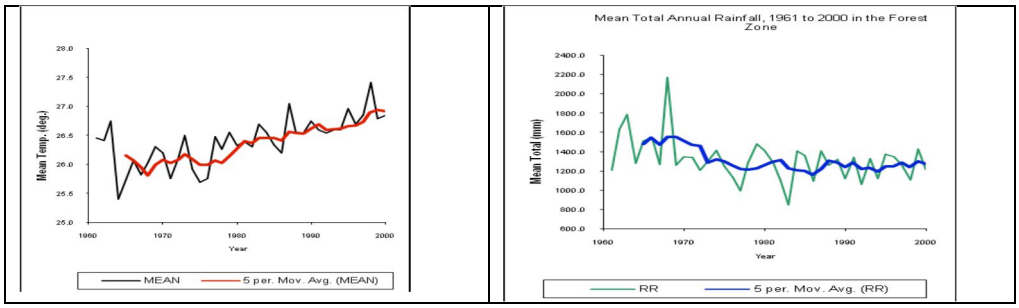


Figure 3.4 Mean Annual Daily Temperature and Total Annual Rainfall Amount: Forest Zone

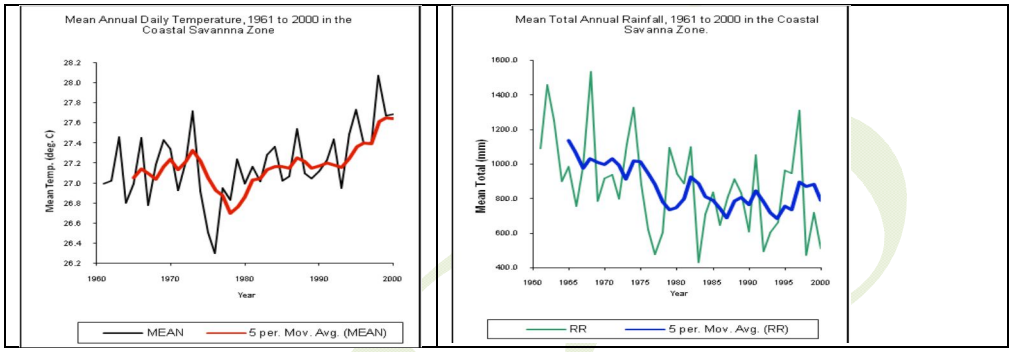


Figure 3.5 Mean Annual Daily Temperature and Total Annual Rainfall Amount: Coastal Savannah Zone

Following the 30-year mean of observed temperatures, the predicted scenarios developed over 2020, 2050 and 2080 time horizons, temperatures are generally expected to change by 0.6°C, 2.0°C and 3.9°C in 2020, 2050 and 2080 respectively (Table 1). The hottest months in the year are still likely to be between February and May whereas between June and September temperature will be relatively low.

Table 1: Scenarios of mean annual change in rainfall (%) for the ecological zones

Year	Sudan	Guinea	Transitional	Deciduous Rainforest	Rainforest	Coastal Savannah
2020	0.8	0.8	0.8	0.8	0.8	0.8
2050	2.6	2.5	2.5	2.5	2.5	2.5
2080	5.8	5.4	5.4	5.4	5.4	5.4

Using the observed rainfall records between 1961 and 2000, the scenarios for changes in rainfall for the six ecological zones for 2020, 2050 and 2080 predicts that annual mean rainfall levels are likely to reduce between 1.1% and 3.1% across all the agro-ecological zones by 2020(Table 2). The highest reduction is expected in the rainforest and the coastal savannah zones. The changes in annual mean rainfall by 2080 is expected to be between 13% and 21% of the observed baseline values. The rainforest zone is still likely to be the wettest areas in Ghana whereas Coastal and Sudan Savannahs continue to experience the least rainfall.

Table 2: Scenarios of mean annual change in rainfall (%) for the ecological zones

Year	Sudan	Guinea	Transitional	Deciduous Rainforest	Rainforest	Coastal Savannah
2020	-1.1	-1.9	-2.2	-2.8	-3.1	-3.1
2050	-6.7	-7.8	-8.8	-10.9	-12.1	-12.3
2080	-12.8	-12.6	-14.6	-18.6	-20.2	-20.5

Climate Impacts on Livelihoods, Water Resources and Food Security in Ghana

In Ghana just like in other African countries, the life of 'the poor' is a life of vulnerability, which reflects the deeper problem of insecurity[4]. The poor depend heavily on environmental goods and services. Their livelihoods are punctuated by dependence on agriculture, fisheries and forestry (which revolve on the use of land and water resources), and on the capacity of ecosystems to provide the services vital for environmental balance, without which food production and other productive activities cannot be carried out on a sustainable basis. This trend puts the poor at risk relative to the rich. In both rural and urban Ghana, the poor are indeed highly vulnerable to environmental disasters and environment-related conflicts and it is believed that the depth of vulnerability is correlated with the pace of environmental degradation exacerbating climate change impacts. Droughts, forest fires, and floods impact the poor in rural and urban areas more and show an increasing trend. Evidence of some extreme climate events that the country has experienced over the years includes:

- Floods
- Drought
- Bush fires
- Erratic rainfall patterns
- Sea level rise along the eastern coast
- Increased desertification/land degradation
- Consistent loss of forest cover
- Loss of some biodiversity

The country experienced severe drought in 1983. Since the late 1990s, floods have been increasingly frequent in the northern regions. Floods affected more than 300,000 people in 1999, 630,000 in 2007/08 and 140,000 in 2010, causing deaths, damaging farmlands, and destroying livelihoods. This resulted in severe hunger, which affected the poor and reduced gross domestic product for that year. The most severe flood occurred in 2007 during which 630,000 people were affected, through losses of life and displacement, and extensive infrastructural damage and loss of crops. This phenomenon demonstrates the potential impact of climate change on Ghana's development.

Under a changing climate, poor farmers are finding it difficult to predict the timing of rainy seasons. Consequently, it is becoming difficult manage climate risks to crop production. Failure in crop production is one of the key factors undermining food security. The World Food Programme's (WFP) Comprehensive Food Security and Vulnerability Analysis (2009) found that 5% of the population or 1.2 million people are food insecure. The bulk of the food insecure population is located in the northern regions: 34% in Upper West, 15% in Upper East, and 10% in Northern region. This is the equivalent of approximately 453,000 people.

Water is recognized as a crosscutting resource underlying the National Growth and Poverty Reduction Strategy (GPRS 11) of Ghana[5] and the National Water Policy[6] with direct linkages to the realization of all the eight Millennium Development Goals. The consumptive demand for surface water resources is projected to be 5.13 billion m^3 (13% of the surface water resources) by 2020.[7] The lack of potable water through incidences of extreme climate events such as droughts and floods, increase the exposure of people especially women and children to water-borne and other hygiene related diseases such as diarrhea, cholera, etc. Presently only 45% of the rural and 70% of the urban population have access to portable drinking water in Ghana. The burden of disease in Ghana indicates that about 70% can be attributed directly to environment, mainly due to the lack of drinkable water and means of sanitation. Besides household wellbeing, water plays central roles in many industrial activities providing livelihood opportunities and contributing to the national GDP. For example, hydropower generation, transportation services, tourism and the agricultural, livestock and fisheries sectors depend on water resources. Rainwater harvesting serves

[4]Draft National Climate Change Adaptation Strategy. Environmental Protection Agency & Ministry of Environment, Science and Technology. 2011.
[5]Growth and Poverty Reduction Strategy II. National Development Planning Commission. 2005.
[6]National Water Policy. Ministry of Water Resources, Works and Housing. 2007.
[7] Ghana's Second National Communication to the UNFCCC. Environmental Protection Agency & Ministry of Environment, Science and Technology. 2011.

as the major source of surface water for many rural communities during the rainy season. In northern Ghana, aquifers have been located between 10 and 60 metres with an average of 27m.

Given the multiple uses of water (such as for agriculture, power generation, transport, industry, domestic purposes, ecosystems, fisheries and livelihoods), addressing the problems of adaptation to the challenges that climate change poses cannot be achieved by those responsible for only managing water and acting in isolation. Multi-sectorial and multi-disciplinary collaborative responses are needed. However, given that a substantial proportion of Ghanaians directly depend on agriculture for their livelihoods, it is particularly important that the relationship between water resources management and land management is cultivated. It is also important to treat water resources as a natural resource in tandem with forestry and direct land uses, rather than a commodity, as this undermines its judicious use. Not only does the availability of water resources affect socio-economic conditions, but also its variations and especially the extremes (e.g. floods and droughts) present a serious hazard and threat to national growth and development (e.g. increased production costs).

The Climate Change-induced Problem

There is high agreement by all national and regional scale analyses of vulnerability by various sources including government commissioned reports and independent scholastic research [10] that vulnerability especially to drought effects has geographical patterns and socioeconomic associations, with the three northern regions (Northern, Upper West and Upper East regions) the most vulnerable. Similarly, the adaptive capacity of these three northern regions is the lowest nationwide due to low socioeconomic development and heavy dependence of local economies and livelihoods on rain-fed systems such as agriculture and forestry.

Decreasing annual rainfall and increasingly erratic rainfall patterns, due to climate change, are adversely affecting rural livelihoods in northern Ghana especially agricultural and pastoral practices. Such decreases in annual rainfall with erratic patterns are also expressed as drought and flooding posing enormous challenges to local communities to deal with such extreme events. Thus, against this backdrop, the problem statement therefore is that the livelihoods of communities in northern Ghana are increasingly vulnerable to water-related impacts of climate change, such as decreasing annual rainfall, increasingly erratic rainfall patterns and increased frequency of high intensity rainfall events. The Government of Ghana (GoG), using resources from the Adaptation Fund will therefore address climate change-induced decreases in the availability and increasing unpredictability of water resources, and the associated negative impacts of these trends on the livelihoods of rural communities.

Agriculture is a major driver of Ghana's economy, consistently contributing more than 30 per cent of GDP since independence and employing close to 60% of the population. The agricultural sector's contribution to national development is highly linked to its potential for poverty reduction. In the northern regions much of the agriculture is rain fed and on a subsistence scale. Food crops are cultivated mostly in only one season. In addition, since the agricultural practice is dependent upon the availability and distribution of the rainfall over the rainy season months, farmers suffer significant losses when the rains fail.

The water storage potential of the agricultural landscape is not at its full potential, which restricts agricultural production potential in northern Ghana. Land degradation, high rates of erosion and high intensity rainfall contribute significant volumes of sediment to the existing small dams and dugouts, reducing their water holding capacity. Efforts to reduce erosion such as reforestation and riparian zone management, coupled with efforts to de-silt and repair infrastructure will be necessary in order reduce the vulnerability of agriculture to increasing rainfall reductions and variability. In addition, a predicted overall reduction in rainfall, coupled with greater rainfall irregularity will have negative implications for the important hydropower component of Ghana's energy sources.

Non-sustainable forest management under high rate of deforestation is amplifying climate change impacts in Ghana manifested in scarcity of freshwater, desertification, loss of soil fertility, loss of agricultural productivity, loss of fuel wood, loss of safety nets in Non-Timber Forest Products(NTFPs), and increased sensitivity to human and natural hazards.

SELECTION OF THE LANDSCAPE/WATERSCAPE

The selection of the landscape/seascape for the GEF Small Grants Programme (SGP), 6th Operational phase (OP6) begun with series of consultations among major stakeholders of the environment in Ghana. The consultative processes involve key ministries: Ministry of Environment, Science, technology and Innovation; Ministry of Lands and Natural Resources; Ministry of Water Resources Works and Housing. Other consultative engagements included holding talks with researchers from the University of Energy and Natural Resources, the Ghana Water Resources Commission, Environmental Protection Agency and Civil Society Groups in Environment.

The Black Volta basin was selected as a target landscape after series of interactions and consultations with relevant stakeholders. Based on the GEF SGP strategic decision to adopt landscape approach to implementing GEF-6, the SGP secretariat presented three candidate landscapes/seascapes to the National Steering Committee (NSC) for consideration and selection. After much deliberations panning over two NSC technical meetings, the Black Volta basin was selected as the priority landscape /waterscape.

Following the recommendation of the NSC, the NC held consultation meetings with the four District Assemblies and built consensus with opinion leaders, public servants and policy makers and the traditional rulers within the proposed landscape during the month June 2015. During the consultations process the concept of integrated management of socio-ecological production landscapes, based on the objectives of the OP6 implementation strategy was introduced.

The Ghana portion of the Black Volta Basin was selected for the baseline study due to the following reasons:

1. The selected area is largely characterized by biodiversity, natural reserve sites, sensitive ecosystems and a great potential for tourism development. It is rich in biodiversity being a priority conservation area for several important species of flora and fauna including the white-breasted guinea fowl, the colobus monkey, chimpanzee, hippopotamus, African crocodiles and the honey badger.
2. Much of the research works conducted within the Volta basin of Ghana focused so much on the white Volta basin and thus there is very little effort in terms of water resource governance within the black Volta basin
3. The construction of the Bui dam within the Black Volta basin calls for more environmental support services within the selected area. A new lake is gradually developing and habitats of the endangered and threatened wildlife are being inundated forcing the wildlife to migrate into vulnerable haven. This requires interventions to guide development.
4. The area is gradually witnessing a great deal of migrant communities due to the activities of illegal mining dotted across the landscape.
5. The landscape is vulnerable to climate change and variability and constitutes one of the most deprived areas in Ghana. Within the landscape are found some minority ethnic groups like the Lobis.

Description of the selected area

The Black Volta basin lies between Latitude 7°00'00"N and 14°30'00"N and Longitude 5°30'00"W and 1°30'00"W, and covers an estimated area of about 130,400 km2. In Ghana, the basin covers an area of about 18,384km^2 constituting 14% of the basin. The Black Volta river basin is a trans-national river system that stretches from North to South through Mali, Burkina Faso, Ghana and Cote d'Ivoire, and from Burkina Faso, Cote d'Ivoire and Ghana from West to East. The selected area cuts across two administrative regions and four Districts. The selected area within the basin is shown in figure 4 below:

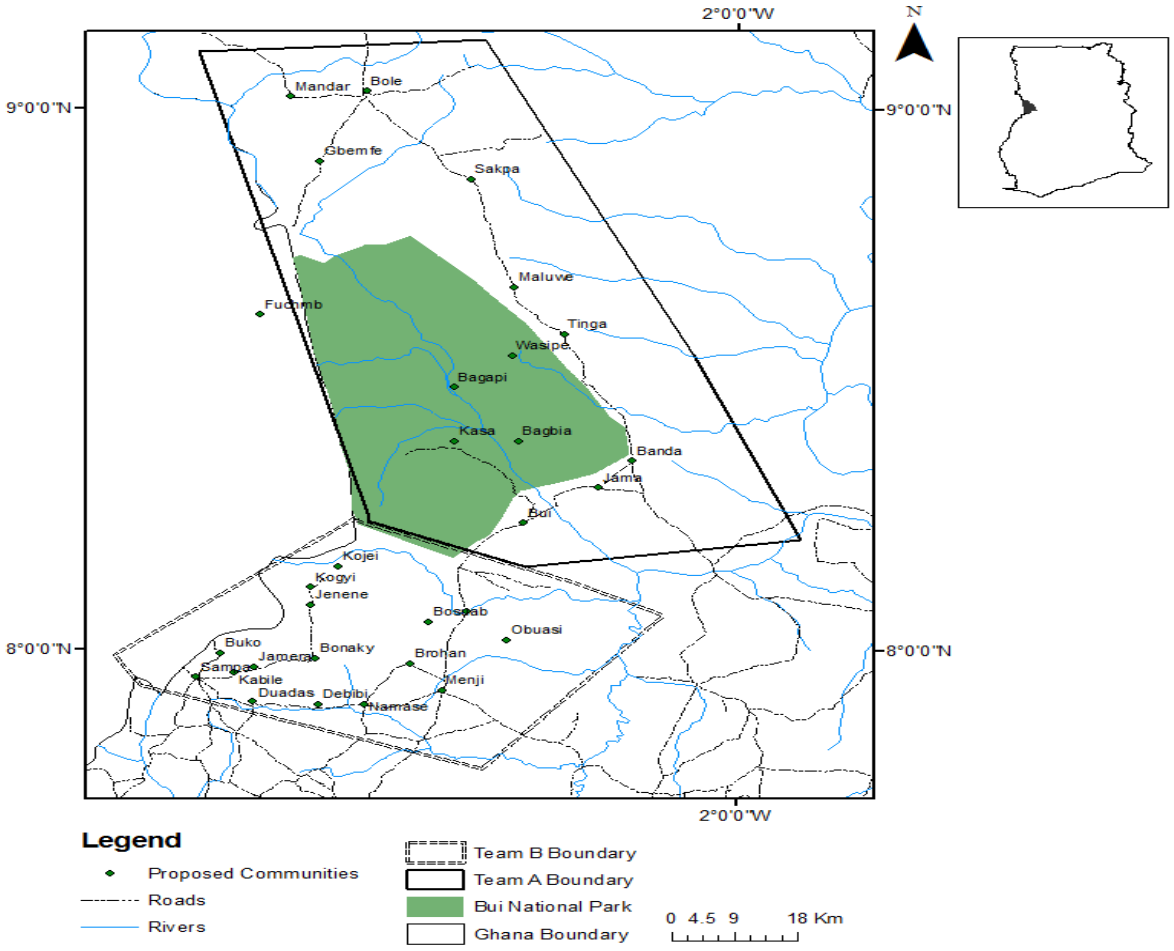


Figure 4: Map of the selected area

Source: Author's own construct (2015)

The Black River basin is mostly degraded and is one of the seriously affected desertification-prone areas of *savannah* region. The basin is in the guinea savannah agro-ecological zones with mono modal rainfall pattern. Rainfall amount varies from 645 mm to 1,250 mm per annum with a long dry period of more than 5 months followed with little agricultural activity and limited income during the period. The vegetation consists, typically, of a ground cover of grasses of varying heights interspersed with fire resistant, deciduous, broad-leaved trees at the forest margins along the river Banks. This grade into a more open grassland with widely spaced shorter trees towards the north.

Biodiversity of the selected area

The vegetation of the Black Volta Basin is that of the typical guinea savannah. This vegetation is generally characterized by short grasses, short trees with thick barks; which allows them to wither during the dry season and grow new leaves during the onset of rains. Trees with major economic value situated within the Basin include Dawadawa, Mango, Shea Butter and the Baobab.

The Bui National Park is a tourist site within the project area with great tourist potentials. Animals within the park include reptiles (crocodiles, soft shell turtles, monitor lizards, viper species), mammals (hippopotamus, antelopes, monkeys, foxes, porcupines, and advac). Various other species of animals exists but in very small numbers.

Most of the lands are considered to be rural and mainly used for agricultural purposes and free range livestock rearing.

Climate Change impacts in the target landscape

Water availability is the single most important production and livelihood factor in the northern regions. There is thus a clearly articulated need to counteract the negative impacts of climate change on water resources-reliant development and livelihoods. It is also necessary to look at the efficiency of water use. Likewise the ability to cope with floods and droughts is necessary in order to protect people, livelihoods, and development.
The northern region is expected to witness the widest range of temperature variability. One of the greatest influences of climate change on the environment has been desertification. According to the Environment Protection Agency of Ghana (EPA 2003), out of the 35% (~83,489 km^2) of Ghana's total land area prone to desertification, 33% (~78,718 km^2) is in the northern regions, which tends to be increasing following recent assessments that show diminishing precipitation (World Bank 2009).
Climate change is expected to have an impact on agricultural production by increasing pressure on water resources. Agriculture in the three northern regions is predominantly rain-fed with only 4 per cent of irrigation potential developed nationally. About 90 percent of the rainfall is received between June and September and soil moisture surplus is only found during these months. Both the onset and the cessation of the rains are irregular and the temporal and spatial variability is high. Even within the humid months of June to September, 10 to 14 days of dry spells are common. Potential evaporation is in the range of 2000 mm per year. Most of the soils have low water holding capacity due to their light textured nature and low organic matter content. High surface runoff rates during the rainy months result in silting up of water storage facilities, such as small dams and community dug-outs. High evaporation rates in the dry and hot season, and siltation driven by erosion and land clearing contributes to reduced water holding capacity, and rapid drying up of these dugouts.
Extreme flood events are increasing in the three northern regions, partly due to the impacts of climate change in the form of extreme rainfall events. Flooding results in a loss of crops, waterborne diseases and sometimes loss of life.

Climate change trends in the selected landscape

Climate change is expected to exacerbate the current situation due to its impact on water resources and thus also on programmes and activities of water-dependent sectors such as agriculture. A recent study by the Water Resources Commission (WRC) enumerates climate change scenarios for water resources in three representative water catchments (Pra, Ayensu and White Volta) across Ghana:

i. Runoff or discharges in all three representative basins are sensitive to changes in precipitation and temperature and thus to climate change. A 10 percent change in precipitation or a 1°C rise in temperature could cause a reduction in runoff of not less than 10 percent

ii. Simulations using climate change scenarios indicated reductions in flows between 15-20 percent and 30-40 percent for the year 2020 and 2050 respectively

iii. Climate change could cause reduction in groundwater recharge between 5 and 22 percent by the year 2020. Reductions for the year 2050 are projected to be between 30 and 40%

iv. Irrigation water demand could be affected considerably by climate change. For the dry interior savannah, increases in irrigation water demand are about 150 percent to 1200 percent for 2020 and 2050 respectively

v. A vulnerability index (persons/mill. m^3 of water) shows that the White Volta basin was marginally vulnerable in 1990, while in 2020 the basin would be vulnerable (water stressed) and in 2050 it would be extremely vulnerable (water scarcity)

Climate change impacts in the northern regions of Ghana will severely impact the livelihoods of rural communities following their high dependence on climate-driven sectors like agriculture, livestock production, fisheries, etc. There is therefore the need to minimize impact of climate change on traditional livelihoods through the provision of alternatives and diversifications. Using resources from the AF, the GoG will implement a programme of livelihood diversification from the traditional ones (particularly rain-fed agriculture) and that are capable of creating independent and profitable sources of incomes for the local communities. This is crucial as forest safety nets are lost following the rapid loss of forest cover currently at 62,000 hectares per annum. The three northern regions have comparatively lower attendance rates for all school going ages which demonstrate the low turnover of capacity

development through formal educational programmes which constitute an important factor in the adaptive capacity to climate change[8]. According to the 2008 Ghana Living Standards Survey Report (GLSS 5), the three northern regions (Upper West, Northern, and Upper East) have the highest household sizes of 6.5, 5.5 and 5.4 respectively in the country.

About 40% of household nationwide in Ghana have access to pipe-borne water.[18] In rural areas, the majority of the households (59%) get their water from a well or natural sources (26%). In the northern savannah region, 57.7% of households depend on wells and 36.5% on natural sources (rivers, streams, rainwater, dugouts, ponds, lakes, dams etc.). This demonstrates the vulnerability of household water supply to climate change impacts as temperature increases and rainfall amount reduces. With regards to other social amenities in the northern regions, 82.3% of household directly depend on wood as a source of cooking fuel and 80.9 % on kerosene for lighting. Over 68.9% have no formal toilet facilities. The majority of livestock activities in Ghana take place in the northern regions. The predicted trend in climate change in the three northern regions is therefore likely to have severe impacts on the livelihoods of communities.

Climate Change Accelerants and Impacts

Much of the poverty in the north is risk and vulnerability induced. This exposure to risks and vulnerabilities is determined by a number of factors, ranging from natural, social, and human made causes. These include the following[9]:

Climate induced risks and vulnerabilities: More than 80 percent of the population of northern Ghana depends on unimodal rain fed agriculture for their food, income and livelihoods. Therefore, incidents of droughts and floods have multiple effects on the coping strategies of the people. With climate change, it is expected that the frequency of the incidence of both droughts and floods will increase and hence erode the viability of coping strategies overtime.

Vulnerabilities associated with limited opportunities for off farm and non-farm economic activities: The north remains dependent on food crop farming with very little opportunity for non-farm activities. The share of household income derived from non-farm activities remains significantly lower than the rest of the country and is the lowest in the most food-insecure region (Upper East). For seven to eight months in the year, the majority of the agricultural population in northern Ghana has no alternative or complementary means of securing their livelihoods, as infrastructure to support off-season agricultural activities are underdeveloped or non-existent. Although women usually engage in micro-agro processing initiatives such as the production of seed oils (shea butter, groundnut oil), and handicrafts, the markets for these products are small, and underdeveloped, with production limited by ineffective commercial practices. Therefore, these small-scale activities will provide a boost to business growth and development. The livestock sector that holds a promise for providing alternative sources of income is also largely underdeveloped due to limited investments in the sector. Consequently, opportunities for supplementing food and income from the rain-fed subsistent farming activities during the long dry season are limited.

Weakening Traditional Safety Nets and Increased Vulnerabilities: Mutual support initiatives and remittances from friends and family members living outside the community once served as an important source of supplementary food, income, and livelihood support to the families in the north. However, due to social and economic pressures, this traditional safety net mechanism has been weakened, thereby increasing exposure of the poor, especially women, the young, and the aged to greater and increasingly more protracted poverty induced vulnerabilities. Incidentally, the risk exposure of these subcategories of the population to poverty induced vulnerability is greater because they face considerable cultural and institutional obstacles in gaining access to productive resources such as land, credit, and other support services for their farm and off-farm income generation ventures. This programme will build on ongoing income generating activities in the north such as food processing. Efforts to retrain community members in other marketable skills will also assist communities to reduce their reliance on rain-fed agriculture, reducing their vulnerability to climatic shocks.

[8]Ghana Living Standards Survey Report (GLSS 5) 2008

[19] SADA Strategy and Work plan 2010-2030. Savannah Accelerated Development Authority. 2010.

Population Projections of Black Volta Basin Communities

From a diagnostic study of the Black Volta Basin prepared by Global Water Initiative (2012), it has been reported that as of the year 2000, the entire Black Volta basin was home to about 4.5 million people. The population of the Black Volta Basin and their corresponding estimates is presented in Table 3.

Table 3: Past, current and projected, population growth trends of the Black Volta Basin in Ghana.

Year	1984	1990	1995	2000	2005	2010	2015	2020
Rural population	446,905	609,395	719,151	851,762	1,012,565	1,208,242	1,447,336	1,740,537
Total population (urban and rural)	607,372	738,449	872,332	1,034,067	1,230,088	1,468,405	1,758,791	2,115,192

Source: Quandzie, 2012 *and cited in GWI, 2009*

Economic Activities

The major economic activity in the upstream zone of the selected area is agriculture covering about 80% of the population, crops grown are mostly cereals such as Maize, Sorghum and rice in the rainy season and vegetables including pepper; tomatoes and onions in the dry season. Other minor economic activities are trade, shea butter production, charcoal production, gari processing, weaving, production of traditional textiles, fishing, and mining. In the downstream zone, 64% of the populace are involved in agriculture which includes both annual crops such cocoyam, maize, cassava, yam and cash crops such as cocoa, cashew and plantation whereas the remaining populace involve in production, transport operators, sales workers and professional and related workers.

Agriculture is the predominant livelihood strategy for people in this area and is the most important activity in terms of spatial extent employing about 90% of the labour force. Agriculture is not merely an economic activity but for most people it has been a way of life for many centuries. The economic base of the area hinges on smallholder agriculture with over 98 percent of the population depending on agriculture for their livelihood. The crops grown include guinea corn, maize, yams, vegetables, and beans. Groundnuts and cotton are cultivated as cash crops. These crops are cultivated in compound and bush farms. Land preparation is largely by hoeing and in few cases by draught animals and tractors. Soil fertility in compound farms is managed using household refuse, crop residue and animal dung.

In the bush farms land holdings are usually large and soil fertility is managed by crop rotation, and short fallow periods that allow the soil to regain its fertility. Shea *(Vitellaria paradoxa),* Baobab *(Adansonia digitata),* and Dawadawa (*Parkia biglobosa*) trees are well protected on cropped fields. Cashew and mango are also cultivated. The ecosystem provides a safe haven for the conservation of hippopotamus, elephants, monkeys and other savannah wildlife resources.

More than 96 per cent of the inhabitants of the rangelands are farmers who grow food crops and rear ruminant livestock. The traditional cattle rearing are based on an extensive system of production and are entirely dependent on the natural grassland vegetation. Densities of cattle may range from 77 to 103 per km^2. The population increase has led to overgrazing of marginal lands. Crop residues are fed to livestock leaving the land bare during the dry season and early part of the wet season.

The constraints to agricultural development in the area include erratic rainfall pattern, low soil fertility, *Striga* infestation and difficulty in accessing credit. Others include inadequate irrigation facilities, theft of livestock (especially cattle), post-harvest losses, land tenure system (land is vested in the Landlords/Tendambas/ Tendana's), inaccessible roads and annual wildfires.

Apart from the Bui National Park, land is mainly used for agriculture with bush fallow food crop cultivation and animal husbandry. The system of farming is predominantly shifting cultivation or land rotation cultivation on a mostly subsistence basis. The Bui National Park habits a wide range of biodiversity.

Rainfall and evaporation

Annual rainfall patterns vary from about 1043mm to 1270mm to the south. The minimum potential evaporation is about 1450mm/year to about 1800mmm/year and average runoff is about 243m3/year. The mean monthly runoff from the basin within Ghana

Demographics of the Districts within the selected area

Demographics of the Bole District

The Bole Bamboi District occupies an estimated area of about 4800 square km. It has an estimated population of about 75,151 (2010 population projected) with population growth rate of about 3.6% per annum (Ghana Statistical Service Report, 2014).

The District Capital is Bole. Other major towns in the District include Bamboi, Maluwe, Tinga, Tasilma, Mandari and Banda/Nkwanta. For the percentage land take of District and the Northern Region in relation to Ghana (238,533sq km), they are 2.0% and 29.6% respectively. This means that the land take of the district is 6.8% of the total land mass of the Northern Region.

From the Ghana Statistical service report (2014), it is estimated that of the population 11 years and older, 41.8 percent are literate and 58.2 percent are non-literate. The proportion of literate males is higher (47.1 %) than that of females (36.0%). About three out of ten people (35.4%) indicated they could read and write both English and Ghanaian languages. Of the population aged 3 years and above in the District, 51.2 percent have never attended school, 34.7 percent are currently attending and 14.2 percent have attended in the past.

The economical active population in the District is about 74.7 percent of the population aged 15 years and older is economically active; of the economically active population, 97.3 percent are employed whilst less than three (2.7%) percent are unemployed. For those who are economically not active, a larger percentage of them are students (39.0%), 31.6% perform household duties and 5.4 percent are disabled or too sick to work. Less than half (45.7%) of the unemployed population are seeking work for the first time (GSS report, 2014).

The Bole Bamboi District is a predominantly rural agrarian District. From the Ghana Statistical Service report on Bole Bamboi District (2010), it is recorded that 61.6 percent of households in the District are engaged in agriculture. This means that 6 out of every ten people are engage in some agricultural activities. Of the agricultural activities engaged in, crop farming is the commonest; engage in by 95% of population in agriculture with the remaining 5% engaged in livestock rearing (GSS Report, 2014).

Demographics of the Jaman North District

The district is located between latitude 7'40" N and 8' 27"N, and longitude 2'30"W and 2' 60" W. The district is physically located to the North-Western part of the Brong Ahafo Region. It shares boundaries with Tain District to the North-East, Jaman South District to the South-West and Berekum District to the South-East. It is bordered on the East to the La Cote d'Ivoire. The district capital, Sampa is located about 119km from Sunyani the regional capital while it is 504 km from Accra, the national capital.
The population of Jaman North, according to the 2010 Population and Housing Census, is 83,059 representing 3.6 percent of the Northern region's population with Males constituting 48.1 percent and females 51.9 percent of the total population. The proportion of the population living in urban localities (52.5%) is slightly higher than that living in rural localities (47.5) of the district (GSS Report, 2014).

According the Ghana Statistical Service, of the population 11 years and above, 71.7 percent are literates. It is further reported that almost seven out of ten people (68.8%) can speak and write both English and Ghanaian languages. Of the population aged 3 years and above (48,131) in the district, 22.2 percent has attended school in the past and 46.1 percent are currently attending. A higher proportion of males (51.6%) are currently attending school than females (41.4%).

About 70.3 percent of the populations aged 15 years and older are economically active and mostly engaged in agricultural activities. About 71.6% of the population is engaged in skilled agricultural, forestry and fishery workers. In the rural localities, as high as 91.4 percent of households are agricultural households while in the urban localities, 73.1 percent are into agriculture. Most (99.0%) of the agricultural households in the district are involved in crop farming. Poultry (chicken) is the dominant animal (58.1 percent of all animals) kept by the higher proportion (39.0%) of households in the district (GSS Report, 2014).

Demographics of the Tain District

Tain is one of the districts established in August 2004 in Brong-Ahafo Region by Legislative Instrument (L.I) 2090. The District has Nsawkaw as its capital. It shares common boundaries with Wenchi Municipal to the East, Jaman North, and Jaman South to the West, Sunyani West to the South and Berekum Municipal to the South West. It is also bounded by the Banda District to the North and La Cote d'Ivoire to the North West. The location of Tain District has helped boost economic trade as the District continues to engage in inter-district trade with the bounded districts. In terms of land area, Tain District covers 1,829.84960 km2 representing 3.5 percent of the total land area of the Brong Ahafo Region.

The population of Tain District, according to the 2010 Population and Housing Census, is 88,104 representing 3.8 percent of the Brong-Ahafo region's total population. More than half (51.5%) of the population of the district is rural. The district has a sex ratio of 97.6. The population of the district is youthful (40.3%) depicting a broad base population pyramid which tapers off with a small number of elderly persons. Of the population 11 years and older, 64.0 percent are literate and 36.0 percent are non-literate. Seven out of ten people (71.2%) has been reported as being able to speak and write both English and Ghanaian languages (GSS, 2014).

About 81.2 percent of the population aged 15 years and older is economically active while 18.8 per cent are economically not active. Of the economically active population, 98.7 percent are employed while 1.3 percent is unemployed. The common economic activities in the District are farming and allied agricultural activities. A proportion of 71.6% of the population of the District are engaged as skilled agricultural, forestry and fishery workers (GSS, 2014).

Demographics of the Banda District

The Banda District lies within latitudes 7^{o}and 8^{o} 45` north and longitudes 2$^{o}$ 52` and 0^{o} 28` west. In terms of land area, the district covers a total of 2,298.3 square kilometres out of the region's size of 39,558 square kilometers. The district shares boundaries with the Bole District (Northern Region) to the north, Tain District to the south, La Cote d'Ivoire to the east and Kintampo South District to the west.
The population of the Banda District according to the 2010 Population and Housing Census is 20,282 representing less than one percent (0.9%) of the region's total population. Males constitute 51.1 percent and females represent 48.9 percent. The district is entirely rural. The District has a sex ratio of 104.7. The population of the District is youthful (41.1%) of the 0-14 age group, depicting a broad base population pyramid which tapers off with a small number of the 65 plus years (6.1%). With reference to school attendance, of the population aged 3 years and above, 62.5 percent are currently attending school and 37.5 percent have attended in the past.

Almost eight out of ten (79.2%) of the population aged 15 years and older are economically active. Of the economically active population, 97 percent are employed while 3 percent are unemployed. Almost eight out of ten of the population (78.6%) of households in the District is engage in agriculture, Crop farming is the main agricultural activity with almost seven out of ten (67.0%) households engage in it (GSS 2014).

PREFERRED SOLUTIONS FOR CLIMATE CHANGE CHALLENGES IN THE SELECTED LANDSCAPE

Climate change present societies with a variety of new challenges, especially in the poorest regions of the world as changes in mean temperature affect food productivity and water availability, triggering other burden of malnutrition, diarrheal illnesses and other water and airborne infections. Ghana's water resources and water supply systems are extremely vulnerable to current climatic patterns that generate periodic droughts and flooding. Similarly, the

production sectors (agriculture, grazing, fisheries, forestry etc.) that sustain the livelihoods of the majority of the population, especially in rural areas, are also severely affected by climatic patterns affecting water resources and supply. Both vulnerability and capacity to adapt are uneven, and in many cases, it is the most vulnerable individuals and communities who are least able to adapt. This further shapes the scale and types of adaptation actions required in response to the nature and context of the climatic vulnerability. The primary problem addressed by the people requires adaptation is climate change-induced decreases in the availability and increasing unpredictability of water resources, and the associated negative impacts of this on the livelihoods of rural communities in the northern regions of Ghana.

Under such circumstances, the preferred solutions for adaptation should address climate impacts on water availability and well as measures that reduce the vulnerability of sectors (e.g. agriculture, livestock, forestry etc.) supporting community livelihoods in the northern region.Although the consequences of climate change effects on water have been well established an understanding on how to cope with the potential impacts at regional, national and local levels is still not properly managed by developing countries due to limited investigation to generate knowledge required for adaptation and resilience of natural or human systems to actual or expected climatic threats. There is need for in depth knowledge in addressing the underlying causes of vulnerability of water resources in order to tailor adaptation measures and interventions put in place. The suggested actions in the landscape will target the principal causes of vulnerability identified in the northern regions of Ghana and this will include the following key elements:

a. Natural resource management planning taking into account the impacts of climate change

Although the GoG has invested in major catchment development programmes, there is no basin wide management plan for the Black Volta. He District plans fail to take into consideration climate change impacts and the vulnerability of the sectors and communities that depend on the Black Volta as their primary source of water. The importance of the SGP interventions, therefore, is to ensure that natural resources can be sustainably provide the range of goods and services required for social, economic and environmental adaptation. Therefore, some of the proposed measures targeting the underlying sources of vulnerability for communities and institutions affecting their capacities for climate change adaptation are provided under the main sources of vulnerability identified above.

Mainstreaming biodiversity, climate related issues into the local community activities will help local communities who are usually the most vulnerable in society, to respond timely to climate change disasters. More practically, SGP interventions will draw on diverse options for landscape intervention as (i) conserve water supplies efficiently; (ii) adopt innovative means sustainable land management based on SGP experience, especially supplies for irrigation and livestock watering; (iii) increase water storage and improve availability; (iv) explore the role of groundwater; and (v) improve water basin management, and restore ecosystems through catchments protection and buffer zones.

It is expected that the SGP intervention will ensure grassroots participation in natural resource management planning and community capacity for the implementation of water resource management activities to reduce vulnerability to climate change impacts on community livelihoods

Following the predominance of smallholders' community activities, proper coordination systems will be put in place for the water management planning to improve on their cost effectiveness and reduction in transaction costs. This will thus, improve on the competitiveness of agricultural products in the market following post-harvest and other climate-risk sharing measures and the ability to manage water resources. Importantly, emphasis will be placed on developing and building the capacity of existing community level institutions where possible, taking advantage of existing institutional arrangements (e.g. water management bodies).

b. Diversification of livelihoods of local communities as safety nets to climate change impacts

There is over-reliance on rain-fed agriculture and livestock in the northern region of Ghana that makes communities vulnerable to climate change, with limited capacity to capture, manage and conserve water. Because of erratic rainfall patterns, there is limited ability to increase productivity and low capacity for livelihood diversification. Financial resources and capacity enhancement will be required to provide the knowledge and alternative means of livelihood activities and the ability for agricultural intensification.

c. *Improving agricultural techniques*

Encouraging the use - and where appropriate - development of agricultural techniques and approaches that are more favorable than those used currently in future water availability scenarios. This includes the use of seed varieties that enable adaptation to a changing climate such as the use of rapidly maturing maize varieties that secure production during a decreasing growing season.

d. *Institutional capacity enhancement to deal with climate risks*

The current knowledge base on the impacts of climate change on the water resources of the northern regions is weak to support institutional processes and development, from a regional to local institutional level. Improving the knowledge base in institutions to support "on the ground" measures in terms of water resource management and livelihood diversification is an important solution targeted in the Programme. Building the capacity of local communities and local, regional and national institutions in addressing climate change will also provide sustainability and the required ownership of the programme.

e. *Promoting land tenure systems that favor contiguous crop fields for supply of services*

To improve productivity of crop fields and efficiency in the use of inputs and other services, local institutional policies that facilitate land use planning and tenure systems that provide for contiguous crop fields for local communities, will be advocated. There are some institutional regulations prohibiting the clearing of tree sin riparian zones but enforcement remains a challenge.

Barriers to achieving preferred solutions

The persistence of risks and the exacerbation of vulnerability in northern Ghana also derive from an intricate network of causal factors that have their roots, in many cases, in both historical and contemporary failures of national development policies related to the north. Central to these are some major barriers that limit the realization of the preferred solutions for adaptation. Addressing these barriers will constitute the overarching change instigated by the Adaptation Fund resources in order to reduce vulnerability of the local communities in the northern regions. The barriers are discussed under the expected outcomes in providing preferred solutions for adaptation:

- Limited local institutional capacity in integrating climate change in natural resource planning and management within the landscape.
- Limited capacity to manage trans-border sources of risks and vulnerabilities
- Absence of civil society groups to work with the people.

STAKEHOLDER ANALYSIS

From the environmental scoping the following were the stakeholder groups identified in the landscape.

a. Civil society groups operating around the Black Volta landscape
b. Municipal and District Assembly within the range
c. Government service providers – Forestry Commission, Food and Agriculture, Ghana National Fire Service, National Disaster Management Organization, Department of Social Welfare, Police, Ministry of Education (Non-Formal Education Unit)
d. Land owners and Chiefs
e. Opinion leaders
f. Private sector operators within the area.
g. Members of Parliament in the Area
h. The Press
i. Traditional Land owners
j. Farmers (men & women)
k. Youth & Women (
l. Hunters
m. Migrant settlers
n. Chainsaw operators

a. Miners

Analysis of the stakeholder's interest, relative importance in the environment, participation in the project activity and perceived impact is shown in table 9

Table 9 : Influence-importance matrix of primary stakeholders

Type of beneficiary	Stakeholder Group	Interests	Relative importance of interest	Participation in project activity	Perceived Project Impact	Influence/Importance
Direct beneficiaries	Traditional Land owners	▪ Maintenance of traditional norms and taboos ▪ Sustainably management of resources for sustainable income ▪ Benefit sharing	**1**	**High**	+	**A**
	Farmers (men & women)	▪ Soil fertility improvement ▪ Benefit sharing ▪ Access to NTFPS ▪ Wood fuel availability	**1**	**high**	+	**A**
	Youth	▪ Enterprise development at the community level for alternative livelihoods ▪ Availability of wildlife, and medicinal plants, ▪ Financial support to produce & process products from the woodland ▪ Increase productivity	**2**	**low**	**(+, -)**	**A**
	Women (	▪ Accessibility to tree resources ▪ Availability of planted trees ▪ Alternative livelihood activities ▪ Access to NTFP	**1**	**high**	**(+,-)**	**B**
	Hunters	• Availability of wildlife • Unrestricted access to wildlife from the woodlands	**2**	**Very low**	**(+)**	**B**
	Migrant settlers	▪ Land availability and accessibility	**2**	**Very low**	**(+, -)**	**D**
Adversely affected groups	Chainsaw operators	• Availability of timber • Job security • Loss of revenue	**2**	**Very low**	**(-)**	**B**
	Miners	• Low social responsibility agreements • Availability of timber • Sustainable management of timber	**1**	**High**	**(+, -)**	**C**

KEY TO TABLE

STAKEHOLDER INFLUENCE/IMPORTANCE:

A Stakeholders of High Importance and also with High Influence on Project Activities

B Stakeholder with high importance but with low influence

C Stakeholders with High Influence on Project Activities but whose interests are not the targets of the project

D Stakeholders with of low Importance and also have low Influence on Project Activities

RELATIVE IMPORTANCE OF INTEREST:
1 High interest in activity and goal of Project
2 Medium interest in activity and goal of Project
3. Low interest in activity and goal of project

PERCEIVED PROJECT IMPACT
Project Impact is positive
-Project Impact is negative

Table 10: **Influence-Importance matrix of Secondary Stakeholders**

Stakeholder category	**Stakeholder Group**	**Interests**	**Relative importance of interest**	**Participation in project activity**	**Perceived Project Impact**	**Influence/ Importance**
Government Policy makers and technical service providers	Forestry Commission Agriculture Extension Division District Assemblies	•Policy, legal and institutional reforms •Clear definition of the role of traditional rulers and civil society in natural resource management •Custodian/ownership of policy reforms, local byelaws or regulations for natural resource management •Provision of fora for sharing of experiences between project sub-components	1	low	(+)	B
Implementing Agencies	District Assemblies Forest Services Division Rural Fire Division Agriculture Extension	▪ Install effective regulatory measures to maintain the unique features of the protected areas as well as full capture of the benefits by the local people ▪ Timber royalties ▪ Bushfire controls ▪ Soil fertility improvement ▪ Food security	**1**	**High**	**(+)**	**B**
Civil society (NGOs, CBOs, Religious Organizations	Churches	▪ Protection of sources of Non Traditional Forest Products (NTFPs) that provide food, income and livelihood to the poor ▪ Protection of medicinal plants and their natural habitats ▪ Management of Traditional protected areas (eg. sacred groves) ▪ Install effective regulatory measures to maintain the unique features of the protected areas as well as full capture of the benefits by the local people ▪ Developing the capacities of civil society	**1**	**High**	**(+)**	**A**

CONCLUSION

The selection process took into consideration the GEF strategic objectives and followed very comprehensive and elaborate consultative processes in arriving at the Black Volta basin as the selected area for the OP6.
The consultative processes which led to the engagement of major stakeholders both within and outside the selected area yielded good results and gave enough reasons such as those contained in this report for the GEF-SGP to proceed to select the Black Volta Basin as the project area and to adopt the landscape approach in the OP6.

OP6

Annex 3: BASELINE ASSESSMENT OF BLACK VOLTA BASIN SOCIO-ECOLOGICAL PRODUCTION LANDSCAPE AND WATERSCAPE IN GHANA

PROJECT DESCRIPTION

Background

The Global Environment Facility (GEF) was established to help tackle the numerous and most pressing environmental problems. It was established in 1992 on the eve of the Rio Earth Summit. GEF has since become an international partner for many developing countries, civil society groups and private sector actors to address major environmental challenges. In Ghana, the United Nations Development Programme (UNDP) is one of its implementing partners.

The GEF Small Grants Programme (SGP) initiated its 6th Operational Phase (OP6) which will be under implementation during 2015 to 2018. Ghana selected the Landscape Approach among the SGP's Strategic Initiative for the OP6. The Ghana portion of the Black Volta Basin has been selected for the baseline study. The selected area is largely characterized by biodiversity, natural reserve sites, sensitive ecosystems and a great potential for tourism development.

Objectives

The current study is titled '**Baseline Assessment of Black Volta Basin socio-ecological production landscape and waterscape in Ghana'** and has the following objectives;

1. To document the socio-economic status of the communities and the ecological status in the project area,
2. To facilitate multi-stakeholder consultation to achieve a broad consensus of the delimitation of the landscape
3. To document and recommend practical high yielding solutions towards the development of an impact-oriented 4-year strategic plan for providing alternative livelihood solutions for vulnerable communities in the landscape, protecting and revitalizing endangered species in the project areas

Methodology

The project was conducted using the following approaches.

A. Initial consultations with key stakeholders and identification and selection (sampling) of participants for the study.

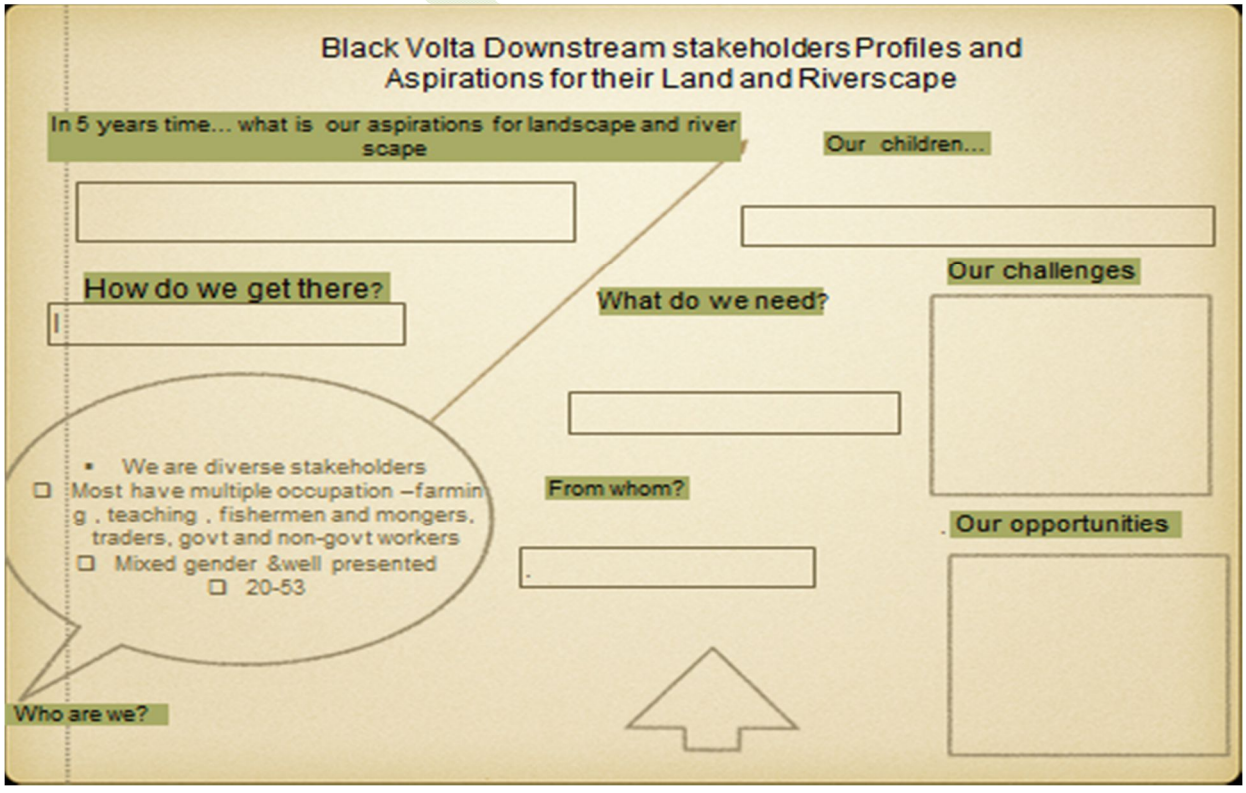
- Consultation with the SGP National Coordinator to identify landscape area and its boundaries, and capture and address any initial concerns
- Reconnaissance survey and informal visit to 30 communities purposively selected to identify key informants and relevant stakeholders of the study.
    - The selection of the communities was based on their proximity to the Black Volta basin which is the focal geographical area of the study.
    - Stratified purposive sampling technique was used to select 2 participants from each selected community to participate in the baseline assessment workshop.
    - The selection of the Participants took into consideration the existing social, religious and cultural diversity of people in the project areas
    - The other stakeholders selected included, staff of District Assemblies, Traditional Authorities, Directors of allied organizations such as NGOs and Game and wildlife Department, Farmers, Traders, Assemblymen/women and other people considered knowledgeable in the study subject.
- Public Participatory Geographic Information System (PPGIS) was employed to identify available natural resources in the communities and had them mapped out using Google Earth Pro.

B. Identification of Ecosystem Protection and Maintenance of Biodiversity, within the landscape

- Conduct baseline assessment of the ecosystem of the entire landscape and integrate it with results from PPGIS
- Special emphasis at this stage was on
  - Forest cover (protected, unprotected, sacred site etc.)
  - Agricultural biodiversity
  - Knowledge learning and innovation
  - Social equity and infrastructure

C. Conduct Participatory Workshops

- Designed and facilitated in collaboration with the SGP National Coordinator, two workshops to collect baseline data
  - Participants included two (2) individuals each from the 30 communities selected
  - Each workshop involved getting participants to identify challenges and discussed in focus groups (FGD) strategies that can improve ecosystem resilience. Participants were allowed to agree or disagree with each other so that it provides an insight into how a group thinks about an issue, about the range of opinion and ideas, and the inconsistencies and variation that exists in a particular community in terms of beliefs and their experiences and practices.
  - Participants also identified the overall goal of the ecosystem resilience strategies and expected outcomes
- Utilized baseline data collected and strategies discussed in workshops to develop the Country Programme Development Strategy based on guidelines and template provided by SGP National Coordinator.
- A diagrammatical representation of the framework under which the workshops were conducted is presented below:



D. Remote Sensing Mapping and GIS

Relevant satellite imagery such as Landsat was used for classifying the various thematic imagery ultramafic substrates, vegetation types, primary and secondary forests, and associated vegetation as well as geophysical features in the landscape. In general, cloud free images were acquired and in cases that, there was cloud-cover, appropriate atmospheric model was applied. The satellite images were validated using data from Groundtruthing.

OP6

Description of the Black Volta Basin Landscape

The Black Volta basin lies between latitude 7º00'00"N and 14º30'00"N and longitude 5º30'00"W and 1º30'00"W. It covers an estimated area of about 130,400 km^2. In Ghana, the basin covers an area of about 18,384km^2 constituting 14% of the basin. The Black Volta river basin is a trans-national river system that stretches from North to South through Mali, Burkina Faso, Ghana and Cote d'Ivoire, and from Burkina Faso, Cote d'Ivoire and Ghana from West to East.

The study was carried out in the Ghana portion of the basin in the Bole-Bamboi District (upstream) and downstream parts of Banda, Jaman North and Tain Districts in the Brong-Ahafo Region of the Republic of Ghana within the basin as shown in figure. 1

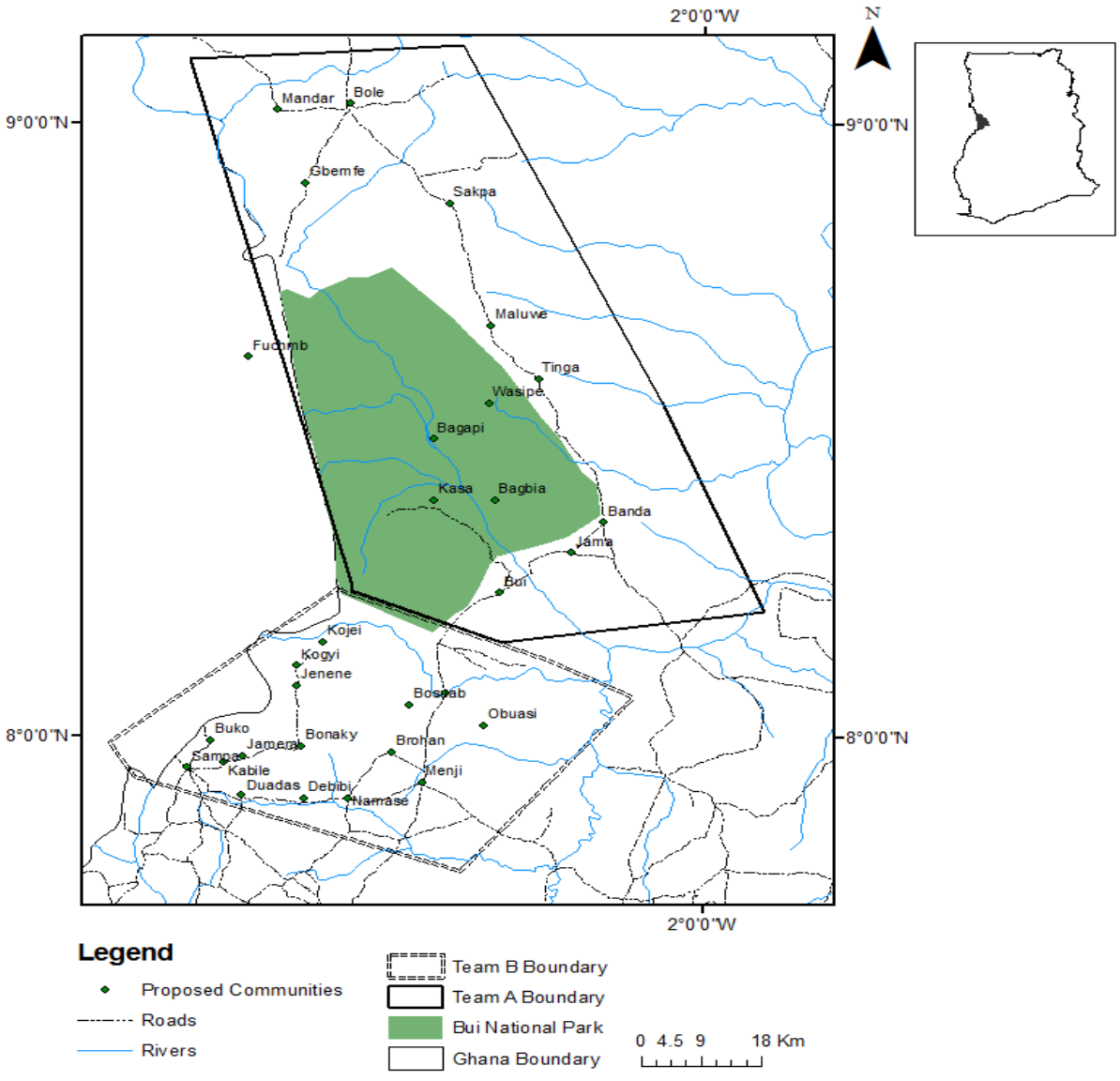


Figure 5. Map of the project area

1.4.1 Population of Black Volta Basin communities

From a diagnostic study of the Black Volta Basin it has total population, of 4.5 million people. The trends in population change over time are summarized in table 1. The estimated population of the landscape under study is

Table 11: Past, current and projected, population growth trends of the Black Volta Basin in Ghana.

Year	1984	1990	1995	2000	2005	2010	2015	2020
Rural population	446,905	609,395	719,151	851,762	1,012,565	1,208,242	1,447,336	1,740,537
Total population (urban and rural)	607,372	738,449	872,332	1,034,067	1,230,088	1,468,405	1,758,791	2,115,192

Source: Quandzie, 2012 *and cited in GWI, 2009*

1.4.2 Rainfall and evaporation

Annual rainfall patterns vary from about 1043mm to 1270mm to the south. The minimum potential evaporation is about 1450mm/year to about 1800mmm/year and average runoff is about 243m3/year. The mean monthly runoff from the basin within Ghana

1.4.3 Geology and soil

The geology is generally characterized by basal sandstone, birimian sediments, birimian volcanics, upper voltaian, Bosum and Oti beds, Tarkwaian and Dahomeyan (see Figures 2). The soil type according to FAO classification is predominately Ferric Luvisols interlaced by Eutric Cambisols and Gleyic Luvisols (See Figure 6).

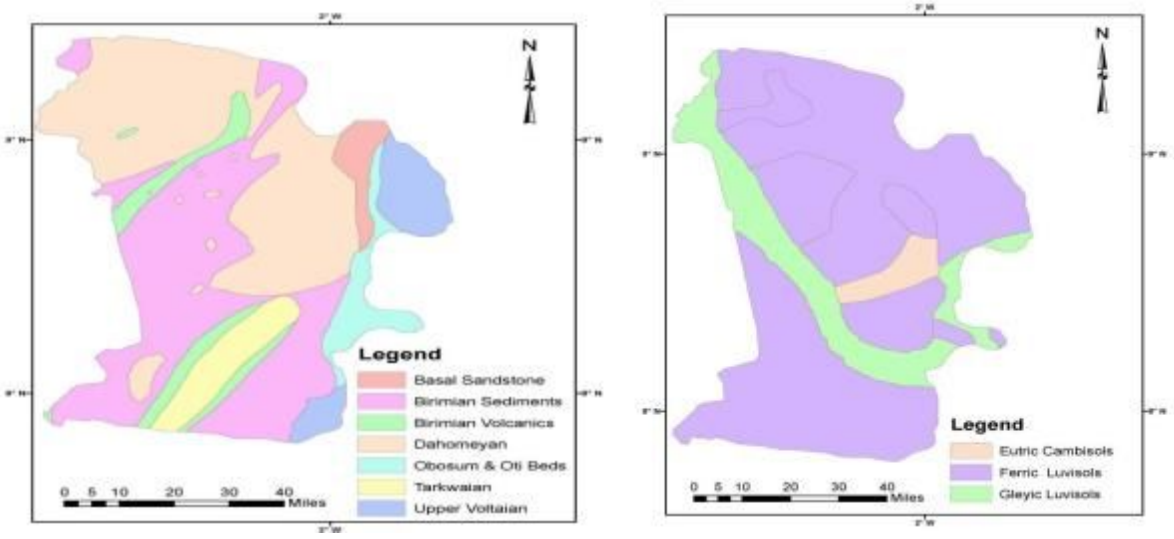


Figure 6 Geology map of the project area and Soil Map of project area

1.4.4 Forest cover

The structure of forest tree stands determines the number of ecosystem and community processes and defines the habitat for much forest dwelling species. The study area is composed of diverse forest cover types. The forest type is predominantly of the guinea savanna with scattered trees and shrubs, and a sparse ground cover of grasses, examples of trees found include Baobab, Khaya spp, dawadawa, shea and acacia species in the Northern Region. In Brong

Ahafo Region, the vegetation type is moist semi-deciduous and guineas savanna woodland forest types and examples of trees found comprise of Khaya spp, ceiba, Odum, wawa, oprono, emire, otie and onyina. Within this area is the Bui National Park which serves as a priority conservation area and serve as a home for several important species of flora and fauna (including the white-breasted guinea fowl, the colobus monkey, chimpanzee, hippotamus, and the honey badger).

The most common plant species found within the study area are characterized in Table 12

Table 12: Plant species and characteristics

Tree species	Average height (m)	Diameter at Breast Height (DBH) (cm)	Basal Area m^2	Canopy size (m)	
				North-South	West-East
Shea tree	9	55	0.24	7.35	7.16
Dawadawa	8	65	0.33	6.53	6.33
Yellow Berry	9	70	0.38	7.35	7.16
Boabab	12	120	1.13	9.8	9.6
Khaya spp.	13	95	0.71	10.4	10.20
Ceiba	10	100	0.79	8.17	7.97
Emire	10	80	0.50	8.17	7.97
Acacia	9	90	0.64	7.35	7.16

Demographics of the Black Volta Basin

The total population of the landscape is about 266,500 (2010 Pop Census). The breakdown per district is as follows:

Bole District

The Bole Bamboi District occupies an estimated area of about 4800 square km. It has an estimated population of about 75,151 (2010 population projected) with population growth rate of about 3.6 percent per annum (Ghana Statistical Service Report, 2014).
The District Capital is Bole. Other major towns in the District include Bamboi, Maluwe, Tinga, Tasilma, Mandari and Banda/Nkwanta. For the percentage land take of District and the Northern Region in relation to Ghana (238,533sq km), they are 2.0 per cent and 29.6 per cent respectively. This means that the land take of the district is 6.8 per cent of the total land mass of the Northern Region.
From the Ghana Statistical service report (2014), it is estimated that of the population 11 years and older, 41.8 percent are literate and 58.2 percent are non-literate. The proportion of literate males is higher (47.1 percent) than that of females (36.0 per cent). About three out of ten people (35.4 percent) indicated they could read and write both English and Ghanaian languages. Of the population aged 3 years and above in the District, 51.2 percent have never attended school, 34.7 percent are currently attending and 14.2 percent have attended in the past.

The economical active population in the District is about 74.7 percent of the population aged 15 years and older is economically active; of the economically active population, 97.3 percent are employed whilst less than three (2.7 percent) percent are unemployed. For those who are economically not active, a larger percentage of them are students (39.0 percent), 31.6 percent perform household duties and 5.4 percent are disabled or too sick to work. Less than half (45.7 per cent) of the unemployed population are seeking work for the first time (GSS report, 2014).

The Bole Bamboi District is a predominantly rural agrarian District. From the Ghana Statistical Service report on Bole Bamboi District (2010), it is recorded that 61.6 percent of households in the District are engaged in agriculture. This means that 6 out of every ten people are engage in some agricultural activities. Of the agricultural activities

engaged in, crop farming is the commonest; engage in by 95 percent of population in agriculture with the remaining 5 percent engaged in livestock rearing (GSS Report, 2014).

Demographics of the Jaman North District

The district is located between latitude 7'40" N and 8' 27"N, and longitude 2'30"W and 2' 60" W. The district is physically located to the North-Western part of the Brong Ahafo Region. It shares boundaries with Tain District to the North-East, Jaman South District to the South-West and Berekum District to the South-East. It is bordered on the East to the La Cote d'Ivoire. The district capital, Sampa is located about 119km from Sunyani the regional capital while it is 504 km from Accra, the national capital.
The population of Jaman North, according to the 2010 Population and Housing Census, is 83,059 representing 3.6 percent of the Northern region's population with Males constituting 48.1 percent and females 51.9 percent of the total population. The proportion of the population living in urban localities (52.5 per cent) is slightly higher than that living in rural localities (47.5) of the district (GSS Report, 2014).

According to the Ghana Statistical Service, of the population 11 years and above, 71.7 percent are literates. It is further reported that almost seven out of ten people (68.8 percent) can speak and write both English and Ghanaian languages. Of the population aged 3 years and above (48,131) in the district, 22.2 percent has attended school in the past and 46.1 percent are currently attending. A higher proportion of males (51.6 per cent) are currently attending school than females (41.4 percent).

About 70.3 percent of the populations aged 15 years and older are economically active and mostly engaged in agricultural activities. About 71.6 percent of the population is engaged in skilled agricultural, forestry and fishery workers. In the rural localities, as high as 91.4 percent of households are agricultural households while in the urban localities, 73.1 percent are into agriculture. Most (99.0 percent) of the agricultural households in the district are involved in crop farming. Poultry (chicken) is the dominant animal (58.1 percent of all animals) kept by the higher proportion (39.0 percent) of households in the district (GSS Report, 2014).

Demographics of the Tain District

Tain is one of the districts established in August 2004 in Brong-Ahafo Region by Legislative Instrument (L.I) 2090. The District has Nsawkaw as its capital. It shares common boundaries with Wenchi Municipal to the East, Jaman North and Jaman South to the West, Sunyani west to the South and Berekum Municipal to the South West. It is also bounded by the Banda District to the North and La Cote d'Ivoire to the North West. The location of Tain District has helped boost economic trade as the District continues to engage in inter-district trade with the bounded districts. In terms of land area, Tain District covers 1,829.84960 km2 representing 3.5 percent of the total land area of the Brong Ahafo Region.

The population of Tain District, according to the 2010 Population and Housing Census, is 88,104 representing 3.8 percent of the Brong-Ahafo region's total population. More than half (51.5 percent) of the population of the district is rural. The district has a sex ratio of 97.6. The population of the district is youthful (40.3 percent) depicting a broad base population pyramid which tapers off with a small number of elderly persons. Of the population 11 years and older, 64.0 percent are literate and 36.0 percent are non-literate. Seven out of ten people (71.2 percent) has been reported as being able to speak and write both English and Ghanaian languages (GSS, 2014).

About 81.2 percent of the population aged 15 years and older is economically active while 18.8 per cent are economically not active. Of the economically active population, 98.7 percent are employed while 1.3 percent are unemployed. The common economic activities in the District are farming and allied agricultural activities. A proportion of 71.6 percent of the population of the District are engaged as skilled agricultural, forestry and fishery workers (GSS, 2014).

Demographics of the Banda District

The Banda District lies within latitudes 7^{o}and 8o 45` north and longitudes 2o 52` and 0o 28` west. In terms of land area, the district covers a total of 2,298.3 square kilometers out of the region's size of 39,558 square kilometers. The

district shares boundaries with the Bole District (Northern Region) to the north, Tain District to the south, La Cote d'Ivoire to the east and Kintampo South District to the west.

The population of the Banda District according to the 2010 Population and Housing Census is 20,282 representing less than one percent (0.9 percent) of the region's total population. Males constitute 51.1 percent and females represent 48.9 percent. The district is entirely rural. The District has a sex ratio of 104.7. The population of the District is youthful (41.1 percent) of the 0-14 age group, depicting a broad base population pyramid which tapers off with a small number of the 65 plus years (6.1 percent). With reference to school attendance, of the population aged 3 years and above, 62.5 percent are currently attending school and 37.5 percent have attended in the past.

Almost eight out of ten (79.2 percent) of the population aged 15 years and older are economically active. Of the economically active population, 97 percent are employed while 3 percent are unemployed. Almost eight out of ten of the population (78.6 percent) of households in the District is engage in agriculture, Crop farming is the main agricultural activity with almost seven out of ten (67.0 percent) households engage in it (GSS 2014).

Relief, Land Use and Land Cover Changes

Terrain Characteristics

The terrain characteristics were derived from the Shuttle Radar Topography Mission (SRTM) 90m Digital Elevation Model (DEM). The elevation varies between 586m to 74m.

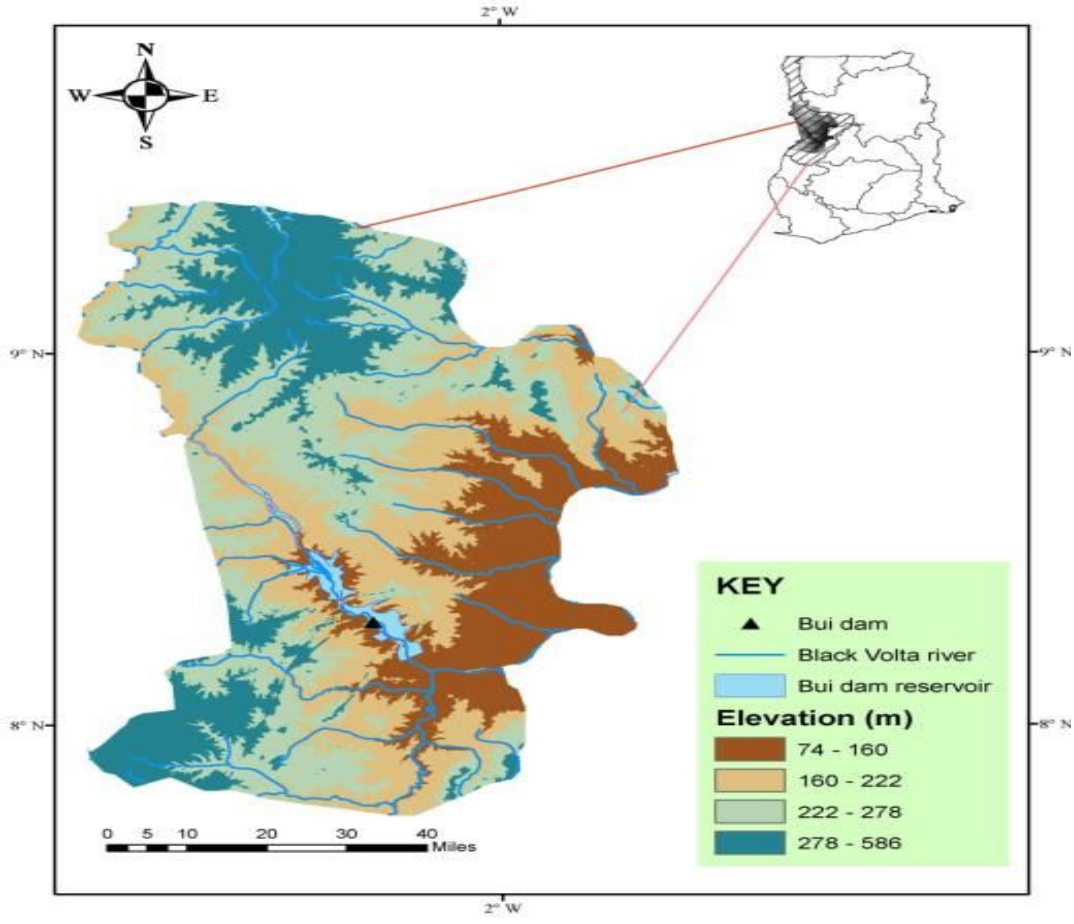


Figure 7 Elevation of the study area

Land Use Land Cover (LULC)

The cloud-free Landsat images were acquired on the following dates – 20th February 2001, 7th January 2008 and 18th February 2015. These were used to derive the LULC maps for the study area. Various land cover changes are shown in table 2 and figures 5 to 7. The changes are irregular over the time owing to the various activities such as

mining and the building of the Bui Power Plant that has led to the rapid changes in the LULC classes. The most significant change is the Bui Reservoir which has increased in size within a period of less than 3years to covering an approximate area of 451.74sqkm^2 and a perimeter of 129.5km. Bare lands, Farmlands, settlements and pasture lands are on the increase. It is very difficult to see clearly from a 30m resolution Landsat image these key differences, but the field survey revealed that settlements around the Bui reservoir are increasing and these are usually dotted settlements and would be typically be grouped under this large category.

Table 13: LULC changes over the years (2001-2015)

Land cover Classes	Area (ha) (2001)	2001 (per cent Area)	Area(ha) (2008)	2008 (per cent Area)	Area(ha) (2015)	2015 (per cent Area)
Water bodies	1,106,939.50	0.83	1,321,099.50	0.99	7,288,132.50	5.45
Forest Deciduous	17,372,391.50	12.99	23,849,393.00	17.83	3,642,058.50	2.72
Bare Land	48,683,922.00	36.40	5,403,524.50	4.04	20,777,535.50	15.54
Farmlands & Settlements	38,408,257.50	28.72	28,809,874.00	21.54	8,551,676.50	6.39
Pasturelands	28,168,732.50	21.06	74,356,352.00	55.60	93,480,840.00	69.90
Total	133,740,243.00	100.00	133,740,243.00	100.00	133,740,243.00	100.00

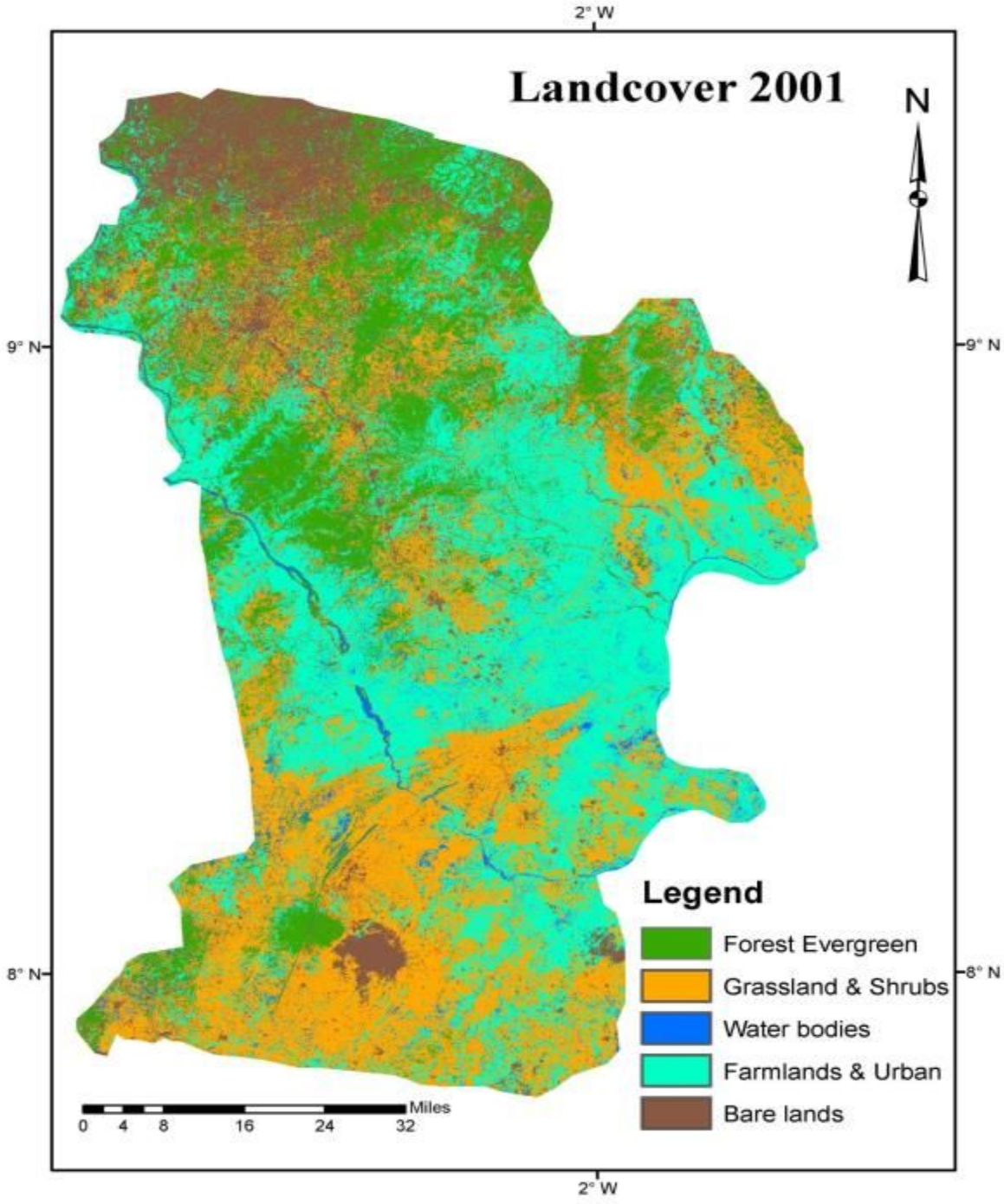
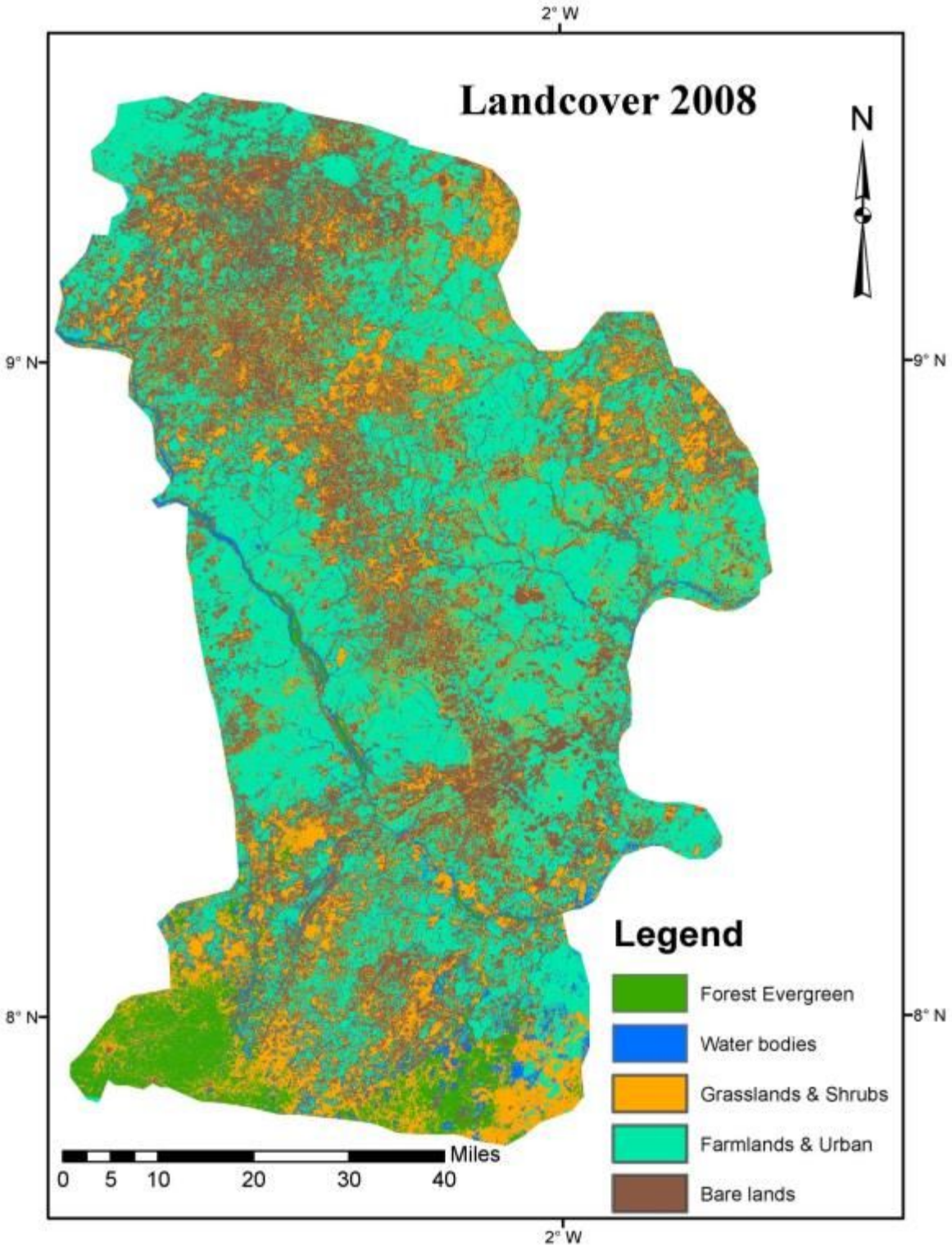


Figure 8: LULC map for 2001

Fig. 6. LULC map for 2008



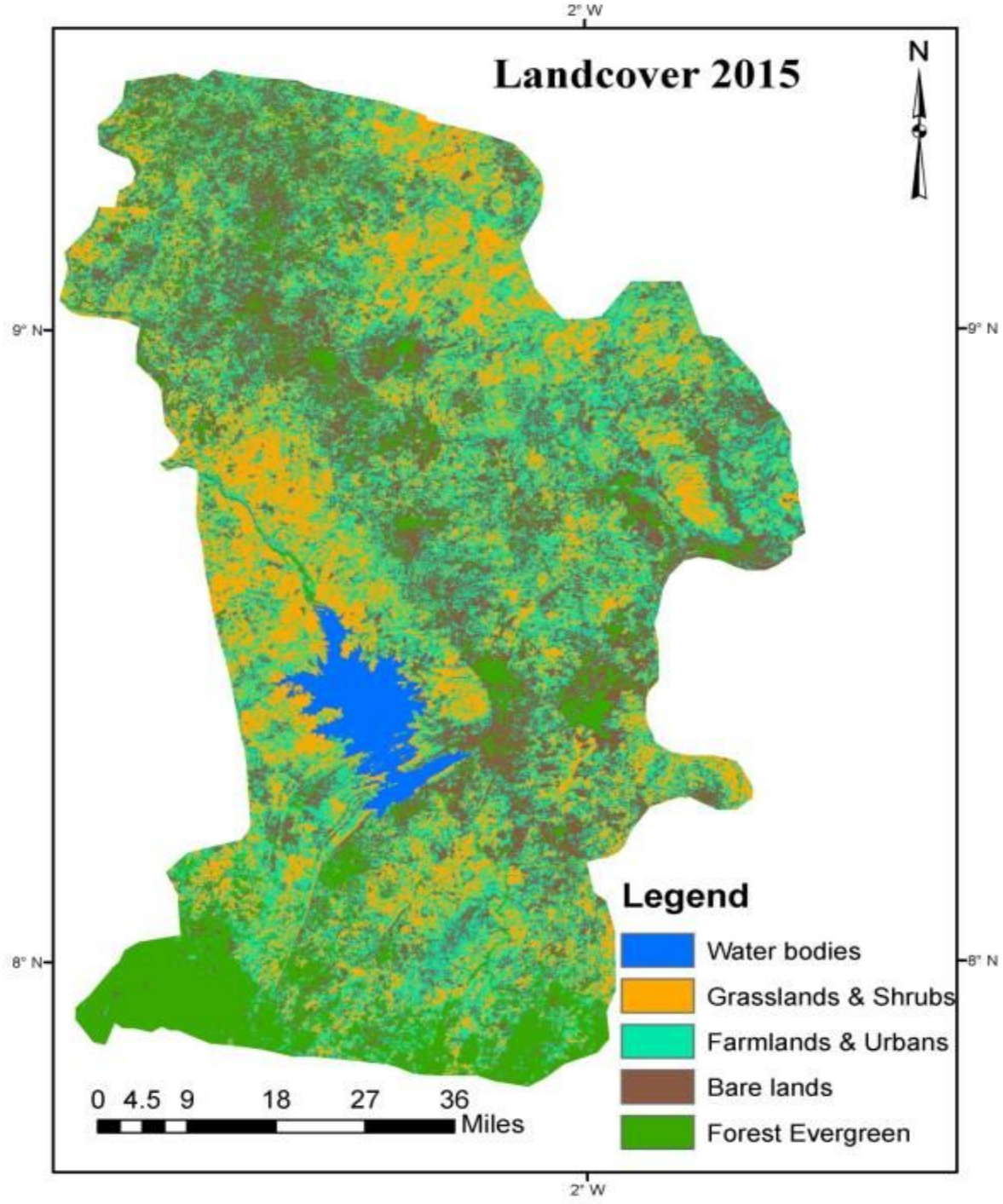


Figure 9 LULC map for 2015

Normalized Differential Vegetation Index (NDVI)

The NDVI which indicates the strength of vegetative activity in the project area shows varying values over the years (See figures 8-10). In 2015, the vegetative activity within the study area has decreased significantly owing to the large destruction of the forests and shrubs in the study area.

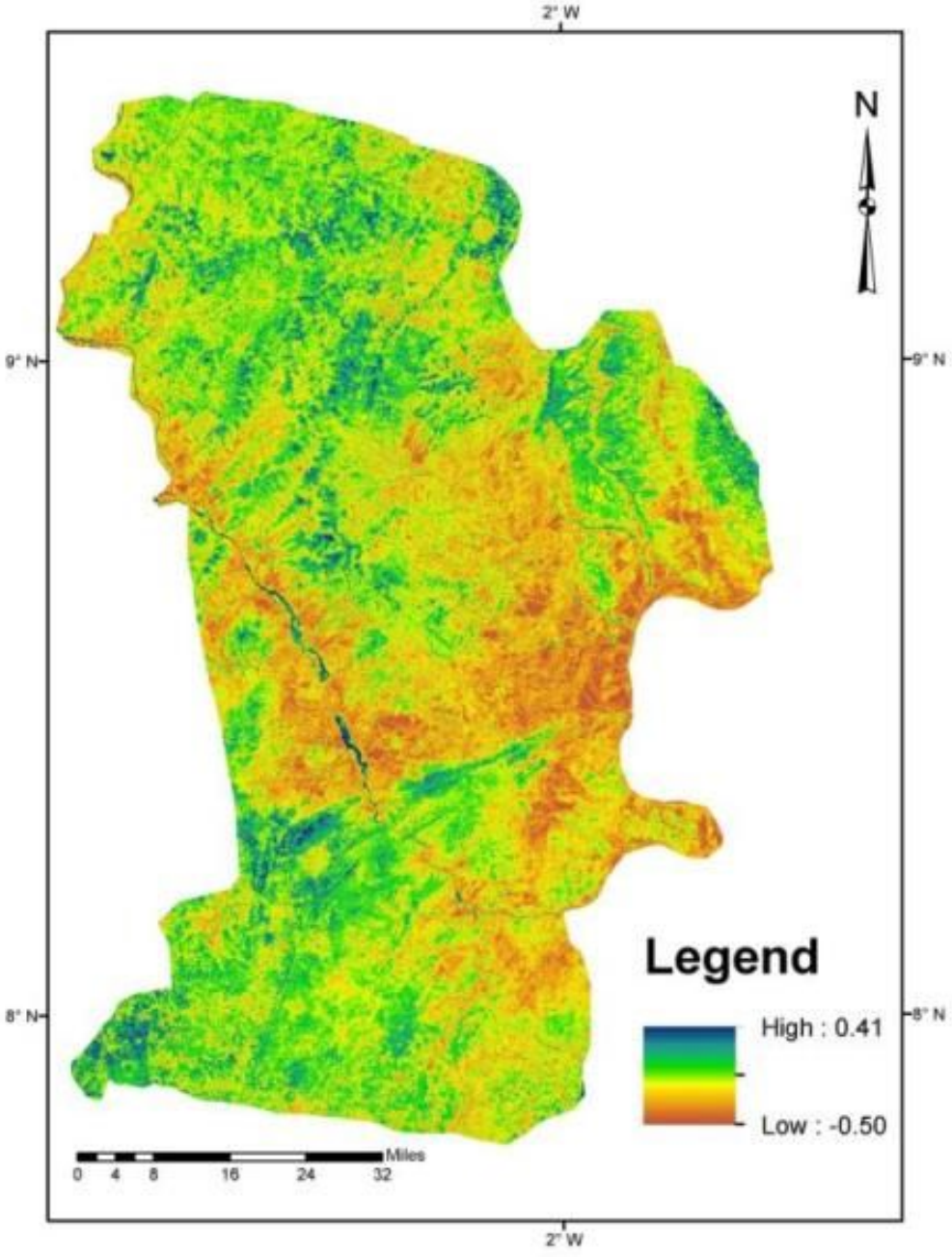


Figure 10: NDVI map for 2001

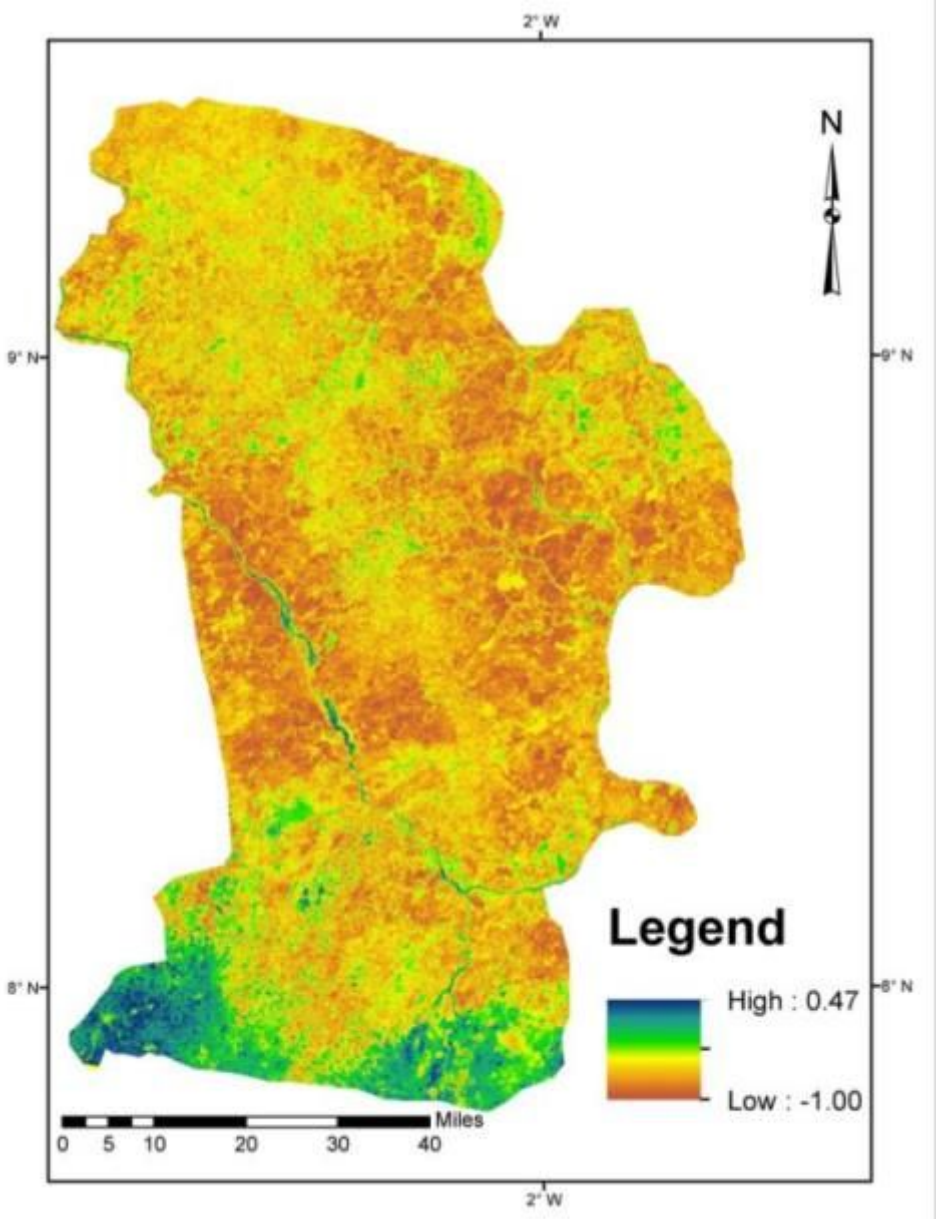


Figure 11 NDVI map for 2008

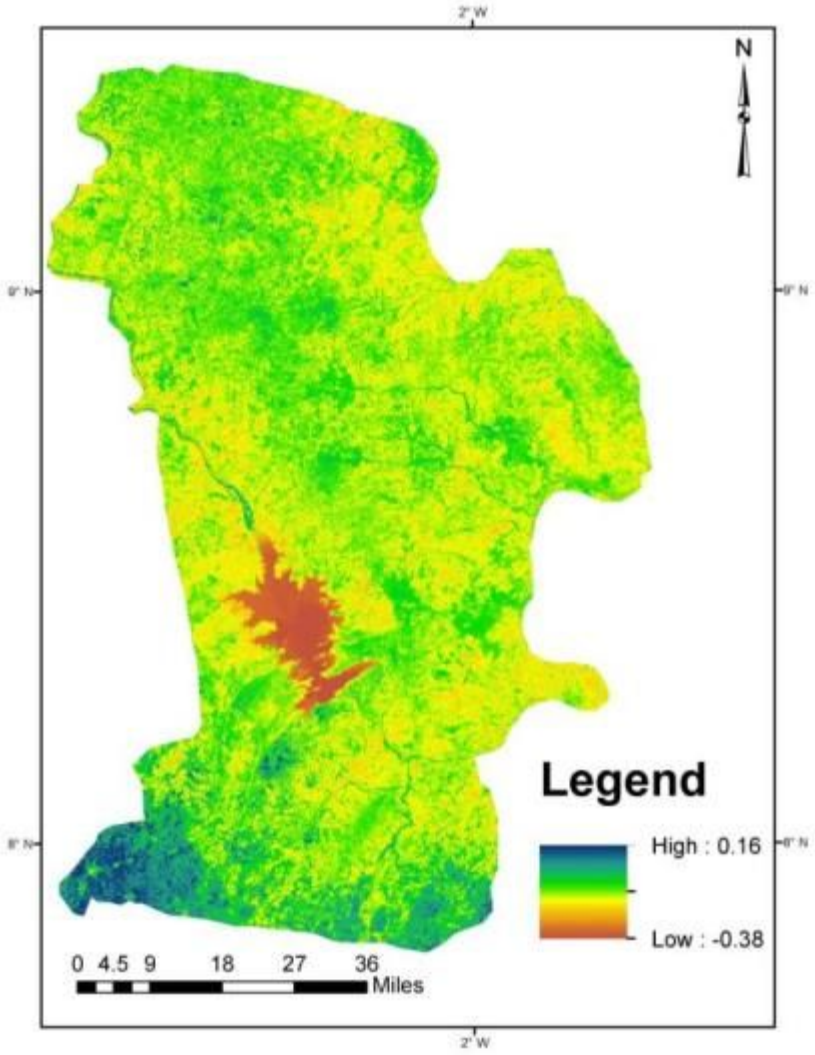


Fig. 10. LULC map for 2015

PROJECT OUTCOMES

Findings

Individual Scoring On Various Indicators

The scoring was done based on the individuals own idea or opinion on what the 20 indicators are in relation to the general outlook of their respective communities within the study area. In all, a total of 60 respondents were examined with all of them administering all the 20 indicators.

Landscape Diversity and Ecosystem Protection

The study examined the perception of participants with regards to the extent of landscape diversity and ecosystem protection in their communities. Respondents were asked to rate various indicators of landscape diversity and ecosystem protection from very high to very low. The indicators used included, landscape diversity, ecosystem protection, ecological interaction between different components of the landscape, and recovery and regeneration of landscape/seascape. The results from analysis of responses/ratings of each indicator are presented in Table 2

Table 2: Participants' Rating of Landscape Diversity and Ecosystem Protection indicators

Indicators	Response				
	Very low (per cent)	Low (per cent)	Medium (per cent)	High (per cent)	Very high (per cent)
Landscape diversity	3(5)	19(31.7)	25(58.3)	2(3.3)	1(1.7)
Ecosystem protection	14(23.3)	26(43.3)	15(25)	5(8.3)	0(0)
Ecological interactions between different components of the landscape/seascape	9(15)	21(35)	27(45)	2(3.4)	1(1.7)
Recovery and regeneration of the landscape/seascape	14(23.3)	25(41.7)	18(30)	3(5)	0(0)

Source: Field Survey Data (2015)

The results in Table 2 show that majority of the participants rated landscape diversity as medium. As seen in the results of the analysis 25 representing 58.3 per cent of the respondents rated landscape diversity as medium in terms of the availability of different natural ecosystems and land uses while some (31.7 per cent) of them also indicated that, ecosystem diversity is low. Also about 5 per cent of the respondents rated landscape diversity as very low, meaning there is only one or a very small number of natural ecosystems and land uses.

In terms of ecosystem protection, the results show that most (43.3 per cent) respondent believed there is a low ecosystem protection effort in their communities. A significant number of respondents (23.3 per cent) rated ecosystem protection as very low, meaning there is no formal or informal protection of any area as strict nature reserves, national parks, wilderness areas, heritage sites, community conserved areas, marine protected areas, limited-use areas, sacred sites or grazing reserve areas in the community. Only 8.3 per cent of the respondents indicated high ecosystem protection in their communities.

As to whether ecological interactions are considered while managing natural resources, a cumulative 95 per cent of the respondents revealed that this is in the range of very low to medium. Only 3.4 per cent and 1.7 per cent of the respondents rated this indicator high and very high respectively. This implies that no efforts are made in sustaining ecological services such as pollination, pest control, nutrient cycling and water purification via promoting ecological interaction between species in the landscape. Natural ecosystems naturally have the ability to recover provided the exploitation is within its recovery limit. The inability of a natural ecosystem to continuously recover to near its natural state is indicative of an ecosystem being over exploited and stressed. From the results of the studies, majority (41.7 per cent) of the respondents thinks that ecosystems in their communities are low to recovery. An additional 23.3 per cent show that the natural ecosystems have very low ability to recover from human shocks.

Agricultural Biodiversity

The study also sought to ascertain the extent of biodiversity/agro-biodiversity in respondents' communities. Respondents were therefore asked to rate from very high to very low indicators such as diversity of local food system, maintenance and use of local crop varieties and animal breeds as well as sustainable system of management of common resources. Respondents' ratings of biodiversity indicators in their communities are presented in Table 14.

Table 14: Respondents Ratings of Biodiversity Indicators in Their Communities

Indicators	Response				
	Very low (per cent)	Low (per cent)	Medium (per cent)	High (per cent)	Very high (per cent)
Diversity of local food system	2(3.3)	13(21.7)	23(38.3)	21(35)	1(1.7)
Maintenance and use of local crop varieties and animal breeds	9(15)	22(36.7)	21(35)	6(10)	2(3.3)
Sustainable management of common resources	14(23.3)	32(53.3)	12(20)	2(3.3)	0(0)

Source: Field Survey Data (2015)

Diversity of local food system is considered an important coping strategy for food insecurity in most agrarian communities in Ghana. However, from the results in Table 3, it is quite clear that majority do not believe there is high diversity of local food in their communities. Cumulatively, 63.3 per cent of the respondents rated diversity of local food system from very low to medium. . Nevertheless, 21 representing 35 per cent of the respondents indicated that there is high diversity of local food system in their communities with only 3.3 per cent indicating very low.

With regards to the maintenance and use of local crop varieties and animal breeds, about 35 per cent of the respondents indicated that although there are some few varieties of food crops grown in the area, but this is in the medial range. However, 10 per cent and 3.3 per cent of the respondents respectively thinks that maintenance and use of local crop varieties and animal breeds can be rated as high and very high.

When it comes to sustainable management of common resources, majority (53.3 per cent) of the respondents rated low the efforts of their communities meaning common resources are being overexploited and not sustainably managed. Only 20 per cent of the respondents rated this indicated as medium with the remaining 3.3 per cent and 23.3 per cent rating it high and very low respectively.

Knowledge and Innovation

The study also sought to find out knowledge and innovation in resource management among respondents. The indicators used to determine the extent of knowledge and innovation in resource management included i) innovation in agriculture and conservation practices, ii) traditional knowledge related to biodiversity, iii) documentation of biodiversity-associated knowledge and iv) women's knowledge. The ratings of these indicators by respondents are presented in Table 15

Table 15 Respondents rating of knowledge and innovation indicators

Indicators	Response				
	Very low (per cent)	Low (per cent)	Medium (per cent)	High (per cent)	Very high (per cent)
Innovation in Agriculture and Conservation Practices	9(15)	35(58.3)	10(16.7)	5(8.3)	1(1.7)
Traditional knowledge related to biodiversity	3(5)	23(38.3)	28(46.7)	4(6.7)	2(3.3)
Documentation of biodiversity-associated knowledge	14(23.3)	23(38.3)	20(33.3)	2(3.3)	1(1.7)
Women's knowledge	11(18.3)	17(28.3)	20(33.3)	12(20)	0(0)

Source: Field Survey Data (2015)

From the results in Table 15, it is clear that innovation and ability to adapt to changing situations was rated low by majority (58.3 per cent) of the respondents. Only 15 per cent and 16.7 per cent of the respondents rated this indicator as very low and medium. This means that there is general low reception to change and innovations within the communities. The results also show that though few (6.7 per cent) respondents rated high traditional knowledge related to biodiversity, 38.3 per cent and 46.7 per cent of the respondents however believe local knowledge and traditional practices relating to biodiversity is low and medium respectively. Similarly, 1.7 per cent of the respondent also rated very high documentation of natural resources and conservation practices while 23.3 per cent, 38.3 per cent and 33.3 per cent rated this indicator as very low, low and medium respectively.

In terms of whether women's knowledge, experiences and skills are recognized and respected, the results show that 18.3 per cent of the respondents considered this as very low. Also, about 28.3 per cent and 33.3 per cent of the respondents considered this to be low and medium respectively. Only 20 per cent reported on this indicator as high.

Governance and Social Equity

Governance and social equity issues were also considered. In this respect, respondents were asked to rate indicators such as rights in relation to land/water and other natural resource management, community-based landscape/seascape governance, social capital in the form of cooperation across the landscape/seascape and social

equity (including gender equity) which are considered important in the underlining issue of governance and social equity. The ratings given by respondents for these indicators are presented in Table 16.

Table 16: Respondents Rating of Governance and Equity Indicators

Indicators	Response				
	Very low (percent)	Low (percent)	Medium (percent)	High (per cent)	Very high (percent)
Rights in relation to land/water and other natural resource management	6(10)	16(26.7)	18(30)	16(26.7)	4(6.7)
Community-based landscape/seascape governance	13(21.7)	30(50)	13(21.7)	3(5)	1(1.7)
Social capital in the form of cooperation across the landscape/seascape	4(6.7)	22(36.7)	25(41.7)	9(15)	0(0)
Social equity (including gender equity)	5(8.3)	22(36.7)	24(40)	7(11.7)	2(3.3)

Source: Field Survey Data (2015)

From the results in Table 17, it is evident that contrary to the 10 per cent and 26.7 per cent of the respondents who believed rights to natural resources are not recognized and are heavily disputed thus rated very low and low respectively, 30 per cent, 26.7 per cent and 6.7 per cent of the respondents held the opposite view and hence rated rights as medium, high and very high respectively in relation to land/water and other natural resource management.
On the availability of multi-stakeholder platform or institution for the management of natural resources, only 1.7 per cent and 5 per cent of the respondents rated this indicator as very high and high respectively. However, a considerable number of 21.7 per cent, 50 per cent and 21.7 per cent of respondents considered this to be very low, low and medium respectively. This means there is either not a multi-stakeholder institution or if present, it is not capable of transparent, participatory and effective decision making. Only 11.7 per cent of the respondents rated cooperation and coordination in terms of natural resources management as high and in contrast to 36.7 per cent and 40 per cent of the respondents who rated this indicator as low and medium respectively.

Livelihood and Well-Being

The indicators that were used to determine the livelihood and well-being of respondents included socio-economic infrastructure, human health and environmental conditions, income diversity, biodiversity-based livelihoods and socio-ecological mobility. The ratings assigned to these indicators by respondents are presented in Table 17.

Table 17: Livelihood and Well-Being

Indicators	Response				
	Very low (per cent)	Low (per cent)	Medium (per cent)	High (per cent)	Very high (per cent)
Socio-economic infrastructure	5(8.3)	22(36.7)	24(40)	7(11.7)	2(3.3)
Human health and environmental conditions	2(3.3)	22(36.7)	22(36.7)	14(23.3)	0(0)
Income diversity	2(3.3)	26(43.3)	27(45)	4(6.7)	1(1.7)
Biodiversity-based livelihoods	3(5)	23(38.3)	30(50)	3(5)	1(1.7)
Socio-ecological mobility	3(5)	5(8.3)	31(51.7)	19(31.7)	2(3.3)

Source: Field Survey Data (2015)

The socio-economic infrastructure such as safe drinking water, hospitals, roads, electricity and schools is not adequate as a cumulative percentage (85 per cent) of the respondents rated this indicator as low and medium. Only 11.7 per cent rated that this indicator is high.
Human health and the health of the environment are strongly interrelated. The health of an environment usually determines the health of the people resident there. Although the data do not show a bad picture of the health situation, a substantial 36.7 per cent of the respondents rated this to be low while an additional 36.7 per cent of the respondents also rated this as medium.

Households in the area do not have diversity of economic activities. Consistent to the findings on Table 11, majority 43.3 per cent of the respondents rated low income diversity. This implies most of the respondents depend on single sources of capital for their livelihood. Very few livelihood support activities exist in this area.

On biodiversity and livelihood, 50 per cent of the respondents rated this as medium. Perhaps this is attributable to the depletion of biodiversity in the area and hence the inability of biodiversity to continuously support livelihood. Also 38.3 per cent of the respondents rated biodiversity based livelihood as being low with only 5 per cent rating this indicator as high.

Group Scores on Various Indicators

The group scoring exercise was conducted at the two stakeholders' consultation workshops. Unlike the individual scoring, the downstream portion of the area focused on only the downstream while the upstream also responded to the indicators based on the upstream. In all, ten groups (5 for the upstream and 5 for the downstream) were examined with each of them administering one of the broad themes of indicators. The indicators used included landscape diversity, ecosystem protection, ecological interaction between different components of the landscape, and recovery and regeneration of landscape/seascape.

Landscape Diversity and Ecosystem Protection

The study examined the perception of participants with regards to the extent of landscape diversity and ecosystem protection in their communities. Respondents were asked to rate various indicators of landscape diversity and ecosystem protection from very high to very low. The indicators used included, landscape diversity, ecosystem protection, ecological interaction between different components of the landscape, and recovery and regeneration of landscape/seascape. The results from analysis of responses/ratings of each indicator are presented in Table 18.

Table 18: Group's Rating of Landscape Diversity and Ecosystem Protection indicators

Indicators	Group scores	
	Downstream	Upstream
Landscape diversity	4	4
Ecosystem protection	2	5
Ecological interactions between different components of the landscape/seascape	2	5
Recovery and regeneration of the landscape/seascape	2	3
Score Key: 1= very low 2= low 3= medium 4= high and 5= very high		

Source: Field Survey Data (2015)

The results in Table 11 show that both the upstream and downstream rated landscape diversity as being high. This means that, there are diverse ecosystems and land uses in both the upstream and downstream portion of the area. For the upstream, some of these ecosystems include mountains, river systems, forests and grasslands. Land uses include cultivated lands, plantations, backyard gardens, irrigation farming, surface mining and fishing. The downstream comprises of stretch of mountains, a national park, and water systems including the Black Volta reservoir near Jama

community. There is not much difference between the upstream and downstream in terms of land uses except that there are no surface mining activities in the downstream.

Ecosystem protection was rated low for the downstream zone while the upstream considers this to be very high (see Table 11). This implies that ecosystems are well protected in the upstream than in the downstream. This is because in the upstream, cultural systems do not permit citizens to temper with ecosystems.
The rating for the downstream and upstream in relation to ecological interactions and management were low and very high respectively. This implies that no efforts are made in sustaining ecological services such as pollination, pest control, nutrient cycling and water purification via promoting ecological interaction between species in the landscape for the downstream zone.
From the results of the analysis, recovery and regeneration of the landscape is low for the downstream and medium for the upstream. This means ecosystems are generally slow to recovery for both zones (Table 11).

A landscape mapping exercise for both the upstream and downstream of the Black Volta Basin sketched by workshop participants is presented in fig. 9 (Downstream) and fig. 10 (upstream) respectively.

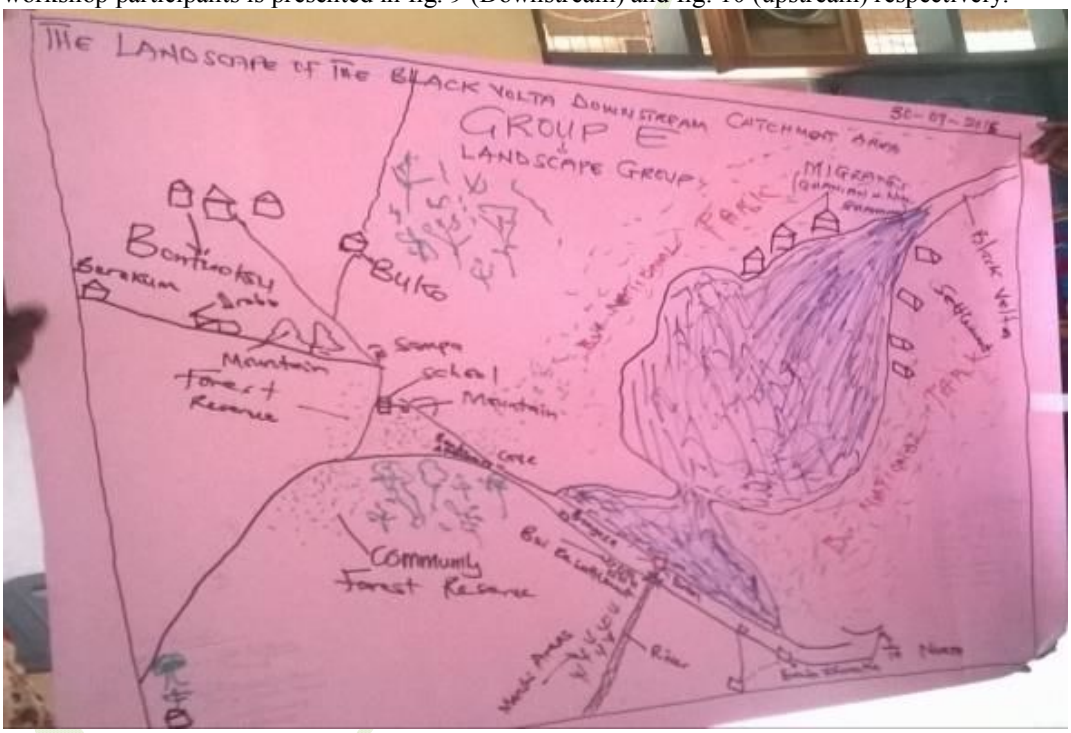


Figure 12 **Landscape map sketched by downstream participants**

Fig.6. Landscape map sketched by upstream participants

Biodiversity (Including Agricultural Biodiversity)

The results in Table 13 show that there are diverse food and animal breeds in the upstream zone. In the downstream zone, this was recorded low indicating that although different variety of food and animal breeds exists, these are not enough to satisfy the food needs of the populace in the area and beyond.

Table 19: Group's Ratings of Biodiversity Indicators in Their Communities

Indicators	Group scores	
	Downstream	Upstream
Diversity of local food system	3	5
Maintenance and use of local crop varieties and animal breeds	2	2
Sustainable management of common resources	2	1
Score Key: 1= very low 2= low 3= medium 4= high and 5= very high		

Source: Field Survey Data (2015)

With regards to the maintenance and use of local crop varieties and animal breeds, both zones indicated that this is in the low range. Also, the response for sustainable management of resources for both zones do not vary so much as it has recorded low and very low responses respectively (Table 13). This clearly shows that sustainable management of common resources is lagging across the entire Black Volta basin.

Knowledge and Innovation

From the results in Table 14, it is clear that innovation and ability to adapt to changing situations has been rated very low by the downstream and in the medial range in the upstream zone. Although traditional knowledge related to biodiversity is been rated very high in the upstream zone and low for the downstream, this is however not documented at all for both zones.
Respect and recognition for women's knowledge has been rated as medium and very low respectively for the downstream and upstream zones (see Table 20).

Table 20 Group's rating of knowledge and innovation indicators

Indicators	Group scores	
	Downstream	Upstream
Innovation in agriculture and conservation practices	1	3
Traditional knowledge related to biodiversity	2	5
Documentation of biodiversity-associated knowledge	1	1
Women's knowledge	3	1
Score Key: 1= very low 2= low 3= medium 4= high and 5= very high		

Source: Field Survey Data (2015)

Governance and Social Equity

As shown in Table 21, it is evident that rights to natural resources are not recognized and disputed and hence rated low for the downstream zone. However, in the upstream zone, the opposite view holds as it has been rated high.

Both zones record that there is either not a multi-stakeholder institution or if present, it is not capable of transparent, participatory and effective decision making.

Table 21: Group's rating of Governance and Equity Indicators

Indicators	Group scores	
	Downstream	Upstream
Rights in relation to land/water and other natural resource management	2	4
Community-based landscape/seascape governance	1	2
Social capital in the form of cooperation across the landscape/seascape	2	1
Social equity (including gender equity)	3	4
Score Key: 1= very low 2= low 3= medium 4= high and 5= very high		

Source: Field Survey Data (2015)

Livelihood and Well-Being

The socio-economic infrastructure such as safe drinking water, hospitals, roads, electricity and schools is not adequate as both the downstream and upstream zones perceive this to be very low and medium respectively. In relation to human health and the environment as well as diversity of sources of household income, this is in the medial range for both zones (Refer to Table 16). On biodiversity and livelihood, the downstream rated this as high while the upstream rated it as medium.

Table 22: Group's responses to their community's Livelihood and Well-Being

Indicators	Group scores	
	Downstream	Upstream
Socio-economic infrastructure	1	3
Human health and environmental conditions	3	3
Income diversity	3	3
Biodiversity-based livelihoods	4	3
Socio-ecological mobility	1	4
Score Key: 1= very low 2= low 3= medium 4= high and 5= very high		

Source: Field Survey Data (2015)

ENVIRONMENTAL AND SOCIO-ECONOMIC CONCERNS AND ACTION PLANS

General Concerns

Endangered species of the Bui National Park

The Bui National Park is a tourist site within the project area with great tourist potentials. Animals within the park include reptiles (crocodiles, soft shell turtles, monitor lizards, viper species), mammals (hippopotamus, antelopes, monkeys, foxes, porcupines, and advac). Various other species of animals exists but in very small numbers. However, because of the construction of the Bui dam, many of these animals have relocated to different ecosystems due to disturbances of their previous habitats. Thus they are yet to be rediscovered.

Charcoal Production

Apart from farming, communities such as Nuoyiri, Brohani, Kamaankpiese, Taselima, Carpenter, Dorboar, Tinga, Wakawaka, Kilanbobile and Jogboi also practice charcoal production to support their livelihood. These communities produce large quantities of charcoal and transport in large trucks to bigger cities. This situation has led to the destruction of many of the trees in these communities which hitherto would have served as habitats for some animal species.

Fishing

Fishing is one of the main sources of livelihood of the people of Jama, Nsuonno and Bamboi communities. This practice is however highly unregulated and the use of chemicals for fishing possess great danger for both animals and humans living in the downstream potions of the reservoir. Some local communities solely depend on this water for their drinking water sources.

Mining (Illegal)

The practice of illegal mining is very widespread in Tinga, Banda Nkwanta and Wassipe communities. The activities of these communities are not only illegal but also cause a great deal of destruction to the water courses and the vegetation cover of such environments. Unfortunately, most of the people engaged in this act are mostly people who are not natives of such communities or Ghana but other migrants from neighboring countries. This impoverishes the indigence as the cost of living in those communities is high due to the mining activities.

Gari Processing

Gari processing is also practiced in some communities within the study area. This is either done by individuals or in groups; usually women groups. A few women groups exist in Bamboi, Bole and Teselima and gari processing is their main form of activity. Their activities however need strengthening and capacity building to ensure the sustainability.

Shea-butter Production

Shea trees are common in the upstream portion of the study area. While some women harvest the fruits, process and sell it to individual traders, others also produce local cooking oil out of the fruits to support their living. This is common at Bole, Kilanpobile and Choriban. Such activity could serve as income generation for the women when their capacity in entrepreneurial skills and marketing are enhanced.

Challenges confronting downstream and upstream communities

Table 23: Overview of upstream and downstream communities of Black Volta River Basin Challenges

Upstream communities challenges
1. Landscape Diversity And Ecosystem Protection • Rampant felling of trees • Burning of forest and vegetation • Miners do not reclaim lands • Invasion of Fulani herdsmen and destruction of farmland and water bodies by free range cattle 2. Biodiversity (Including Agricultural Biodiversity) • Burning of forest and vegetation • Habitat destruction • Illegal mining leading to destruction of water ways and farmlands • Climate change and its effects on life. 3. Knowledge and Innovation • High illiteracy rate 4. Governance and Social Equity • Lack/inadequate social amenities • No multi-stakeholder platforms focusing on the management of natural resources. • No institutional arrangements to tackle rights relating to water or other natural resources. 5. Livelihood and Well-Being • Inadequate socio-economic infrastructure such as boreholes and accommodation for school teachers and students alike. • Insufficient drugs in the various clinics and no availability of money • Poor sanitation which leads to a lot of diseases like malaria • Bush fires caused by hunters and unscrupulous people • Over grazing by Fulani herdsmen. No restriction to their movement • Lack of processing machines for gari and shea butter making • Rising cost of living as a result of small scale mining. • No rules governing the operations of fishermen
Downstream communities challenges
• Climate change effects on their farming system • No rules/ineffective rules governing natural resources • Use of harmful chemicals for fishing and clearing of agricultural lands • Felling of trees for charcoal production • Bush burning • Farming along river banks resulting in chemicals infiltration thereby kill aquatic species • Illegal mining, cutting down of trees, indiscriminate sand winning. Score very low • Inadequate socio-economic infrastructure (especially toilet facility, market and bad road network) • There is less variety of sustainable, income-generating activities

Prioritized Strategic Areas for Implementation

The prioritized strategic areas for implementation for long term solutions include;

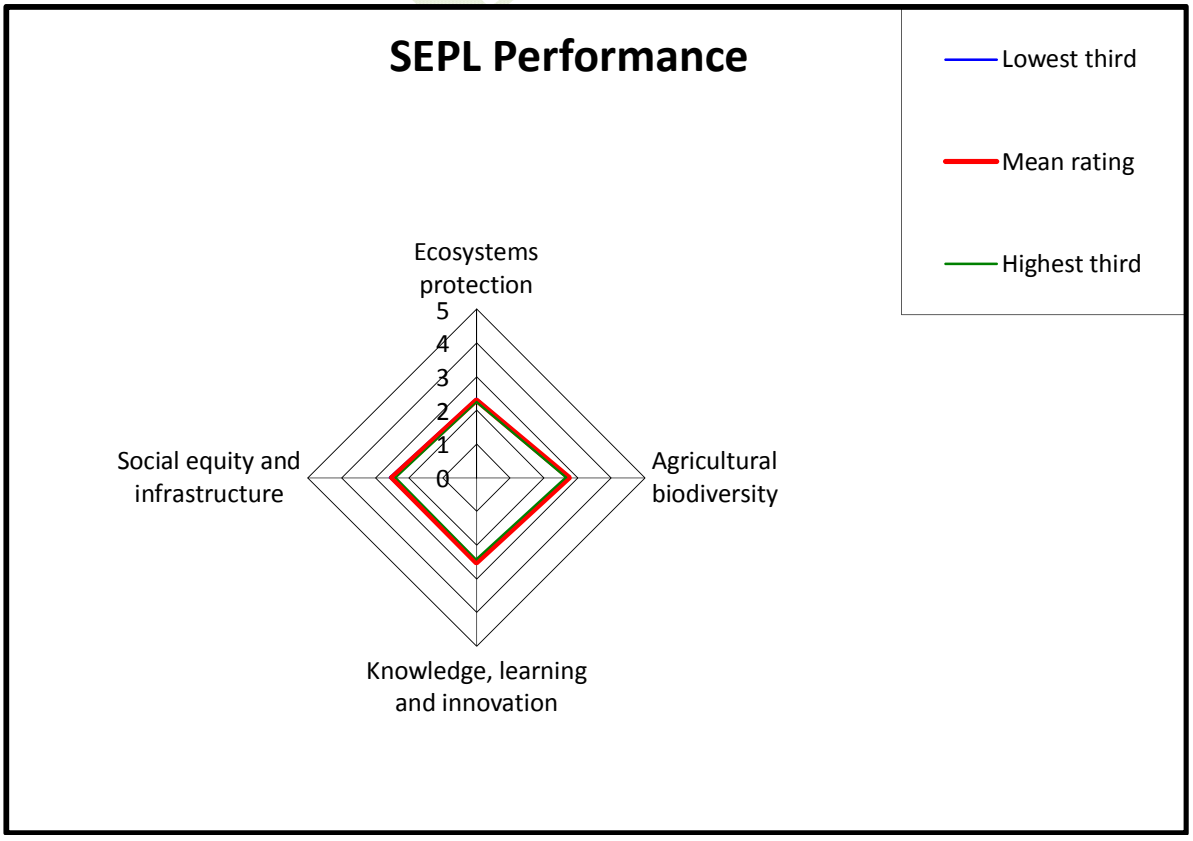
- Introducing climate smart agricultural practices

- Improving the well-being of upstream communities by regulating the framework for activities of Fulani herdsmen
- Re-afforestation of degraded or deforested communities
- Reducing bush burning
- Creation of and enforcement of bye-laws on biodiversity conservation
- Identify and support alternative livelihood strategies with little environmental or ecological disturbances
- Provide socio-economic infrastructure such as boreholes and accommodation for school teachers and students alike
- Provision of multi-stakeholder platforms to focus on disputes and matters of interest in relating to the management of natural resources
- Support institutional arrangements that tackle rights relating to water or other

General Consensus Validation (Radar Diagram)

In summary, the radar diagram presented show below gives the general consensus on the four main themes; ecosystem protection and maintenance, agricultural biodiversity, knowledge management and social equity and infrastructure in terms of prioritization.

The mean rating for ecosystem protection, agricultural biodiversity, knowledge management and social equity and infrastructure are respectively 2.31, 2.76, 2.52 and 2.52 (see excel sheet for details). This means that ecosystem protection, social equity and infrastructure and knowledge management are the areas that require prior promotion.



LESSONS LEARNT AND CONCLUSION

The following conclusions have been drawn from the study:

- Since the construction of the Bui hydro dam, a lot has changed within the Black Volta Basin in Ghana. The size of the reservoir continuous to increase thereby resulting in job losses and massive resettlements.
- Most of the animal species within the Bui National Park can no longer be located because of the destruction of their natural habitats. These animals are yet to be rediscovered.
- No efforts are made in sustaining ecological services such as pollination, pest control, nutrient cycling and water purification via promoting ecological interaction between species in the landscape for both downstream and upstream zones.
- Land uses include cultivated lands, plantations, backyard gardens, irrigation farming, surface mining and fishing. The downstream comprises of stretch of mountains, a national park, and water systems including the Black Volta reservoir near Jama community.
- Ecosystems are generally over stressed thus very slow to recovery and regeneration.
- Sustainable management of common resources is lagging across the entire Black Volta Basin.
- Charcoal production is common among upstream communities and is causing a lot of destruction to forests and the vegetation.
- Illegal mining and the use of unfriendly environmental practices such as felling of trees, destruction of watercourses and pollution of water bodies with chemicals used for mining operations is very common in the upstream sector.
- In both upstream and downstream sectors, there is no multi-stakeholder capable of transparent, participatory and effective decision making in relation to the management of the environment.
- The socio-economic infrastructure such as safe drinking water, hospitals, roads, electricity and schools is not adequate as both the downstream and upstream zones perceive this to be very low and medium respectively
- Livelihood support activities such as gari processing, shea butter production, charcoal production and fishing exist within the study area but these however needs to be strengthened. Appropriate technologies to maximize productivity are lacking.

2 VALIDATION WORKSHOP

5.1. BACKGROUND

A stakeholder validation workshop was conducted to validate the outcomes contained in the baseline survey report. Stakeholders from both upstream and downstream were brought together. Major stakeholders included:

- Representatives of the District Assemblies (Jaman North, Bole, Banda and Tain)
- Representative of NADMO
- Representative of Non-Formal Education Division
- Representative of the Ghana Police Service
- Representative of the Ghana National Fire Service
- Representative of Chiefs/landowners
- Researchers
- Assemblymen
- Representatives of NGO's
- Opinion leaders and
- Representatives of shea butter and Gari processing

Key findings of the baseline survey report were summarized for participants to better appreciate the outcomes and make their inputs, comments and recommendations.

2.4 PARTICIPANTS VALIDATION OF BASELINE OUTCOMES

During this session, the participants were put into two groupings; upstream and downstream groups. This is to facilitate a better appreciation of the challenges and proposed community solutions outlined in the baseline survey report and draw spatial maps of the challenges and mitigation measures thereof.

2.4.1 Upstream challenges (spatial)

The challenges identified in the upstream zone include:

- Rampant felling of trees along the Bamboi-Bole main road for charcoal production
- Widespread burning of forests and vegetation especially during dry season
- Illegal mining and non-reclamation of mine sites
- Invasion of farmlands by Fulani Herdsmen
- High illiteracy rate
- Lack/inadequate social amenities
- No multistakeholder platform for the safeguarding of the environment
- Insufficient drugs and medical facilities at Health Facilities
- Lack of equipment for Gari and Shea butter processing
- Rising cost of living especially in mining communities
- Chemical pollution by illegal miners and fishermen
- No markets for farm products

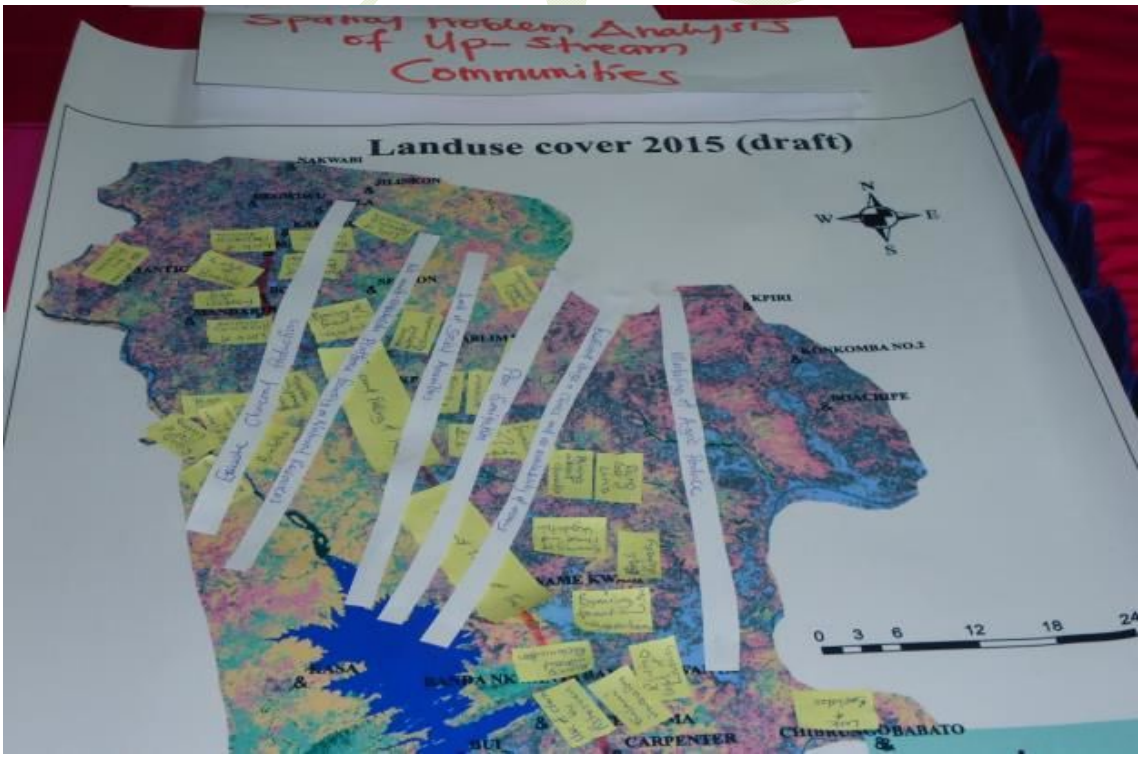


Figure 13: All these are spatially represented in the figure below by the upstream participants

2.4.2 Upstream mitigation strategies (spatial)

The mitigation strategies identified as shown in the figure below include:

- Reforestation of degraded areas
- Enforcement of by-laws relating to the environment

- Formation of fire volunteer groups
- Creation of multi-stakeholder platforms
- Capacity building on the adoption of climate smart agricultural practices
- Provision of socioeconomic infrastructure
- Establishment of market centers

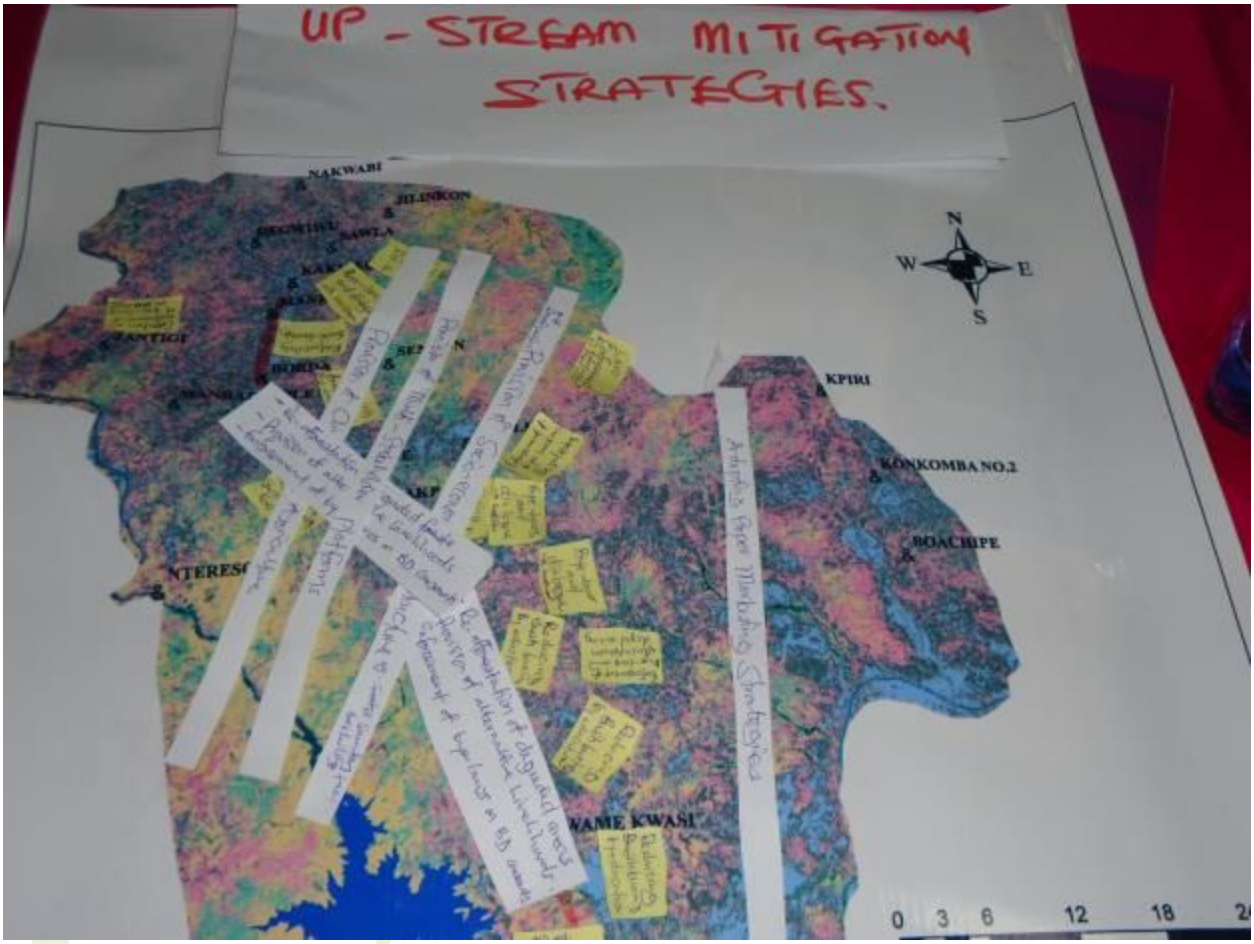


Figure 14: Mitigation Strategies

2.4.3 Downstream challenges (spatial)

The major challenges identified by downstream participants include:

- Felling of trees for charcoal production
- Illegal mining
- Bush burning
- Less variety of sustainable income generating activities
- Poor sanitation
- Poor road network to create access routes for agricultural produce

These challenges are spatially represented below

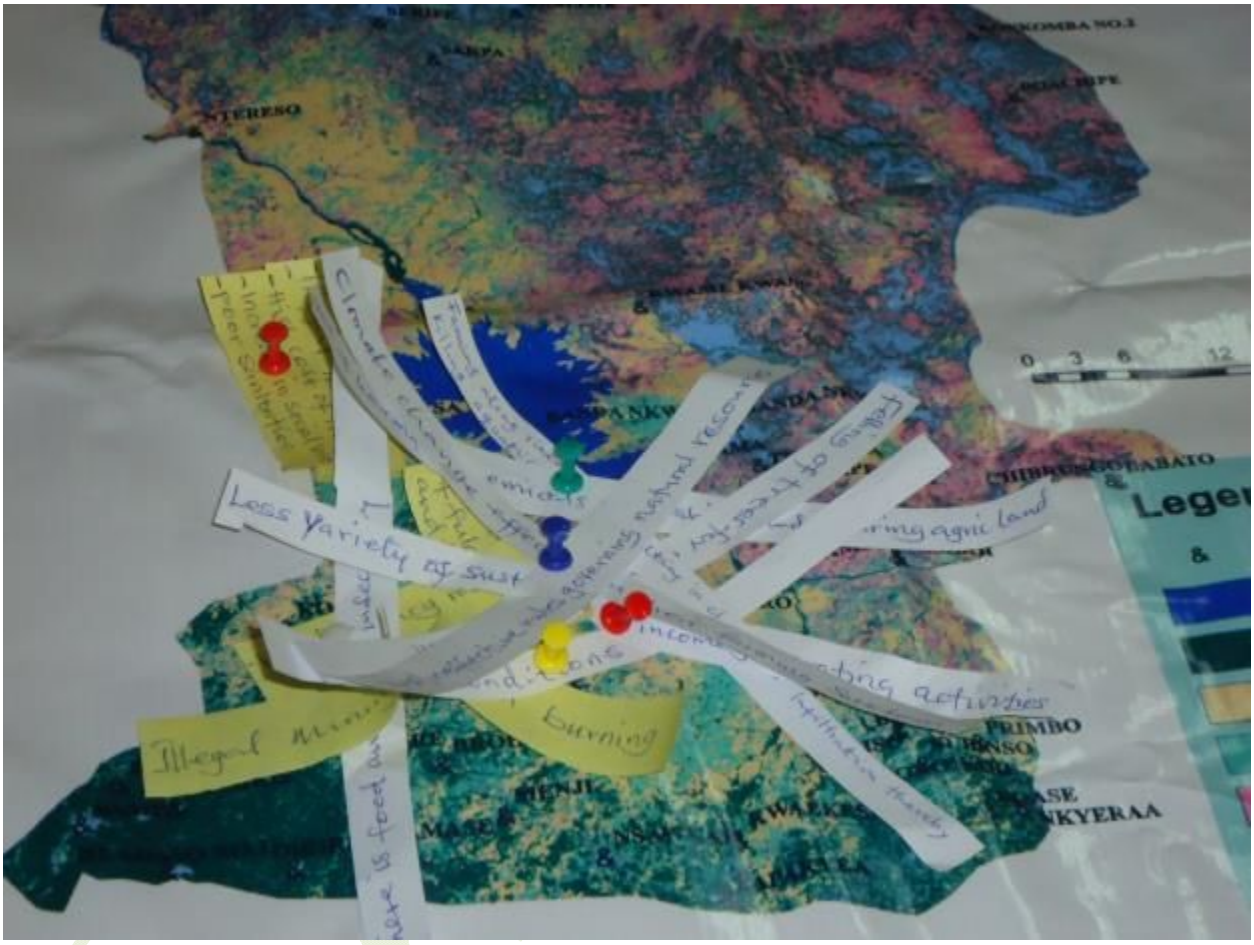


Figure 15: Spatial challenges (Upstream)

2.4.4 Downstream mitigation strategies (spatial)

The mitigation measures proposed by the downstream group include:

- Land reclamation
- Formulation and enforcement of by-laws on environmental conservation
- Maintenance of access roads to promote the easy marketing of cashew
- Provision and enhancement of sanitary facilities
- Reforestation

The figure below outlines these mitigation measures.

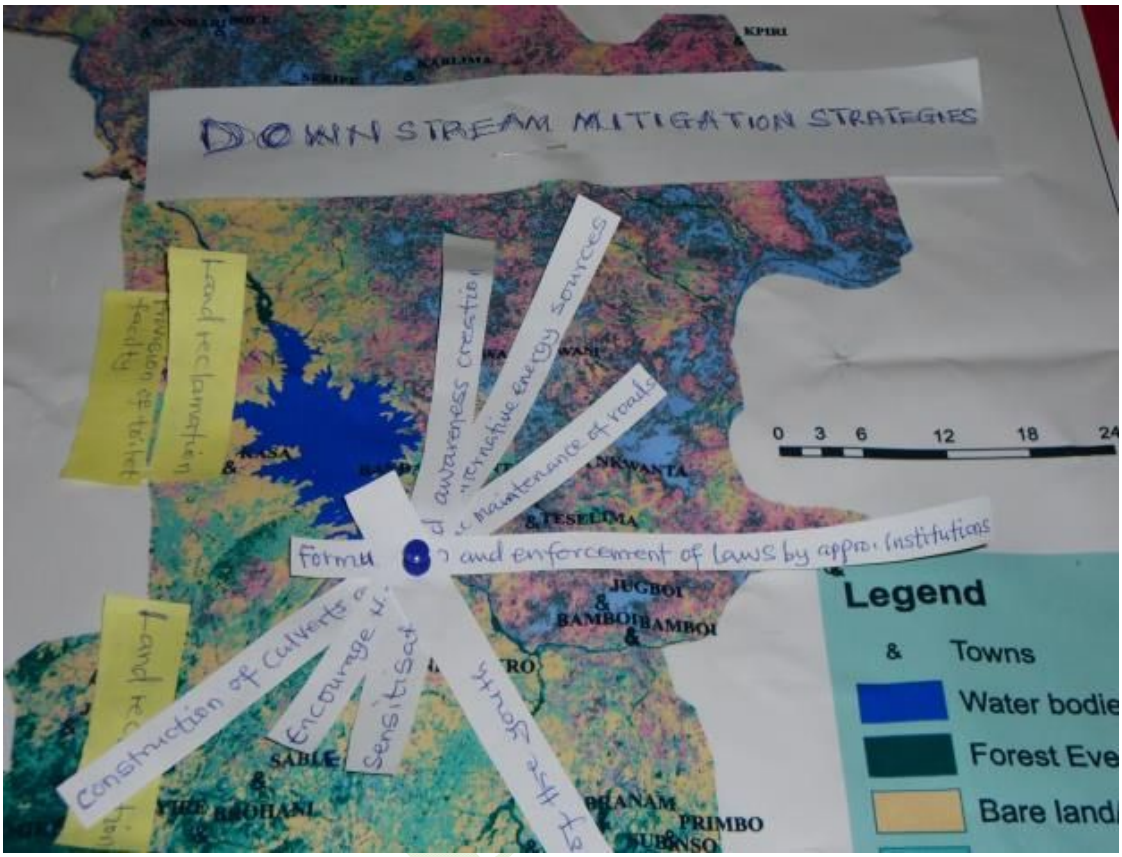


Figure 16: **Spatial mitigation downstream**

5.3. LANDSCAPE PROBLEM ANALYSIS

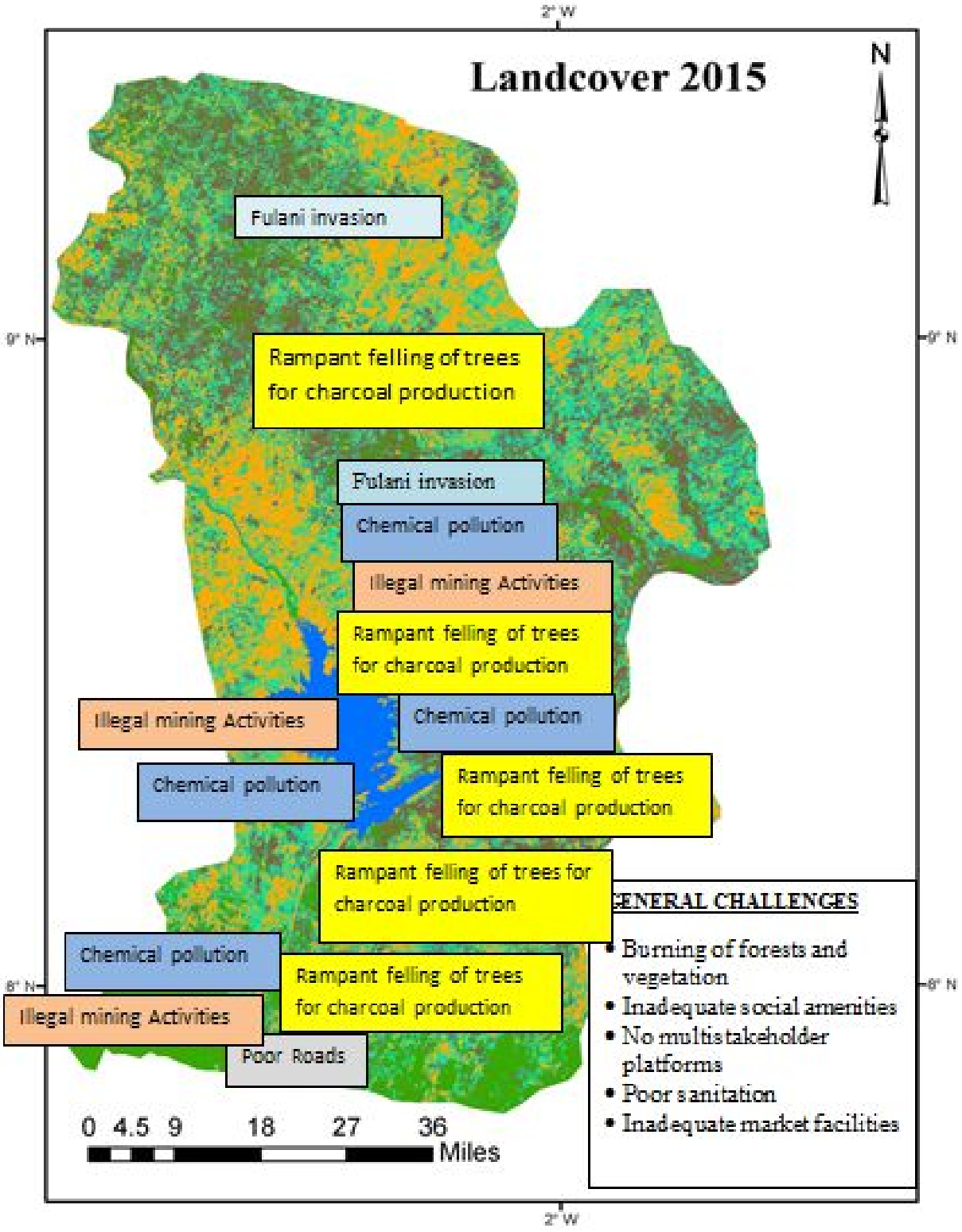


Figure 17: General challenges for both the downstream and upstream zones

5.4. LANDSCAPE MITIGATION MEASURES

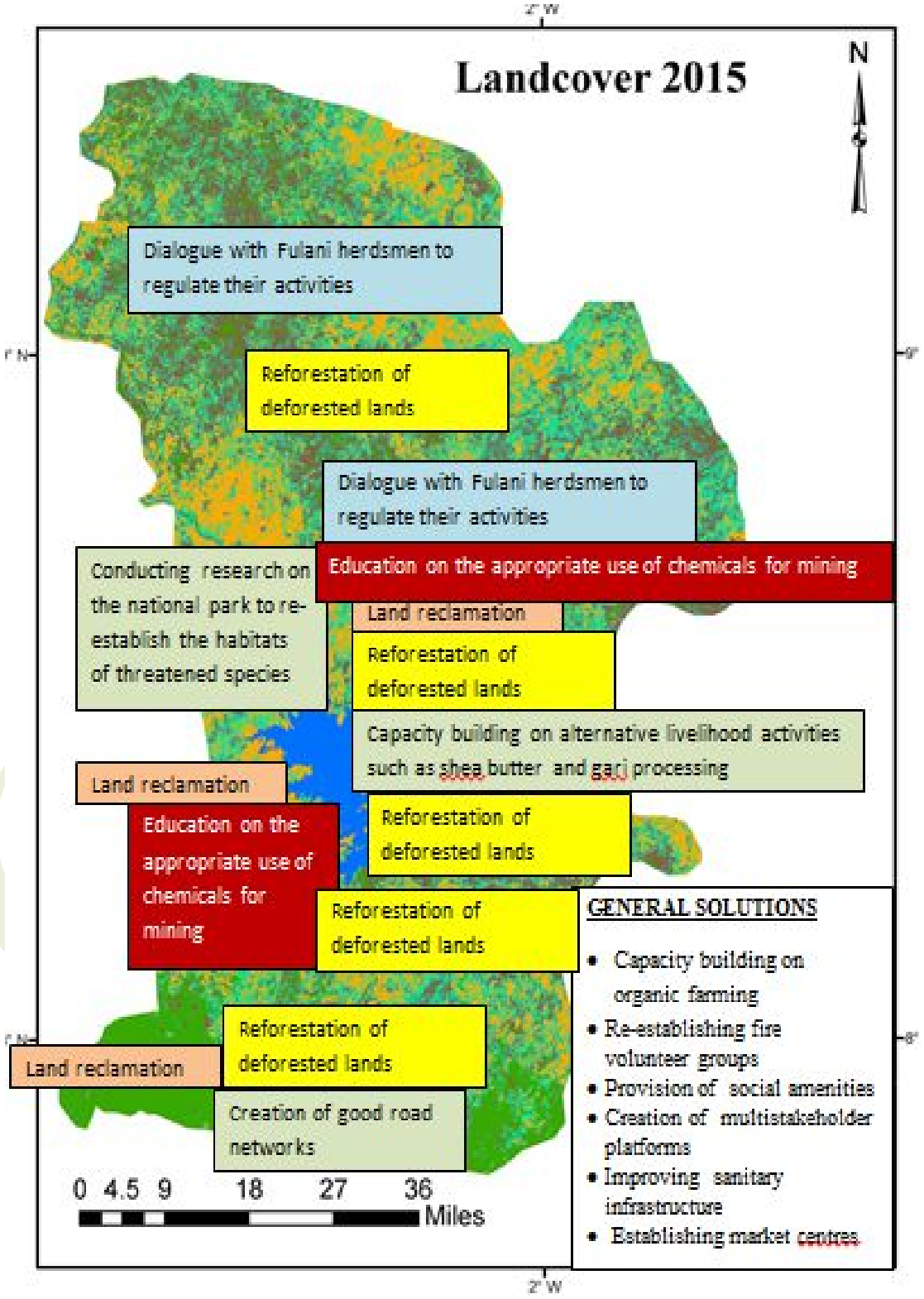


Figure 18: Spatial mitigation measures to the challenges

BIBLIOGRAPHY

Allwaters consult Ltd (2012). Diagnostic Study Of The Black Volta Basin In Ghana. Final Report

Ampomah, B., Adjei, B. and Youkhana, E. (2008). The transboundary water resources management regime of the volta basin. http://www.zef.de/fileadmin/webfiles/downloads/zef_wp/wp28.pdf

Andreini M., van de Giesen N., van Edig A., Fosu M., Andah W. (2000). Volta basin water balance. ZEF-Discussion Papers on Development Policy No. 21 Center for Development Research (ZEF), Bonn, March 2000.
Atulley Joan Akandi (2013). Impact Of Small Reservoirs And Dugouts In Ghana On Hydrology And Water Allocation In The Black Volta Basin. MSc.THESIS. http://ir.knust.edu.gh/bitstream/123456789/5380/1/Atulley per cent 20Joan per cent 20Akandi.pdf

Barry B., Obuobie E., Andreini M., Andah and Pluquet M., (2005). The Volta River Basin: Comprehensive Assessment of Water management in Agriculture. Comparative Study of River Basin Development and Management.

Basin Focal Project, Volta (2008).

Gorden C, and. Amatekpor J. K., (1999): The Sustainable Integrated Development of the Volta Basin in Ghana. Volta Basin Research Project, University of Ghana, Legon.

Groundwater Quality in Ghana. WaterAid Working Document. Published By British Geological Survey, 2002. *Hydrological Study of the Black Volta Basin - Upper West Region Water Audit Section by Allwaters Consult ltd*

GSS (2014). 2010 Population and Housing Census
Gymfi Charles (2012). Enhancing Cooperation In water resources management within communities in the Black volta basin. MSc Thesis. http://ir.knust.edu.gh/bitstream/123456789/6547/1/CHARLES per cent 20GYAMFI.pdf

IUCN (2003). International Union for the Conservation of Nature (IUCN) Project for Improving Water Governance in the Volta River Basin (PAGEV) Final Project Document. IUCN-BRAO, West Africa Regional Office, Ouagadougou, Burkina Faso

Kortatsi B., (1997). Ghana Water Resources Management Study. Information Build Block on Geology and Groundwater.

Larmie S. A. and Annang T. Y. (1996). Volta Basin - Hydrological Information on Water Quality. Interim Report.

Martin N., and van de Giesen N. (2005). Spatial Distribution of Groundwater Production and Development Potential in the Volta River Basin of Ghana and Burkina Faso. International Water Resources Association. Water International, Volume 30, Number 2, Pages 239–249, June 2005.
Quandzie Stephen (2012): Potential For Increasing Agricultural Water Productivity In The Black Volta Basin, Ghana. MSc. Thesis

Volta Basin Profile. Baseline Report No. 8. Volta River Basin: Enhancing Agriculture Water Productivity through Strategic Research (2005). Edited by W.E.I. Andah and F. Gichuki.
Winston E.I. Andah, Nick van de Giesen, Charles A. Biney (undated). Water, Climate, Food, and Environment in the Volta Basin. Contribution to the project ADAPT. Adaptation strategies to changing environments. Available: http://www.weap21.org/downloads/ADAPTVolta.pdf (3/10/2015).