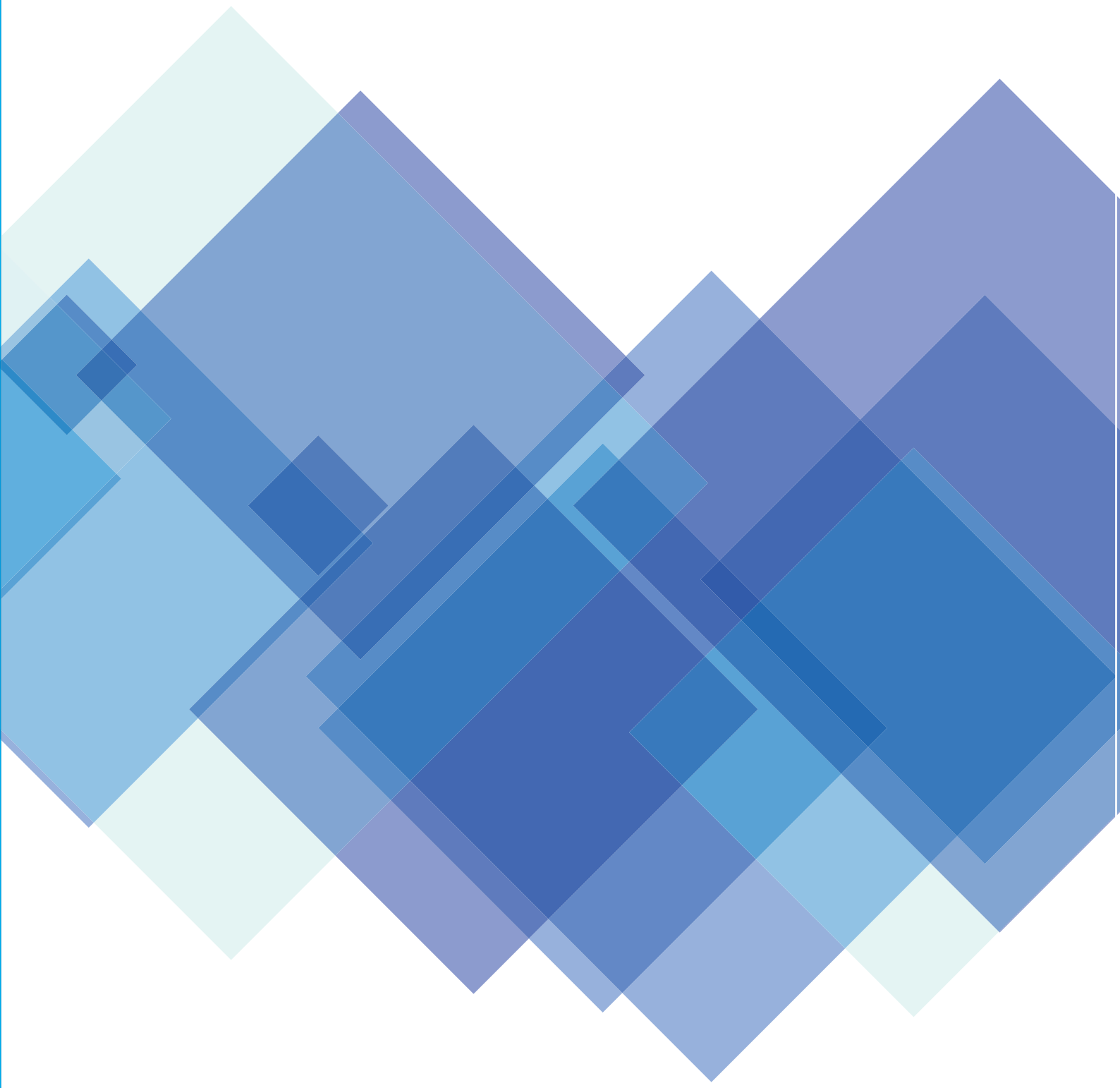
Outlines and Principles for Sustainable Development of the Volta Basin



Global Water Partnership West Africa

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African Minister's Council on Water

Outlines and Principles for Sustainable Development of the Volta Basin

FINAL REPORT

June, 2014

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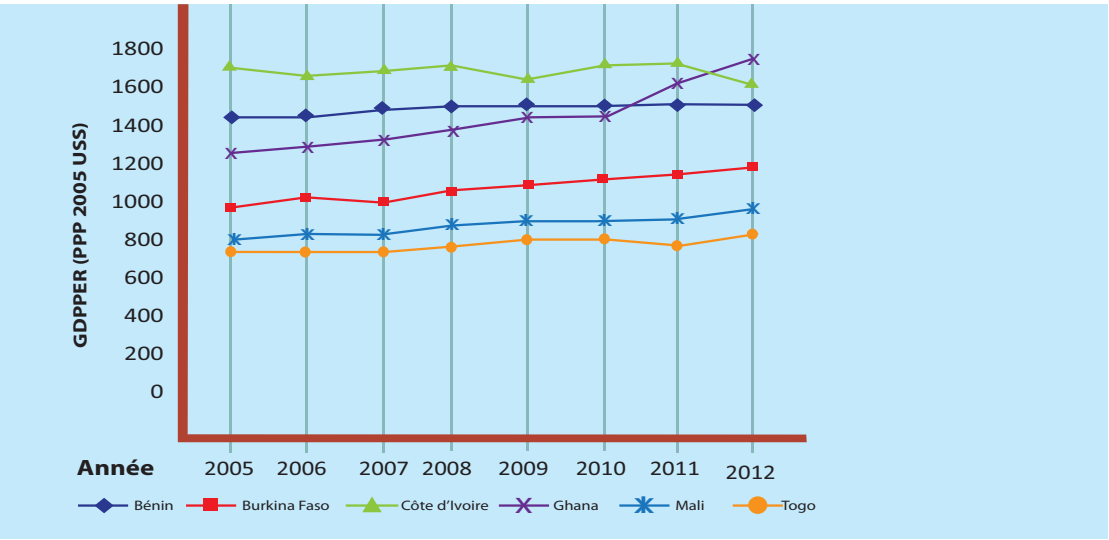
EXECUTIVE SUMMARY

Background

Following a request from the African Ministers' Council on Water in 2009, Global Water Partnership is implementing the Water, Climate and Development Programme (WACDEP) in response to the 2008 commitments expressed by African Heads of State in the Sharm el-Sheikh Declaration on water and sanitation in Africa. WACDEP is intended to support countries and river basin organizations (RBOs) in Africa to integrate water security and climate resilience in their development planning and decision-making processes. At the request of the Volta Basin Authority, this report has been prepared as a deliverable of the WACDEP. It presents the Outlines and Principles for sustainable development of the Volta Basin as part of the elaboration of the Master Plan for Development and Sustainable Water Management (MPDSWM), taking into consideration the aims and objectives of the WACDEP and the uniqueness and development objectives of the Volta Basin.

Trends in the development of the Volta Basin

The countries that share the Volta Basin are generally poor, and poverty is greatest in rural areas. The economic situation has however improved in recent years. There is an upward trend in terms of GDP for most countries, except Cote d'Ivoire which saw a decline from 2005 (Figure 1).



Sources: https://data.undp.org/dataset/GDP-per-capita-2005-PPP-/navj-mda7

Figure 1: GDP per Capita of the Riparian Countries Volta Basin (2005-2011)

The population of the basin which was 18.6 million in 2000 is projected to reach 33.9 million by 2025. It is estimated that 64 to 88% of the population of the basin is rural and lives directly on natural resources, which is a challenge for sustainable management. The implications of rapid population growth, combined with climate change pose a real threat to sustainable development of the Volta River Basin.

The most significant water resources developments in the basin to date are for hydropower generation and located at Akosombo and Kpong in Ghana, and Bagré and Kompienga in Burkina Faso. There are also water abstractions for irrigation, urban drinking water supply and rural drinking water supply in various locations in the basin. Future water developments planned for the basin focus primarily on hydropower generation and irrigation development.

Water development and management priorities for the Volta basin

Considering the development trends and the needs of the riparian countries, some priority actions that need to be considered in the formulation of the MPDSWM may include the following:

- Implementation of measures to expand and intensify irrigated agriculture for food security and poverty alleviation;
- Implementation of measures to improve the sustainability of hydropower development;
- Implementation of measures to acquire essential knowledge to address uncertainty and minimise risk of the identified development opportunities;
- Implementation of measures to address biodiversity conservation;
- Mainstreaming climate adaptation and gender into national development plans

Guiding principles for the development of the Master Plan

At the Global level, the 1997 UN Watercourses Convention provides a useful framework for international relations in the management of shared international watercourses. The VBA Convention and Statutes present the legal as well as political framework for cooperation and transboundary water management in the Volta Basin. In addition, the bilateral agreement between Burkina Faso and Ghana (the Code of Conduct for the sustainable and equitable management of shared water resources of the Volta Basin) offer specific framework principles that are unique in the context of Volta Basin.

Conclusions and recommendations

The Master Plan for Development and Sustainable Water Management will be a strategy-oriented document that outlines the regulations for balanced management of water resources over a period of 10 to 15 years. It will incorporate the choices of all basin stakeholders whose activities impact on water resources and ensure coherence in decision-making by incorporating the different national programmes and sectoral development plans. Specifically;

The MPDSWM should provide an integrated basin perspective against which current and future national water resources development plans can be assessed to ensure an acceptable balance between economic, environmental and social outcomes in the basin, and also ensure mutual benefits to the Volta riparian countries, as required by the Convention;
The MPDSWM should provide the framework through which the infrastructural investments for socioeconomic development can be mobilized in a sustainable, equitable and efficient manner;

The MPDSM should contribute to a wider adaptive planning process that links regional and national planning for sustainable development and management of the Volta basin;
The MPDSWM should consider projected development scenarios over a long-term future to create at least a twenty-year view of basin development and management.

The development of the MPDSM will be grounded on the following:

- Defining the scope of opportunities for water resources development (hydropower, irrigation, water supply, flood and drought management), their associated risks and the actions needed to optimize opportunities and minimize risks;
- Defining other water-related opportunities (fisheries, navigation, environment and ecosystems, watershed management); and
- Providing a coordinated, participatory and transparent process that promotes sustainable development.

1. INTRODUCTION

1.1 Background and Context

The Volta is a transboundary river system that for many years remained one of the major river basins in Africa without legal and institutional arrangements between the riparian countries. To establish measures for the sustainable management of transboundary water resources, the Ministers responsible for water resources of the riparian countries (Benin, Burkina Faso, Ivory Coast, Ghana, Mali and Togo) approved a Convention to establish the Volta Basin Authority (VBA) on 16 July 2006 in Lome. The Convention on the Status of the Volta River and the Creation of the Volta Basin Authority was signed by the Heads of State of the riparian countries during their first Summit held in Ouagadougou on 19 January 2007 under the auspices of the Government of Burkina Faso; the Convention entered into force after ratification on 14 August 2009.

Under Section III, Article 6 of the Convention, the Authority has a mandate to:

• Promote tools for continuous dialogue among stakeholders on the development of the Basin;

• Promote the implementation of integrated water resources management and fair sharing of benefits arising from their different uses;

• Approve works and projects proposed by the involved States that may have a significant impact on the water resources of the basin;

• Carry out joint projects and works;

• Contribute to poverty reduction, sustainable development of the involved States and to better socio-economic integration in the sub-region.

In order to operationalize the Convention and the Statues, a long-term development strategy - Master Plan for Development and Sustainable Water Management (MPDSWM), which is non-existent at the moment, should be formulated as a guiding document for the Volta Basin and its member states that will provide for integrated development and management of the basin's water and other natural resources. As part of its Strategic Plan, VBA intends to prepare such a Master Plan. The MPDSWM will also facilitate the integration of issues such as climate change adaption and environmental and social safeguards into investment planning. The VBA Experts Committee at its 6th meeting in May 2012 finalized the Terms of Reference (ToR) for the formulation of the MPDSWM. The document identified two phases for carrying out the formulation of the MPDSWM, as: 1) the plan development phase and 2) detailed investment programme preparation phase.

Global Water Partnership (GWP) has developed the Water, Climate and Development Programme (WACDEP) with the overarching goal of promoting water as a key part of sustainable regional and national development and to contribute to climate change adaptation for economic growth and human security. WACDEP, which responds to the commitments expressed by African Heads of State in the Sharm el-Sheikh Declaration on water and sanitation, is intended to support countries and river basin organizations (RBOs) in Africa to integrate water security and climate resilience in their development planning and decision-making processes.

The VBA has received support from the Global Water Partnership-West Africa (GWP-WA) as part of WACDEP, to continue the processes of elaboration of the MPDSWM. VBA intends to conduct a study on the Outlines and Principles for the development of the Volta Basin as proposed under Phase 1 of the ToR for the Master Plan, which will:

• Translate the VBA mandate into concrete actions to reduce poverty, protect the environment of the basin and strengthen cooperation among member countries of the VBA;

• Formulate a Master Plan in support of the sustainable

development of the Volta Basin;
• Ensure responsible and sustainable participation of stakeholders in the definition and implementation of the plan;
• Indicate the modalities for organizational setting and implementation as well as provide the VBA with a tool for efficient coordination among the countries;
• Propose sustainable development options, cost and benefit sharing and maintenance of the ecosystem diversity.

The Terms of Reference for the Master Plan are attached as Annex 1 to this report.

1.2 Objective and Scope of the Assignment

The objective of this assignment is to define the Outlines and Principles for Sustainable Development of the Volta Basin as part of the elaboration of the Master Plan for Development and Sustainable Water Management (MPDSWM), taking into consideration the aims and objectives of the WACDEP and the uniqueness and development objectives of the Volta Basin. The Master Plan will be a strategy-oriented document that outlines the regulations for balanced management of water resources over a period of 10 to 15 years. It will incorporate the choices of all basin stakeholders whose activities impact on water resources and ensure coherence in decision-making by incorporating the different national programmes and sectoral development plans.

The MPDSWM will demonstrate a strong commitment of the Volta Basin Authority to institute a coherent management of the basin and will also strengthen the coordination role of the Authority.
In this context, the Terms of Reference for this assignment (Annex 2) proposes the following key tasks for the assignment:
• Analysis of development patterns in the basin;
• Defining the objectives which will become the basis for decision-making with respect to development of the basin through jointly-planned interventions to prevent non-coordinated approaches;
• Defining the technical (development and management), economic, social and environmental principles for the Master Plan.

1.3 Methodology and Approach

The study was based on a review of water resources development and management plans of some transboundary river basins (e.g. Murray–Darling Basin Authority 2010). In addition, a number of documents on the activities of VBA and other relevant stakeholders, institutional frameworks, strategies, policies and reports that have bearing on water security and climate change were also reviewed. Socio-economic and development trends in the Volta Basin were analysed, focusing on key and emerging climate change issues that are most likely to shape development of the Volta Basin and its natural resource use over the coming years.

The study draws extensively on the following reports: i) Environmental and Socioeconomic Assessment of the Volta Basin - Analysis of problem areas and issues regarding sustainable management of water resources (VBA/Observatory, 2012), Transboundary Diagnostic Analysis (TDA) of the Volta Basin (UNEP GEF Volta Project, 2013a) and the recently completed Strategic Action Plan (SAP) for the Volta Basin (UNEP GEF-Volta Project, 2013b). It explores the linkages between the SAP and the expected basin planning framework and proposes guidelines through which the Master Plan will be formulated. Extensive consultations with the Staff of VBA were undertaken at all stages of preparation of the study.

A workshop was organised to validate the report. Based on the outcomes of the consultations the draft report was finalized. The list of participants at the workshop is presented in Annex 3.

1.4 Report Structure

The report comprises four (4) Sections organised as follows: This introductory Section 1 outlines the background and context for the study following which the objectives and approach for the assignment has been introduced.

In Section 2, a summary of socio-economic development trends in the Volta Basin is outlined, focusing on key and emerging socioeconomic issues that are most likely to influence development of the Volta Basin and its natural resource. The key environmental and climate change challenges to the development in the basin are then analysed, following which the opportunities for addressing the transboundary challenges are identified.

Section 3 details the objectives for decision-making on jointly planned interventions. It highlights the following: i) the water development and management priorities; ii) development objectives of the MPDSWM; and iii) Steps in formulating the MPDSWM. Section 4 highlights some generic principles which will serve as guide to the formulation of the Master Plan. The concluding Section 5 provides the way forward with specific recommendations for studies that need to be undertaken towards the development of the MPDSWM.

2. TRENDS IN THE DEVELOPMENT OF THE VOLTA BASIN

In this section, key and emerging socioeconomic issues that are most likely to shape development of the Volta basin and its natural resource use over the coming years are discussed.

2.1 Socio-economic Trends in the Volta Basin

According to demographic statistics, the population of the basin was 24 million in 2010 and is projected to reach 33.9 million in 2025 (UNEP/GEF-Volta TDA, 2013). The population is predominantly rural, 64% to 88%, and this will continue into the foreseeable future, despite a trend towards urbanization which also increases pressure on resources. The rapid population growth suggests that there will be increasing pressure on the natural resources, notably water. This strong population growth in the basin will also impact on existing infrastructure and will have social and political consequences;

2.1.1 Economic Profile of the Basin Countries

The countries that share the Volta Basin are generally poor, and poverty is greatest in rural areas.
There has however been an upward trend in terms of GDP for most countries in recent years except Cote d'Ivoire which saw a decline Fig. 2.1.

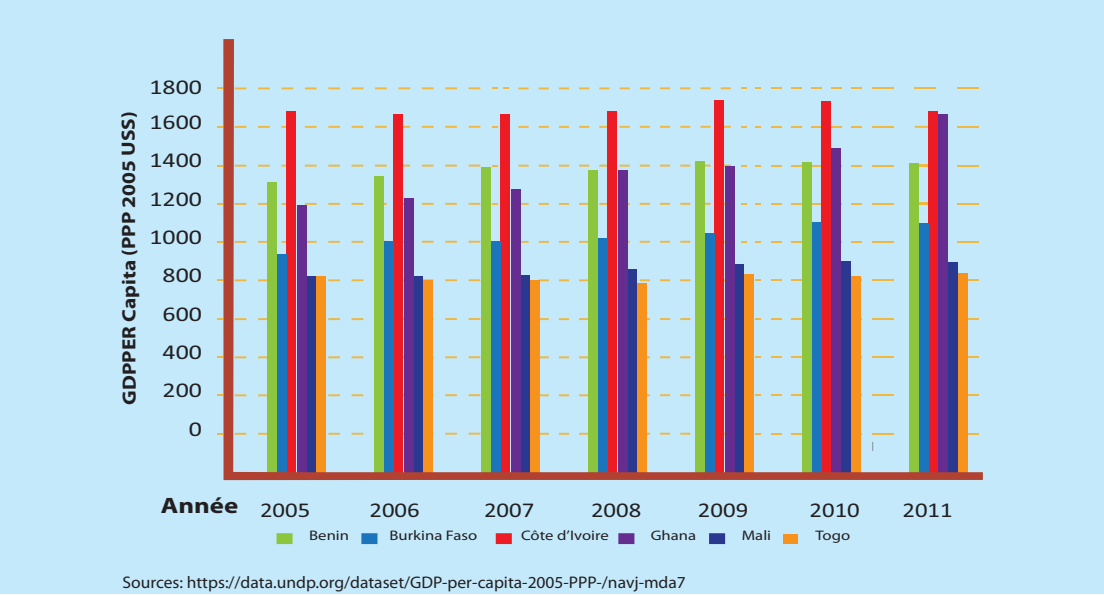
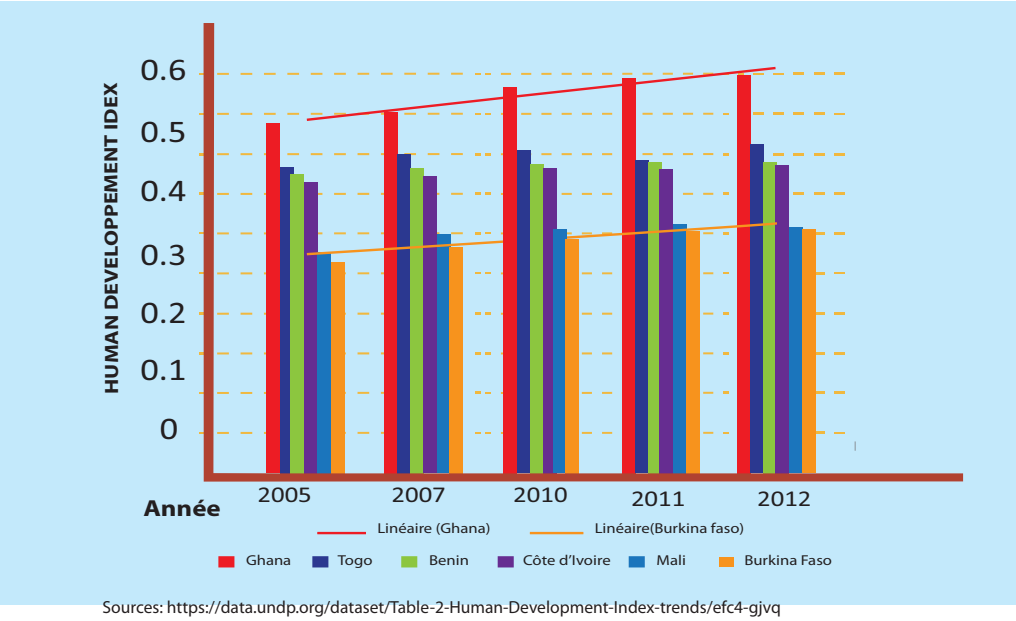


Figure 2.1 : GDP per Capita in the Riparian Countries of the Volta Basin (2005-2011)

However, economic growth is not stable, and varies from country to country with agriculture remaining the mainstay of the basin economy. In some countries, the high costs of energy and agricultural inputs, and low yields due to climate change have thwarted industrial production. In fact, the riparian countries of the Volta Basin experienced reduced productivity between 2006 and 2008 in terms of food processing; a fact that can be attributed to low agricultural production and the high cost of agricultural inputs (GEF-Volta SAP, 2013).

The rising cost of food has also led to high inflation in these countries. Using the Human Development Index (HDI) to assess progress made by countries in the basin, countries like Ghana, Benin, and Togo have witness improvements in human development (Figure 2.2).



Sources: https://data.undp.org/dataset/Table-2-Human-Development-Index-trends/efc4-gjvq

Figure 2.2 : HDI Trends in the Volta Basin (2005-2012)

2.2 Development trends

The most significant water resources development in the basin to date is the construction of the Akosombo Dam, which was built between 1961 and 1965 for hydropower generation and created the Volta Lake. Other hydropower generation infrastructure include the Bagré and Kompienga dams in Burkina Faso. A number of small, medium and large reservoirs have been constructed primarily for irrigation and hydropower generation. Details of major existing reservoirs are listed in (Table 2.1). In addition, a number of informal irrigation schemes exist, especially in urban areas, but there is not enough information on the extent of their operations. There are nearly 2,000 such small dams and dugouts spread across regions in Burkina Faso and northern Ghana with estimated combined storage of approximately 230 Mm3. On the whole, hydropower and irrigation potentials in the Volta basin are undeveloped.

Table 2.1: Major Reservoirs in the Volta Basin

Sub-basin / Catchment	Name of dam /scheme	Location /Country	Storage Capacity (Mm^3)	Irrigated area (ha)	Installed hydropower capacity (Mw)
Black Volta Basin					
Nwokuy	Nwokuy Irrigation	Burkina Faso (BF)	-	3,291	-
	Lerinord	BF	-360	9,646	-
Dapola	Dapola Irrigation	BF	-	1,362	-
Noumbiel	Noumbiel Irrigation	BF	-	230	-
Bamboi	Subinja	Ghana (GH)	135	110	=
Bui	Bui	GH	12,570	30,000	400
White Volta Basin					
Wayen	Kanozoe	BF	75	5,319	-
	Loumbila	BF	42	-	=
	Ziga	BF	200	-	-
Yakala	Bagré	BF	1,700	4,695	10
Nagodi	Nangodi Irrigation	BF	-	184	-
Nawuni	Tono	GH	93	2,430	-
	Vea	GH	16	850	-
Oti River Basin					
Kompienga	Kompienga	BF	2,025		14
Sabari	Sabari Irrigation	GH		1,915	-
Lower Volta Basin					
Prang	Tanoso	GH	125	129	
Senchi	Amate	GH	120	308	
Lower Volta	Akosombo	GH	148,000	-	1,020

Sources: Adapted from McCartney, M. et al. 2012. IWMI Research Report 147

Future water developments planned for the basin focus primarily on hydropower generation and irrigation development.

Table 2.2: Planned Water Resources Development in the Volta Basin

Sub-basin /Catchment	Name of dam /scheme	Location /Country	Storage Capacity (Mm^3)	Irrigated area (ha)	Installed hydropower capacity (Mw)
Black Volta Basin					
Nwokuy	Samandeni	Burkina Faso	610	5,000	2.4
	Bonvale	Burkina Faso	130	-	0.3
Dapola	Bagri	Ghana		100	-
	Bontioli	Burkina	320	-	5.1
	Bon	BF	2,000		7.8
Noumbiel	Duuli	GH		150	
	Gbari	Gh		100	
	Noumbiel	BF	11,300	7,800	48
	Gongourou	BF	1,000		5
	Koulbi	Ghana	2,950		68
	Ntreso	Ghana	1,370		64
	Lanka	Ghana	-	-	95
	Jambito	Ghana	760		55
White Volta Basin					
Nawuni	Daboya	Ghana	3.430	50	43
	Pwalugu	Ghana	3,260		50
	Kulpawn	Ghana	7,200		40
	Dipala			100	
	Sogo			100	
Yakala	Bage Aval	Burkina	107		14
Nangodi	Bandongo	Burkina	480		3
Oti River Basin					
Sabari	Juale	Ghana	1,200		87
	Namiele	Togo		1.250	
	Wakuti	Togo		1,350	
Mango	Arli	Burkina			0.92

Sources: Adapted from McCartney, M. et al. 2012. IWMI Research Report 147

2.3 Main Transboundary Challenges and Opportunities

The Volta basin faces a number of challenges in the management of water and other natural resources including high climate variability, water scarcity and generally weak institutional capacity. The baseline situation assessment of the Volta Basin carried out by the VBA Observatory and through the UNEP-GEF Volta Transboundary Diagnostic Analysis (TDA), identified six priority transboundary issues and problems, which have been grouped into three distinguishable clusters as follows:

a. Changes in water quantity and seasonality flows;

b. Degradation of ecosystems, leading to:

i. loss of soil and vegetative cover,

ii. increased sedimentation in the river courses,

iii. coastal erosion downstream of the Volta river basin and

iv. aquatic invasive species

c. Water quality deterioration (from agricultural, industrial and domestic/municipal effluents).

Additionally, climate models show temperatures in the Volta basin rising by between 1.5oC and 2oC over the next century, which the scientists warn could significantly increase water lost through evaporation (McCartney et al., 2012). The models also indicate average annual rainfall could drop by about 20 percent. It is estimated that water flows in the Volta basin could fall by 24 percent by 2050 and by 45 percent by 2100, depriving the basin of water that countries are counting on to drive hydropower production and food security.

These issues and challenges contribute to related problems of desertification that exacerbate climate change impacts (flooding and droughts), and devastate livelihood especially of the rural poor. In addition to the above, there are cross-cutting issues such as limited availability of reliable and

useable climate information and generally weak institutional capacity. Information is key in planning for adaptation to climate change.

Countries lack the capacity and resources to track meteorological patterns, forecast impacts and assess risk, and are unable to target the public investments and develop policies that can reduce vulnerability. Building climate resilience requires multi-level actions across multiple sectors, particularly water resources, land use/forest, agriculture, health, etc.

There are also linkages with other policies such as poverty reduction and planning for sustainable development. These challenges will be taken into consideration and addressed when developing and implementing any future Basin Plans.

2.4 Opportunities for Addressing the Transboundary Challenges and Problems

2.4.1 National IWRM programmes

Water cuts across all aspects of development and IWRM comes in handy as a holistic tool to deal with the multiple challenges of water and other natural resources as identified in the Volta Basin TDA. Fortunately, all the riparian countries of the basin are at various stages of implementing IWRM, which can be tailored to help the countries in adapting to climate change. GWP-West Africa is working together with WRCC of ECOWAS to promote IWRM in the sub-region and help countries and stakeholders to operationalize IWRM principles.

At the Global level, all the six basin countries are signatories to the three Rio Conventions (UNFCC, UNCBD and the UNCCD) and are implementing actions to meet their respective obligations under the Conventions. Supporting the countries to fulfil their obligations under the Conventions will present opportunities for VBA to enhance its coordination role with respect to water management and climate change. VBA could as part of the Observatory, establish a framework for monitoring the progress made by the riparian countries with respect to these conventions, which would contribute to water security and climate resilience.

2.4.2 Conservation and restoration of ecosystems

Ecosystems provide essential services such as water supply, agriculture, animal husbandry, fisheries, wildlife, fibre and wood, genetic and biochemical resources, and also play an important role in climate adaptation. For instance they can contribute to flood regulation by attenuating the variability of hydrological events, including in downstream countries. Forests can retain water, thus slowing down run-off, and wetlands have a buffering effect against floods and droughts. Healthy ecosystems increase resilience. Conservation and restoration of ecosystems can contribute to addressing the above transboundary challenges and should therefore be an integral part of strategic objectives of VBA Plan.

The Communication Plan is the appropriate tool for advertising the VBA. Communication is indispensable for an organization operating in a basin as diverse and vast as the Volta to ensure operation in a manner that is not contrary to the set objectives. Thus a Communication Plan must be developed as a matter of priority in order to create awareness of the basin (its resources and problems), inform on actions undertaken and their outcomes, explain the role of the VBA and establish a continuous link with all the partners.

3. SETTING OBJECTIVES AND OUTCOMES

The MPDSWM should include high-level statements of objectives that encompass government, industry, and community views on how the resource is to be managed for environmental and human benefit. Outcomes for the environment, the economy as well as other public benefit should also be explicitly identified, guided by the following principles:

Setting a planning timeframe
The time period covered by the MPDSWM should be considered at the outset of the process of developing objectives and outcomes for the plan.

Setting high-level strategic objectives for sub-basin and themes
The MPDSWM should set outcomes that are to be achieved within the planning timeframe, including an adequate description of both outputs and outcomes to ensure that progress can be assessed. These should include the broad direction for water resource management (e.g. a water plan in an irrigation area will have different objectives from an urban river system)

Assessment of trade-offs and risks for a range of competing outcomes
Using the best available scientific and socio-economic analyses, scenarios of possible impacts (including of climate change) on future water use should be developed.

3.1 Water Development and Management Priorities

The foundation for a future MPDSWM is provided by the VBA Convention, its vision, and mission statements. The principles espoused in Section 4 of the Convention provide guide for the development of the MPDSWM. The MPDSWM should bridge the gaps by providing a mix of structural and non-structural, regulatory and economic instruments and measures to address climate change risks as well as other priority problems such as those identified in the TDA of the Volta basin. The MPDSWM should provide an integrated basin perspective through which current and future national water resources development plans can be addressed to ensure an acceptable balance between economic, environmental and social outcomes in the basin, and also ensure mutual benefits to the countries of the Volta basin, as required by the Convention.

Some priority actions to be considered include the following:

3.1.1 Implementation of measures to expand and intensify irrigated agriculture for food security and poverty alleviation

The MPDSWM will target expansion and intensification of irrigation, which will significantly increase agricultural production, food security, farm incomes and employment. This is currently under consideration in the basin countries but there is scope in many areas for increasing agricultural yields and generating higher farm incomes through improved varieties and farming practices. Drought mitigation strategies are also needed for rainfed areas; in some areas groundwater will be part of the solution.

3.1.2 Implementation of measures to improve the sustainability of hydropower development

The MPDSWM will emphasise the need for evaluating options for development of sustainable hydropower, addressing the risks of hydropower expansion, and assessing alternative energy options to reduce dependence on hydropower in the face of climate change.

3.1.3 Implementation of measures to acquire essential knowledge to address uncertainty and minimise risk of the identified development opportunities

The uncertainties and risks associated with basin development opportunities, including uncertainties of climate change, require that a range of initial studies of strategic importance are conducted to fill knowledge gaps and to develop risk mitigation measures, as required.

3.1.4 Implementation of measures to address biodiversity changes.

Using baseline information, the MPDSWM will identify the consequences of development on biodiversity and formulate suitable indicators for monitoring biodiversity loss. One key approach is to consider flagship species such as fish, but a broader view is needed to protect species that are an integrated part of wetland functions and services, requiring the mapping of ecosystem units and habitats and the roles of water, sediment and nutrient flows;

3.1.5 Implementation of measures to monitor social impacts

The MPDSWM will investigate the impacts and risks of ongoing and planned development on the lives of women and men in the basin and identify solutions to minimise/mitigate them.

3.2 Development Objectives of the MPDSWM

The development objectives of the MPDSWM will be a mix of the objectives derived from the VBA Strategic Plan and key development objectives related to socio-economic developments and environmental protection. Table 3.1 indicates the strategic objectives in terms of deliverables by the MPDSWM in the medium- to long-term.

Table 3.1: Development Objectives of the MPDWM

Primary Objectives	Development Objectives
1 Economic Development	1.1 Increase irrigated agricultural production
	1.2 Increase hydropower production
	1.3 Improve navigation of river courses
	1.4 Decrease damages by floods
	1.5 Maintain productivity of fishery sector
2. Environmental Protection	2.1 Maintain water quality and acceptable flow conditions
	2.2 Maintain wetland productivity and ecosystem services
	2.3 Minimize channel effects on bank erosion
	2.4 Conserve biodiversity
3. Social Development	3.1 Maintain livelihoods of vulnerable resource users (Women and children)
	3.4 Increased employment generation in water related sectors
4. Equitable Development	4.1 Ensure that all six riparian countries benefit equitably from the development of water and related resources
5. Communication and Capacity Building	5.1 Strengthen the knowledge base of the Volta basin
	5.2 Develop and implement plan for stakeholder participation and capacity building
	5.3 Identify and establish partnerships and networks
6. Improved Governance	6.1 Prepare the Water Charter for the Volta Basin
	6.2 Prepare the Master Plan for the Volta Basin
	6.3 Support and reinforce sustainable regional cooperation for management of transboundary use of water resources
	6.4 Improve and harmonize regulations and safety standards on hydro - infrastructures in the Volta Basin
	6.5 Support the Volta Basin countries to implement the institutional aspects of their IWRM plans

3.3 Steps in Formulating the MPDSWM

The Master Plan for Development and Sustainable Water Management is a rolling IWRM-based Development Plan that will provide an integrated basin perspective to the basin's development and management. It will incorporate the water development and management priorities identified in section 3.1 with the choices of all basin stakeholders whose activities impact on water resources. It will also ensure coherence in decision-making by incorporating the different national programmes and sectoral development plans. The formulation of a MPDSWM shall be carried out in several stages. Figure 3.1 sets out the generic steps to be taken in water planning. The key feature of the process is the inter-play between national and sub-national plans with basin-level opportunities made possible through effective transboundary cooperation.

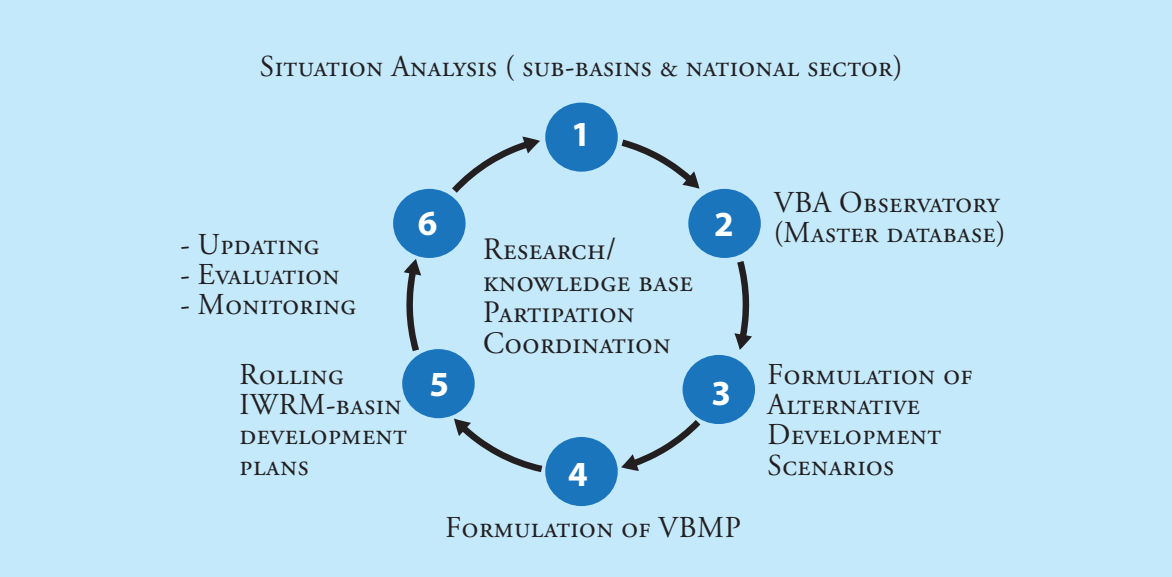


Figure 3 1: Key Stages for Basin Planning

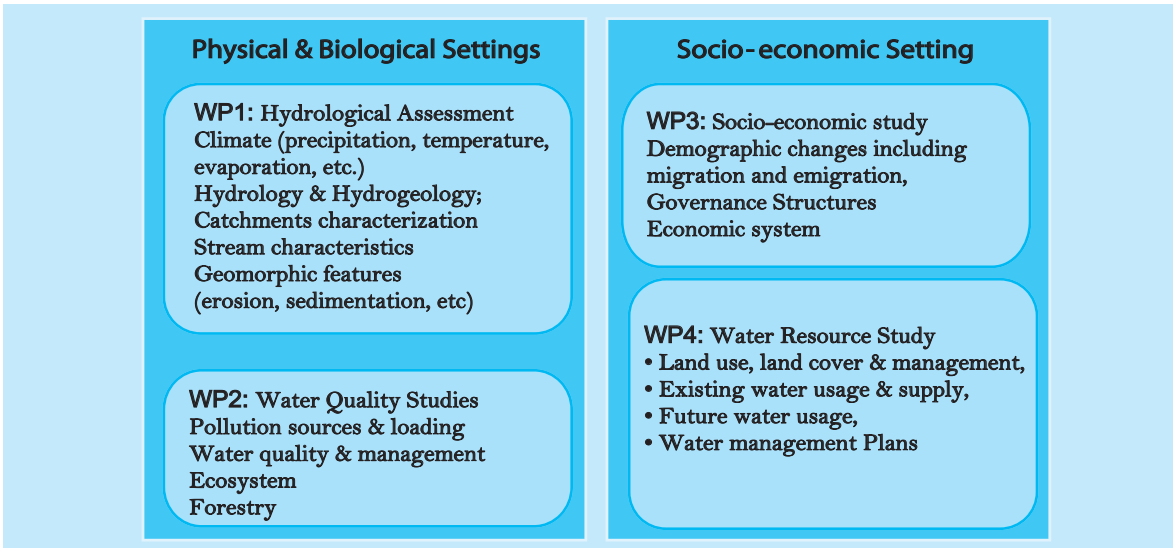


Figure 3 2: Framework for Basin Characterization

Stage 1- Assessment of baseline conditions

The assessment of baseline conditions is to facilitate characterization of the basin. It involves identification of key issues, physical and management characteristics, as well as hydro-meteorological conditions, etc. The activities involved have been put together as work packages (WPs) and illustrated in Figure 3.2.

Some baseline studies have already been conducted as part of the UNEP-GEFVolta Project (2008-2012), GLOWA-Volta Project, CGIAR-IWMI activities and the PAGEV/IUCN Water Audit (2006 and 2012). Additionally, the recent Hydrometeorological and Socioeconomic studies carried out as part of the 5-year VBA Strategic Plan (2010-2014) have updated some of the information needs for a future Master Plan. The information generated is kept by VBA as part of establishment of the Observatory (Master database). The formulation of the MPDSWM will also draw on the vast amount of research and practical application experience that

is available with VBA and its member countries in order to select appropriate criteria for the formulation of scenarios for future basin development (Stage 3).

The plan also recognises that there are inevitably knowledge gaps. A subsidiary objective of the assessment therefore, is to identify critical areas where further research is needed to better understand those aspects of the resource system which have bearing on planning and decision-taking within the basin.

Stage 2- Establishment of an Observatory (Master Database)

The MPDSWM recognizes the importance of establishment of a robust planning database not only to facilitate the current assessments but also to lay a foundation for assessments to be made in the future. The Observatory will serve as a reference base to enhance future development of simulation models, decision support and other analytical tools, while improving the coordination role of VBA. VBA is in the process of completing the establishment of the Observatory with financial support from Fonds Francais pour l'Environnement Mondial (FFEM), co-funding by the Swedish International Development Agency (SIDA)/International Union for Conservation of Nature (IUCN).

Stage 3: Formulation of Alternate Developmental Scenarios

Generating alternate developmental scenarios is an important step in MPDSWM formulation. Each scenario is formulated to represent different combinations of sectoral development, recognizing the synergies and trade-offs between water-related sectors, such as irrigation and hydropower synergies and hydropower and fisheries trade-offs. Various possible measures of water conservation and distribution, integration of their operation and management, conjunctive use of surface and ground water, possibilities of inter-basin transfers are some of the possible courses of actions that may be considered in generating the scenarios. Environmental considerations including water quality aspects and provisions for interstate agreements are also to be kept in view. Main categories of scenarios that may be considered for MPDSWM include:

Baseline Situation – that establishes the reference situation as regards hydrological, economic, environmental and social conditions against which all future developments can be compared. The base date/duration will have to be agreed on (e.g. hydrological situation of 1985-2000 and the socioeconomic situation of the year 2000-2010).

Definite Future Situation – assesses the cumulative impact of developments that are fully expected to occur by for example, 2015 (i.e. have been built since Year 2000, are under construction or already committed), including new dams in the upstream catchments and other significant reservoir developments in the basin.

Foreseeable Future Situation – assesses the impact of plans that the basin countries have put forward for development in the next 15 years (up to 2030), such as mainstream dams, other tributary dams, irrigation expansion, and rising water supply demands.

Long-term Future Situation – looks at two levels of development that might occur in the very long term (next 50 years), as formulated by the countries and how these may impact on near term decisions.

After the scenarios have been generated, the consequences have to be assessed in order to form the bases for deciding on the final plan. Modern analysis techniques such as systems analysis (multi-criteria analysis) and mathematical modelling are mostly used. Climate risk screening of projects, the SEA and EIA are some other assessment methodologies that could be applied to assess the impacts of each scenario.

The various alternative scenarios are studied and the impacts on the developmental objectives are evaluated. Socio-economic benefits that arise, or could arise, will be evaluated only where they are directly linked to development and management of the mainstream (e.g. hydropower generated and irrigation made possible by increased dry season flows) and where they are relevant to the trade-offs to be considered. The scenarios for the foreseeable future and the long-term are assessed with and without the potential impacts of climate change.

Extensive consultation and consensus building between the Volta riparian countries will be required during all aspects of the scenario assessment process. For example, the suitability of models to be used for predicting impacts of water resource developments on flow regime will have to be tested and agreed on by all stakeholders.

Stages 4 and 5: The Master Plan Framework

In general a river basin master plan should cover, but not to be limited to, topics such as basin features, status of water resources development, assessment of water and related resources, development needs and potential projects. The contents of the MPDSWM as proposed by the VBA Experts Committee and Forum of Parties are attached as Annex 2.

Stage 6: Monitoring

A monitoring program should be included in the plan to provide an ongoing assessment of whether the management objectives are being achieved. The design of the monitoring program should take into account available resources (for example, labour, expertise, equipment). In establishing a sustainable water extraction regime for example, the MPDSWM should set a number of outputs or performance indicators by which the outcomes of the water extraction plan can be measured. Possible examples include: maintenance or improvements in water flow regimes and water quality condition, or achieving specific targets in relation to abstraction, recreational use or river navigation.

Reporting and evaluation

Water planning is a cyclical process and its review is an important component. Ideally, the review process will identify lessons that can and have been learned from the previous season or planning period. Similarly, specific identification of the actions taken to address issues that threatened to, or did, compromise the achievement of specified objectives and outcomes should be included in the reporting and review process.

4. THE GUIDING PRINCIPLES FOR DEVELOPMENT OF THE MASTER PLAN

The 1997 UN Watercourses Convention provides a useful framework for international relations in the management of shared international watercourses. The core obligations under the Convention include an obligation to prevent, control and reduce transboundary impacts, such as significant adverse effects on the environment, and their socioeconomic implications; an obligation to ensure a reasonable and equitable use of transboundary waters and an obligation to cooperate in the use and management of such waters.

The VBA Convention and Statutes also present the legal, as well as political framework for cooperation and transboundary water management in the Volta basin. Article 4 of the VBA Convention defines the operational principles for sustainable development of the basin (Box 1). In addition, the bilateral agreement between Burkina Faso and Ghana (the Code of Conduct for the sustainable and equitable management of shared water resources of the Volta Basin) offers specific framework principles that are unique in the context of Volta Basin. The key principles on which the VBA Master Plan will be formulated are therefore based on the VBA Convention, the Code of Conduct and the UN Watercourses Convention. As described below, these have been grouped into general, procedural and substantive principles.

Box 1: Principles for sustainable development of Volta Basin

i. The use of the water resources of the basin and the participation in their development in an equitable and reasonable manner

ii. The general obligation to co-operate for the States sharing the same river basin

iii. The regular exchange of data and information among State Parties

iv. The notification of planned activities that can have negative effects, as well as the related consultation and negotiations

v. Precaution and prevention

vi. The protection and conservation of ecosystems;

vii. The obligation not to cause damage

viii. The notification of emergency situation

ix. The freedom of navigation on the river

4.1 General Principles

Some generic principles to guide basin planning include:

a. Principle of management by hydrographical basin

The States shall adopt and implement an approach based on managing the hydrographical basin as a unit, which is the most appropriate framework for planning, mobilisation, management and protection of water resources.

b. Common heritage principle

i. The water resources of a basin constitute a common heritage for all States and their respective local communities which must be adequately managed and safeguarded.

ii. It shall therefore be the duty of States and local communities to preserve this heritage, particularly the fragile ecosystems for present and future generations.

c. Principle of sovereignty

In accordance with the United Nations Charter and principles of International Law, the States shall have the right to use the water resources according to their development policies, and

to ensure that activities carried out within their jurisdiction are not detrimental to the interests of the other States' territories.

4.2 Procedural Principles:

These guide the way in which the basin planning process should be conducted. They reflect the institutional, political and historical management context in the basin, and may include the following:

a. Cooperation principle

i. The States shall encourage and promote cooperation on all issues of mutual interests in all areas, at all levels to avoid delays or unjustified blockages in the implementation of country specific/joint projects or programmes on conservation or sustainable use of the resources.

ii. To optimize the management of the basin's water resources, States shall encourage transboundary cooperation between the border administrative authorities on the one hand, and on the other, between the trans-boarder local communities. The administrative authorities and the local communities at the border shall be encouraged to set up structures or mechanisms, agreements such as protocols and Memoranda of Understanding,

b. Principle of mutual information sharing

The States shall inform each other on a regular basis with the greatest transparency, on issues and initiatives of mutual interest in relation to the basin.

c. Principle of information, education and sensitization of the public

i. The States shall ensure on a regular basis that the public has access to available data and information on water resources of the basin and also to measures taken or planned for its conservation and sustainable use in accordance with appropriate modalities.

ii. The States shall promote public education and sensitization on the issue of water resources to raise awareness of the public on the importance of sustainable use and conservation of the water resources.

d. Notification principle

i. Whenever a State undertakes actions or takes measures likely to harm the environment or the water resources of the Basin States, this should be notified ahead of time.

ii. The States shall inform each other and their respective local populations concerned as quickly as possible of any emergency situation which may suddenly cause harmful damage to the shared water resources of the basin and should offer mutual assistance in this regard.

e. Compensation principle

The States shall facilitate the compensation of people who are victims of damage resulting from the management of the shared water resources of the basin.

f. Principle of conflicting uses

i. In the event of conflicting uses in a context of water shortage, the States shall pay particular attention to the basic human needs.

ii. No State shall be denied sound and equitable use of the water just under the pretext of preserving the water for future use by another State.

g. Precautionary principle

In the event of serious or irreversible damage to the basin's water resources, the lack of scientifically proved evidence cannot be used as an excuse to delay taking efficient measures which prevent the further degradation of these resources.

h. Principle of sustainable development

i. In the process of the management of the water resources of the basin, States have to balance the use for economic needs with environment protection and social development.

ii. Preservation of ecosystem services is a prerequisite to economic development and social welfare of the people of the basin.

i. Principle of conservation and sustainable use

i. The States shall encourage the conservation and sound

use of the water resources of the basin to ensure sustainability for the benefit of present and future generations.
ii. Further, the States shall ensure the security of the water resources of the basin for the local communities.

j. Principle of equitable use

The States shall make equitable use of the water resources of the basin taking into consideration the legitimate interests and needs of the other riparian States of the basin

k. Principle of subsidiarity

This principle concerns management at the lowest appropriate level, particularly through other institutions, where these have appropriate mandate and capacity.
i. The States shall design policies on the management of the water resources of the basin and implement policies within the appropriate decision making level
ii. The States shall particularly promote a decentralized management of the water resources by recognizing the key role that local institutions have in the conception and implementation of sustainable policies, development programmes or projects in the basin.

l. Principle of participation and mainstreaming gender

i. The States shall involve stakeholders such as civil society organisations, private sector, NGOs, community based organizations, traditional and customary authorities, women and youth groups to play a key role in the management of the water resources of the basin owing to their presence on the ground and their good understanding of the local situation.
ii. The States shall encourage and promote development of partnership and effective involvement of these organizations in designing and implementation of projects and programmes for a sustainable and equitable management of the basin's water resources.
iii. The States shall give priority to the participation of the disadvantaged, women and youth in this process of integrated, sustainable and equitable management of the water resources of the Basin.

m. Consultations and negotiations principle

i. When a notification gives rise to conflict, the States shall consult or negotiate to come to an agreement.
ii. During consultations or negotiations, the States shall refrain from undertaking any initiative likely to aggravate the situation.
iii. Consultations and negotiations shall be conducted in accordance with the principles of International Law.
n. Principle of benefit sharing
The States shall share together with the local population of the basin, the benefits derived from the sustainable use and conservation of the water resources of the Basin.

4.3 Substantive Principles

These guide the strategic development of the basin plan itself, which need to reflect planning priorities and development imperatives of the core stakeholders and may include the following:

a. Principle of environmental and social impact assessment

i. Prior to undertaking any activity on shared water resources, which may bear significant effects on the environment, the States must assess the impact on the environment and people.
ii. The States shall encourage the sharing of the results of environmental impact assessments at appropriate levels and times.

b. Principle of preservation of the quantity and quality of water resources

The States shall agree to safeguard and improve both quantity and quality of water resources of the basin.

c. Principle of prevention of detrimental situations

The States shall adopt relevant measures to prevent human-driven and/or reduce the impact of natural situations that are likely to cause harm to the States, the basin and/or the people. Such detrimental situations may include water borne

diseases, siltation, erosion, and intrusion of salt water, drought or desertification.

d. Principle of controlled introduction of new and foreign aquatic species

The States shall adopt all necessary measures to avoid introduction into the basin, new and foreign species which may cause prejudice to the ecosystem and eventually harm the States.

e. Pollution prevention and polluter pays principles

i. The States shall take all necessary measures to prevent, stop or minimize any possible pollution factors, which may endanger people, the environment and the water resources of the Basin.

ii. If the basin's water resources are severely affected by pollution, the States shall ensure that the concerned polluter bear the costs.

f. Principle of priority conservation of aquatic ecosystems

The States shall give priority to the conservation of the biodiversity of aquatic ecosystems with regard to its role in the regulation and renewal of water resources, and to its social, economic and cultural dimensions.

g. Principle of user pays:

This specifies the principle of meeting the social needs for water as a priority, while recognising the economic value of water and the goods and services it provides. The principle provides incentive for users to reduce their consumption.

5. CONCLUSIONS AND RECOMMENDATIONS

The foundation for a future MPDSWM is provided by the VBA Convention, its vision and mission statements and the above principles for the sustainable development of the basin. It will provide the framework through which the infrastructural investments for socioeconomic development can be realized in a sustainable, equitable and efficient manner.

The MPDSM should:

- Contribute to a wider adaptive planning process that links regional and national planning for sustainable development and management of the Volta basin;
- Consider projected development scenarios over a long-term future to create at least a twenty-year view of basin development and management;
- Provide an integrated basin perspective through which current and future national water resources development plans can be assessed to ensure an acceptable balance between economic, environmental and social outcomes in the basin, and also ensure mutual benefits to the VRB countries, as required by the Convention.

The principles for MPDSM development:

- Define the scope of opportunities for water resources development (hydropower, irrigation, water supply, flood and drought management), their associated risks and the actions needed to optimize opportunities and minimize risks;
- Define other water-related opportunities (fisheries, navigation, environment and ecosystems, watershed management); and
- Provide a coordinated, participatory and transparent process that promotes sustainable development.

Some issues that need to be taken into consideration as part of the basin planning processes include the following:

- Establishing monitoring systems that will have the capability for early detection of ecological and water quality changes;
- Promoting the development and improvement of models (climate and hydrological aspects) and scenarios for the basin;
- Investigating the effects of climate change on various sectors in the Volta basin and evaluating indirect increases in impacts on water resources;
- Conducting a climate vulnerability assessment of basin ecosystems;
- Encouraging the riparian states to promote and apply methodologies and standards for climate-proofing infrastructure projects and integrating climate considerations into EIA and SEA procedures;
- Providing a platform for sharing of research information on climate change in the basin;
- Integrating all knowledge, results and lessons learnt related to climate change threats in the VBA Observatory.

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ANNEXES

ANNEX 1: TERMS OF REFERENCE FOR VBA MASTER PLAN

VOLTA BASIN AUTHORITY

AUTORITE DU BASSIN DE LA VOLTA

Benin – Burkina Faso – Cote d'Ivoire – Ghana – Mali - Togo

DEVELOPMENT OF THE MASTER PLAN OF THE VOLTA BASIN AUTHORITY

TERMS OF REFERENCE

DRAFT 1

22 October 2013

Acronyms and Abbreviations

WRCC	Water Resources Coordination Centre
ECOWAS	Economic Community of West African States
CILSS	The Permanent Inter-State Committee for Drought Control in the Sahel
GEF	Global Environmental Fund
WRMI	Integrated Water Resources Management
GWP	Global Water Partnership
WMO	World Meteorological Organization
GIS	Geographical Information System
WAEMU	West African Economic and Monetary Union
IUCN	International Union for the Conservation of Nature
UNESCO	United Nations Educational, Scientific and Cultural Organization
WWF	World Wildlife Fund

I. CONTEXT

Background

The Master Plan for the development and management of water resources of the Volta basin is designed to satisfy the needs of the population and for the development of economic activities while ensuring a good ecological state of the aquatic environments.

The Volta is a transboundary river, which is shared by six countries in West Africa - Benin, Burkina Faso, Cote d'Ivoire, Ghana, Mali and Togo - that are dependent on its natural resources for their development. In order to institute measures for sustainable transboundary water resources management of the Volta basin, the Ministers responsible for water resources of the riparian countries approved a draft Convention and Statutes for the Volta Basin Authority (VBA) on 16 July 2006 in Lome. During their 1st Assembly in Ouagadougou on 19 January 2007, the Heads of State of the riparian countries of the Volta Basin signed the VBA Convention. The 1st meeting of the VBA Council of Ministers, which was held on 16 November 2007 in Ouagadougou, signed the Statutes and approved the Institutional Framework of the VBA. The Convention on the Status of the Volta River and Establishment of the Volta Basin Authority came into force on 14 August 2009.

Article 6 of the VBA Convention mandates the Authority to:
i. Promote permanent consultation tools among the parties for the development of the basin;
ii. Promote the implementation of integrated water resources management and the equitable distribution of the benefits resulting from their various utilizations;
iii. Authorize the development of infrastructure and projects planned by the stakeholders and which could have substantial impact on the water resources of the basin;
iv. Develop joint projects and works;
v. Contribute to poverty alleviation, the sustainable development of the Parties in the Volta basin, and for better socioeconomic integration in the sub-region.

Before the establishment of the VBA, several institutions had, in reaction to the increasing pressure on the water resources of the basin, initiated various projects and programmes to provide information and develop solutions for sustainable management of the water and other natural resources of the Volta basin.
These include:
• UNEP/GEF Project on Addressing Transboundary Concerns in the Volta Basin and its Downstream Coastal Area;
• IUCN Project for Improving Water Governance in the Volta Basin;
• The Volta HYCOS project with the WMO;
• Challenge Programme for Food and Water;
• The GLOWA Volta Project.

The available documents are listed in the chapter of Administrative Arrangement

VBA Strategic Plan
Towards achieving its mandate and also in order to coordinate the activities of the on-going projects and programmes in the basin, VBA and its partners have developed a Strategic Plan for the period 2010 to 2014 (Annex 1), which aims to facilitate the monitoring of priorities of the Volta basin while avoiding duplication of efforts. The five Strategic Objectives of the 5-year Strategic Plan are:
i. Strengthening policies, legislation and institutional framework;
ii Strengthening the knowledge base of the basin;
iii. Coordination, planning and management;
iv. Communication and capacity building for all stakeholders;
v. Effective and sustainable operations.

Apart from developing a Master Plan which is the object of the present Terms of Reference, the development of a Water Charter (not yet accomplished) is also part of the VBA Strategic Plan.

Baseline Study
A baseline study on the social economic and environmental state of the basin and an analysis of the problems and challenges of sustainable water resources management was carried out in 2011. A «material balance» was carried out which presented the rates of flow and the evaporation with respect to rainfall and the quantity of water available for the various users. This baseline study should be updated or completed to fit the context of the present study.

II. OBJECTIVES OF THE STUDY

The geographical area covered by the study is the jurisdiction of the VBA, as stated in Article 7 of the VBA convention: the Volta basin includes the Volta River, its tributaries and sub-tributaries, the reservoirs and lakes, groundwater and wetlands as well as the aquatic and land ecosystems linked to the basin, the estuary of the river including the zone of coastal and oceanic influence.

The timeframe for the Master Plan is 2030, such that the Investment Programme is renewable every five years.
The general objective of the study is the drafting of a Master Plan for the development and management of water resources, a regional framework for the development of the Volta Basin towards:
• the coherent development of the basin;
• an integrated and collaborative management of the water

resources and associated ecosystems;
• sustainable management of the various resources of the basin.

The study on the formulation of the Master Plan aims at achieving the following specific objectives:

Phase 1: Master Plan

• Translate the VBA mandate into concrete actions to reduce poverty, protect the environment of the basin and strengthen cooperation among member countries of the VBA;
• Formulate a Master Plan in support of the sustainable development of the Volta Basin;
• Ensure responsible and sustainable participation of stakeholders in the definition and implementation of the plan;
• Indicate the modalities for organizational setting and implementation as well as provide the VBA with a tool for efficient coordination among the countries;
• Propose sustainable development options, cost and benefit sharing and maintenance of the ecosystem diversity.

Phase 2: Investment Programme

• Definition of the priority areas or strategic directions: state the priority areas in the ToR, directions of activity and themes or sectors to be further examined;
• Comparison and choice of scenarios: use of decision-support tools for the choice of sustainable development options, cost and benefit sharing and the maintenance of the ecosystem diversity;
• Short-term investment program (5 years): definition of a detailed investment program on the priority actions of the Master Plan (additional objective of Phase 2);
• Cyclical, dynamic, flexible and evolutive design of the Master Plan: possibility for regular update, improvement and consolidation.

III. ACTIVITES AND RESULTS

Phase 1: Master Plan

Directions and principles for the sustainable development of the basin

The Consultant shall:
• define the objectives which will become the basis for decision-making with respect to the development of the basin using clear and jointly-planned interventions to prevent non-coordinated approaches;
• confirm the development patterns and formulate operational guidelines for their implementation;
• define the technical (development and management), economic, social and environmental principles.

Justification and development priorities of the basin

The Consultant shall:
• identify projects and programs of common interest and/or of a transboundary nature to be developed in the framework of the Master Plan to accelerate the shared and integrated development of the basin;
• define cost and benefit sharing scenarios, evaluate their possible impacts on poverty;
• evaluate the impacts of each scenario in terms of food security, employment, environmental protection, migratory movements, prevention and control of water-related risks (flooding, drought, pollution);
• define the necessary additional studies.

Use of decision-support tools

• estimation of water withdrawals,
• choice of tools and scale of work, taking into account and adapting to experiences in the basin countries,
• collection of hydro-meteorological (rain, temperature, volume), socio-economic (sampling) entry data,
• preparation of a model or models (topology, rain flow-rate modules, propagation, allocation) and setting,

• preliminary study of the scenarios, choice of five main scenarios, comprehensive study, economic optimization including environmental and social aspects,
• choice of scenario,
• study of the compatibility and complementarity of developments and using the outcomes of simulations undertaken and supported by decision- support tools;
• cost-benefit analysis of the various scenarios and proposal of the strategy which seems the most adaptive.

Analysis and ranking of priorities

The Consultant shall:
• develop a Master Plan which takes into account the objectives of VBA and helps to reduce poverty in the member countries;
• take into account other projects or studies undertaken or in progress (to be listed: PAS/GEF, etc.);

Institutional aspects and modalities of implementation

The Consultant shall:
• define the modalities for a better integration of the programs of member countries with those of the VBA, and also taking into account those of sub-regional institutions;
• define institutional involvement;
• establish roles and duties of the parties (VBA, member countries, partners, stakeholders) and determine their capacities for implementation;
• define the modalities for capacity development of the various actors,
• define the monitoring and evaluation mechanisms of the implementation of the plan;
• undertake a strategic environmental assessment of the master plan; generally identify the social, economic and environmental impacts of the Master Plan.

Phase 2: Detailed Programme of Investment

The Consultant shall:
• define the additional institutional mechanisms through which transboundary operations can be undertaken;
• prepare files on transboundary and/or common projects, including technical summaries;
• assess the costs and propose financial arrangements for implementation, taking into account cost-sharing among the VBA member countries and the contribution of donors;
• promote partnerships between the public and private sectors, when necessary and at the appropriate time;
• define a coherent and realistic implementation schedule.

IV. METHODOLOGY

Contents of plan

Phase 1: The Master Plan shall include:
• the key outlines of water development and management policies as well as actions for their implementation;
• a multi-sectorial and integrated development action plan;
• an accompanying action plan including measures to support production; economic, financial and institutional
• a general programming of actions to be undertaken;

Phase 2: definition of the detailed investment program

• analysis of the costs of investments, accompanying actions and operating costs.

• A computerized tool for programming with a function for monitoring and evaluation of activities and financing.

In addition, the Consultant shall indicate the measures that will facilitate the proper management of the natural resources of the basin, especially the quantitative and qualitative management of the water resources. These measures will ensure coherence between the development program and the sustainable management of the basin's resources. To this end, he shall define:

• minimum flow targets (dry-weather flow, crisis flow) at strategic points to be indicated and rules for withdrawals;
• plans for management of low flows, limited volumes of consumption and sharing among users;
• conditions for the restriction of withdrawals and discharges in crisis situations;
• institutional modalities for the joint management of withdrawals and resources;
• measures for improving water management (regulatory measures, water policing);
• water quality monitoring plan and evaluation criteria;
• measures to combat water-related risks (flooding, drought, water pollution): ecosystem restoration measures;
• quantitative and qualitative improvement of groundwater in the basin.

Organization and procedure

The method proposed by the consultant will determine the analysis and planning tools required and how they will enable to attain the objectives of the work plan. The Consultant will propose a sector-wise sub-basin division or a division based on large homogeneous zones.
The major venue for these activities shall be Ouagadougou in Burkina Faso, headquarters of the VBA Executive Directorate. Activities will also take place in the various countries.

Conceptualization of the terms of reference

The Consultant shall start the study with in-depth analyses of the socio-economic and environmental situation as well as the problems and challenges of sustainable water resource management in the basin. At the preliminary stage, he will examine the major development opportunities in the basin and will determine the implications for their implementation. The Consultant is expected to delve into the relevance of the defined opportunities and actions to be developed, and identify the benefits accruing from them as well as the sharing of their costs and benefits.

• Taking into account other relevant studies and projects of VBA (SAP/GEF, GLOWA, etc.)
• Consultation and consideration of national master plans: SDAGE, Mouhoun, Nakanbé, Sourou, etc.
• Taking into account other regional master plans (agriculture, energy, environment, etc.): ECOWAS, WAEMU, CILSS, etc.

The Consultant shall suggest, on the basis of the established subsidiarities, the role of the VBA Executive Directorate in the coordinated and concerted implementation of the Master Plan. The development of the Master Plan involves a progressive preparatory approach supported by a permanent and structured consultation which is widened to cover all actors within the basin. This work shall go on hand-in-hand with a systematic sensitization campaign. The whole of this iterative process among the Consultant, the VBA and country experts as well as the partners of the basin shall underscore the legitimacy of the final document.

These necessary consultations, carried out by the consultant and facilitated by VBA, shall be done with the various state departments of the Member States, development and management companies, research organizations, national and international stakeholder institutions and stakeholders.

The Consultant shall produce a database from a Geographic Information System (GIS) which will facilitate the illustration of the plan. He can also use available data at the VBA. The Consultant shall clearly state in his package the prescribed methodology for the production of this tool, which will provide the necessary harmonization with the current VBA GIS tool.

ADMINISTRATIVE ARRANGEMENTS AND REPORTS

Support and services provided by VBA
• Project ownership and management of study
• Facilitation
• Contacts with countries, role of focal points

Monitoring of study

• Steering Committee: composition
• Participation of countries, partners, stakeholders
• Mode of validation and adoption
• Stages of validation (breakpoints)
• Number of national meetings (Consultant funding)
• Number of regional meetings (direct funding by VBA)
• Assumptions and risks
• Indicators

Schedule of Activities

• Period of 18 months including the study and validation of documents
• Study schedule to be completed
• National workshops (consultations): 2 to 3 missions in each country (2 days of validation …)
• Regional Workshops: start, mid-term breakpoints (objectives – areas – sub-divisions – choice of scenarios…), draft final report …
• Number of Committee of experts, Number of stakeholder Forums
• Final Council of Ministers

All these workshops shall be facilitated by the Consultant

Results expected from the Consultant

• Inception (content to be specified: scoping note) and progress reports
• Mid-term reports: breakpoints = working documents for each workshop
• Final versions (draft and final = 0 and 1st drafts)
• Synthesis of Mater Plan
• Computerized and relational tool for planning, monitoring and funding of activities (GIS link)
• Number of hard and digital (soft) copies

These reports shall be submitted in two languages: French and English.
The reports shall be completed with sets of maps. The maps shall be designed at an appropriate scale and presented in A3 format. The corresponding data shall be supplied by the Consultant and shall remain the property of the VBA. The final versions (draft and revised) of the documents will take into account the comments and amendments of the various bodies of the VBA.

Documentation

• List of available documents put at the disposal of the Consultant by the VBA (including GIS)
• Other useful documents

Title	Project Manager	Author	Date
Convention and Statutes of the VBA	VBA	VBA	2009
Strategic Plan 2010-2014	VBA	VBA	Jan 2011
Development of the Water Charter of the Volta basin (initial version)	VBA	AHT Group	Dec 2009
(PAGEV). WaterAudit of the Volta basin	IUCN	Nii Consult	August 2007
The baseline of the hydrometeorological situation in the Volta basin. Diagnostic Account system of the existing monitoring	VBA	SHER	January 2011
Study on the establishment of a regional data and information exchange system for the Volta River Basin	GEF-Volta	UNEP-GEF-UNOPS	December 2008
A transboundary Diagnostic Analysis of the Volta River basin: National report (6 countries)	GEF-Volta	UNEP-GEF-ABV-UNOPS	December 2010
Note de synthèse- Le Programme de Défi pour l'Eau et l'Alimentation (CPWF) dans le Bassin de la Volta	CPWF		2010
The baseline of the social economic and environmental situation in the basin and the analysis of problems and challenges of sustainable water resources management	VBA	SHER - GRET	January 2012

ANNEX 2: TERMS OF REFERENCE FOR THE ASSIGNMENT

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Fax: (+226) 50 37 64 86
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Global Water Partnership West Africa
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WATER, CLIMATE AND DEVELOPMENT PROGRAMME (WACDEP)

TERMS OF REFERENCE FOR

Support for Elaboration of the VBA Master Plan: Outlines and Principles for Sustainable Development of the Basin

1. Background

The Volta is a transboundary river, which is shared by six countries in West Africa - Benin, Burkina Faso, Cote d'Ivoire, Ghana, Mali and Togo - that are dependent on its natural resources for their development. In order to institute measures for sustainable transboundary water resources management of the basin, the Volta Basin Authority (VBA) was established in 2007 with the signing of the Convention on the Status of the Volta River and Establishment of the Volta Basin Authority. The Convention came into force in August 2009.

Article 6 of the VBA Convention mandates the Authority to:

i. Promote permanent consultation tools among the parties for the development of the basin;

ii. Promote the implementation of integrated water resources management and the equitable distribution of the benefits resulting from their various utilizations;

iii. Authorize the development of infrastructure and projects, which could have substantial impact on the water resources of the basin;

iv. Develop joint projects and works;

v. Contribute to poverty alleviation, the sustainable development of the Parties in the Volta basin, and for better socioeconomic integration in the sub-region.

The jurisdictional coverage of the Authority in the performance of its functions, as stated in Article 7, includes the Volta River, its tributaries and sub-tributaries, the reservoirs and lakes, groundwater and wetlands as well as the aquatic and land ecosystems linked to the basin, the estuary of the river including the zone of coastal and oceanic influence.

Before the establishment of the VBA, several institutions had, in reaction to the increasing pressure on the water resources of the basin, initiated various projects and programmes to provide information and develop solutions for sustainable management of the water and other natural resources of the Volta basin. These include:

- UNEP/GEF Project on Addressing Transboundary Concerns in the Volta Basin and its Downstream Coastal Area;
- IUCN Project for Improving Water Governance in the Volta Basin;
- Volta HYCOS Project;
- Challenge Program for Water and Food;
- GLOWA Volta Project.

2. VBA Strategic Plan

Towards achieving its mandate and also in order to coordinate the activities of the various on-going projects and programmes in the basin, VBA and its partners have developed a Strategic Plan for the period 2010 to 2014 (VBA,

2010), which aims to facilitate all interested parties to better focus on priorities of the Volta basin while avoiding duplication of efforts. The five Strategic Objectives of the 5-year Strategic Plan are (Annex 1):

1. Strengthening policies, legislation and institutional framework;
2. Strengthening the knowledge base of the basin;
3. Coordination, planning and management;
4. Communication and capacity building for all stakeholders;
5. Effective and sustainable operations.

As part of Strategic Objective 2 of the Strategic Plan on 'Strengthening the knowledge base of the basin', VBA is in the process of establishing an Observatory for Water Resources and Related Ecosystems with support of Fonds Francais pour l'Environnement Mondial, SIDA/IUCN and the Member States. The Observatory will be a reference base on the water resources and related ecosystems that can be continuously updated. It will also enhance future development of simulation models, decision support and other analytical tools, while improving the coordination role of VBA.

Strategic Objective 3 of the Strategic Plan also envisages the development of a Master Plan for Development and Sustainable Management of Water Resources. Using the Master Plan, the riparian countries will identify and plan projects and investments to be jointly implemented for optimum benefits, including improved adaptation and increased resilience to on-going impacts of climate change and variability.

During the 6th meeting of the VBA Experts Committee in May 2012, Guidelines for the Terms of Reference for the VBA Master Plan were drafted. According to the Guidelines, the study on formulation of the Master Plan will be in two phases as outlined below:

Phase 1: Formulation of a Master Plan covering the following specific objectives:

i. Translation of the VBA mandate into concrete actions to reduce poverty, protect the environment and strengthen cooperation among member countries;
ii. Drafting of a Master Plan in support of sustainable development of the basin;
iii. Ensuring responsible and sustainable participation of stakeholders in defining and implementing the plan;
iv. Indicating the modalities for organizational setting and implementation and providing the VBA with a tool for efficient coordination among the countries;
v. Proposing sustainable development options, cost and benefit sharing and maintenance of ecosystem diversity.

The activities and outcomes envisaged under Phase 1 are:

i. Outlines and principles for the sustainable development of the basin
ii. Justification and development priorities of the basin
iii. Use of decision-support tools
iv. Analysis and ranking of priorities
v. Institutional aspects and modalities of implementation

Phase 2: Definition of a detailed Investment Program based on the priority actions of the Master Plan.

3. Climate Change in the Volta Basin

West Africa is among one of the most vulnerable regions to climate change because some of its physical and socio-economic characteristics predispose it in such a way as to be disproportionately affected (Niasse et al, 2001). Such characteristics include the highly visible contrast between wetlands and arid zones and continuing poverty. Within the Volta basin, several studies have predicted negative impacts including increasing temperatures, reduced rainfall and decreased availability of water resources, water quality deterioration and spread of some water-related diseases (Biney, 2012). With water resources already stressed by non-climatic factors such as rapid population growth and development, pollution and deforestation, the impacts of climate change will further aggravate the situation.

In reaction to the above, West African countries have recognized the need to strengthen their efforts to adapt to the

changes resulting from climate change as well as other global changes. Attempts are also being made to mitigate the emission of greenhouse gases such as through reduction in deforestation. There is also the recognition that climate change presents various opportunities that can accelerate national and regional development (UNECA et al., 2010). These require mainstreaming the issue of climate change into national development activities to elevate it from an environmental challenge into a development challenge. Among others, solutions to such challenges would rely on strengthening the scientific and technological capacities of sub-regional and regional institutions and also supporting the countries to increase their capacity to cope with the impacts of climate change.

4. The Water, Climate and Development Programme

The Water, Climate and Development Programme (WACDEP) was initiated by the Global Water Partnership (GWP) to meet the demand of the African Ministers' Council on Water (AMCOW) for the implementation of the Declaration of the Summit of Heads of States in 2008. According to its Terms of Reference, WACDEP is a 5-year programme, from May 2011 to April 2016, which aims to integrate water security and climate resilience in the development planning processes, build climate resilience and support countries to adapt to a new climate regime through increased investments in water security. By building climate resilience, the initiative will contribute to peace building and conflict prevention, support pan-African integration and help safeguard investments in economic development, poverty reduction and the Millennium Development Goals. On a pilot basis, WACDEP will be implemented in eight countries: Ghana, Burkina Faso, Mozambique, Zimbabwe, Burundi, Rwanda and Tunisia; and four river basins: Volta Basin, Lake Chad, Lake Victoria-Kagera, and Limpopo Basin.

The overall objective of WACDEP is to support integration of water security and climate resilience in development planning and decision-making processes, through enhanced technical and institutional capacity and predictable financing and investments in water security and climate change adaptation. The expected outcomes of the programme are:

- Water security and climate resilience integrated in development planning and decision-making processes
- Capacities of partnerships, institutions and stakeholders enhanced to integrate water security and climate resilience in development planning and decision-making processes
- "No regrets" investment and financing strategies for water security, climate resilience and development formulated and governments begin to implement them. In addition, fundable projects for water security, climate resilience and development defined and shared with development banks

WACDEP consists of 4 components with 8 Work Packages. Component 1, on Investments in Regional and National Development, has the following 4 Work Packages:

- Work Package 1: Regional and Transboundary Cooperation
- Work Package 2: National Development and Sector Plans
- Work Package 3: Investments
- Work Package 4: Project Preparation and Financing

Under a Memorandum of Understanding signed in April 2013, VBA has been invited by GWP to participate in Work Package 1, Regional and Transboundary Cooperation, under Component 1.

The objective of Work Package 1 is to support AMCOW, African Union and Regional Economic Communities (RECs) and River Basin Organisations (RBOs) to advance regional cooperation in climate change adaptation in transboundary waters and shared aquifers for regional and economic development. The key output is investment options and tools for enhancing basin water security and climate resilience are defined and integrated in basin and regional development programmes.

The Work Package activities will be implemented in the following 4 phases:

Phase 1: Understanding the Problem

- Basin-wide Assessment and Adaptation Responses: Build

on past and on-going basin climate impacts and risks assessment studies to enhance understanding of current and future constraints to basin water security and development;

• Hydro-climatic Information: Analysis of hydro-climatic information from regional climate service centres to ensure climate information is made available for water security interventions;

Phase 2: Identifying and Appraising Adaptation and Investment Options

• Basin Investment Decision Making: Support RBOs and RECs to elaborate investment options and tools for enhancing Basin Water Security and Climate Resilience defined.;

Phase 3: Delivering Solutions

• Integration of Investments: Support RBOs and RECs to incorporate basin and regional water security and climate resilience investments into regional, basin and national development programmes;

Phase 4: Monitoring and Moving Forward

• Regional Partnerships for Water Security and Climate Resilience: Promote collaboration and partnerships among key regional institutions for implementation; an effective monitoring system for the implementation; and the application of tools for water security and climate resilient investments in transboundary waters and shared aquifers.

In 2013, the following 2 activities are to be undertaken by VBA:

i. Phase 1: Assessment of the current state of water management and climate change in the Volta basin as part of the establishment of an Observatory for Water Resources and Associated Ecosystems;

ii. Phases 2 and 3: Support for the elaboration of the VBA Master Plan: Outlines and Principles for Sustainable Development of the Basin.

5. Objective of Assignment

The objective of this assignment is to define Outlines and Principles for Sustainable Development of the Basin as part of the elaboration of the VBA Master Plan, taking into consideration the aims and objectives of the WACDEP and the uniqueness and development objectives of the Volta basin.

6. Scope of Work

The Consultant shall:

i. Define the outlines and principles for sustainable development by:

• Analyzing development patterns in the basin;

• Defining the objectives which will become the basis for decision-making with respect to development of the basin through jointly-planned interventions to prevent non-coordinated approaches;

• Defining the technical (development and management), economic, social and environmental principles for the Master Plan.

ii. Hold consultations with staff of Executive Directorate and relevant technical partners as well as other stakeholders;

iii. Present the report at a workshop for input from VBA, GWP and other partners;

viii. Incorporate comments and inputs from the workshop and prepare final documents for approval by GWP.

7. Expected Outputs of the Consultant

The expected outputs shall comprise the following:

i. An Inception Report detailing activities and timelines of the assignment;

ii. Draft Reports, in English and French, based on the requirements of the Scope of Work and other relevant issues to be submitted not later than four (4) weeks after the signing of the agreement for the assignment;

iii. Revised Draft Reports in English and French to be submitted, not later than one (1) week, after taking into account comments from the VBA and GWP.

iii. Final Reports in English and French to be submitted, not later than two (2) week, after taking into account inputs received from workshop.

8. Experience and Knowledge Requirements

The consultant for this assignment shall be an individual or a firm, which should propose an individual with the following key qualifications and expertise:

i. Post-graduate qualification in Environmental or Water Resources Management and at least 10 years of relevant work experience;

ii. Additional qualification in Climate Change Analysis or related areas will be an advantage;

Other key requirements include:

iii. Familiarity with and working experience in the riparian countries of the Volta basin and the West-African sub-region in general;

iv. Good understanding of developments in international transboundary water resources management;

v. Excellent knowledge of either French or English and ability to work in the other.

9. Mode of Application

Interested consultants should submit the following documents, in English or French, to the VBA not later than 04 October 2013:

i. Technical Proposal that should include:

• A Work Plan for carrying out the assignment within the allocated timeframe;

• The Consultant's interpretation of the Scope of Work;

• Any other comments that may improve the final outcome of the assignment;

ii. Financial Proposal detailing the budget for the assignment in F CFA.

iii. Curriculum Vitae of the individual who would be responsible for the assignment.

Applications should be forwarded to one of the following addresses:

i.By email to :secretariat.abv@abv-volta.org and secretariat.abv@gmail.com;

ii. By post: 10 BP 13621 Ouagadougou 10, Burkina Faso

iii. By direct deposition at the Executive Directorate of the VBA at Ouaga 2000, Ouagadougou, Burkina Faso; Tel. + 226 50376067

For more information, you may consult the VBA website: www.abv-volta.org

10. Negotiations Meeting

The selected consultant will meet with staff of the Executive Directorate of VBA to discuss and finalize the activities and timeframe for the assignment. The meeting will be concluded with the signing of the Contract.

11. References

Biney, C., 2012. Connectivities and linkages within the Volta basin. In: River Basins and Change, 152-167, Bogardi, J. J., Leentvaar, J and Nachtnebel, H-P, eds. 206 p.

Niasse, M., Afouda, A. and Amani, A. (Eds.) 2001. Reducing West Africa's Vulnerability to Climate Impacts on Water Resources, Wetlands and Desertification. Elements for a Regional Strategy for Preparedness and Adaptation. IUCN Report, 88p.

UNECA, AUC and AfDB., 2010. Science, Technology, Innovation and Capacity Building for Addressing Climate Change. 7th African Development Forum, Addis Ababa. Issue Paper No. 10, 6p.

VBA, 2010., Strategic Plan, 2010-2014.

12. Available Documents from VBA

Guidelines for the Terms of Reference for Developing a Master Plan for the VBA

VBA Strategic Plan, 2010-2014;

VBA Convention and Statutes;

Progress and Annual Reports of the VBA;

Reports on Technical Activities, e.g., VBA Observatory, Volta HYCOS Project;

ANNEX 3: SUMMARY OF SPECIFIC OBJECTIVES, EXPECTED OUTCOMES AND PROGRAMME (2010-2014)

Expected Outcomes	Activities
Strengthening of Policies, Legislation and Institutional Framework	
1.1 Policies for good water governance guide VBA	1.1.1 Ownership and internalization of water resources policies in West Africa and the Volta Basin States
	1.1.2 Assist member States as necessary to introduce IWRM into national legislations and harmonization of approaches where necessary.
1.2 Legislation for water governance in the Volta basin established	1.2.1 Draft a Water Charter for the Volta basin
1.3 All VBA organs are operationalized	1.3.1 Establish and organize regular meetings of the statutory VBA organs (e.g., Council of Ministers, Forum of Parties…)
Strengthen the Knowledge Base of the Volta basin	
2.1 The state of water and environmental resources is known	2.1.1 Conduct inventory of water resources and their uses
	2.1.2 Conduct studies on the environmental status including land use, biodiversity, climate change and socio-economic aspects
2.2 Data management and sharing mechanisms are in place	2.2.1 Support national institutions to strengthen or create qualitative and quantitative monitoring networks
	2.2.2 Support national institutions to strengthen monitoring and evaluation of the quality and quantity of water resources
	2.2.3 Finalize establishment of the VBA Observatory
Coordination, Planning and Management	
3.1 Sustainable management and regulation of water resources	3.1.1 The VBA or its organs (Experts/Technical Committee) direct sustainable water resources management initiatives in the basin
3.2 Knowledge and coordination of projects	3.2.1 Formulate a process for the identification, monitoring and dialogue in respect of projects
3.3 A Plan for environmental management and planning launched	3.3.1 Draft a sustainable Master Plan
Communication and Capacity Building for All Stakeholders	
4.1 Through communication and dissemination of information, ensure common understanding of the basin	4.1.1 Develop and implement a communication plan that takes into account both technical information and general awareness raising
4.2 Capacity for all stakeholders to share and collaborate in t IWRM	4.2.1 Develop and implement plan for stakeholder participation and capacity building
	4.2.2 Identify and establish partnerships and networks with stakeholder groups in the basin
Effective and Sustainable Operations of the VBA	
5.1 Ensure implementation of the Strategic Plan	5.1.1 Monitoring and evaluation framework drafted and activities carried out regularly including mid-term and 2013 revision.
	5.1.2 Direct the implementationof the plan
5.2 Financial resources and partnerships mobilized	5.2.1 Engage and extend the Consultative Group network of technical and financial partners
	5.2.2 VBA plays its role in the network of basin organizations
	5.2.3 Consolidate the internal funds of the VBA
5.3 Human and material resources and administrative procedures developed	5.3.1 Headquarters built and furnished
	5.3.2 Procedures for internal regulations established and implemented
	5.3.3 Qualified personnel recruited according to needs and trained
	5.3.4 Training in basin management for VBA and partners

ANNEX 4: LIST OF PARTICIPANTS AT THE VALIDATION WORKSHOP

ID	Country/ Institution	Name	Position	e-mail
1)	Benin	Dr. Elegbede Manou Bernardin	Direction Générale de l'Eau – Point Focal ABV	elegbedebern@yahoo.fr
2)	Burkina Faso	Mahamadi PORGO	Directeur Générale des Bassin Hydrographique	mahamadiporgo@yahoo.fr
3)	Côte d'Ivoire	KOUAKOU Bouho Jérôme	Sous-directeur de l'évaluation des ressources en eau, Ministère des eau et Forets	kbjero@yahoo.fr
4)	Ghana	Aaron Aduna	Basin Officer, White Volta Basin, Water Resources Commission	aaronaduna@gmail.com
5)	Mali	Chaka TRAORE	Coordinateur du Projet Volta HYCOS, Dir. National Hydraulique, Division Suivi et gestion des Ressources en Eau	chtraore2000@yahoo.fr
6)	Togo	Madame TOZO A. Abla	Chargé d'étude a la Direction des Ressources en Eau	elise_tozoabla@yahoo.fr
7)	GWP/AO	Pr. Abel AFOUDA	Chairman of GWP West Africa	aafouda@yahoo.fr secretariat.gwpao@gwp.org
8)	GWP/South Africa	Armand K. HOUANYE	Programme Manager, WACDEP Coordination Unit/ WACDEP in Africa	a.houanye@cgiar.org
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22)	ABV	Mme Sonia TONDE/BANDE		
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