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SUPPORT TO VOLTA BASIN AUTHORITY ON THE VOLTA-HYCOS PROJECT

APPRAISAL REPORT

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AFRICAN WATER FACILITY

21 December 2008

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LIST OF ACRONYMS

ACMAD	African Centre of Meteorological Applications for Development
ADCP	Acoustic Doppler Current Profiler
AGRHYMET	Regional Training Centre in Agro-meteorology and Operational Hydrology
AMCOW	African Ministers' Council on Water
AOC	West and Central Africa
AOC HYCOS	Hydrological Cycle Observing System in West and Central Africa
AWF	African Water Facility
CILSS	Inter-States Permanent Committee for Drought Control in Sahel
DCP	Data Collection Platform
ECOWAS	Economic Community for West Africa States
EUWI	European Union Water for Africa Initiative (EUWI)
FAO	United Nations Food and Agriculture Organization
FDA	French Development Agency
FFEM	Fond français pour l'Environnement Mondiale
FRIEND	Flow Regimes from International and Experimental Network Data
GEF	Global Environmental Facility
GWP	Global Water Partnership
HYCOS	Hydrological Cycle Observation System
2iE	International Institute for Water Engineering and Environment
IRD	Institute of Research and Development
IUCN	The World Conservation Union
IWRM	Integrated Water Resource Management
LFA	Logical Framework Approach
MoU	Memorandum of Understanding
NBA	Niger Basin Authority
NEPAD	New Partnership for Africa's Development
NHS	National Hydrological Service
O&M	Operation and Maintenance
OHRAOC	Regional Hydrological Observatory for West and Central Africa
OIEau	Office International de l'Eau (International Office of Water)
RAP/IWRM/WA	Regional Action Plan Integrated Water Res. Mgmt in West Africa
RBM	Result Based Management
RPC	Regional Project Centre
SC	Steering Committee
SIDA	Swedish International Development Agency
TA	Technical Assistance
ToR	Terms of Reference
TWRM	Trans-boundary Water Resources Development
UNDP	United Nations Development Programme
UNEP	United Nations Environmental Programme
VBA	Volta Basin Authority
Volta-HYCOS	HYCOS: Volta Hydrological Cycle Observing System
WHYCOS	World Hydrological Cycle Observation System
WHO	World Health Organization
WMO	World Meteorological Organization
WRCU	Water Resources Coordination Unit (of ECOWAS)
WS&S	Water Supply and Sanitation

AWF VOLTA-HYCOS PROJECT - LOGICAL FRAMEWORK

HIERARCHY OF OBJECTIVES	EXPECTED RESULTS	TARGET GROUPS & BENFICIARIES	PERFORMANCE INDICATORS, SOURCES OF VERIFICATION	TARGETS TIME FRAME	RISKS AND MITIGATION STRATEGIES (Chapter 1.5)
DEVELOPMENT GOAL: Contribute to the attainment of the VBA Convention objectives of increased socio-economic growth and standards of living by enhanced water development cooperation and regional integration	**IMPACT** -Enhanced IWRM and water information and knowledge of the basin -Reinforced dialogue and effective cooperation on water resources information and management between the riparian states. - Water sector development contributed to sustainable socioeconomic growth and enhanced standard of living of the basin population	– Public and private sector development actors, NGOs and service providers – Urban and rural populations – Water sector planning and regulatory authorities	Indicators: (i) The VBA functioning according to its Mandate, (ii) Positive economic growth of the water related sectors, reduced poverty according to National plans and strategies. Sources: (i) VBA Annual Reports, Proceedings of Annual VBA Council of Ministers Meetings, (ii) Bureau of Statistics of the Respective Countries, Africa Development Report (ADB), Socio-economic development studies	Africa Water Vision prospective up to 2025	Risks (i) VBA non-functioning due to lack of funding, poor political support, or non-performing national hydrological services (NHS) (ii) Poor performance of the water development projects, inefficient Poverty Reduction Programs in the riparian countries. Mitigation: (i) MoUs with riparian countries, VBA will act as key driving force for promoting NHS cooperation; (ii) VBA advocacy for increased water development
PROJECT OBJECTIVES: To contribute to an effective VBA and sustainable Volta-HYCOS operations delivering reliable water information and performing effective trans-boundary IWRM	**OUTCOMES (Chapter 2.2):** (i) Strengthened VBA actively promoting water development projects and trans-boundary integration and commitment. (ii) National Hydrological Services (NHS) in each basin country strengthened and effectively involved in the HYCOS operations (iii) VBA effectively managing the Volta-HYCOS services that deliver delivering reliable data and information products to the Water Observatory. and external beneficiaries	– Public and private sector development actors, NGOs and service providers – Urban and rural populations Water sector planning and regulatory authorities	Indicators: (i) VBA involved in 10 existing and 5 new water projects; the Convention ratified by the 2 remaining countries. (ii) Operational and sustainable HYCOS networks in all 6 basin states, more than 90% of trained staff still at NHS service after 2 years (iii) High quality water information and knowledge being delivered to users and beneficiaries Sources:(i) – (iii): VBA Progress and annual reports, Minutes of Steering Committee Meetings and Council of Ministers, Baseline Report, Supervision Mission Reports, Project Evaluation Report	2010-15	Risks - HYCOS performance hampered by non-functioning hydrological equipment and data transfer systems. - Weak ownership to the HYCOS by partner countries. Mitigation: -Mitigation risks built into project mgmt quality control and mgmt. structure. - VBA creating favourable working relations with NHS - MoUs between EA and 6 member countries to promote ownership

ACTIVITIES: (Chapter 2.4)	**OUTPUTS (Chapter 2.3):**				
Activity 1: Upgrading hydrometric network and Strengthening of National Hydrological Services (NHS)	- Enhanced IWRM institutional capacity by well trained hydrological personnel and supervisors - Extended and modernized basin-wide hydrological monitoring network and data collection capabilities in riparian countries - Enhanced skills and capacity of the National Hydrological Services (NHS) -NHS delivering quality data to the regional data base	NHS staff and managers, VBA and RPC	Indicators: - Identified physical deliverables and services timely delivered according to plans and Cost Estimates - 12 new Data Collection Platforms (DCPs) installed/ Verification: Baseline Report (the Benchmark),, Annual Progress Reports to Steering Committee supervision missions, Project Evaluation Report,	After 2 years	Risks: - poor quality and reliability of the delivered hydrological equipment and data transfer systems. - inefficient project implementation by the riparian countries, Mitigation: Equipment, design, and standardisation, quality control, stocks of spare parts, training of NHS staff
Activity 2: Strengthening of the RPC and regional info. services	- Upgraded Regional and National Hydrological data bases operated by NHS and RPC.	RPC Staff, NHS, VBA	Indicators: - All equipment and services timely delivered as planned within Cost Estimates - 10 identified water sector projects rate of the Volta-HYCOS information products "highly useful" Verification: See Activity 1	After 2 years	Risks: - inadequate project management and coordination - failure of HYCOS after completion Mitigation: Ample resources to strengthen project management, VBA and NHS operations
Activity 3: Training	- Identified key staff from VBA, RPC and the riparian countries successfully trained in Module M8 and M9	NHS, RPC VBA,	Indicators: - 9 trainers from VBA, RPC and 6 countries successfully trained - 30 staff from 6 riparian countries successfully trained and performing Verification: See Activity 1	After 2 year	Risks: -Personnel leaving the hydrological service after training Mitigation: Motivation by VBA. Improved working conditions
Activity 4: VBA Capacity Building and integration of Volta-HYCOS	-VBA's capacity to manage projects, perform regional integration and coordinate hydrological operations improved. Volta-HYCOS effectively integrated and regularised in VBA operations The Project duly evaluated and reported	VBA staff, Authorities, stakeholders in 6 riparian countries, Donors	Indicators: VBA fully staffed according to staffing plan delivering agreed information products to the users. Baseline Study and Action Plan, Evaluation Report approved. Verification: See Activity 1	After 2 years	Risks: - VBA unable to perform as envisaged Mitigation: Temporary TA support to and working conditions,

0 EXECUTIVE SUMMARY

0.1 The Volta Basin Authority (VBA) with Headquarters in Ouagadougou has requested AWF to provide parallel funding for the implementation of the Volta-HYCOS[1] Project. The objective of the project is to strengthen the water resources knowledge and governance of the Volta basin. The current hydrological services are inadequate to meet the needs for reliable information for continued development of large and small scale water infrastructure to meet food requirements, mitigate natural hazards and promote energy and industrial development of the riparian states. The Volta-HYCOS Project is, together with the recent creation of the Volta Basin Authority (VBA), an important initiative to address the trans-boundary challenges facing the basin states (Benin, Burkina Faso, Ghana, Cote d'Ivoire, Mali, and Togo).

0.2 The overall development objective of the project coinciding with those of the VBA Convention signed on 12th January 2007. The Authority is established as an inter-State organisation for the purpose of ensuring international cooperation for the rational and sustainable management of the water resources of the Volta basin and for socioeconomic development and integration between the riparian countries for increasing the standard of living of their peoples.

0.3 AWF recognises that developing trans-boundary water basin governance and upgrading the water knowledge is a long-term undertaking and an important catalyst for promoting sustainable economic growth and regional integration. The involvement of the Facility is therefore built on the two following pillars: (i) to strengthen the capacity of the VBA as the key driving force for trans-boundary IWRM; and (ii) to contribute to the development of Volta-HYCOS for enhanced water information and knowledge (I&K) and pursue effective incorporation of the HYCOS into VBA's operations. The project will create a basis for better economic efficiency of existing and future hydropower schemes, flood control systems, irrigated agriculture operations, water supply, early flood warning, inland navigation etc. The project will also pursue realistic water sharing agreements among riparian countries and enhanced regional integration as well as providing vital inputs to national and regional adaptation strategies on climate change and variations.

0.4 The overall duration of the Volta-HYCOS is 51 months (September 2006-December 2010) whereas the duration of the AWF Project will be 22 months from March 2009 to December 2010. The VBA will be the Signatory to the AWF Grant and the Executing Agency of the Project. The total project costs are estimated to about 3,570,000 Euro financed by FFEM (1,000,000 Euro), the proposed AWF grant (1,200,000 Euro) and in-kind contributions from the six riparian countries (200,000 Euro) the IRD (870,000 Euro), the 2iE in Ouagadougou (150,000 Euro), and the WMO (150,000 Euro).

0.5 Based on a comprehensive assessment of the request for co-funding of the Volta-HYCOS Project in terms of its relevance, effectiveness, sustainability, and the recipient's credibility and capacity, the President of the Bank is advised to approve VBA's application for funding of 1,200,000 Euros.

[1] Volta Hydrological Cycle Observation System

1 BACKGROUND

1.1 Origin and Context of the Project

1.1.1 The project originates from a request submitted to AWF by the Volta Basin Authority (VBA) to co-fund the implementation of the Volta-HYCOS[2] Project. The project will represent a vital contribution to enhanced water information services and to strengthened management and development of the Volta Basin shared between the six riparian States[3]. Reliable and long-term hydrological data and appropriate water knowledge are a prerequisite for efficient investment planning and effective operation of water infrastructure such as dams, hydropower, flood protection, erosion control, irrigation, inland navigation, water supply, etc. The hydrological services of the riparian countries of the Volta Basin have since long been neglected, and there has been a lack of basin wide cooperation and the current water date and knowledge are inadequate to meet the requirements of effective river basin management and development.

1.1.2 **The Volta-HYCOS** is part of the World Hydrological Cycle Observing System (WHYCOS) coordinated by the World Meteorological Organisation (WMO) in Geneva with the objectives to provide free exchange of hydrological data, information, and knowledge across national boundaries. WHYCOS is developed for promoting a bottom up approach, from the country level through the basin to global scale and it primarily focus on strengthening technical and institutional capacities of National Hydrological Services (NHSs) and improving their cooperation in the management of shared water resources. Figure 1.1 gives a snap-shot of the general scheme of the HYCOS network.

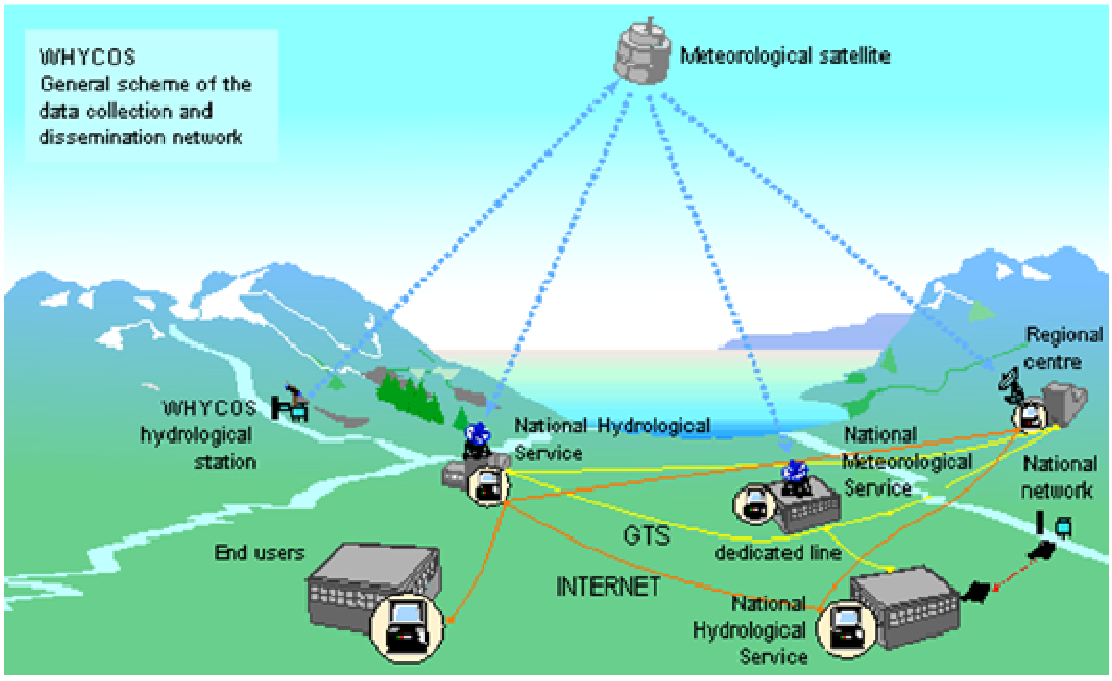

Figure 1.1 Illustration of main elements of a HYCOS Network

[2] Volta Hydrological Cycle Observation System
[3] Benin, Burkina Faso, Ghana, Cote d'Ivoire, Mali, and Togo

1.1.3 The creation of the **Volta Basin Authority (VBA)** (supported by AWF and French cooperation) was an important milestone of the joint management and development of the Volta basin. When fully operational, the Authority will play an important role in management of trans-boundary water resources (TWRM) according to the VBA Convention and the Statutes. A properly operating Volta-HYCOS is a pre-requisite for VBA performing its mandated responsibilities so the AWF project will i.a. support the integration of HYCOS into VBA's operations. The VBA Convention that was signed by heads of States of all six riparian countries in January 2007 had by November 2008 been officially ratified by the required minimum of four States (Burkina Faso, Mali, Ghana and Togo). This provides the VBA with an official permanent status as a formal Authority, which can recruit permanent staff, and act as Executing Agency for the AWF funded project.

1.2 Problem Definition

1.2.1 The Volta River Basin has a total area of 400,000 km^2 and a length of 1,850 km (Basin Map Annex 1). The total population of the basin is 19 million with a growth rate of 2.54% per year. The economies of the six riparian countries highly depend on water related sectors, such as hydropower, agriculture, water supply and Sanitation, fisheries, and inland navigation. Rain-fed agriculture with some irrigated agriculture is the principal means of development for the people of the basin. The total irrigation potential spread over the six riparian countries is estimated at about 1.5 million ha. For several decades, the basin has been subject to continuous development in rural areas and expanding urban centres resulting in increasing pressure on water and land resources in this region.

1.2.2 The main water and environmental challenges facing the basin comprise land degradation, erosion, water scarcity, loss of biodiversity, frequent droughts and floods, growth of aquatic weeds, and water quality degradation. These problems are exacerbated by the uneven annual and spatial distribution of water resources in the region. The total rainfall of the basin varies from 400 mm/yr in the North to 1,800 mm/yr in the South. The total evaporation ranges between 2,500 mm/yr in the North to 1,800 mm/yr in the coastal zone. Like in most African countries, there is a need for considerable investments to expand the water storage capacity of the Volta basin states. Investing in water is good for business and poverty eradication and all riparian countries have a common interest in developing sustainable and trans-boundary management of the shared water resources and joint investments in water infrastructure.

1.3 Sectoral Priorities

1.3.1 The Volta-HYCOS Project responds to a number of priority interventions identified under the Africa Water Vision for 2025 aimed at achieving equitable and sustainable use of water for socio-economic development. The priorities of the Vision are; (i) to strengthen the enabling institutional capacity for integrated management of trans-boundary waters; (ii) enhanced education of water professionals; and (iii) promotion of effective and financially sustainable systems for water data collection, assessment and dissemination for national and trans-boundary water basins.

1.3.2 The Project is also a direct contribution to the fulfilment of priority actions of the African Ministers' Council on Water (AMCOW) and the New Partnership for

Africa's Development (NEPAD) on strengthened cooperative framework to mange trans-boundary water resources. These priority actions are also adopted in AWF's Operational Strategy to strengthen trans-boundary water management (TWRM).

1.3.3 The VBA Convention is a fundamental strategic instrument for the development of the Volta Basin combining the water sector strategies adopted by the riparian countries. It consolidates the commitment of these countries to apply integrated management of land and water resources under the leadership of VBA. The VBA has three interconnected functions that collectively will enable the Authority perform its responsibilities. The three main functions (see details in Annex 5) are: (i) Promotion of Stakeholder Responsive Development; (ii) Water Authorisations and Conflict Prevention; and (iii) Knowledge and Information Services. Figure 1.2, illustrates the different lines of activities and responsibilities between the VBA and the stakeholders of the basin, The development of the Volta-HYCOS system will directly strengthen Function 3 of the VBA, whereas the AWF funded support to AVF will promote a strong interaction between all three functions.

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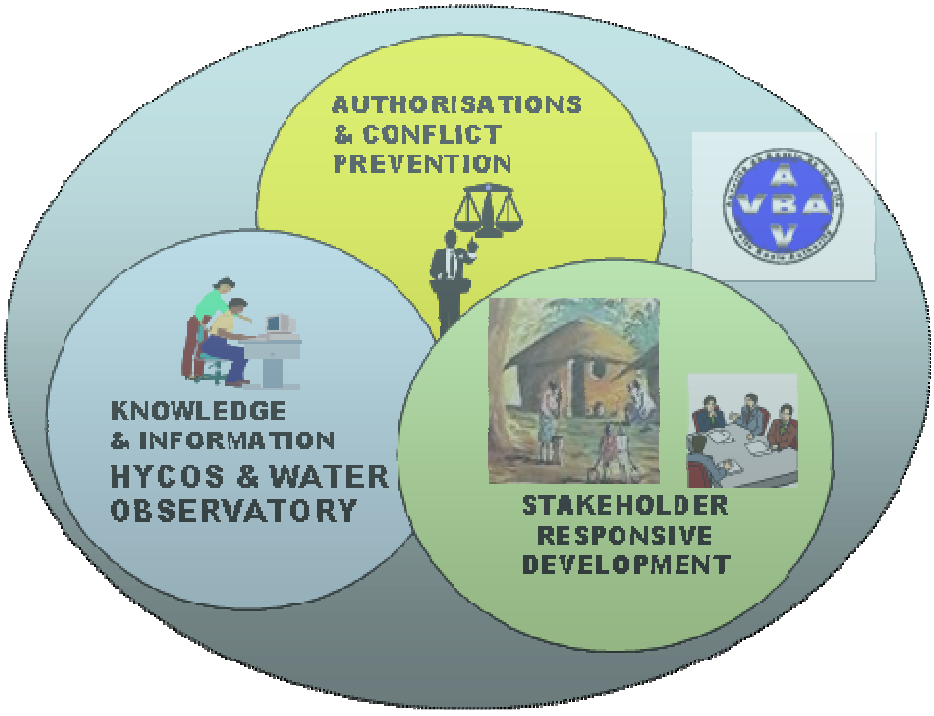


Figure 1.2 Volta Basin Authority Functions at a Glance

1.3.4 The development of the Volta Basin Observatory for Water Resources (supported by FFEM 1.2 million Euros) is hosted by VBA. The Observatory is an important information instrument shat has strong links to Volta-HYCOS. It will be a provider of data and analytical services on natural resources, monitoring of environmental state of the basin, and assessment of the impacts of water development interventions. Volta-HYCOS will be an indispensable supplier of timely and reliable data and information to the Observatory.

1.3.5 The financing of VBA will rely on donor funding and contributions from the riparian countries. Present funding partners are: France, AWF, ECOWAS-WRCU, SIDA/IUCN, and Member States. The distribution of the funding contributions among

the riparian states is: Benin (10%), Burkina Faso (29%), Ghana (29%), Cote d'Ivoire (9%), Mali (9%), and Togo (14%).

1.4 Beneficiaries

1.4.1 The two main pillars of the AWF funded project are (i) strengthening of hydrological services at national and basin level by the means of Volta-HYCOS and (ii) strengthening of VBA's operations and integration of HYCOS in VBA's operations. As shown in Table 1.1 there are many different beneficiaries who will in various ways benefit from the project.

Table 1.1 the Volta-HYCOS PROJECT – Beneficiaries and Benefits Matrix

Beneficiaries	(1) Benefits due to Enhanced I&K (HYCOS)	(2) Benefits due to Strengthened VBA
A. Direct Beneficiaries		
VBA staff, NHS and IWRM Staff, Regional Project Centre; Volta Basin Observatory	Enhanced capacity to perform hydrological services and deliver reliable data and knowledge as a collective cross-boarder activity coordinated by VBA	Enhanced ability to perform IWRM at basin level (VBA) and coordinated IWRM at national level performed by the Autorhorities of the 6 riparian states.
10 Ongoing water projects coordinated by VBA (Annex 6)	Access to reliable hydrological information products and water knowledge for the respective projects	Coordinated by an effective basin authority (VBA) with leading to improved quality and regional integration of each project
Water sector operators (hydropower, flood control, WS&S, irrigation, navigation, industry, etc.)	Access to reliable hydrological information products and water knowledge for operation, forecasting, early flood warning and contingency plans	Guided by an authority capable of issuing knowledge based advice and authorisations on water abstraction, water retention or wastewater discharge.
Potential public and private investors in the water sector	Access to reliable water information and knowledge for planning, design, economic analysis and decision making	Guided by an authority capable of issuing knowledge based advise and the required authorisations
Water and Climate Change Research Institutes	Access to reliable hydrological information and knowledge for modelling of impacts of climate change	Interacting with a knowledgeable basin authority in charge of promoting climate change adaptation strategies
AGRHYMET, ACMAD, WMO, UNEP, UNESCO, FAO	Access to reliable complementary hydrological data and water knowledge)	A capable basin authority as a focal point for new projects in the Volta basin
Water resources consultants	Access to reliable hydrological information products that will improve the quality of plans and studies.	Improved quality of design and master plan studies in the basin under the auspices of a dynamic basin authority
B. Indirect Beneficiaries		
Governments, political leaders, decision makers	Benefiting from strengthened base for decision making at national level	Benefiting from strengthened base for strategic planning and conflict prevention
Local authorities and decision makers	Benefiting from strengthened base for decision making at local level	Assuring integration of local projects in a basin-wide context
Higher Water Education (2iE etc.)	Benefiting from access to see modern hydrological systems and services	IWRM education benefiting from access to VBA as a dynamic basin authority
International development cooperation	Enhanced reliability and design basis for new project proposals for funding	Enhanced integration of for new project proposals for funding for enhanced productivity of water sectors
C. General Beneficiaries		
Academia, universities, and schools	Access to reliable water resources information from HYCOS web-site etc.	Access to information from a dynamic and knowledgeable basin authority
Media (press, radio, television)	Better knowledge base for programs and articles on water resources of the basin	Better knowledge base for programs and articles on TWRM issues
Public society of the Volta Basin, at large (19 million)	Enhanced access to water related information	Improved productivity of water sectors, and reduced impacts of floods & droughts

2 THE PROJECT

2.1 Objectives

2.1.1 The overall development objective of the project coinciding with the purposes of the creation of the Volta Basin Authority as stated in the Convention of 12th January 2007. The Authority is established as an inter-State organisation for the purpose of ensuring international cooperation for the rational and sustainable management of the water resources of the Volta basin and for socioeconomic development and integration between the riparian countries for increasing the standard of living of their peoples. The immediate objective of the AWF project is to strengthen the VBA and incorporate the Volta-HYCOS operations in the Authority to achieve improved trans-boundary water resources management (TWRM) and development of the basin.

2.2 Impacts

2.2.2 The long-term development impacts of the Volta-HYCOS Project will be its contribution to economic growth, reduced poverty, and improved health, and food security of people in the Volta Basin. These impacts are attributed to improved water security and reduced impacts of floods and droughts. The project will contribute to better design and economic optimisation of investment projects in water infrastructure, such as dams for hydropower, agriculture, water supply, flood control (including early flood warning) and inland navigation. Table 1.1 gives a snap-shot of the envisaged impacts of the project from the beneficiaries' perspectives.

2.2.3 In providing reliable and systematic water information and knowledge (I&K) the project will provide an indispensable centre piece for the creation and supervision of water sharing treaties/agreements among riparian countries under the auspices of VBA. This is an important mechanism to create a better political climate to avoid water conflicts through enhanced basin-wide integration and water development cooperation. The information and knowledge generated as a result of this project will also support the riparian countries in developing policies and strategies for Climate Variability and Change Adaptation in the water sector. The forecasts of the impacts of climate change and variations on the region's water resources will benefit from reliable data adapted to the requirements of various users and beneficiaries.

2.3 Outcomes

2.3.1 The long-term development change induced by the Volta-HYCOS Project will be that VBA, the Observatory and the NHS will be able to deliver appropriate and useful hydrological information products and services to users thus contributing to the fulfilment of the VBA Convention. In a long-term perspective the Project will provide an important source of reliable data for hydrological forecasts adapted to the various types of future water resource scenarios including the regional climate change impact predictions.

2.3.2 The above outcomes will stem from: (i) an operational and sustainable HYCOS network and associated operations in place in all VBA member countries; (ii) Volta-HYCOS providing relevant, reliable and timely hydrological information products to the identified users; (iii) the strengthened capacity of VBA to initiate and implement water development projects in the basin; and (iv) NHS in each of the 6

VBA countries strengthened and effectively providing HYCOS data to the Regional Project Centre (RPC) Data Base hosted by VBA; (v) VBA delivering relevant and reliable water formation products to the users and stakeholders including the Observatory. These collective efforts will in turn contribute to the performance of the management and development of trans-boundary water resources at basin, national, and local level.

2.4 Outputs

2.4.1 The direct outputs of the project interventions will include physical deliverables, improved project management capacity, operational performance, and water governance by VBA, improved staff skills, and improved performance of the PRC and NHS,. It also provides direct inputs to the associated Observatory project. The specific outputs of each activity that collectively will contribute to the achievements and outcomes of the Project are summarised in the following:

2.4.2 **Outputs of Activity 1: Upgrading of the hydrometric network and support to NHS country operations**

- Extended and modernized hydrological monitoring networks by new Data Collection Platforms (DCPs) and associated transmission systems. The project intends to provide for the installation of 60 hydrometric stations of which 12 will be funded by AWF and the remaining ones by FFEM
- Strengthened institutional capacity at National Hydrological Services (NHS) by well trained hydrological staff, upgraded equipment, and improved operational mobility
- Quality controlled hydrological data submitted by the NHSs to the PRC as a basis for construction of the hydrological database for the Volta basin

2.4.3 **Outputs of Activity 2: Strengthening of RPC and Development of Regional Hydrological Information System for the Volta Basin**

- Strengthened capacity of the RPC with of a powerful hydrological data base, IT tools, staff capacity, operational mobility, improved quality control procedures, and validation by the NHSs
- A functional and reliable hydrological data base in place at the PRC providing reliable water information accessible via Internet based on interactive data exchange with the NHSs, and positive synergies with Niger-HYCOS
- VBA involved in the validation of rating curves for the Volta-HYCOS stations performed in cooperation with the NHS
- Appropriate hydrological information products including an interactive map of the Volta Basin developed and information being disseminated by the Regional Hydrological Information System (HIS)

2.4.4 **Outputs of Activity 3: Training**

- A permanent system for training in operational hydrology in place at PRC
- Improved skill and increased personal performance of the 9 trained trainers
- Improved skill and increased personal performance of 30 staff from riparian countries trained by the trainers

2.4.5 **Outputs of Activity 4: Strengthening of VBA's project management capacity and incorporation of Volta-HYCOS in VBA's operations**

- Enhanced operational effectiveness of VBA in performing its hydrological monitoring and water information services according to the VBA Convention.
- VBA's project management procedures and implementation capacity strengthened
- Baseline Study documenting the current situation including measurable indicators carried out as a benchmark to verify the impacts of the Project
- Volta Basin Observatory for Water Resources and the associated Web-site duly linked the Volta HYCOS system and delivering relevant water information
- Long-term VBA Action Plan for hydrological operations developed and endorsed by VBA Experts Committee and Council of Ministers.
- VBA promoted and recognised in riparian countries and international forums.
- Post project evaluation of the Volta-HYCOS carried out and reported.

2.5 Activities

2.5.1 In order to achieve the identified outputs, the AWF will support the implementation of a number of activities derived from the request and developed on the basis of discussions held with VBA and the Project Coordinator during appraisal.

2.5.2 **Activity 1: Upgrading of the Hydrometric Network and Support to the Operations of the National Hydrological Services (NHS)**

1.a Planning and supervision missions to selected Volta-HYCOS stations by NHSs AWF will provide support to the country-wise hydrological field operations of this activity.

1.b Acquisition of hydrological equipment for the HYCOS network that will be rehabilitated and equipped with new equipment and instruments (staff gauges, rain gauge, digital water level recorders, DCP, radio HF, GSM telephone or METEOSAT antennas, water quality monitoring) according to the requirement of the NHSs and the PRC. The AWF support will more specifically comprise delivery and installation of hydrometric monitoring systems.

1.c. Collection and validation of hydrological data by the NHSs to be transferred to the PRC. The PRC will monitor the technical and financial execution the field activities by the NHSs on the basis of the support Cost Estimate given to be used for the activities of the project. AWF will support the country-wide hydrological field operations and supply of necessary equipment and vehicles to Ghana and Togo. Transport to the other 4 riparian countries will be funded by FFEM.

2.5.3 **Activity 2: Strengthening of Project Regional Centre (PRC) and Development of Hydrological data base and Information System for the Volta Basin**

2a. Acquisition of computers and associated data management tools, such as servers and data base management software to and Regional Hydrological data base of the PRC and the National bases of the NHSs.

2.b Development of a functional hydrological data base at the PRC that shall serve as an effective information system on the water resources in the basin accessible via Internet. The centre piece of the information system will be the Volta-HYCOS Web site, which will allow users easy access to data and information. The activity will include: (i) Reconstitution of the hydrological data in the Volta basin countries in collaboration with the NHSs for building the Regional hydrological data base; (ii) Creation of protocols (MoU) and formats for the exchange of hydrological data between the NHS and the PRC built on lessons from the Niger-HYCOS project; (iii) Definition and application of data quality control procedures and their validation by the NHSs. The AWF support will comprise funding of project personnel, the PRC Coordinator (2 years), office equipment, computers and software, and other investments and project related operational costs.

2.c Updating and validation of rating curves for the Volta-HYCOS stations to improve the reliability of the measurements facilitated by the Acoustic Doppler Current Profilers (ADCP) purchased by the Project. This activity will be pursued and coordinated by VBA and the acquired data will be transmitted to the PRC. The AWF involvement is further described in Activity 4.a.

2.d Definition and conception of hydrological information products to be delivered by the Regional Hydrological Information System (HIS) based the sensitisation of the users that was carried out during project preparations in 2006. Hydrological products currently being developed include interactive map of the Volta Basin and hydrometric stations, visualisation of hydrographs etc. A validation workshop will be arranged to present the developed hydrological products and obtain the feedback from NHSs and other beneficiaries to ensure that the products are relevant and useful. After validation the data and information products will be subject to online dissemination.

2.5.4 **Activity 3: Training**

The proposed training under the Volta-HYCOS project aims at establishing a permanent structure for training in operational hydrology in the sub-region. The training of trainers, that will take place at the Project Regional Centre (PRC) in VBA, will target officials and personnel of the riparian countries involved in the Volta-HYCOS programme and will be conducted in nine modules basically whereof two will be funded under the AWF project.

3.a Training of Trainers. The AWF contribution will be funding external experts to perform the training under Module M8: Hydrological Modelling as Applied to Flood Forecasting and Module M9: The Use of Satellite-based Information for Water Resources Planning and Management. Altogether 9 trainers from VBA, PRC and the member countries will be trained

3.b ***Training in member countries*** will comprise the training of some 30 staff from the National Hydrological Services and IWRM authorities

2.5.5 **Activity 4: Strengthening of VBA's Management Capacity and Incorporation of Volta-HYCOS in VBA's Operations**

4.a Rating curve validation and O&M of ADCP (also see Activity 2.c.). The provision of Acoustic Doppler Current Profilers (ADCPs) will enable the NHSs carry out flow measurements for the validation of rating curves to ensure reliable river flow measurements. It is proposed that VBA shall be responsible for an activity for coordination of O&M of HYCOS stations validation of rating curves: Volta-HYCOS Project to set up a network for maintenance of the Acoustic Doppler Current Profiler (ADCP) at the basin level. This will be a forerunner to a sub-region team led by VBA with competence in the servicing and repair of ADCPs. This activity will feed into the proposed Action Plan for VBA's long-term hydrological operations (Activity 4.e.)

4.b Strengthening of VBA's project management capacity and incorporation of Volta-HYCOS. The purpose of this activity will be to capacitate the VBA managing the implementation of this project and other upcoming projects that are being transferred to VBA. This activity will also facilitate the rapid incorporation of Volta-HYCOS and its associated Web-site in VBA's operations. VBA is in the process of filling the key positions of permanent staff. The capacity building will be carried out as on-the-job training and coaching of designated VBA staff by 2iE and WMO on a based on MoUs (see Chapter 3.1). The purpose of such arrangement is to transfer to VBA systems and experience from the initial phase of the project. The activity will include the establishment of operational procedures for VBA to manage projects including task management, administrative, accounting, financial management, procurement, legal, monitoring, and reporting. AWF will also fund necessary investments in equipment and a vehicle and project related operational expenditures.

4.c Baseline Study to verify the current situation based on relevant and quantifiable indicators that will serve as a basis for the monitoring and evaluation (M&E) of the Project. The baseline study will take into account and further develop the hierarchy of objectives and the associated impacts, outcomes and outputs in the LFA matrix. The baseline will also include sensitisation of the stakeholders and VBA projects mentioned in Table 1.1 in Chapter 1.4 and elaborate on the anticipated contribution of the AWF project on the demands of the respective beneficiaries, including gender aspects. The ToR for this study will be developed by VBA and will be subject to no objection by AWF.

4.d Promotion of VBA interaction with users and stakeholders. This project component will enable VBA carry out some of its vital functions including (i) promote the ratification of the Convention by the two remaining countries (ii) direct engagement with stakeholders and users of hydrological information products, (iii) promotion of VBA in the member states and international forums, (iv) conducting dialogues on conflict prevention, (v) accomplishment of VBA Expert Committee meetings, (vi) conducting workshops on Information and Knowledge (I&K) among

basin states, and (vii) conducting annual steering committee meetings, and Meetings of the Council of Ministers. The project will provide funding support to the VBA management to undertake and report on the above activities.

4.e Development of an Action Plan for VBA's long-term (post –project) hydrological operations and coordination of the hydrological services and O&M at national level including financial sustainability of those operations. The plan will address the transfer of competence and products of the Volta-HYCOS Project to VBA and the reinforcement of the institutional capacity of the Authority to collect, process, and disseminate hydrological data and information products. The Action Plan shall also develop mechanisms for directly linking the hydrological services to the ongoing and future development interventions of the basin including the stakeholders and projects mentioned in Chapter 1.4. The Action Plan shall also identify the funding requirement for the hydrological operations 2010-2025 and associated financial arrangements that are necessary to ensure long-term operational sustainability. Plans for corrective and preventative maintenance as well as spare part management arrangement shall be addressed. The ToR for the development of the Action Plan will be prepared by VBA and be subject to no objection by AWF.

4.f Post Project Evaluation
AWF will fund the final evaluation of the Volta-HYCOS Project to be conducted upon completion of the project. The findings and indicators of the Baseline Study (Activity 4.c.) will serve as a yardstick for assessment of the impacts of the Project. The Evaluation shall be carried out by independent experts including a mission visiting the RPC and some countries participating in the project. The evaluation report will be forwarded to the Project Steering Committee (SC), the Executing Agency, and AWF plus the donors.

2.6 Risks

2.6.1 The risks threatening the overall efficiency of the project and jeopardising the achievement of the objectives are summarized in the LFA matrix. There is a broad variety of risk factors at different objective levels. The technological risks are linked to the quality and reliability of the delivered hydrological equipment and data transfer systems. Such risks have been mitigated by taking into account previous problems facing the operation and maintenance hydrometric stations. The technological risks will also be mitigated by sufficient provisions for stocks of spare parts that can be quickly mobilised for necessary replacement and repair work.

2.6.2 The risks of poor performance by the riparian countries may be attributed to weak ownership by the riparian countries or insufficient staff capacity at the NHS. The risks are reduced by MoUs signed between VBA and the NHSs that imply binding commitments from the parties. Lessons learned from the initial stage of the Volta-HYCOS 2006-08 show that some project activities are behind schedule so the Steering Committee and Council of Ministers have urged the project partners to speed up the fulfilment of their obligations. Another mitigating factor is the support from AWF project to the National Hydrological Services to enable them cooperate more effectively.

2.6.3 The possibility of inadequate project management and coordination capacity by the Executing Agency (VBA) may be another risk. As a mitigation measure, the

AWF project will assign ample resources to strengthen the VBA management and operational capacity. In this respect, the project will duly benefit from lessons learned from the Niger-HYCOS project. The risk of operational failure of the HYCOS network after project completion may be related to inadequate assignment of staff or insufficient provision of facilities, and financial inputs due to weak recognition and ownership by the partner countries. Weak project performance may result from lack of staff assigned to the project due to overcommitted staff or personnel leaving the hydrological service after training. As a mitigating factor on of the project activities (will be to develop a long-term hydrological Action Plan (20210.2025) to enable VBA promote and coordinate sustainable hydrological services in the basin.

2.6.4 Provided the Volta-HYCOS deliver the information and knowledge services as planned, the envisaged impacts of the project in the view of the overall development goals may still be limited. The risk might be ascribed to low performance of the National water development or Poverty Reduction programmes etc. of the riparian countries. As a measure to strengthen the Project's contribution to the achievement of the development goals the project intend to strengthen the capacity of VBA to promote development projects in the basin including advocacy for basin cooperation and integration. (Examples: Activity 4.c, 4.d and 4.e).

2.7 Costs and Financing Plan

2.7.1 The broad cost estimate for each activity was established during the appraisal mission and subsequent consultations and clarifications. Annex 2 gives the cost estimates (without tax and duties) of the project components funded by AWF, FFEM and in-kind contributions from other partners and these are summarised in Table 2.1.

Table 2.1 Summary of Cost Estimate without tax and duties (Euro)

Activity	FFEM	AWF	Other	Total
1. HYCOS and NHS support	700,000	341,000	200,000[(a)]	1 ,241,000
2. RPC and Regional d-Base	138,000	162,000	870,000[(b)]	1,170,000
3. Training	57,000	88,000	0	145,000
4. VBA Capacity Building and Integration of HYCOS	105,000	609000	150,000[(c)] 150,000[(d)]	1,014,000
TOTAL	**1,000,000**	**1,200,000**	**1,370,000**	**3,570,000**

[(a)]6 Riparian Countries, [(b)]IRD, [(c)]2iE, [(d)]WMO

3 PROJECT IMPLEMENTATION

3.1 Recipient

3.1.1 The Volta Basin Authority (VBA) with Headquarters in Ouagadougou will be the Recipient and Signatory to the AWF Grant Agreement and the Executing Agency of the Project. The AWF-ADB will need evidence that the Convention has been ratified and entered into force (30 days after ratification) and that VBA has the legal authority to act. This will be in terms of a written notification from the Government of Burkina Faso as one of the proofs required for entry into force.

3.1.2 The assignment of VBA as Executing Agency is in line with the ongoing changes of the management arrangement for the Volta-HYCOS Project as manifested in the minutes of the Volta-HYCOS Steering Committee meeting 4th to 5th September 2008. The Recommendation 12.7 states that: "SC members recommended effective participation of VBA in the execution of the Volta-HYCOS project and requested WMO in collaboration with the other partners and VBA, define modalities of transfer of Volta-HYCOS Project to VBA".

3.1.3 To ensure a well-organized transition of the project management responsibility to VBA, WMO and the Authority will sign a MoU related to handing over of files, materials, data and other assets acquired by the project. The MoU will also include necessary conditions and support to ensure appropriate quality of the operations in accordance with WMO standards. The MoU will be submitted to AWF-ADB for consideration as evidence of transfer of responsibilities and cooperation.

3.2 Implementation Arrangements and Capacity

3.2.1 The Project Regional Centre (PRC) which is now hosted by 2iE will be transferred to VBA as of 1st January 2009. It consists of a project Management Unit (PMU) and the Regional Data Base (RDB). The PMU is managed by a Project Coordinator currently contracted from 2iE and comprises 2 seconded staff from IRD The support to strengthen VBA in water information services has already started by the secondment of a Technical Advisor by France who will integrate Volta-HYCOS and its Web-site in the Volta Basin Observatory for Water Resources.

3.2.2 The staff resources of VBA to be involved in the Volta-HYCOS Project will be assigned from the following offices and departments (Annex 7): (i) The Executive Director; (ii) The Department of Operations and its 4 sectoral units (Irrigated agriculture, water supply and sanitation, fishery, and hydropower); (iii) Department of Planning and IWRM; (iv) The Department of Administration and Finance; (v) The Basin Observatory; and (vi) The Financial Controller, Director, who reports to the Council of Ministers but is administratively under the Executive Director. The names and positions of the actual key staff to be allocated to the Volta-HYCOS will be communicated to AWF before the signing of the grant agreement.

3.2.3 The implementation of the Volta-HYCOS project is governed by a Steering Committee (SC) as the highest decision making body of the project. It assures proper coherence between the various project components, performs strategic supervision, takes decision on the possible modifications in terms of project orientation, and approves the annual activity plan and related Cost Estimate. The SC is composed of VBA, representatives from the Directors of Water level of the participating countries, French Development Cooperation, AWF, and from other partners like WMO. Minutes of SC meetings in 2006, 2007, and 2008 are available.

3.2.4 The participating countries have an important responsibility in the project implementation represented by the National Hydrological Services (NHS). To ensure the success and sustainability of the project, it has been indispensable to obtain the approval of participating countries in the form of agreements (MoUs) stating their commitments in the project.

3.3 Implementation Schedule

3.4.1 The time-phased targets of the Volta-HYCOS will be in the framework of a planned duration of 22 months from 1st March 2009 to 31st December 2010 as shown in the general time schedule Table 3.1. The implementation schedule has been revised by VBA to include the AWF funded activities.

Table 3.1 Overall Time Schedule for AWF Activities

	2009												2010											
ACTIVITY	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D
Grant Effectiveness																								
Procurement																								
1 Country support																								
1.a Planning																								
1.b Acquisition																								
1.c Data collection																								
2. PRC + d-base																								
2.a Acquisition																								
2.c Validation																								
2.d Info. Products																								
3. Training																								
3.a of Trainers																								
3.b In countries																								
4. Strengthen VBA																								
4.a Rating curves																								
4.b Project mgmt																								
4.c Baseline Study																								
4.d VBA Advocacy																								
4.e Action Plan																								
4.f Evaluation																								

3.4 Performance Plan

3.3.1 The project implementation supervision will follow the Result Based Management (RBM) format in which the LFA principles play a key role. The AWF activities are integrated elements of the Volta-HYCOS Project. The AWF activities will also follow the project implementation and management modalities as for the overall Volta-HYCOS Project. The LFA matrix of the Project including the AWF activities as presented at the out-set of this report states the project goal and objectives that are linked to the expected outcomes, and project activities and the risks and mitigation measures. The Progress Reports are presented at the Annual Steering Committee Meetings of Volta-HYCOS.

3.5 Procurement and Execution

3.5.1. All procurement of goods, works and acquisition of consultancy services financed by AWF shall be in accordance with the AWF's Operational Procedures, the Bank's Rules and Procedures for Procurement of Goods and Works or as appropriate, Rules and Procedures for the Use of Consultants, using the relevant Bank Standard Bidding Documents. Procurement arrangements are divided into categories and summarized in the Table 3.2 based on the details given in Annex 4.

3.5.2 **Goods.** One contract for goods will be awarded under International Competitive Biding (ICB) procedures for Data Collection Platforms, and valued in total at Euros 106,330. Other contracts for goods valued below Euros 300,000 and

above Euros 50,000 each will be awarded under National Competitive Bidding (NCB) procedures. Three such contracts will be awarded, for vehicles, office equipment and computer. These procurement modes under NCB are justified by the fact that the equipment is available through local dealers. Other miscellaneous goods, such as operation and maintenance expenditures, allowances estimated to cost less than Euros 50,000 per contract and not more than Euros 450,000 in aggregate, will be procured under Shopping Procedures. These procurement modes under Shopping are justified by the fact that the good are readily available locally and direct contracting is justified by the fact that it will streamline the procurement activities.

3.5.3 Consulting Services and Training. Acquisition of consulting services from national firms (from the riparian countries) shall be processed and contracts awarded through competition, for assignments of value below the ceiling established in the Procurement Plan approved by AWF, following National Short-Listing (NSL) procedures and using the quality and cost based selection process. Four such contracts will be awarded, for the Training activities (88,000 Euro)[4], Baseline Study (80,000 Euro)[5], VBA Action Plan (170,000 Euro)[6] and Post Project Evaluation (50,000 Euro)[7]. These procurement modes under NSL are justified by the fact that the procurement efforts must be in proportion to the limited size of each assignment. Individual consultants for specific assignments will be selected following the Bank's procedures for the use of individual consultants.

Table 3.2: Procurement Arrangements for AWF Funded Activities (Euro)

	AWF Funded					
CATEGORIES[8]	**ICB**	**NCB**	**Other**	**Shortlist**	**Not AWF Funded**	**Total**
Goods	106,330	133,200			565,000[(d)]	804,530
Services			114,000[(a)]	388,000	207,000[(d)]	709,000
Miscellaneous			458,470[(b)]		228,000[(d)]	
In-kind funding					1,370,000[(c)]	
Total	**106,330**	**133,200**	**572,470**	**388,000[**	**2,370,000**	**3,570,000**

[(a)] WMO support, RPC Coordinator, local support and translation, [(b)] Operational Expenses etc., [(b)]In-kind contributions from riparian states, IRD, 2iE and WMO, [(b)] Funding FFEM

3.5.4 Miscellaneous. These are items that are not normally procured but are part of the project cost, such as incremental salaries for operating staff, incremental working capital, and other project related operational expenditures.

3.5.5 **Executing Agency**. The Volta Basin Authority will be the Executing Agency responsible for the procurement of goods, consulting services, and training services. One of the project activities (Activity 4.b) shall actually support VBA develop its project implementation management capacity by providing on-the job training of VBA staff. This will be carried out by assignment of temporary external expertise to train and work together with the designated VBA staff including procurement.

[4] Item 3.8, 3.9 and 3.10 Annex 2
[5] Item 4.1 Annex 2
[6] Item 4.2 Annex 2
[7] Item 4.3 Annex 2
[8] For details see Annex 4

3.6 Disbursement Arrangements and Expenditure Schedule

3.6.1 The overall costs for the AWF grant as presented in Table 2.1 totalling Euro 1,200,000. The funds will be channelled through VBA, who will open a Special Account denominated in foreign currency in a Bank acceptable to ADB/AWF. The disbursement will be in the following two tranches:

– Initial disbursement (upon effectiveness)	Euro 800,000
– Second disbursement (mid term)	Euro 400,000
– **Total:**	**Euro 1,200,000**

3.7 Accounting and Audit Arrangements

3.7.1 The Grant Agreement will include the specific accounting arrangements and requirements for the Recipient opening of a Special Account with a local Bank acceptable to AWF from which all eligible payments will be made. The administration of the special account shall be performed by VBA.

3.7.2 In the interest of fast tracking the implementation of the Project actions, the AWF will recruit and retain an auditor to perform ex post evaluation or supporting documents review and audit the project. The Facility will require that a statement of expenditure and supporting documents review be performed and certified by the independent auditor at predetermined intervals to ensure that fund have been utilized in line with the grant agreement. The costs of such audit shall be charged to AWF and are not involved in the Grant.

3.8 Monitoring Evaluation and Reporting Arrangement

3.8.1 The objectives, actions, and expected outputs and outcomes of the AWF activities, as summarised in the attached LFA matrix adopted by VBA, which will form part of the Grant Agreement. The indicators and means of verification shown in the LFA matrix, especially those related to activities and outputs, will serve as a basis for performance monitoring during implementation. The AWF funding will include a Baseline Study to establish relevant performance indicators and to describe the baseline situation.

3.8.2 The implementation supervision of the AWF will include regular correspondence with the Recipient, and review of the Annual Progress Reports and Programmes of Activity submitted by the PMU to the Steering Committee (SC) (where AWF is member) and addressed by the Annual Council of Ministers Meetings. AWF will consider at any time the need for undertaking field supervision missions to check if the specific outputs of the AWF funding have been timely delivered with the required quality and if the expenditures are in agreement with the cost estimates and schedules. The Post Project Evaluation financed by AWF will examine the level of achievement in relation to the project objectives and expected results against the Baseline Study.

4 PROJECT BENEFITS

4.1 Effectiveness and Efficiency

4.1.1 The effectiveness of the AWF involvement in this project is related to its overall performance and the likelihood of achieving the overall objectives and expected outcomes as given in the LFA Matrix. The overall effectiveness depends on the sum of single factors, also those beyond the control of the project management. The appraisal noted that the quality of the project preparation and the funding application holds the necessary standard and was further developed and refined during the appraisal discussions. In conclusion the overall assessment made by the Appraisal Team concludes that the project is likely to be implemented with the necessary efficiency required by AWF.

4.2 Sustainability

4.2.1 The sustainability of the project interventions are closely related to the institutional and technical sustainability of VBA, and the actual contribution of improved knowledge and information services to long lasting development effects of water development investments and services in basin. As addressed under Risk Section, the first factor is directly related to the performance of the project whereas the second concern of development impacts and sustainability is to a large extent beyond the control of the project as such.

5 CONCLUSIONS AND RECOMMENDATIONS

5.1 Conclusions

5.1.1 The Project is an important and well justified initiative taking into consideration the many trans-boundary water challenges facing the Volta Basin riparian countries and the need to provide appropriate hydrological information to enable effective governance and development of the shared water resources. This will have bearings on the political, economic, and public activities in the Volta Basin and is expected to facilitate enhanced regional food production, hydropower production, river navigation, water based industry, early warning of floods, prediction of effects of climate change and other activities contributing to regional socio-economic development. An essential feature of the AWF project is to get the newly established Volta Basin Authority (VBA) directly engaged in the development and operationalisation of the Volta-HYCOS system. This will have thorough bearings on the future performance of the Authority as a common instrument for trans-boundary water resources management and development in the six riparian countries.

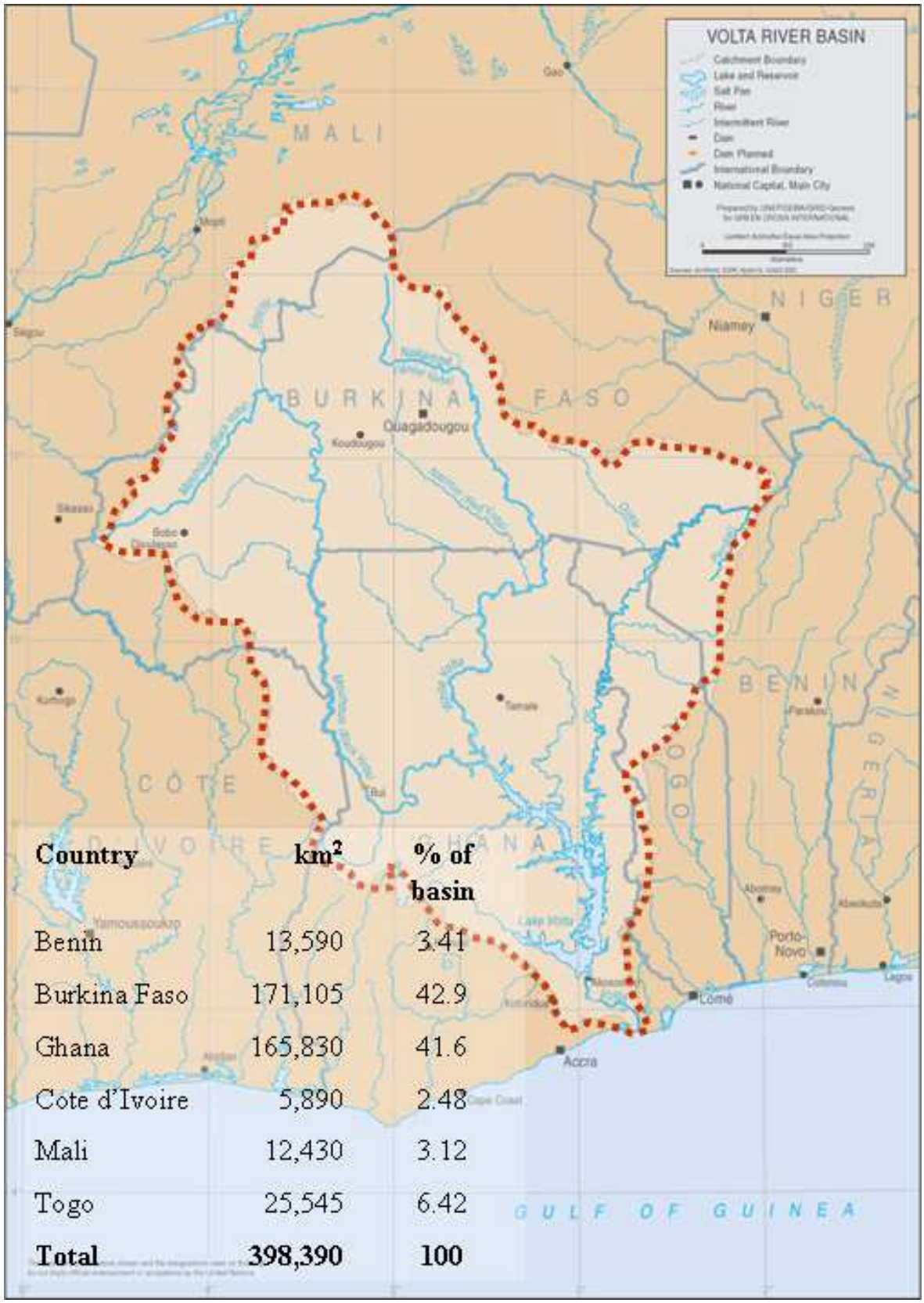
5.1.2 According to AWF's Operational Programme for 2005-09 support to improved trans-boundary water resources monitoring and knowledge enhancement in the Volta Basin is identified as one of the priority areas. Assessments of the eligibility of the Recipient and the project is found to be in accordance with the criteria laid down in AWF's Operational Procedures and Guidelines and the anticipated efficiency, effectiveness and sustainability of the project are found acceptable. The project has duration of 22 months and the Cost Estimate for the AWF grant is 1,200,000 Euro.

5.2 Recommendations

5.2.1 Based upon a critical assessment of the relevance, effectiveness, and sustainability of the Project, as well as the credibility and capacity of the Recipient, it is recommended that the President of the Bank approves the Application from Volta Basin Authority (VBA) for funding of identified activities of the Volta-HYCOS Project totalling an AWF grant of 1,200,000 Euro (34%) out of a total project Cost Estimate of 3,570,000 Euro.

5.2.2 Following this appraisal a draft Grant Agreement between VBA and AWF will be prepared as a basis for approval and signing. The condition for the effectiveness of the Grant Agreement between AWF and VBA are that: (i) ADB/AWF have received official evidence that the VBA Convention has been ratified and entered into and that VBA has the legal authority to act. This will be in terms of a written notification from the Government of Burkina Faso as one of the proofs required for entry into force; (ii) that the ToR for the Baseline Study and the VBA Action Plan have been submitted for AWF's no objection; (iii) that the VBA staff committed to the project has been communicated to AWF for no objection, and (iv) that VBA has established a Special Account denominated in foreign currency in a Bank acceptable to ADB/AWF

ANNEX 1: VOLTA RIVER BASIN MAP



Country	km²	% of basin
Benin	13,590	3.41
Burkina Faso	171,105	42.9
Ghana	165,830	41.6
Cote d'Ivoire	5,890	2.48
Mali	12,430	3.12
Togo	25,545	6.42
Total	**398,390**	**100**

ANNEX 2: COST ESTIMATE FOR THE VOLTA-HYCOS PROJECT

					AWF-Cost	
COMPONENT	**IRD, 2iE,WMO**	**FFEM**	**AWF**	**Total**	**2009**	**2010**
1. Upgrading HYCOS and support to NHS operations						
(i) Hydrological Equipment (see Annex 3)						
1.1 Hydrological equipment, water quality rain gauges		255 000	60 000	315 000	54 000	6 000
1.2 DCPs		140 000	46 330	186 330	41 697	4 633
1.3 IT hardware		95 000	3 000	98 000	2 700	300
1.4 Software Data Base		30 000		30 000	0	0
1.5 IT IT support and subscriptions		40 000	2 200	42 200	1 980	220
(ii) Support to NHS country Operations (see Annex 3)						
1.6 Travel allowances			35 600	35 600	32 040	3 560
1.7 Operating expenses of vehicles			45 400	45 400	40 860	4 540
1.8 Hiring/vehicles Repair			23 700	23 700	21 330	2 370
1.9 Consumable data processing			32 000	32 000	28 800	3 200
1.10 Telecommunication			10 800	10 800	9 720	1 080
1.11 Procurement Vehicle 4x4 Ghana and Togo NHS			54 000	54 000	48 600	5 400
1.12 FFEM contributions		100 000		100 000	0	0
1.13 Miscellaneous		40 000	27 970	67 970	25 173	2 797
1.14 In-kind contributions from riparian countries	200 000			200 000	0	0
Sub-Total 1	**200 000**	**700 000**	**341 000**	**1 241 000**	**306 900**	**34 100**
2. Support to RPC and Regional data base					0	0
2.1 Project Personnel		7 000	15 000	22 000	13 500	1 500
2.2 Fee RPC Coordinator		72 000	48 000	120 000	43 200	4 800
2.3 Telecommunication		5 000	6 000	11 000	5 400	600
2.4 Office furniture and equipment		5 000	3 000	8 000	2 700	300
2.5 Editing and Translation		11 000	5 000	16 000	4 500	500
2.6 Transport and per-diem		38 000	17 000	55 000	15 300	1 700
2.7 Workshop expenses			20 000	20 000	18 000	2 000
2.8 Vehicle RPC			27 000	27 000	24 300	2 700
2.9 Steering Committee			21 000	21 000	18 900	2 100
2.10 IRD Technical Support	870 000			870 000	**0**	**0**
Sub-Total 2	**870 000**	**138 000**	**162 000**	**1 170 000**	**145 800**	**16 200**
3. Training						

3.1 M1-Limnimetry and topographic survey		6 000		6 000	0	0
3.2 M2-Flow measurements with ADCP and current meter		7 000		7 000	0	0
3.3 M3-Establishment of rating curves		7 000		7 000	0	0
3.4 M4-Installation and management of DCPs		14 000		14 000	0	0
3.5 M5-Hydrological data base management software		7 000		7 000	0	0
3.6 M6-Hydrological expertise and IWRM		8 000		8 000	0	0
3.7 M7-Web Page and hydrological products		8 000		8 000	0	0
3.8 M8-Hydrological Modelling Applied to Flood Forecasting		0	18 000	18 000	9 000	9 000
3.9 M9-The Use of Satellite-based Information for IWRM		0	20 000	20 000	10 000	10 000
3.10 Field training in riparian countries			50 000	50 000	25 000	25 000
Sub-Total 3	**0**	**57 000**	**88 000**	**145 000**	**44 000**	**44 000**
4. VBA Capacity Building and Integration of HYCOS						
4.1 Baseline Study			80 000	80 000	40 000	40 000
4.2 Action Plan for VBA			170 000	170 000	85 000	85 000
4.3 Post Project Evaluation			50 000	50 000	25 000	25 000
4.4 Twp validation w/shops information system			25 000	25 000	12 500	12 500
4.5 Management fee for 2ie hosting RPC (up to Jan 09)		20 000		20 000	0	0
4.6a Assistance provided by WMO (charged to project)		40 000	40 000	80 000	20 000	20 000
4.6b In-kind Assistance provided by WMO	150 000			150 000	0	0
4.6c In-kind Project Coordination Support by 2iE	150 000			150 000	0	0
4.7 Field expenses for installation of equipment			10 000	10 000	5 000	5 000
4.8 Staff allowances			30 000	30 000	15 000	15 000
4.9 Staff training			23 000	23 000	11 500	11 500
4.10 ratification of Convention			5 000	5 000	2 500	2 500
4.11 Promotion VBA at basin level			15 000	15 000	7 500	7 500
4.12 Promotion of VBA at international level			5 000	5 000	2 500	2 500
4.13 International meetings			15 000	15 000	7 500	7 500

4.14 Expert Committee			25 000	25 000	12 500	12 500
4.15 Translation services			6 000	6 000	3 000	3 000
4.16 Telecom. subscriptions			7 500	7 500	3 750	3 750
4.17 Water and Electricity			8 500	8 500	4 250	4 250
4.18 Maintenance			3 000	3 000	1 500	1 500
4.19 Operation of vehicles			11 000	11 000	5 500	5 500
4.20 PCs and accessories			12 000	12 000	6 000	6 000
4.21 Office furniture			3 000	3 000	1 500	1 500
4.22 Office materiel etc.			2 000	2 000	1 000	1 000
4.23 Vehicle 4x4			27 000	27 000	13 500	13 500
4.24 Miscellaneous		45 000	36 000	81 000	18 000	18 000
Sub-total 4	**300 000**	**105 000**	**609 000**	**1 014 000**	**304 500**	**304 500**
GRAND TOTAL	**1 370 000**	**1 000 000**	**1 200 000**	**3 570 000**	**801 200**	**398 800**

ANNEX 3: COST ESTIMATE DETAILS OF ACTIVITY 1

Items	Unit Cost	Benin	Burkina Faso	C.I.	Ghana	Mali	Togo	Total	AWF
Number of stations	EUR	*3*	*24*	*3*	*16*	*3*	*11*	***60***	EUR
Staff Gauges	50	0	5	0	5	0	0	10	500
Supports	20	0	0	3	0	5	10	18	360
Current meters	13750	0	0	0	0	0	0	0	0
Current meter parts:									
Axes (body)	660		0		0			0	0
- Propeller type1	1430		0		0			0	0
- Propeller Type2	220		0		0			0	0
- Winch	4950	0	0		0			0	0
- Wading rods	1980		0		0			0	0
- Weight	1650		0		0			0	0
Micro-current meter	2750	0	0	1	0	0	1	2	5 500
Current counter	660	1	4	1	4	1	1	12	7 920
Boats	4420	0	1	0	0	0	0	1	4 420
Out board Motor	2200	0	0	0	0	0	0	0	0
ADCP	33500	0	0	0	0	0	1	1	33 500
Levelling Instrument	1650	0	0	0	0	0	0	0	0
GPS	600	1	4	1	4	1	2	13	7 800
Total cost of flow equipment		1 260	9 710	4 070	5 290	1 360	38 310	60 000	**60 000**
Water quality equipment									

Multiple probe	1650	0	0	0	0	0	0	0	0
Turbidity meter	1650	0	0	0	0	0	0	0	0
Automatic rain gauges	880	0	0	0	0	0	0	0	0
Ordinary rain gauges	330	0	0	0	0	0	0	0	0
Total cost of rain gauges	0	0	0	0	0	0	0	0	0
Total water quality and rain gauges	0	0	0	0	0	0	0	0	**0**
DCP without tele-transmission system	1650	0	6	1	0	0	1	8	13 200
DCP with Meteosat tele-transmission	6600	0	1	0	3	0	0	4	26 400
GSM Telephone	330	0	0	0	0	0	0	0	0
DCP with radio tele-transmission	2770	0	0	0	0	1	0	1	2 770
Installation	330	0	7	1	2	1	1	12	3 960
Total Cost DCPs	0	0	18 810	1 980	20 460	3 100	1 980		**46 330**
Computer - Hardware									
Data base Servers	4400	0	0	0	0	0	0	0	0
Server FTP and Web	4400	0	0	0	0	0	0	0	0
Desktop computers	1650	0	0	0	0	0	0	0	0
Laptop computer	1980	0	0	0	0	0	0	0	0
PDA	550	0	0	0	0	0	0	0	0
Accessories (USB pen drives)	110	0	0	0	0	0	0	0	0
Printer	495	0	0	0	0	0	0	0	0
UPS	220	0	0	0	0	0	0	0	0
Colour printer	1000	0	1	0	1	0	1	3	3 000
Multifunction printer/fax/scanner	220	0	0	0	0	0	0	0	0
Accessories for PRC	1155	0	0	0	0	0	0	0	0

Total Computer Hardware	0	0	1 000	0	1 000	0	1 000		**3 000**
Computer Software									
Hydrological database software	11000	0	0	0	0	0	0	0	0
Total Cost of Software	0	0	0	0	0	0	0		**0**
Computer and Internet Assistance									
Maintenance of computers	3300	0	0	0	0	0	0	0	0
New Internet line and subscription	12100	0	0	0	0	0	0	0	0
Internet subscription	1980	0	0	0	0	0	0	0	0
Network Installation	1100	0	0	0	1	0	1	2	2 200
Total Maintenance and Internet		0	0	0	1 100	0	1 100		**2 200**
Shipping Cost									3 200
Miscellaneous									19 800
Miscellaneous									**23 000**

Item		**Benin**	**Burkina Faso**	**C.I**	**Ghana**	**Mali**	**Togo**		**AWF**
Travel allowance		1 800	23 000	3 000	0	1 900	5 900		35 600
Operational costs vehicles		7 500	11 000	2 900	16 800	4 100	3 100		45 400
Car rent and maintenance		0	0	0	15 500	0	8 200		23 700
Consumables IT		2 700	12 500	5 300	0	6 000	5 500		32 000
PTT		0	0	0	10 800	0	0		10 800
Vehicles		0	0	0	27 000	0	27 000		54 000
Miscellaneous									16 500
Sub-Total 3		**12 000**	**46 500**	**11 200**	**70 100**	**12 000**	**49 700**		**218 000**

ANNEX 4 PROCURMENT DETAILS

Project Categories	Ref (see Annex 2)	ICB	NCB	Other	Short-list	Total AWF	FEEM Funded
Goods							
Hydrological equip and DCPs	1.1, 1.2	106 330				106 330	395 000
Computers and software	1.3, 1.4, 1.5, 4.20		17 200			17 200	165 000
Vehicles	1.11, 2.8, 4.23		108 000			108 000	
Office equipment etc.	2.4, 4.21, 4.22		8 000			8 000	5 000
Consulting Services							
Project Mgmt WMO	4.5, 4.6			40 000		40 000	60 000
Fee PRC Coordinator	2.2,			48 000		48 000	72 000
Local support and translation	2.1, 2.5, 4.15			26 000		26 000	18 000
Sub Total				114 000		114 000	150 000
Baseline Study	4.1,				80 000	80 000	
Action Plan VBA	4.2,				170 000	170 000	
Project Evaluation	4.3,				50 000	50 000	
Training	3.8, 3.9, 3.10				88 000	88 000	57 000
Miscellaneous							
Operating staff, Operational expenditures etc.	1.6, 1.7, 1.8, 1,9, 1.10, 1,3, 2.3, 2.6, 2,7, 2.9, 4.7-4.14, 4.16-4.19, 4.24			458 470		458 470	228 000
Total		**106 330**	**133 200**	**572 470**	**388 000**	**1 200 000**	**1 000 000**

ANNEX 5: KEY FUNCTIONS OF THE VOLTA BASIN AUTHORITY

i. Promotion of Stakeholder Responsive Development:

- Contribute to poverty eradication, the sustainable development of the parties in the Volta Basin, and for better socio-economic integration in the sub-region
- Promote permanent consultation tools among the parties for the development of the Basin at local, national, and sub-regional level
- Coordinate planned or ongoing projects and programmes in the basin and ensure that the interventions are stakeholder responsive

ii. Authorisations and Conflict Prevention:

- Put into practice the instruments for the VBA Convention on prevention of water conflicts at the level of one or several countries and for resolution of disputes
- Promote the implementation of IWRM and the equitable distribution of the benefits resulting from the various utilizations. The effective performance of this function requires comprehensive water information and knowledge
- Authorise the development of infrastructure and project planned by the stakeholders and which could have substantive impact on the water resources of the basin

iii. Knowledge and Information Services:

- Coordinate and provide support to the NHS for the O&M of the HYCOS monitoring network in the respective countries
- Collect and process hydrological data and disseminate hydrological information products via different channels including the Volta-HYCOS web-site
- Interact with the Observatory for Water Resources (supported by FFEM) that provides integration of regional hydrological data with environmental demographic, economic, and land use data to build natural resources, environmental and stakeholder concerns into water management and development

ANNEX 6: VOLTA-HYCOS BENEFICIARIES AND STAKEHOLDERS

Ultimately all people of the riparian countries of the Volta Basin who are current users or will benefit from future river basin development are beneficiaries of the Volta-HYCOS. The benefits will stem from improved performance of VBA and national IWRM authorities as well as development actors, decision makers and investors due to enhanced water information and knowledge. The categories of beneficiaries and stakeholders of the Project at local, national and river basin level include:

- The population of the Volta Basin, totalling 19 million, whose lives have been improved by strengthened water development projects and operations leading to economic growth, reduced poverty, enhanced livelihood, improved health, and food security;
- National and regional institutions and administrations: (i) Staff at the National Hydrological Services (NHS) of riparian countries; (ii) Staff at the Regional Project Centre; (iii) Volta Basin Authority (VBA) staff, the Volta Basin Observatory for Water Resources; (iv) National Governments and political

leaders, IWRM water and economic sectors regulatory authorities, and other policy and decision makers; (v) Public service providers such as WS&S, environmental management authorities; ECOWAS.

- Users of hydrological information: (i) Central and local authorities and decision makers and private and public sector stakeholders; (ii) Private investors in agriculture, agro-industry, hydropower, fisheries, inland navigation, industry, and tourism etc.; (iii) Reservoir operation managers for hydropower production, flood control and irrigation farmers; (iv) inland navigation operators (v) Water resources consultants; and (vi) Centres involved in climate change modelling
- Academia, development agencies, and press: (i) Scientists and researchers of complementary programs,; (ii) Universities and schools; (iii) Regional and International Institutions such as AGRHYMET, ACMAD, WMO, UNEP, UNESCO, FAO; (iii) International development cooperation agencies; (iv) Media (press, radio, television) and the public society at large.

The following ongoing water development projects in the Volta basin will represent important “Beneficiaries and Stakeholders”:

- Volta Basin Observatory for Water Resources hosted by VBA (see Section 1.3.6). Together, the Volta-HYCOS and the Observatory shall serve the interests of all stakeholders and development partners engaged in water and land management in the Volta Basin for enhanced socio-economic development, improved livelihood, and better gender equity
- Burkina Faso IWRM. Upgrading of hydrological monitoring network and training of personnel for centralized IWRM (supported by AWF)
- Challenge Programs on Water and Food being implemented by the Consultative Group for International Agricultural Research (CGIAR)
- GLOWA-Volta program (Global Change in Hydrological Cycle) financed by the German Ministry of Education and Research, supporting IWRM in the Volta basin including decision support system (MoU signed with VBA)
- IUCN PAGEV project International Union for Conservation of Nature (IUCN) (MoU signed with VBA) funded by the Swedish Government
- UNEP/GEF Volta Project (MoU with VBA in progress)
- Water Quality research in Volta River (2iE), Flood warning network at Bagre Hydropower dam in Burkina Faso (AWF approached for funding), and VBA interventions in Tougou sub-basin
- Niger-HYCOS program (AWF supported)
- Ghana: Establishment of Flood Early Warning system based on real-time HYCOS data.
- Ghana: Establishment of Dam Safety Unit and mechanisms (NORAD funded)

ANNEX 7: VBA ORGANIZATIONAL STRUCTURE AND STAFF

The organisation chart for the executive directorate of the VBA is as follows:

a) The Executive Directorate under the Executive Director composed of:

- The International Cooperation and Communication Unit;
- The office of the Executive Director comprising the Bilingual Secretary, the Protocol Officer and the Driver of the Executive Director.

b) Department of Operations managed by the Deputy Executive Director and composed of:

- Four sectoral units (Irrigated agriculture, water supply and sanitation, fishery, hydro electricity)
- The Secretariat of the Director and the Driver

c) Department of Planning and IWRM managed by a Director and made up of:

- The Coordination Unit for Basin Stakeholders and National Focal Points
- The Monitoring and Evaluation Unit
- The Legal Unit
- The Research and Planning Unit
- The Secretariat and the Driver

d) The Department of Administration and Finance led by a Director and composed of:

- Administration and Human and Material Resources Management Unit;
- Finance and Accounting Unit;
- Translation and Interpretation Unit;
- The secretariat and the liaison officer/driver.

e) The Basin Observatory, which is a department managed by a Director;

f) The Financial Controller, with a rank of Director, who reports to the Council of Ministers but is administratively under the Executive Director;