Project Preparation for the Implementation of Integrated Flood Management with a Focus on Benin, Burkina Faso, Cote d'Ivoire, Ghana, Mali, Togo and the Volta River Basin

Regional Needs Assessment Report – Volta Basin

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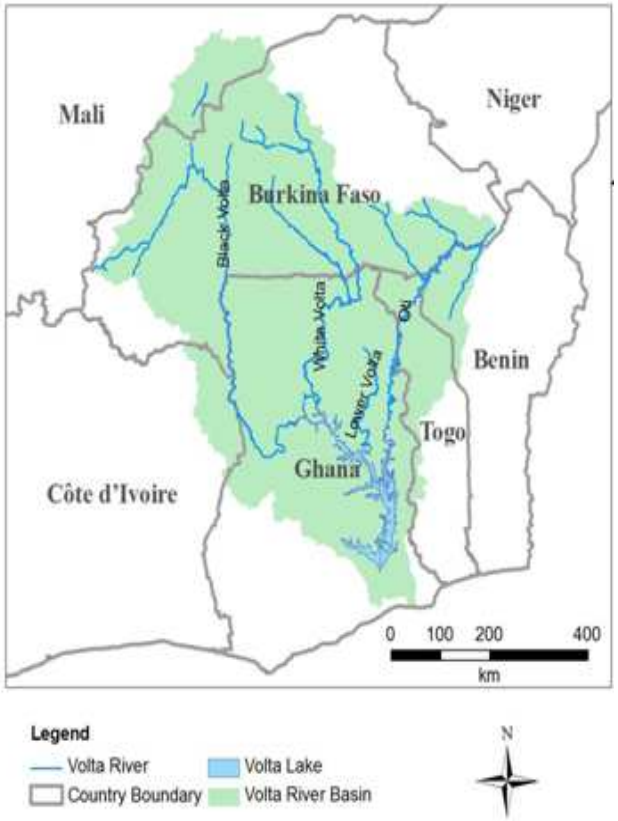
Outline

- General Overview of the Volta Basin
- Impacts of Floods in the Volta Basin
- Institutional Environment for Floods Management
- Flood Risk Management - Hazard Assessment
- Flood Risk Management - Vulnerability Assessment
- Capacity Development Activities for the Transboundary Basin
- Conclusions/Recommendations
- The Way Forward

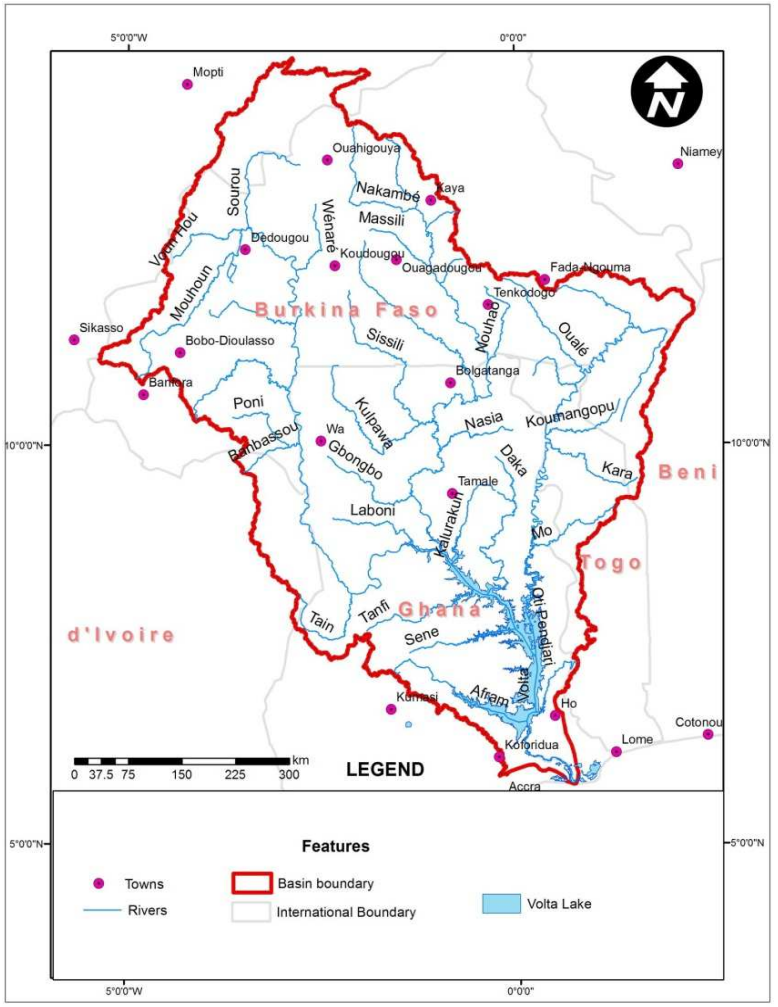


General Overview of the Volta Basin

- Trans-boundary river basin
- Surface area: ~400,000 km^2
- Human population: 25 million (34 million by 2025)
- Riparian countries depend very much on natural resources for their development
- Environmental issues: land degradation, water scarcity, biodiversity loss, water borne diseases, aquatic weeds, coastal erosion, water quality degradation and flooding
- Highly impacted by recurrent floods
- Volta Basin Authority in place since 2006

Country	Area of Volta River Basin (km^2)	% of basin	% of country in the basin
Benin	17098	4.10	15.2
Burkina Faso	178,000	42.65	63.0
Cote d'Ivoire	12,500	2.99	3.9
Mali	15,392	3.69	1.2
Togo	26,700	6.4	47.3
Ghana	167,692	40.18	70.0

Source: Moniod, et al (1977)



(Source: Mul et al, 2015)

General Overview of the Volta Basin

- Flood management is recognised in the Strategic Action Programme (SAP) for the VBA (Component A3)

	Component A: Ensuring consistent water availability
A3	Set up an early warning system for droughts, floods and inundations in the Volta Basin
	Component B: Conserving and restoring ecosystem functions
	Component C: Ensuring high water quality
	Component D: Strengthening governance and improving the quality of information on water resources

- ***Project Preparation for the Implementation of Integrated Flood Management (IFM) in the Volta Basin riparian countries***
  - **Needs Assessment of 6 VBA Countries**
  - **Needs Assessment of VB**

Impacts of Floods in the Volta Basin

❖ Socio-Economic Impacts of Floods in the Volta Basin

Floods affect various social and economic activities and facilities in the Volta Basin

- Loss of lives and property
- Deplorable health, water and sanitation facilities
- Decreased economic and social activities
- Psychosocial effects
- Hindrance to economic growth and development
- High financial cost
- Political implications







Impacts of Floods in the Volta Basin

Impact / Year	Number of victims of the flood	Number of deaths	Number of people injured	Number of houses damaged	Area of farmland flooded (ha)	Number of livestock perished (head / cattle, goats, poultry, etc.)	Number of dams destroyed	Distance of road destroyed (km)	Number of bridges destroyed	Number of schools damaged
1985	270,000 (Be)	61 (Be)	-	11,637 (Be)	17,412 (Be)	5,421 (Be)	-	2,704 (Be)	201 (Be)	651 (Be)
1988	270,000 (Be) 23,324 (BF)	16 (BF)	-	-	30,000 (Be)	-	-	-	-	-
1991	700,000 (Be)	-	-	-	556 (Be)	-	-	-	-	-
1992	5,485 (BF)	6 (BF)	-	3,133 (BF)	-	-	14 (BF)	-	-	-
1994	74,080 (BF)	22 (BF)	4 (BF)	4,600 (Be) 21,000 (BF)	7,690 (Be) 106,164 (BF)	-	18 (BF)	-	-	-
1996	147,901 (Be)	-	-	-	1,544 (Be)	-	-	-	-	-
1999	51,342 (BF)	6 (BF)	18 (BF)	2,188 (BF)	-	-	-	-	-	-

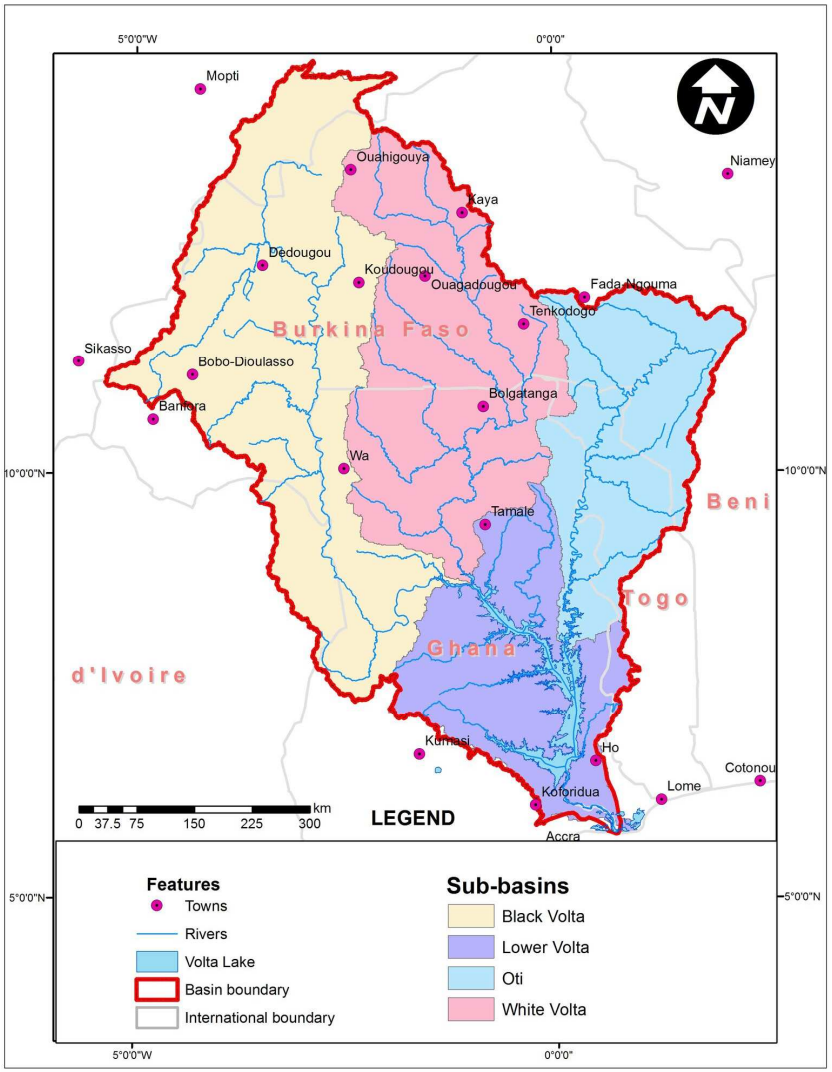
Impacts of Floods in the Volta Basin

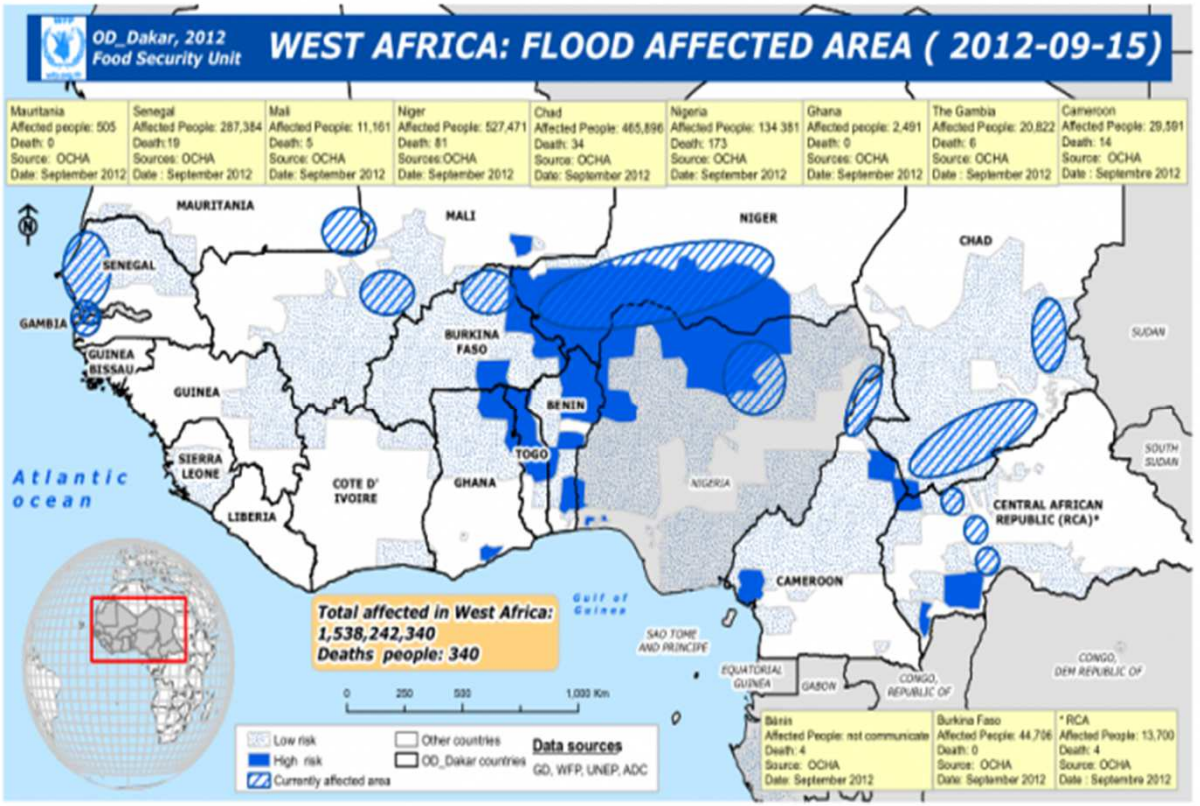
Impact / Year	Number of victims of the flood	Number of deaths	Number of people injured	Number of houses damaged	Area of farmland flooded (ha)	Number of livestock perished (head / cattle, goats, poultry, etc.)	Number of dams destroyed	Distance of road destroyed (km)	Number of bridges destroyed	Number of schools damaged
2006	3,476 (Be)	-	-	1,382 (Be)	5,459 (Be)	-	-	-	-	-
2007	146,202 (BF) 300,000 (Gh.)	83 (BF)	74 (BF)	26,833 (BF)	-	20,000 (BF)	-	-	-	-
2008	24,676 (BF)	5 (Be) 5 (BF)	54 (BF)	-	15,498 (Be)	3,190 (Be)	-	-	-	-
2009	180,386 (BF)	41 (BF)	62 (BF)	33,172 (BF)	-	-	-	-	-	-
2010	680,000 (Be) 25,112 (Gh)	46 (Be) 17 (Gh)	-	55,000 (Be) 3,234 (Gh) 3,832 (Tg)	-	1,109 (Gh)	-	-	-	455 (Be)
2011 - 2015	46,871 (Be) 255,849 (BF) 1996 (CI)	25 (Be) 211 (CI)	215 (Be) 3 (CI)	11,652 (Be)	140,287 (Be)	37,339 (Be)	-	-	-	119 (Be)

Impacts of Floods in key sectors in countries of the Volta Basin

Sector	Sub-Sector	Estimated Cost (M €)
Productive	Agriculture, Livestock, Fisheries	51.813
	Trade (informal)	33.053
	Tourism	12.145
	Industry	-
	Dams breach (direct)	10.502
	Dams breach (indirect)	52.627
	Sub-Total 1	166.14
Infrastructure	Transport	25.071
	Energy	-
	Water Supply and Sanitation (including solid waste)	62.469
	Other Infrastructure	80.952
	Sub-Total 2	320.943
Social	Education	24.914
	Housing	56.69
	Health	52.297
	Sub-Total 3	125.524
	Grand Total	***612.901***

Floods risks zones in the Volta basin





Institutional Environment for Flood Management

Stakeholder	Field of Action/Field of Competence
The State represented by Ministry of Interior and other allied Agencies	• Define and implement national policy for prevention and disaster risk management; • Develop policies for the prevention and management of disaster risk; • Establish institutions, tools and mechanisms of prevention and disaster risk management; • Coordinate activities related to prevention, emergency relief operations, humanitarian assistance and recovery; • Establish an enabling environment for the participation of institution/ organizations.
Representatives of Districts/ Communes	• Participate in the development and implementation of the national policy related to prevention and disaster risk management; • Participate in the development and implementation of prevention and disaster risk management plans; • Enforce laws at the community level; • Develop and implement national plans, local plans of prevention and risk management including prevention of floods and flood control
Research institutions	• Monitor, compile and process information for decision making by authorities towards prevention of the risk of disasters.
Humanitarian services	• Assist the affected population through legal, social, financial, material and technical support.
Private sector	• Participate in the financing of prevention and management of risks, humanitarian crises and disasters.
Civil Society Organizations	• Participate in the information, education and the awareness of the population on prevention and risk management, humanitarian crises and disasters; • Provide technical, material and financial contributions to support the measures of prevention, rescue and recovery.
CBOs	• Support to the State and local authorities in the prevention and management of risk, humanitarian crises and disasters.
Local communities	• Participate in the prevention and management of risks, and disaster harnessing traditional practices and local knowledge
Technical and financial partners	• Provide technical and logistical support to state institutions to support victims; • Contribute to the financing of measures of prevention and risk management, through cooperation between two or more partners

Institutional Environment for Flood Management

No.	Development partner	Country/ Basin Organisation						
		Benin	Burkina Faso	Cote d'Ivoire	Ghana	Mali	Togo	Volta Basin Authority
1	The World Bank (WB)	No	No	No	Yes	-	Yes	Yes
2	United Nations Development Programme (UNDP)	Yes	No	Yes	Yes	Yes	Yes	No
3	Food and Agricultural Organisation (FAO)	Yes	No	Yes	Yes	Yes	Yes	Yes
4	World Food Programme (WFP)	Yes	No	Yes	Yes	Yes	Yes	No
5	United Nations Educational Scientific and Cultural Organisation (UNESCO)	Yes	No	Yes	Yes	Yes	No	No
6	World Health Organisation (WHO)	Yes	No	Yes	Yes	Yes	Yes	No
7	United Nations International Children's Emergency Fund (UNICEF)	Yes	No	Yes	Yes	Yes	Yes	No

Financial partners/ donors in flood management and their interventions

Institutional Environment for Flood Management

No.	Development partner	Country/ Basin Organisation						
		Benin	Burkina Faso	Cote d'Ivoire	Ghana	Mali	Togo	Volta Basin Authority
8	Emergency Response Team of ECOWAS	Yes	No	Yes	No	No	Yes	Yes
9	United Nations High Commissioner for Refugees (UNHCR)	Yes	No	Yes	Yes	Yes	Yes	No
10	African Development Bank (AfDB)	No	No	Yes	Yes	Yes	Yes	Yes
11	Economic Monetary Union of West African (UEMOA)	No	No	Yes	No	No	Yes	No
12	United Nations Environment Programme/ Global Environment Facility (UNEP/GEF)	No	No	Yes	Yes	Yes	Yes	Yes
13	World Meteorology Organisation	No	No	No	Yes	Yes	No	Yes
14	Swedish International Development Cooperation Agency	No	Yes	No	Yes	No	No	Yes

Financial partners/ donors in flood management and their interventions

Institutional Environment for Flood Management

Coordination and cooperation mechanism(s) existing between the various organizations, institutions, sectors and users that relates to flood management

- There is more participation at the national level than at local or district levels.

❖ **National Platforms** have been established in Benin, Burkina Faso, Ghana and Togo where disaster risks and related issues are articulated in order to propose workable solutions to the threats posed by Climate Change and disasters, in general.

- Cote d'Ivoire and Mali are yet to set up national platforms for disaster consultations(?)

❖ **Trans-boundary Platforms:** The Volta Basin Authority (VBA) in place to facilitate platforms in the basin drawing lessons from the Ghana - Burkina Joint Technical Committee for Integrated Water Resources Management (JTC-IWRM).

- *SONABEL and the Volta River Authority (VRA)* , e.g. of transboundary cooperation in the discharge of excess water from the Bagre dam when necessary.

Institutional Environment for Flood Management

Enabling environment for all stakeholders to participate and make collective decisions regarding flood management

- The relatively ***peaceful political climate*** experienced in the Volta Basin countries gives good indication of an enabling environment for stakeholder participation particularly of development partners, in flood management.
- A good lesson from the riparian countries of the Volta Basin is the ***establishment of national platforms*** to deliberate on Disaster Risk Reduction and Adaptation to Climate Change related issues.

Lessons Learned

- **Flood Hazard Mapping**: Provides a better understanding of the levels of risks and vulnerability of communities. ➔ improves strategies for preparedness and response to floods
- A multi-stakeholder and sectoral coordination and communication platform is critical to mitigate climate-related risks
- The **wide range of expertise** involved in flood related responses enhance concerted planning.
- **Timely information delivery** and well co-ordinated dissemination among the different stakeholders are needed

Institutional Environment for Flood Management

Lessons Learned

- It takes **both natural and built hydraulic infrastructure to attenuate flood peaks.** This includes preserving wetlands, river bank vegetation and construction of dams, weirs and reservoir as well as storm drains in urban areas in particular. Observably, the river banks are encroached and constitute areas where farmers engage seriously in farming activities. Therefore, the vegetation that could attenuate the high flow rates along the banks are no longer there to play such useful functions. In Ghana, Buffer zone policy has been enacted for promulgation towards minimising the impact of floods;
- **Flooding in VB arises from high intensity of precipitation at short duration. Thus the climate information must as much as possible be credible**, especially when communicating to end-users including communities, thereby shaping public education and awareness creation of the citizenry. However, where warnings are not always accurate, the citizenry take for granted the information relayed to them or may not understand properly or heed to
- **involvement of community volunteers and Community based organisations in the surveillance** of water levels and river flows as noted in the Community Resilience and Early Warning (CREW) project enhanced ownership at the grassroots. Where water levels reach/exceed a threshold, community members are alerted to take steps to avert the possible losses. This minimises the damage caused.

Table : Meteorological and hydrological stations in the national part of the Volta basin

Country	No. of Synoptic Stations	No. of Climatological Stations	No. of Rainfall stations	No. of Agro-meteorological Stations	Total	Total within the Volta basin	% in the Volta basin	No. of river gauging stations
Benin	6	21	45	Included in the climatology st.	72	?	?	?
Burkina Faso	10	10	120	5	145	110	76	?
Cote d'Ivoire	14	5	100	?	119	?	?	?
Ghana	22	61	173	79	334	157	47	20
Mali	?	2	6	?	8	8	?	3
Togo	?	?	?	?	?	?	?	22
Volta Basin	**52**	**99**	**444**	**84**	**678**	**275**	**41%**	**45**

Flood Risk Management - Hazard Assessment

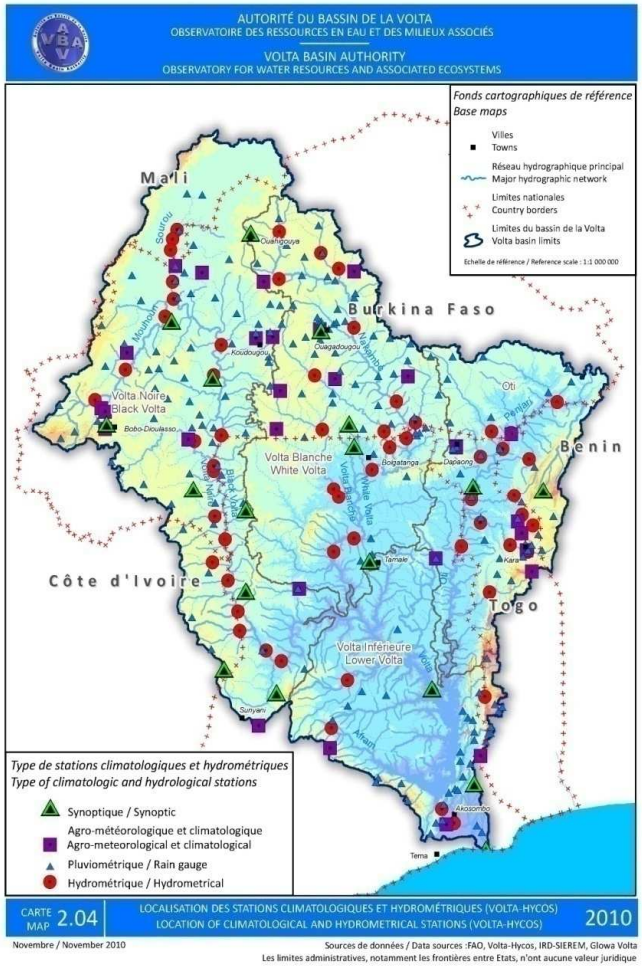


Figure **Hydro-meteorological stations of the Volta Basin (Source: VBA, 2010)**

Status of hydro-meteorological observation network in the VB

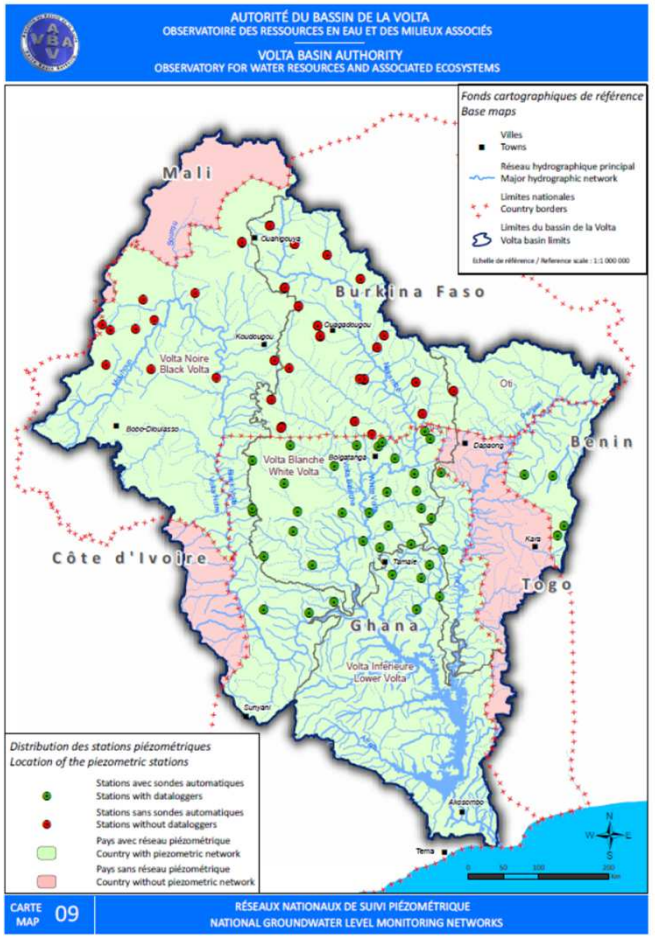


Figure **Groundwater monitoring stations in the Volta Basin (Source: VBA, 2011)**

Flood Risk Management - Hazard Assessment

Status of flood forecasting and early warning solutions in the basin

- There is no flood early warning system for the Volta Basin.

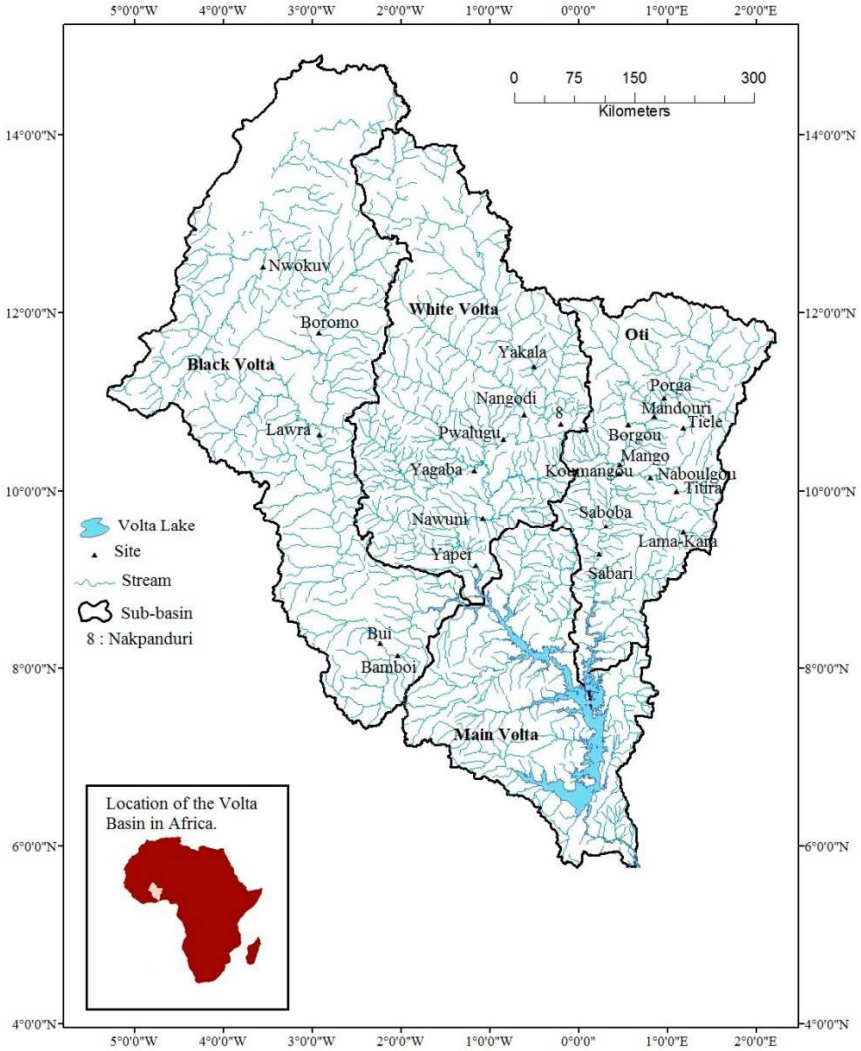
- **Opportunity for the VBA to work with countries** to scale up Flood Early Warning Systems such as FEWS-Volta (currently in the White Volta in Ghana) to take into account upstream dynamics of Burkina Faso? Etc.

- VBA is encouraged to continue efforts aimed at providing skill and training, among other support services for countries in the basin, through collaboration with regional bodies such as AGRHYMET.

Availability and accessibility of the basic data and information for informed decision-making for flood management

It is acknowledged that VBA is taking steps to establish protocols on data sharing and exchange

Flood Risk Management - Vulnerability Assessment



Map of the natural courses of the Volta River

Flood Risk Management - Vulnerability Assessment

Economic Vulnerability

- Use of floodplains as protective measures
  - Reserved to attenuate floods
  - Buffer zone policies in states
  - Soil nutrient recycling, provisioning, regulatory functions, cultural and non-material services
- Economic development in flood-prone areas
  - Migration and population pressure
  - Human settlement and development in low lands
  - Valley bottom and recession farming activities
- Existing structural measures to reduce exposure
  - Built dams (hydropower, irrigation, water supply, etc) attenuate flood
  - Post-dam conditions (D/S constant flow) have altered hydrological and livelihood regimes
  - Multi-purpose dams planned to be built
- Flood preparedness/vulnerability of infrastructure, such as buildings, sanitation works, electricity supply, roads and transportation
  - **Lack of preparation/plan for flood events**
  - Lack of logistics required to trigger any attempts to ameliorate the catastrophe associated with floods
  - Inadequate storm water drainage system
  - **No flood water retention structures**
  - Poor awareness on good practices of basic and collective sanitation and the danger communities face under construction in lowland and water ways
  - **All infrastructure at risk (roads, bridges, schools, houses, etc)**
  - **Much disruption in goods and services ➔ High economic losses**

Flood Risk Management - Vulnerability Assessment

Country	Sub-basin	Dam Name	Capacity (Mm^3)	Year of operation	Purpose
Benin	Oti-Pendjari	-	-	-	-
Burkina Faso	Black Volta	Samendeni	1,050	2012	(a) Hydropower (b) Irrigation
		Lery	300	1980	(a) Irrigation
	White Volta	Bagre	1,700	1995	(a) Hydropower (b) Irrigation
		Ziga	200	2000	(a) Potable water supply
		Loumbila	36	1990	(a) Potable water supply
		Ouaga II+III	5	1980	(a) Potable water supply
	Oti-Pendjari	Kompienga	2,050	-	(a) Hydropower
Cote d'Ivoire	Black Volta	-	-	-	-
Ghana	White Volta	Tono	100	1982	(a) Potable water supply (b) Irrigation
		Vea	17	1968	(a) Irrigation
	Black Volta	Bui	12,300	2014	(a) Hydropower (b) Irrigation
	Lower Volta	Akosombo	148,000	1966	(a) Hydropower (b) Irrigation
		Kpong	200	1984	(a) Potable water supply (b) Irrigation
Mali	Black Volta	-	-	-	-
Togo	Oti	Dalwak	10		(a) Potable water supply
		Kara	5		(a) Potable water supply

Table Existing major dams in the Volta Basin

→Mainly for hydro-power and water supply

→ Collateral benefit to flood control

Flood Risk Management - Vulnerability Assessment

Social Vulnerability

- Well-being, strength and resilience
- **High population pressure, migration and occupation in a risky area**
- Social support networks/community organizations – existence and threats
- **Communication networks exist but not adequate**
- Motivational/attitudinal conditions
- Awareness of development issues, rights and obligations
- **Beliefs, customs and fatalistic attitudes**
- **Much dependence on external support**
- Existing participatory and capacity building mechanisms
- Information sharing, public hearings, consultations, collaboration in decision making and delegation of responsibilities
- **Low representation of women, youth, people with disabilities and indigenous people**
- Training sessions and workshops
- Networking for information sharing
- Secondments of key personnel in other organizations
- Public awareness raising campaigns

Flood Risk Management - Vulnerability Assessment

Environmental Vulnerability

- Flood, as a water flow phenomenon, finds its place in the regulatory function of an ecosystem
- Water flows including flood flows (peak flow, duration, etc), are affected by land use and land use changes. Changes in land use also affect rainfall partitioning, modifying evaporation and infiltration and water availability

- **In recent times, there has been much exploitation of the environment in the Volta basin**
- **Increasing human population, urbanisation, increased demand for bio energy, increasing livestock population, expansion of agriculture, mineral and forest exploitations, and infrastructure development, and the effects of climate change are all having a toll on the environment in the Volta basin**

- **The frequent and high intensity of occurrence of flood in the Volta basin could be attributed to these drivers, with associated increased vulnerabilities of the environment and communities**

Flood Risk Management - Vulnerability Assessment

Environmental Vulnerability

Mechanisms to Assess/Monitor Environmental Degradation through Environmental Impact Assessments and Environmental Action Plan

- **Field visits and inspections**
- Non-sharing of data and information among stakeholders
- **EIA and SEA mandatory requirements for development but not fully enforced by Environmental Agencies**
- **VBA is partnering the European Space Agency (SPA) TIGER project to support the use of satellite and possibly drones to do near real-time monitoring**
- **Implementation of buffer zone policy requires frequent assessment and monitoring of the activities on floodplains but the WRC do not have the resources to do this hence monitoring becomes an enormous work**

State of the environment and preservation efforts

- High rate of development of structures/lot of construction activities
- Increasing exploitation of natural resources and pollution of the environment

→ Increased Inspection and monitoring

Recommendations

Opportunities to Implement IFM at a Trans-boundary Basin Level

i. **There are some opportunities to implement IFM at the trans-boundary level through the water related institutions and focal agencies of VBA in member countries**

ii. The use of national, regional, district and river basin offices with the IWRM mechanisms in place in the Volta basin and other platforms used for disaster management offer a lot of opportunities to implement regional and trans-boundary IFM

iii. Member countries ought to clearly develop policies, backed by the appropriate legislative instruments, with active involvement and co-ordination by VBA

iv. VBA could take advantage of existing bilateral agreements between member countries to drive home the concept of IFM in the Volta basin

Recommendations

Opportunities to Implement IFM at a Regional and Transboundary Basin Level

iv. Key stakeholders in the basin already have some capacity with regards to flood management which would help reduce the amount of time and resources needed to further develop their capacities on the concept of IFM through tailored trainings or workshops

v. Hydrological models for flood hazard mapping that exist at water related ministries, departments, agencies and institutions in member countries of VBA could be further developed into a basin-wide decision support system (DSS), maintained and co-ordinated by VBA

vi. Identified water related ministries, departments, agencies and institutions in member countries of VBA in such network could be assigned clearly defined roles and responsibilities for IFM for and on behalf of VBA in synergy

Recommendations

Opportunities to Implement IFM at a Regional and Trans-boundary Basin Level

vi. IFM has not been integrated into development planning and decision making processes in the Volta basin and at national and regional levels yet. There is therefore a huge opportunity to do this through the mainstreaming of water security and climate resilient development which have been mainstreamed into the Medium and Long Term Development Plans with the support of the WACDEP project in some countries like Ghana

vii. There are a lot of vulnerable communities in the Volta basin, especially along the main White and Black Volta basins, who need support to deal with the impacts of floods. → There is a high chance of stakeholder acceptance and approval for the proposed IFM project in the Volta basin

viii. IFM projects could start in identified hotspots/pilot communities

Recommendations

Opportunities to Implement IFM at a Regional and Transboundary Basin Level

viii. Opportunity exist to actively involve civil society, NGOs, educational institutions, media and private sector of the basin in flood management

ix. Opportunity exist to undertake flood hazard assessments at the basin scale for use by member countries

x. There is the need to create common flood emergency fund from which VBA member countries could access to meet immediate needs

xi. The VBA Strategic Plan and Observatory: Arising from these, reliable data and information are being collected for scientifically informed decision making in water resources management, including IFM

Recommendations

Opportunities to Implement IFM at a Regional and Transboundary Basin Level

xii. **Some development partners and NGOs (eg. WMO World Bank, UNDP, JICA, WASCAL, Norwegian government, etc.) continue to support VBA member countries with flood management and could be approached for technical and financial support**

xiii. This implies there is a high chance of getting external support and hopefully governments' support to develop and implement a regional and basin-wide IFM plan

Recommendations

Prioritized Activities and APFM Support in Capacity Development at a Regional/Trans-boundary Basin Level

i. **Proper characterisation of hydrologic processes of rivers and management of dams and other water systems in the Volta basin**

ii. **Identification of flood prone/vulnerable localities in the Volta basin**

iii. Identification of suitable sites and proper design and construction of flood control structures in the Volta basin

iv. **Technical and financial support for disaster management and evacuation plans and provision of relief items for victims (putting in place adequate measures for preparation, prevention, protection and reconstruction)**

Recommendations

Prioritized Activities and APFM Support in Capacity Development at a Regional and Transboundary Basin Level

v. **Support for development and use of early warning systems**
vi. Support for public awareness/education on flood disasters and management among local/vulnerable communities
vii. Support for bilateral and multilateral transboundary committees for water resources management
viii. **Support for integration of member countries disaster management plans**
ix. **Development of the capacities of key stakeholders on the concept of IFM and the development of bankable proposals on IFM at the regional/transboundary level. An effective way to go about this is to start from the national level with a training of trainers for the regions to train the people in their districts with some technical backstopping from WACDEP**

Recommendations

Prioritized Activities and APFM Support in Capacity Development at a Regional and Transboundary Basin Level

x. Development of capacities of key water institutions in member countries of VBA on database management so as to enable the easy collection, analysis and sharing of data and information among member countries

xi. Development of capacities of stakeholder institutions in member countries of VBA to maintain (and update) flood related (hydrological) models developed for them by former projects

xii. Creation of common flood emergency fund from which VBA member countries could access to meet immediate needs

xiii. There is no need to create an IFM Authority but for VBA to have the extra mandate and be supported legally, technically and financially to carry out this additional mandate, among others

Recommendations

Potential Sources for Funding IFM at a Regional and Transboundary Basin Level

i. **Development partners (Norwegian Government, World Bank, WMO, UN system organisations (UNDP, UNEP/GEF), AfDB, EU, AFD, JICA, etc.)**

ii. **VBA to approach donor agencies for support on the development of an IFM plan and its implementation in the Volta basin**

iii. **Funding from VBA member countries to support IFM is ideal and national governments should be entreated to offer full support financially**

iv. Other sources of funds could include writing proposals to respond to calls on grants on flood management, climate change adaptation and disaster risk reduction

Recommendations

Potential Sources for Funding IFM at a Regional and Transboundary Basin Level

iv. Support could also be solicited from global initiatives such as:

a) WRCC - ECOWAS

b) International Flood Initiatives, Japan

c) Green Climate Fund

d) Climate Adaptation Fund

e) UN International Strategy for Disaster Reduction/ UN Office for Disaster Risk Reduction

f) Associated Program on Flood Management (APFM) of the WMO

g) Identified international disaster organisations

Way Forward

Need for Integrated Flood Management (IFM) to:

- **Improve preparedness** for flood in VBA countries
- **Increase capacity and technologies** for improved and timely early warning information provided to relevant agencies/departments/orgainisations
- **Enhance the capacity** of relevant national and international agencies/departments/orgainisations to address flood related issues
- **Provide scientific-based technology** for flood warning and forecasting in the Volta basin
- **Improve resiliency to flood and changing climate**
- **Increase beneficial effects flood (e.g. recession faming)**
- **Increase ecosystem valuation in VB**

Way Forward

Take a cue from the Sendai Framework for Disaster Risk Reduction 2015 – 2030 (UNDRR)

- It aims to achieve the substantial reduction of disaster risk and losses in lives, livelihoods and health and in the economic, physical, social, cultural and environmental assets of persons, businesses, communities and countries over the next 15 years
- The Framework was adopted at the Third UN World Conference on Disaster Risk Reduction in Sendai, Japan, on March 18, 2015

❖ Priorities for Action

In pursuance of the expected outcomes and goal, there is a need for focused actions by VBA and States at local, national and regional levels in the following priority areas:

- **Priority 1: Understanding flood risk**
- **Priority 2: Strengthening flood risk governance to manage disaster risk**
- **Priority 3: Investing in flood risk reduction for resilience**
- **Priority 4: Enhancing flood preparedness for effective response and to "Build Back Better" in recovery, rehabilitation and reconstruction**

Way Forward

Proactive

Reactive

Source: Adapted from National Drought Mitigation Center, http://drought.unl.edu

FROM CRISIS TO RISK MANAGEMENT

→ **Need to develop *RISK-BASED* IFM**

EARLY WARNING & DETECTION as part of RISK-BASED APPROACH

Way Forward

❖ **Formation of a VBA IFM platform will be consistent with the mandate of VBA**

- Mode?
- Either:
  - Establish a "new" platform for forecasting and responding to flood disasters

    OR
  - Adopting one of the Flood Early Warning System (FEWS) of a member country and bringing on board all member countries and institutions / organisations that could support basin-wide processes

❖ **Adequate Data and Information Collection, Processing, Storage, Retrieval and Dissemination are key to IFM**

➔ Capacity building of personnel, equipment and facilities (VBA and member countries)

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WORLD METEOROLOGICAL ORGANIZATION

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