

**THE NECESSITY FOR NATIONAL  
HYDROGRAPHIC SERVICE IN  
AFRICAN COUNTRIES. USING  
GHANA AND NIGERIA AS CASE  
STUDIES.**

**BY**

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**INTRODUCTION**

- Millions of people live in the coastal areas and depend on the sea and marine environment as their source of life.
- Hydrographic information is a national asset required by both governments and private sectors.
- Each country needs to establish, agree and set its international borders and boundaries.
- Hence It is evident that somebody needs to have the responsibility, at the National Level, of conducting Hydrographic Surveys and producing Nautical Charts, also of building and keeping hydrographic databases for the preparation of special products required.

## INTRODUCTION CONT.

- At the moment, in most African Countries, there are no standard quality control and quality assurance on the information generated through individual efforts. Moreover, the data and information collected by private companies are not maintained and kept conveniently archived for future national uses.
- Although conducting hydrographic surveys and producing nautical charts are activities that can be contracted, it is a must to have the capability to understand and establish technical specifications and standards that must be followed. All these can only be managed by a Centralized Agency, a National Hydrographic Service.
- This paper intends to highlight some of the hydrographic problems in Africa and the urgent need for a National Hydrographic Service.

## HYDROGRAPHY DEFINED

- IHO defined Hydrography as the branch of applied sciences which deals with the measurement and description of the physical features of oceans, seas, coastal areas, lakes and rivers, as well as with the prediction of their change over time, for the primary purpose of safety of navigation and in support of all other marine activities, including economic development, security and defence, scientific research, and environmental protection.

## IMPORTANCE OF HYDROGRAPHY

- Resource exploitation - fishing, minerals, etc
- Environmental protection and management
- Maritime boundary delimitation
- National marine spatial data infrastructures
- Recreational boating
- Maritime defence and security
- Tsunami flood and inundation modelling
- Coastal zone management
- Tourism
- Marine science

## PROBLEMS OF HYDROGRAPHY IN AFRICA -GHANA



## LOCATION AND SIZE OF GHANA

- Ghana, lies in the center of the West African coast, 2,093 km of land borders with the three French-speaking nations of Burkina Faso (548 km) to the North, Côte d'Ivoire (668 km) to the West, and Togo (877 km) to the East. To the South are the Gulf of Guinea and the Atlantic Ocean. See figure 1 above.
- It has a total area of 238,533 square kilometers.
- Ghana statistically has a coastal length of 539 km, a continental shelf area of 23,700 km<sup>2</sup> and an exclusive economic zone (EEZ) of 349 km<sup>2</sup>.
- Volta Lake, the largest artificial lake in the world, extends from the Akosombo Dam in Southeastern Ghana to the town of Yapei, 520 kilometers (323 mi) to the North. The lake generates electricity, provides inland transportation, and is a potentially valuable resource for irrigation and fish farming.

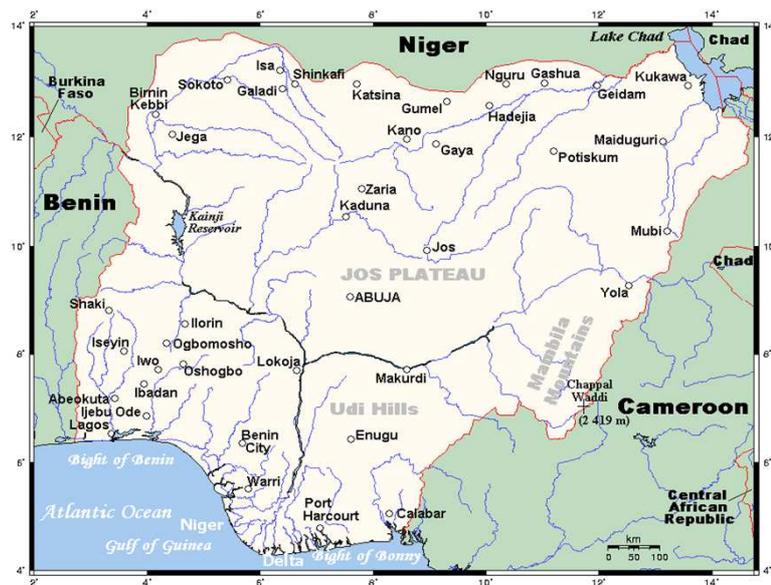
## PROBLEMS OF HYDROGRAPHY IN GHANA CONT.

- Poor or dangerous maritime facilities resulting in reduced maritime trade.
- Underdeveloped fishery activities
- Poor development of marine recreation and boating
- Poor protection of coastal areas from maritime disasters (tsunamis, typhoons etc...)

## PROBLEMS OF HYDROGRAPHY IN GHANA CONT.

- Difficulty in managing and developing the coastal zone
- Limited support to national and international shipping affecting safety, the environment and mariners' lives.
- It will be difficult to support and progress the exploitation of marine resources
- Inability to properly delimit, declare and enforce national maritime boundaries

## PROBLEMS OF HYDROGRAPHY IN NIGERIA



## BRIEF ABOUT NIGERIA

- Nigeria has a population of over 120 million and a growing economy fueled by the exploitation of hydrocarbons. The maritime sphere plays a vital role in this growth.
- Over 80% of Nigeria's trade is conducted by sea.
- Southern Nigeria is dominated by the combined delta area of the Niger and Benue river systems which provide extensive inland waterways and numerous inland ports.
- Oil and Gas products are extracted both onshore and offshore.

## PROBLEMS OF HYDROGRAPHY IN NIGERIA

- Nigeria does not have any natural harbours on the coast, all of the ports have been developed inside the vast system of river tributaries of the Niger-Benue delta.
- Congestion is a problem at most ports, where there is no space for expansion on the network of islands and increasing pressure on land access routes due to high traffic density and poor road networks.
- Although the inland waterway system is extensive it suffers from heavy siltation and continuous maintenance dredging is needed to keep routes open. The coastal ports act as transshipment points between ocean, coastal and inland routes.

## WHY A NATIONAL HYDROGRAPHIC SERVICE IN GHANA

- Ghana is a Coastal State and lies on the Western Coast of Tropical Africa.
- Ghana is bordered on the south by the Gulf of Guinea and The Atlantic Ocean.
- Ghana has two International Ports, Tema and Takoradi harbours
- Ghana has one of the largest artificially created lakes in the world, Lake Volta.

## WHY A NATIONAL HYDROGRAPHIC SERVICE IN NIGERIA

- Proliferation of data. Different sectors both in the Government and Oil and Gas industry are custodian of their data and thus have different information about an area.

## SOME ROLES OF HYDROGRAPHIC SERVICE

- Primarily to aid the efficient and safe use of maritime transport
- To collect, with systematic surveys at sea and along the coast, geo-referenced data.
- To process the information collected in order to create organized databases capable of feeding the production of thematic maps, nautical charts and other types of documentation
- To update the databases through re-survey when and where needed, gathering supplementary information from other maritime authorities
- To ensure the production, distribution and updating of charts
- To ensure the timely dissemination of maritime safety information

## SOME FUNCTIONS OF HYDROGRAPHIC SERVICE

- Primarily for the co-ordination and management of hydrographic services such as
  - –Determine the need for hydrographic surveys
  - – Instigate surveys
  - –Co-ordinate government ministries and commercial surveys

## SOME FUNCTIONS OF HYDROGRAPHIC SERVICE CONT.

- Nautical Charts
  - –Production
  - –Distribution
  - –Maintenance
- Nautical Publications
  - –Production
  - –Distribution
  - –Maintenance
- Provide information to marine spatial users

## PROCEDURE FOR ESTABLISHMENT OF HYDROGRAPHIC OFFICE

- Ghana / Nigeria has to acknowledge the need for a National Hydrographic Service.
- Identify all Stakeholders and Institutions that possess and use hydrographic data.
- Institutions/Stakeholders to determine the appropriate governmental authority to which the future hydrographic service will report, then identify a body to host the National Hydrographic Service.
- A Technical Status Report be prepared as a result of a Technical Cooperation Project.

## SOME WORLD HYDROGRAPHIC OFFICE / SERVICE

- THE UNITED KINGDOM HYDROGRAPHIC OFFICE (UKHO)
- The UKHO has a world-class reputation for providing safe and accurate navigational information, essential to the needs of the Royal Navy and merchant mariner.
- The UKHO has a proud history, going back more than 200 years. It has always had an enviable reputation for the quality and accuracy of its charts and other products.
- Some of the objectives of the UKHO are to provide:
  - Operational support to the Royal Navy and other Defence customers
  - – Support to “Safety of Life at Sea” treaty obligations
  - – Developing profitable business streams
  - – Organisational Excellence

## SOME WORLD HYDROGRAPHIC OFFICE / SERVICE CONT.

- UNITED STATES OF AMERICA
- In United States statutory authority for hydrographic surveys of territorial waters and the Exclusive Economic Zone (EEZ) lies with the National Oceanic Atmospheric Administration (NOAA).
- NOAA hydrographic surveys are conducted by the National Ocean Service a uniformed corps within NOAA and a fleet of survey vessels based at two major centers. The organic survey assets are supplemented by other agencies and contract surveys in order to survey the large areas within its responsibility.
- For inland surface waters such as rivers, streams and inland lakes the US Geological Surveys (USGS) has national responsibility. USGS coordinates survey data collection and publishes a National Hydrography Dataset that is designed to be used with geographical information systems (GIS).
- The U.S. Coast Guard conducts hydrographic survey operations, particularly in the Polar regions.

## SOME WORLD HYDROGRAPHIC OFFICE / SERVICE CONT.

- **UNITED STATES OF AMERICA**
- The National Geospatial-Intelligence Agency (NGA) oversees charting of international waters for Department of Defense purposes. The Navy's Naval Oceanographic Office conducts many of the oceanic surveys.
- The U.S. Army Corps of Engineers conducts hydrographic surveys supporting its responsibility for the major waterway projects that include navigation and flood control.
- Hydrographic data from those surveys is published by districts. Such data is incorporated into both NOAA and NGA products and the Corps engages in efforts to improve hydrographic collection methods.

## SOME WORLD HYDROGRAPHIC OFFICE / SERVICE CONT.

- **AUSTRALIAN HYDROGRAPHIC SERVICE**
- The Australian Hydrographic Service (formerly known as the Royal Australian Navy Hydrographic Service) is the Australian Commonwealth Government agency responsible for providing hydrographic services that meet Australia's obligations under the SOLAS convention and the national interest; enabling safe navigation, maritime trade and supporting protection of the marine environment.
- The agency, is an element of the Royal Australian Navy (RAN), and serves both military and civilian functions.

## CONCLUSION / RECOMMENDATIONS

- That the significance of hydrography in the general development of nations cannot be over emphasised. Despite this significance and the fact that its practice has been on for over a century, the level of hydrography awareness is very low in Africa.
- There is need to raise the awareness of Hydrography to the African nations for them to know the importance and economic benefit of hydrography and hence hydrography be given its prime of place
- There are no strong institutional and legal framework that will enhance or facilitate the development of hydrographic practice in Africa.
- One of the objectives of the IHO is to tender guidance and advice to Maritime States engaged in setting-up or expanding their hydrographic services. The National Hydrographic Service will ensure that the hydrographic service rendered to the nation is holistic in nature and meets international standards as laid down by the World Hydrographic body

## CONCLUSION / RECOMMENDATIONS

- Drawing an inference from the various world Hydrographic Office / Service, there is need for African Countries especially Ghana and Nigeria to have a National Hydrographic Office / Service or similar coordination structure, composed by all stakeholders needing hydrographic information as required to define the size, mission, objectives and policies of the National Hydrographic Service / Office as well as its annual work program.
- Establish strong institutional and legal framework to facilitate the development of hydrography in Africa
- Collaborate on issues of hydrography so as to synergize and fastrack the development of hydrographic practice.
- Call on IHO and the various concerned African countries to step-up their partnership for the development of Hydrography in Africa.
- Call on all hydrographers in Africa to be proactive and work assiduously for the development of hydrography.

