



TERMS OF REFERENCE

FOR

CONSULTANCY SERVICES FOR COMPREHENSIVE GAP ANALYSES AND SCOPING OF EXISTING DRAINAGE STANDARDS, LEGAL FRAMEWORK AND FLOOD RISK MANAGEMENT STRATEGY

A. BACKGROUND AND CONTEXT

Ghana Hydrological Authority (HYDRO) is the state institution established by an ACT of Parliament (ACT 1085) in 2022 under the Ministry of Works and Housing (MWH) with the responsibility to promote and regulate the delivery of hydrological services for planning, design, execution, operation and maintenance of flood control mechanism, works related to coastal engineering, sewerage, drainage improvement and river development, operational and applied hydrology for the quantification, conservation and development of the water resources of the country.

The Authority has carried out several oversight projects and initiatives throughout the years that have greatly aided Ghana's efforts to mitigate flooding. As part of its mandate, HYDRO recognizes the increasing importance of addressing flood risk comprehensively including reviewing drainage standards, existing strategies and the regulatory framework to align with contemporary challenges and global best practices.

Ghana is characterized by diverse hydrological features, including rivers, lakes, and coastal areas, which are susceptible to seasonal variations and extreme weather events. Ghana is one of the countries most prone to floods in West Africa with devastating effects, especially for the urban poor. The country has experienced a series of notable flooding events in recent years, with varying magnitudes and impacts on communities, agriculture, and critical infrastructure. In 2017, Ghana was hit by severe floods that impacted around 1 million individuals. The following year, floods caused by heavy rainfall and water releases from the Bagre Dam in Burkina Faso affected 100,000 people and caused significant damage to farmland.

More recently, water spillage from the Akosombo Hydropower Dam affected over Forty Thousand people (40,000). In addition to these annual floods, Ghana also faces secondary disasters caused by floods, which disrupt important infrastructure. An example of this was seen in 2015 when floods and a fire in Accra resulted in a tragic explosion at a gasoline station, leading to the tragic loss of One Hundred and Fifty-Two (152) lives and causing extensive property damage. These events have underscored the importance of robust flood risk management strategies, standards and regulations.

Rapid urbanization and changes in land use patterns contribute to altered hydrological dynamics, affecting natural drainage systems, and exacerbating flood risks. The expanding urban footprint often leads to increased impermeable surfaces, disrupting natural water absorption, and increasing runoff. Also, urban expansion, including the encroachment of development into flood-prone areas, often occurs without adequate consideration of drainage infrastructure and increasing flood risk. The impacts of climate change, such as rising sea levels, changing precipitation patterns, and more frequent extreme weather events, pose a significant threat to our nation's socio-economic development agenda. The increasing frequency and intensity of floods necessitate a proactive approach to ensure the resilience of our communities, infrastructure, and ecosystems. Projections suggest that these trends will continue and likely to get worse, necessitating urgent adaptive measures in flood risk management.

The Ministry of Works and Housing and HYDRO have led the country's effort to build resilience to the increasing climate change induced flooding risk. However, there are other government institutions and key stakeholders whose mandates and activities influence flood risk management.

These include, Water Resources Commission (WRC), Ghana Meteorological Agency (GMet), Water Research Institute (WRI), National Disaster Management Organisation (NADMO), Land Use and Spatial Planning Authority (LUSPA), Ministry of Sanitation and Water Resources, Ministry for Lands and Natural Resources and Ministry for Local Government, Decentralisation and Rural Development as well as the Ministry of Roads and Highways. Collaboration with government institutions, local communities, non-governmental organizations, and academic institutions is critical for the success of flood risk management and climate resilient initiatives.

Furthermore, the effective management of drainage infrastructure is critical in mitigating the impact of urbanization, climate change, and ensuring sustainable development. In Ghana, there is a lot of concern about the state of the drainage infrastructure in communities, some of whom are prone to flooding and its effects.

One of the biggest challenges facing Ghana's drainage industry is the absence of drainage standards for all categories of drains including standards for Nature Based Solutions and associated guidelines for developers. The existing drainage standards have been instrumental in flood mitigation measures. However, they were developed specifically for Highway Projects and there are critical gaps in these standards, particularly concerning the lack of specifications; for buffer zone distances from water bodies and allowance for climate change factor.

There has also been the adoption of one-size-fits-all drainage standards during designing without considering the current diverse climatic, topographic, and hydrological characteristics of specific regions in the country.

In the light of above, Ghana Hydrological Authority seeks consultancy services to conduct a comprehensive review of the existing flood risk management legal framework, review the roles of the various stakeholders, identify gaps and make recommendations for the development of a comprehensive strategy, drainage standards and regulations for managing flood risk in the country.

B. OBJECTIVE OF THE ASSIGNMENT

The primary objective of this consultancy assignment is to conduct a comprehensive gap analyses and scoping of existing drainage standards and flood risk management regulations and strategy. This is to equip the Ghana Hydrological Authority with evidence-based recommendations and a strategic roadmap for updating/developing new drainage standards including nature-based solutions along with flood risk management strategy/regulations and design guide for developers. This initiative will contribute to building a resilient and adaptive water management system that effectively mitigates the impacts of flooding in the context of evolving environmental and climate condition.

C. APPROACH TO ASSIGNMENT

The Client for this consultancy is Ghana Hydrological Authority (HYDRO). The Client is hereby requesting technical and financial proposal from a suitably qualified and experienced consultancy firm, (demonstrating experience of comparable work in the past five years).

The consultancy assignment will adopt a holistic and multidisciplinary approach to ensure a thorough gap analysis and scoping of drainage standard and flood risk management regulations. The approach will integrate various methodologies and stakeholder engagement to provide comprehensive insights into the current drainage standards and flood risk regulatory framework and their effectiveness. The consultancy aims to provide Ghana Hydrological Authority with a nuanced understanding of the current regulatory landscape, offering actionable insights for its review and update for flood risk management regulations and also review of drainage standards. The integration of technology, stakeholder engagement, and comparative analysis ensures a robust foundation for building a more resilient and adaptive regulatory framework.

The Consultancy firm shall bear in mind that the list of tasks and activities can by no means be considered as the complete and comprehensive description of the Consultancy firm's duties. The firm is expected to critically review the Client's requirements as stated in this document and recommend additional innovative approaches and activities that are deemed essential to achieving the Client's stated objectives based on their professional experience and judgement.

D. DETAILED TASK DESCRIPTIONS

The consultancy firm shall undertake these following assignments:

- i. Conduct an exhaustive review of existing drainage standards, flood risk management regulations, policies, strategies, guidelines at national, regional, and local levels.
- ii. Undertake a literature review of relevant international and local studies, best practices, and guidelines related to nature-based solutions for drainage.
- iii. Identify and map key stakeholders, including government institutions, local communities, urban planners, engineers, environmentalists, subject experts and academia.
- iv. Engage with relevant stakeholders to gather input and ensure a comprehensive understanding of National, Regional, local needs and challenges.
- v. Conduct a comparative analysis of existing flood risk management regulations against international best practices.
- vi. Conduct a systematic gap analysis to identify regulatory weaknesses and vulnerabilities in the current framework, strategies and drainage standards being used.
- vii. Assess the practical implications of regulatory gaps on flood risk management.
- viii. Develop an initial report outlining the identified gaps, weaknesses, and recommended actions.
- ix. Conduct a validation session with key stakeholders to ensure the accuracy and completeness of the gap analysis and scoping report.
- x. Finalize gap analysis and scoping, incorporating feedback from stakeholders and ensure that the recommendations are clearly articulated and supported by evidence.
- xi. Prepare a detailed report outlining the identified gaps, weaknesses, and propose recommendations for the development of a comprehensive strategy, drainage standards, and flood risk regulations.
- xii. Prepare terms of reference for addressing the gaps identified.

E. DURATION OF ASSIGNMENT

The consultancy engagement is expected to be nine (9) months.

F. TEAM COMPOSITION AND QUALIFICATION REQUIREMENTS FOR THE KEY EXPERTS

Key professional staff critical to the performance of the services are listed in the table below.

Table 1 Staff requirements and corresponding workload

Description	Key/Non-Key Staff
Comprehensive gap analysis and scoping of Existing Flood Risk Management Framework	Team Leader (Hydrologist/Civil/Environmental Engineer)
	Legal Expert
	Flood Risk Management Expert
	Environmental/Civil Engineer
	Data Analysts/Scientist
	Stakeholder/Community Engagement Specialist

The minimum requirements for key staff for the assignment are provided in Table 2 below.

Table 2 Academic qualification and professional experience / requirements of each staff

Key Staff	Academic Qualifications	Minimum years of work experience	Relevant Professional Experience / Requirement
Team Leader (Hydrologist / Civil Engineer)	Master's degree in hydrology, civil, environmental engineering, or a related field.	<ul style="list-style-type: none"> 15 years 	<ul style="list-style-type: none"> Proven experience in project management and regulatory development. Professional accreditation or membership of a relevant engineering association. Experience in hydrological assessments, flood risk management, and regulatory analysis. Proven experience in drainage system design, standards development with experience in nature-based solutions. Familiarity with local and international best practices in flood risk management Strong leadership and coordination skills Familiarity with Ghana's flood risk challenges Experience in drainage and flood risk reduction infrastructure, technical

Key Staff	Academic Qualifications	Minimum years of work experience	Relevant Professional Experience / Requirement
			standards, implementation / supervision <ul style="list-style-type: none"> • Familiar with nature-based solutions. • Fluency in the English language.
Legal Expert	Master's degree in environmental law, law, regulatory affairs or related field	<ul style="list-style-type: none"> • 10 years 	<ul style="list-style-type: none"> • Knowledge of relevant national and international legal framework • Experience in legal and regulatory analysis, with a focus on water-related regulations. • Experience in drafting and reviewing environmental regulations, especially in the field of flood and water management. • In-depth knowledge of national and international water-related laws and regulations. • Experience in conducting regulatory impact assessments. • Fluency in the English language.
Flood Risk Management Expert	Master's degree in hydrology, flood risk management, civil engineering, or related field	<ul style="list-style-type: none"> • 10 years 	<ul style="list-style-type: none"> • Experienced in hydrology, flood risk management global best practices and comprehensive frameworks. • Experience in cross-agency coordination and integrated flood risk management approach, and flood risk management laws and regulations • Familiarity with the local hydrological conditions. • Fluency in the English language.
Environmental Scientist	Master's degree or higher in Environmental Science, Ecology, or a related field	<ul style="list-style-type: none"> • 10 years 	<ul style="list-style-type: none"> • Experience in environmental impact assessment and nature-based solutions for flood management. • Expertise in environmental regulations related to flooding from different sources. • Experience in handling similar consultancy tasks. • Familiarity with Ghana's context • Fluency in the English language.

Key Staff	Academic Qualifications	Minimum years of work experience	Relevant Professional Experience / Requirement
Data Analyst / Scientist – Flood Risk Analyst	Master's degree in Data Science, Statistics, or a related field.	<ul style="list-style-type: none"> • 8 years 	<ul style="list-style-type: none"> • Experience in data analysis with a focus on hydrological data. • Experience in modeling, and interpretation. • Proficiency in data analytics tools and software. • Proficient in statistical analysis and data visualization. • Experience in handling large datasets related to hydrology and flood risk. • Fluency in the English language.
Stakeholder / Community Engagement Specialist	Master's degree in Social Sciences, Community Development, or a related field.	<ul style="list-style-type: none"> • 8 years 	<ul style="list-style-type: none"> • Experience in stakeholder engagement and community outreach. • Strong communication and interpersonal skills. • Experience in organizing and facilitating workshops and consultations. • Proven track record in stakeholder engagement for environmental and flood related projects. • Fluency in the English language.

G. ESTIMATED WORKLOAD FOR ASSIGNMENT

The total workload for this consultancy assignment is estimated to be 18 man-months.

H. DELIVERABLES AND TIMELINES

The list of deliverables and respective timelines are provided in Table 1 below.

Table 3 - List of deliverables and corresponding submission schedules

Report	Time for Submission	Number of Copies
Inception Phase	By end of week 2	3 hard copies and 1 soft copy
Document Review and Stakeholder Mapping	By end of week 6	3 hard copies and 1 soft copy
Gap Analysis and Vulnerability Assessment including Comparative Analysis with International Best Practices	By end of week 14	3 hard copies and 1 soft copy
Stakeholder Engagement Report	By end of week 22	3 hard copies and 1 soft copy

Report	Time for Submission	Number of Copies
Drafting of Scoping and Gap Analysis Report	By end of week 26	3 hard copies and 1 soft copy
Validation and Finalization	By end of week 32	3 hard copies and 1 soft copy
Preparation of Terms of Reference, Final Report Submission and Assignment Closure	By end of week 36	3 hard copies and 1 soft copy

A detailed description of the required deliverables is provided below:

Table 4 – Content of deliverables

Report	Content
Inception Phase	This report shall include: <ul style="list-style-type: none"> • Details of meeting to finalize the scope, objectives, and expectations. • Outline of detailed work plan, methodology and team composition. • Outline of report for subsequent stages
Document Review and Stakeholder Mapping	This report shall include: <ul style="list-style-type: none"> • Report of in-depth review of existing flood risk management regulations and drainage standards. • Stakeholder mapping and scheduling of initial consultations.
Gap Analysis and Vulnerability Assessment including Comparative Analysis with International Best Practices	This report shall include: <ul style="list-style-type: none"> • A systematic gap analysis identifying standards and regulatory weaknesses and vulnerabilities. • Evaluation of the vulnerability of critical infrastructure to flooding under current and projected regulatory framework. • Identification of regulatory weaknesses contributing to vulnerabilities. • Research and comparison of existing flood risk management framework with global best practices. • Evaluation of the adaptability of international best practices to the local context.
Stakeholder Engagement Report	This report shall include but not limited to: <ul style="list-style-type: none"> • Meetings and workshops organized. • Gathered insights and feedback, for updating the standards and introducing nature-based solutions in Ghana • Identified capacity building and training needs assessment for stakeholders.
Drafting of Scoping and Gap Analysis Report	This report shall include: <ul style="list-style-type: none"> • Synthetization of findings and recommendations.
Validation and Finalization	This report shall include:

Report	Content
	<ul style="list-style-type: none"> • Conducted validation session with key stakeholders to review and validating the findings and recommendations. • Incorporation of feedback into the final gap analysis and scoping report.
Final Report Submission and Assignment Closure	<p>This report shall include:</p> <ul style="list-style-type: none"> • Finalized comprehensive gap analysis and scoping report. • Finalized recommendations for regulatory enhancements. • a comprehensive final report summarizing the entire consultancy assignment. • Draft Term of reference for the next phase • Record of closeout meeting discussing findings, recommendations, and next steps.

I. QUALIFICATION AND EXPERIENCE OF THE CONSULTING FIRM

Core Business: Risk management, civil engineering, environmental science, flood risk management and legal.

Years in Business: 10 years in the core business

Relevant Experience: Comprehensive gap analyses for flood risk management frameworks, scoping exercises related to flood risk/disaster management and resilience, familiarity with local, regional, or national regulations and standards review of drainage standards, nature-based solutions for flooding such as green infrastructure, and past projects related to drainage infrastructure design, evaluation and implementation.

J. CLIENT'S INPUT AND COUNTERPART PERSONNEL WORKING ARRANGEMENTS

The consultancy firm will work closely with the Ghana Hydrological Authority, and regular progress meetings will be scheduled to review and discuss project milestones and deliverables. The firm should ensure effective communication and collaboration with all relevant stakeholders throughout the assignment.

HYDRO will:

- a) Ensure timely review of reports submitted by the consultancy firm and facilitate the provision of feedback.
- b) Initiate the consultation and co-operation of other agencies required to provide support to the consultancy firm for realization of the relevant aspects of the assignment.
- c) Provide access to all relevant existing information including the Ghana Hydrological Act, Highway Drainage Standards and the Environmental Protection Act.

The Consultancy firm will:

- a) Execute the duties and tasks outlined with due diligence, efficiency and in accordance with the highest standards of professional competence, ethics and integrity.
- b) Be responsible for the collection and analysis of all data and information to assist in the timely completion of the assignment.
- c) Submit reports and plans within the stipulated timeframes stated in the Terms of Reference for review by HYDRO.
- d) Execute the services in accordance with the laws, customs and practices in Ghana and use the appropriate international/regional standards for preparation of technical information.

Professional and support counterpart personnel to be assigned by the Client to the Consultant's team:

The Consultant will work closely with the Heads of Hydrology, Drainage, Coastal and Survey, as well as an assigned team of the Authority on day-to-day basis in executing this assignment. The overall project manager for the client in this assignment is the Chief Executive Officer.

Confidentiality: The Consultancy firm shall not, during the term of this Contract and within 5 years after its expiration, disclose any proprietary or confidential information relating to the Services under this Contract or HYDRO'S business or operations without the prior written consent of HYDRO.

Ownership of Material: Any studies reports or other material, graphic, software or otherwise, prepared by the Consultant for HYDRO under this Contract shall belong to and remain the property of HYDRO. The consultancy firm will be required to hand over all such materials upon completion of the assignment.

Payment arrangement: This is a lump sum contract and payment will made at the end of each stage following acceptance of the output.