Federal Government of Nigeria

Federal Ministry of Power and Federal Ministry of Water Resources and Sanitation

SUSTAINABLE POWER & IRRIGATION IN NIGERIA (SPIN) PROJECT

TERMS OF REFERENCE[1]

For the

Environmental Expert as Member of

Hydropower Panel Experts (HPPOE)

for Preparation of Nigeria Hydropower Master Plan under the SPIN Project

Project **: SPIN**

Credit No. **: 7637NG**

Assignment: **Provide Independent Reviews For the Consultancy of Hydropower Masterplan and Strategic Environmental & Social Assessment For The Spin Project**

February, 2026

[1]This Terms of Reference are to be read in conjunction with the Terms of Reference for the Hydropower Masterplan and SESA.

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1 BACKGROUND

Under the Sustainable Power and Irrigation in Nigeria (SPIN) Project, the World Bank is providing funds to the Federal Government of Nigeria (FGN) to support the development of a Hydropower Master Plan (HMP) and a Strategic Environmental and Social Assessment (SESA),[2] covering all significant river basins with hydropower and multipurpose potential within Nigeria. The vision of the SPIN Project is to make integrated management of water, energy and food more effective and resilient in Nigeria. This would be achieved through investment in the management and resilience of multipurpose water infrastructure as well as strengthening the policies, institutions, capacities, and inter-governmental cooperation required. This vision builds on promoting holistic water and storage management by the inclusion of the hydropower sector and supporting institutional strengthening, such as on dam safety regulations and guidelines.

2 PROJECT DESCRIPTION

Consistent with the mandated accountabilities of the Federal Ministry of Water Resources and Sanitation (FMWRS), Federal Ministry of Power (FMP), and its agencies coordinating large investments in hydropower projects and tasks of flood control, navigation, and water supply and providing power across Nigeria, **Sub-component 1.1.3 Institutional Strengthening and Capacity Building for Hydropower** of the SPIN Project will provide strategic support to prepare a HMP, undertake an SESA and select one optimized large transformative hydropower project from the identified project within the HMP through cooperation between the FMWRS and FMP. The project will be optimized from both water and power perspectives, as it is a multipurpose development. Key parameters such as location and size (MW capacity and reservoir volume) will be defined through the HMP study. The technical design of the selected project would be carried out during the feasibility stage. .

SPIN shall support the preparation of the HMP which will include better synergies with existing water resources Master Plans and: (a) serve as input to [3]Nigeria's Integrated Energy Resource Plan and to a broader least-cost power development plan considering the role of hydropower in integrating other renewable energy sources; and (b) establish a screening criteria agreed by both the FMWRS and FMP and developed through a stakeholder process for selection of transformative and climate-resilient projects from the HMP. The selection criteria can then be applied to candidate projects as proposed by the ministries. For

[2] SESA – According to the World Bank's Environmental and Social Framework (ESF) (2018), Environmental and Social Standard (ESS) 1 – Annex 1. Environmental and Social Assessment, A. General, paragraph 4(J), Strategic environmental and social assessment (SESA) is a systematic examination of environmental and social risks and impacts, and issues, associated with a policy, plan or program, typically at the national level but also in smaller areas. The examination of environmental and social risks and impacts will include consideration of the full range of environmental and social risks and impacts incorporated in ESS1 through 10. SESAs are typically not location specific. They are therefore prepared in conjunction with project and site-specific studies that assess the risks and impacts of the project.

[3] The **Least-Cost Power Development Plan (LCDP)** for electricity is a critical analytical input to the broader **Nigeria Integrated Resource Plan** approved by the Federal Executive Council**.** The NIRP establishes high-level policy objectives and scenarios, which the LCDP then optimizes to achieve the least-cost outcomes within defined boundaries. The **Hydropower Master Plan (HMP)** provides a detailed, resource-specific foundation that informs both the LCDP and the NIRP, which would be reviewed regularly. The optimised project is to be selected from projects identified in the HMP.

this, the SPIN Project will finance a qualified international transaction adviser who will be assisted by local consultants.

The HMP is expected to include characterization of the water resource and environmental, and social conditions in the water basins being considered for development, and identification of a portfolio of hydropower projects including multi-purpose projects. The HMP would analyse the hydropower capacity and energy capabilities firstly at a national level and then for a series of development scenarios, including the potential for hybrid operation of solar energy resources with hydropower that can increase the total dispatchable energy yield of the combined systems.

Optimizing the development of hydropower in Niger River sub-basins, and its gradual integration with solar power and the national energy grid, will make the hydropower sector more resilient to climate change–exacerbated precipitation and river flow variability.

To ensure the HMP is sustainable and aligned with the World Bank's ESF, an integrated strategic environmental and social assessment (SESA) will be conducted to support the HMP's development. The SESA will assess key environmental and socio-economic risks and impacts of the HMP, and then the preferred portfolio options of the HMP. The SESA's output will prescribe management and mitigation actions. The SESA will provide the FGN with a framework for developing a sustainable hydropower sector that minimises environmental and socio-economic risks of power generation and transmission while maximising its benefits to the citizens of Nigeria.

3 WORLD BANK POLICY REQUIREMENTS FOR INDEPENDENT PANELS OF EXPERTS

Given the size and complexity of the Project and its potential impacts, in compliance with the World's Bank ESF, the project has been classified as high risk. In accordance with the World Bank's Environmental and Social Framework (ESF), for projects that may pose high environmental risks, one or more independent advisory panels will be established. The SPIN Federal Project Management Unit (FPMU) will be required to establish the Hydropower Panel of Experts to review both the HMP and SESA. (referred to throughout this document as HPPOE). Members of the panels will be hired by SPIN FPMU to advise it and to provide guidance in their respective discipline areas.

The HPPOE will provide advice and guidance on: (a) the final terms of reference for the HMP ("the HMP studies"); (b) key issues and methods for preparing the HMP studies; (c) recommendations and findings of the HMP studies; (d) implementation of the HMP studies' recommendations, (e) development of dam engineering and water resources management capacity (f) energy economics and planning, (g) the final terms of reference for the SESA; (h) key issues and methods for preparing the SESA studies; (i) recommendations and findings of the SESA studies; (j) implementation of the SESA studies' recommendations; and (k) development of environmental and social management capacity.

4 OBJECTIVES OF THE PANEL OF EXPERTS

The purpose of the HPPOE will be to provide independent review of the Hydropower Masterplan and SESA. In particular, the HPPOE will provide review of key consultancy reports of the Consulting Services

for Preparation of a Hydropower Development Master Plan, and the Strategic Environmental and Social Assessment. The assignment will be conducted at a specified timeline and report as per the requirement of the SPIN FPMU. The HPPOE will also review the HMP study at the Inception Phase of the Consultancy and advise on any critical aspects that should be further studied for design optimization under this Consultancy. The HPPOE also has to review and advise SPIN FPMU on matters related to dam safety and other critical aspects of the dam, its appurtenant structures including spillways, all major structures. It may also comment on any other matter which it perceives to be important to the successful design, construction and operation of the hydropower projects and to the long-term safety of the dams and appurtenances..

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5 SCOPES OF WORK OF THE PANEL OF EXPERTS

The SPIN FPMU requires the HPPOE to provide independent design review of the HMP and independent review of the SESA, respectively. The services carried out by the HMP / SESA Consultant shall be reviewed periodically by the Panel of Experts. The reports submitted by the expert shall be accepted by SPIN FPMU upon Panel approval. The tenure of the Panels will span until the end of the Study.

5.1 Environmental expert scope

The Environmental expert shall provide independent, strategic, and high-level technical advice throughout the preparation of the Hydropower Master Plan (HMP) and the Strategic Environmental and Social Assessment (SESA). The role of the Environmental expert is advisory and oversight-oriented, aimed at ensuring technical soundness, dam safety, sustainability, and full alignment with the World Bank Environmental and Social Framework (ESF), applicable national regulations (including FMEnv requirements), and Good International Industry Practice (GIIP).

Specifically, the Environmental expert shall:

- Provide independent review and advice on the approach, methodologies, assumptions, and key outputs of the HMP and SESA, including consistency and integration between both studies.
- Review and advise on dam safety considerations, basin-wide planning options, site screening and selection criteria, cumulative and downstream impacts, climate and hydrological risks, institutional capacity, and proposed risk management and mitigation measures.
- Review and provide written comments on all key deliverables of the HMP and SESA consultants, including inception, scoping, baseline/data plans, screening and prioritization outputs, draft HMP, draft SESA, and final reports.
- Prepare formal review reports at each key milestone, including at a minimum:
    - Inception stage
    - Scoping and baseline stage
    - Screening and site-selection stage
    - Draft HMP and Draft SESA stage
    - Final HMP and Final SESA stage

The HPPOE is expected to produce not less than five (5) formal reports over the duration of the assignment. The assignment is expected to span the full duration of the HMP and SESA preparation, estimated at 12–18 months, in line with the consultants' work program.

- Participate, as necessary, in technical meetings with the HMP and SESA consultants organized by the SPIN Federal Project Management Unit (FPMU), including both virtual and in-person meetings.
- Undertake travel to Nigeria, as necessary and subject to security considerations, to meet with the SPIN FPMU and to visit proposed dam sites and relevant river basins to support effective review and validation of the studies.
- Meet directly with the World Bank task team, as required, to present the HPPOE's findings, conclusions, and recommendations and to support alignment with World Bank technical and policy expectations.

To enable effective and timely reviews, the SPIN FPMU shall share with the HPPOE all relevant technical instructions, correspondence, and communications exchanged with the HMP and SESA consultants. In addition to the above, the Environmental expert may raise and advise on any other issues it considers critical to the successful preparation of the HMP and SESA and to the sustainable and safe development of hydropower in Nigeria.

6 ORGANIZATION AND MEMBERSHIP OF THE PANEL

6.1 General Organization

The HPPOE shall consist of a Hydropower Expert, who will be a core member and the **Chair** of this technical panel; Hydrologist/Water Resources Expert; Geotechnical/Geology Expert; Energy Expert; SESA Expert; Environmental Expert; and Social Expert as core members, complemented by non-core members of Sedimentologist, Electrical and Mechanical expert. Additional experts maybe needed as required, with the need established by the core group. The HPPOE Chair will coordinate with other panellists to ensure the membership's objectivity and provide balance to its reviews and recommendations, and will be responsible for the HPPOE reports

Collectively, the members of the panel will have extensive experience with design of hydropower facilities, and have the following background with varying degrees of experience for each position:

(a) General overall engineering experience in design and construction of large hydropower projects including optimization and feasibility studies in respective fields;
(b) Energy demand and resource assessment of and understanding of energy supply mix based on energy security, economy and finance.
(c) Engineering experience in design and construction of similar types of dams and hydropower projects;
(d) General understanding of design consideration of minimizing the environmental, social, including resettlement, impacts and have a good working knowledge with the WB ESF and IFC Performance Standards
(e) Familiarity with the World bank Good Practice Note on Dam Safety (2020) and e-flows

The panel members should have practical and technical expertise in reviewing project reports produced by

consulting firms, and have strong analytical and reporting skills as well as an ability to work in teams. The panel shall also identify any new expertise on an ad hoc basis that is needed according to the findings of the panel and ongoing studies and recommend to the SPIN FPMU to hire experts with relevant experience and knowledge for a given time period to assist with relevant issues. The constitution of the panel may thus change over the project period, but it is highly desirable that a strong continuity of knowledge of the Project problems and progress be maintained.

The tasks and reports to be reviewed by the HPPOE are attached in **Annex B**.

6.2 Technical qualifications of the members

All panel members should be internationally renowned experts familiar with the WB ESF and IFC Performance Standards and related guidance documents, as well as modern design practices; have practical and technical expertise in carrying out and/or reviewing Engineering Design reports; have strong analytical and reporting skills; as well as an ability to work in teams; and have fluency in both written and spoken English. The panel members should demonstrate experience of working as a member of previous panels of experts in hydropower projects.

6.2.1 Qualification of Environmental Expert

The Environmental Expert shall have a minimum of a Master's Degree in Environmental Engineering or Environmental Sciences or Environmental Engineering, or other relevant technical field, with at least 20 years of experience in preparing and managing the preparation of SESA, ESIAs and preparing and implementing ESMPs for large scale infrastructure projects including dams and hydropower for large hydropower projects. Additional expertise in a relevant field such as biodiversity, waste management, and/or Occupational Health and Safety would be an advantage. Demonstrated experience with the applying the World Bank's Environmental and Social Framework (ESF), and/or other IFI E&S standards, and good international industry practice, and World Bank Group General Environmental, Health, and Safety Guidelines (EHSG) to major hydropower infrastructure projects. At least one assignment as a POE member on large-scale infrastructure projects including dams and hydropower. Good report writing skills and oral presentation skills. Experience with transboundary environmental impacts, and cumulative impact assessment.

The scope of work of the Environmental Expert will include the following main tasks:

- Providing input to the SESA Terms of reference;
- Participating in the reviews of all materials produced by the Study Consultant, including draft and final inputs and reports associated with the HMP and SESA;
- Coordinating activities, including consolidation of panel views and recommendations to ensure consistency in the approach on design, construction and operation issues;
- Coordinating input of Environmental and Social experts for preparing technical notes and reports, and maintaining good records of all notes, calculations, and other work products.
- Providing advice on key environmental issues and methods for the preparation of environmental and social documents in line with WB ESF requirements;

- Providing advice on key issues and methods in the public consultation and disclosure processes;
- Providing advice on the effective integration of environmental findings and recommendations on E&S studies and reports, into the technical design, implementation, and operational plans for the Project;
- Providing advice on the key environmental issues and methods for the preparation of the required management plans intended to mitigate the identified risks and impacts in a technically and financially feasible manner;
- Providing advice regarding measures to enhance the overall environmental outcome of the Project, especially related to stakeholder engagement, labour management, training and building capacity in environmental management for stakeholders commensurate with their responsibilities in project activities, community health and safety, worker and stakeholder grievance redress mechanisms, resettlement, and livelihood restoration programs, social inclusion and cultural heritage, and to identify opportunities for creating positive environmental outcomes/benefits;
- Identifying potential optimizations;
- Participating in selected field visits;
- Participating in selected HPPOE meetings;
- Attending meetings with consultants, contractors, and other stakeholders under the guidance of the SPIN PMU to support the discussion of the environmental plans and address any issues related to their implementation.
- Preparing sections related to the environmental discipline in the HPPOE reports.

6.2.2 Coordination of HPPOE Chair

The panel Chair of HPPOE will coordinate with its respective panel members to ensure their respective panel memberships' objectivity and to provide balance to their reviews and recommendations. The Panel Chair will coordinate the activities and communications of the panel, call and chair its meetings, and liaise as appropriate inviting as deemed necessary experts relevant for each meeting.

3 APPROACH AND METHODOLOGY

The panel will commence their work through in-house reviews of relevant documents, meetings with technical staff and other stakeholders, as well as through field visits to the project areas, with security and safety considered. The schedule of meetings will be coordinated jointly with the SPIN FPMU, the Study Consultants, and the HPPOE. The panel shall meet as frequently as necessary during the preparation of the Study Consultants' work and deliverables of each project phase to assess the quality, due diligence, timeliness and status of the works and to present recommendations. The meetings will normally take place at the SPIN FPMU's Abuja office or by MS TEAMS, and shall be attended by relevant members of the panel, the World Bank, the SPIN FPMU, and any other parties as authorized by the SPIN FPMU.

Meetings should be held when important decisions regarding key aspects of the Project must be made and when draft reports become available for each deliverable of the Consultants' work.

The schedule of the meetings should be arranged well in advance, taking into account the work program of the Project. The panel may carry out its necessary field visits to the site – security and safety considered. After each meeting, the panel will prepare a report and the panel chair will be responsible for obtaining sign-off of its panel members.

The services of the individual members of the panel may be used as necessary or desirable during intervals between meetings, as agreed with the SPIN FPMU, with copies of their comments being sent to the other members of the Panel and to the SPIN FPMU.

4 SELECTION PROCESS

The selection of the members of the panel will be in accordance with the Individual Consultant Selection method set out in the Procurement Regulations (September 2025). The SPIN FPMU shall directly contract the members of the panel on an individual basis. The selection will be based on the requirements, qualification and capability of the individual experts to carry out the assignment. The World Bank will provide its "No Objection" to the final selection of the members.

5 SUPPORT SERVICES

The SPIN FPMU shall make available its authorized personnel and that of the HMP/SESA Consultants for discussions at the request of the HPPOE and they shall be present during all meetings with the HPPOE. The SPIN PMU, and the Study Consultants shall provide the necessary documentation. The SPIN PMU will facilitate the interaction of the panel with all Study Consultants as well as any other key stakeholders which the panel members identify as necessary to consult with directly to fulfil the objectives of the assignment.

The SPIN Project shall take necessary actions to allow prompt travel clearances (if necessary) of the members of the Panel or specialists requested by the Panel and shall provide full safe physical access to the Project area and sites.

6 REPORTING REQUIREMENTS

The members of the panel will share technical expertise and knowledge through meetings, consultations and field visits. Each panel shall document the results of each of its visits and of the overall conclusions and recommendations. Each panel will also provide a consolidated report at the conclusion of its meeting schedule. The drafts shall be shared by SPIN PMU with the World Bank for their comments. The minutes and reports of the meetings shall be prepared by the panel. The minutes shall be signed by participating members of the panel and presented to the SPIN PMU, the Study Consultants, and reviewed with them prior to the departure of the panel members. The two panel chairs will be responsible for reaching consensus and getting signatures. The panel shall be expected to maintain the confidentiality of any commercial or proprietary information of the Project that the members may have received from SPIN PMU or any government entity.

7 PROJECT DOCUMENTS

The following project documents are to be made available to the panel:

- Terms of Reference for The Hydropower Masterplan and SESA (Annex A)
- Other relevant documents that the Panel may request, as available.

Description of Key Activities and the indicative level of efforts of the experts are attached in Annex *B*.

ANNEXES

ANNEX A – Link to Terms of Reference for The Hydropower Masterplan and SESA

https://1drv.ms/w/c/bea66a6a0847ee73/IQC-bLJJzQPmSrB6Q7bWGnONASG0M3pv2d9DBHFcUGbQBdc?e=OyZ1hh

ANNEX B: Expected Involvement of Environmental Expert

The Environmental Expert, as a core member of the Hydropower Panel of Experts (HPPOE), shall provide independent, strategic, and high-level environmental advisory and oversight support throughout the preparation of the Hydropower Master Plan (HMP) and the Strategic Environmental and Social Assessment (SESA). The Expert's engagement shall be aligned with key milestones of the HMP and SESA and shall include document reviews, reporting, meetings, and field engagement, in line with Section 5.1 of this ToR.

Phases and Description of Key Activities	**Indicative Level of Effort**
Phase 1: Inception	Days
Key Activities: • Review inception reports, methodologies, work plans, and proposed analytical frameworks of the HMP and SESA consultants. • Advise on the incorporation of environmental considerations, including biodiversity, cumulative impacts, climate risks, and dam safety, at the outset of the studies. • Participate, as necessary, in inception meetings with consultants organised by the SPIN FPMU. • Contribute to the HPPOE Inception Review Report.	5
Phase 2: Scoping and Baseline	
Key Activities: • Review scoping reports, baseline data plans, and identification of key environmental risks, sensitivities, and opportunities across river basins. • Review and advise on environmental screening, categorisation, and selection of sub-basins and potential hydropower sites. • Assess basin-wide, cumulative, downstream, and transboundary environmental impacts, including biodiversity, sedimentation, water quality, and ecosystem services. • Participate in technical meetings with consultants and SPIN FPMU, as required. • Contribute to the HPPOE Scoping and Baseline Review Report.	12
Phase 3: Screening, Prioritization, and Optimization	
Key Activities: • Review and advise on environmental aspects of screening, ranking, and optimization of hydropower portfolios across selected sub-basins. • Assess proposed environmental mitigation, management, and institutional strengthening measures, including feasibility and alignment with GIIP and the World Bank ESF. • Participate, as necessary, in field visits to Nigeria to meet with the SPIN FPMU and to visit selected river basins or proposed dam sites, subject to security considerations. • Participate in meetings with consultants and SPIN FPMU as required.	13

• Contribute to the HPPOE Screening and Optimization Review Report.	
Phase 4: Draft HMP and Draft SESA Review	
Key Activities: • Review the draft HMP and draft SESA to ensure environmental risks, impacts, and recommendations are adequately addressed and integrated. • Assess consistency between the HMP and SESA and alignment with the World Bank ESF, national regulations, and GIIP. • Participate in review meetings organized by the SPIN FPMU. • Contribute to the HPPOE Draft HMP and Draft SESA Review Report.	5
Phase 5: Final HMP and Final SESA Review	
Key Activities: • Review final HMP and SESA reports to confirm that previous HPPOE comments have been adequately addressed. • Validate the robustness, clarity, and implementability of environmental recommendations and management measures. • Participate, as required, in direct meetings with the World Bank task team to present HPPOE findings and recommendations. • Contribute to the HPPOE Final Review Report.	5
Total	40

Indicative Total Level of Effort

Total Indicative Level of Effort: 40 days, spread across the full duration of the HMP and SESA preparation period (estimated at 12–18 months).