

## *Terms of Reference:*

### *Baseline Survey for Global Multi-tier Measurement for Access to Energy*

#### **Background**

In order to realize the vision of the Government of Bangladesh (GOB) for universal access to electricity by 2021, generation capacity has been increased in three fold within last seven years. Access to electricity has increased from 47% to 76% in the last 7 years through grid and off-grid solar home systems. However, people connected to the grid power often suffer from reliability and quality of supply. Also, majority of the population use energy inefficient traditional stoves for cooking. As a result, they are exposed to smoke and soot from the stoves causing eye problems and respiratory diseases.

GOB now intends to conduct a baseline survey on access to electricity and improved cooking using the Global Tracking Framework (GTF). The GTF is meant to analyze and track the progress and level of energy access using multi-tier measurement of energy access.

Power Cell, Ministry of Power, Energy and Mineral Resources intends to appoint a reputed firm to conduct baseline survey on access to electricity and improved cooking using GTF. The firm must have extensive experience in household survey of at least one hundred thousand in Bangladesh and survey experience through satellite tracking device is preferable. Working experience in union level and familiar with rural inhabitants is preferable. The People's Republic of Bangladesh received a fund from the IDA towards the cost of the Rural Electrification and Renewable Energy Development II (RERED II) Project and it intends to apply part of the proceeds of this credit to payment under the contracts for this survey.

#### **Scope of Work**

The task has four major components as outlined below. Details of the activities are provided in the next section.

- 1) Design and implement baseline surveys: This will include developing samples for the surveys, hiring and training of the survey team, pre-testing the questionnaires, and finally implementing the surveys. The sample selection, questionnaire content and survey team are covered under specific tasks.
- 2) Clean data and archive them in suitable forms: The collected data need to be entered into a database and cleaned. The final data should be in Stata.
- 3) Carry out tier analysis of the data: The consulting firm will carry out tier analysis and calculation of indices of energy access based on multi-tier framework. The firm will also conduct basic descriptive analysis of the cleaned data.
- 4) Prepare a GIS database consisting of the GPS coordinates of the survey units: The Consulting firm should produce their database with GPS, start and end timestamp of the samples. The collection of data should be through a reliable electronic device recording both the GPS coordinates and the timestamp of the sample.

The consulting firm will be responsible for delivering high quality data according to the expectation and protocols of, and within a timeframe defined by the TOR. Specifically, the consulting firm will be responsible for the following activities and tasks:

1) Design and implement baseline surveys: This includes all the pre-survey activities, starting from sample design to finalizing questionnaires, and administering the surveys. The activities under this task are described here.

- a. ***Questionnaire development and revision***: The consulting firm will be given an English language copy of the energy access questionnaires developed by ESMAP to capture multi-tier framework (MTF). The questionnaires will cover modules for household and productive activities. The firm will also develop a community/village questionnaire. Based on the demand of the client, additional questions may be added to existing questionnaires. The consulting firm will be responsible for adapting the questionnaires to get context-specific responses, carefully considering the importance of cross-country comparability. The consulting firm will also be responsible for the translation of the questionnaires into Bangla. Consulting firm will review the questionnaire and improve the wording, ordering and placement of questions where necessary to ensure objectivity and accuracy. The consulting firm may conduct application based survey using software or paper based. For this the consulting firm will develop necessary scripts to do so, enter the electronic questionnaires into tablets in suitable formats, and develop the web-server to receive the completed questionnaires via internet and process them. The consulting firm will be responsible for development of the sequence and skip pattern of the tablet-based questionnaires.
- b. ***Estimate the sample size and design the sample***: The sample size for accurate assessment of tiers and calculation of indices of energy access for households and productive activities will be determined at RFP stage. The sample should be nationally representative of the 8 (eight) divisions of Bangladesh.
- c. ***Recruit and train interviewers, field supervisors and data entry operators***: The Consulting firm will be responsible for hiring and training of survey interviewers, field supervisors, and data entry operators. Interviewers should be able to interact with all classes of people, be skilled at building rapport, and be experienced at dealing with numbers. They should have at least Bachelors level of education and experience in survey work, and be available for the entire survey period. Interviewers and supervisors should be trained for at least 3 days, and longer if needed. The consulting firm will develop questionnaire instruction manual (interviewer guide) for the trainings, which will cover detailed explanation of the questions, how to articulate them in an understandable way, how to approach the respondents and prompt them for accurate responses, and so on. Instruction manuals should be developed before the trainings start. Participants will be required to attend all sessions and prove competence through tests and exercises administered during the training. It is advisable that the consulting firm trains few extra individuals to make up for any absentee or nonperformance.
- d. ***Pretest the questionnaires***: Pretesting will ensure that the questions are relevant, well sequenced, non-ambiguous and easy to understand, the codes used for close-ended questions are relevant, and determine if the duration of the interviews are within reasonable limits of what is expected. It will be the consulting firm's responsibility to conduct the pretesting of the questionnaires. The pretesting should be conducted among 15 households and 5 business enterprises prior to finalizing the questionnaires. After the pretest, a feedback session will be arranged and the questionnaires will be checked for errors detected and issues raised during the pretest, and then again the questionnaires (and the instruction manual if necessary) will be revised and finalized. The actual survey work cannot commence until the client provides clearance on the final version of the questionnaires.
- e. ***Provide logistical and other support to enumerators and supervisors***: The field enumerators and supervisors will require logistical support and subsistence during their stay in rural areas to conduct

the field work. This support and relevant expenses (for transport, per-diem, etc.) have to be borne by the consulting firm in a manner consistent with the norm of similar surveys in Bangladesh.

- f. **Carry out the surveys:** The household or enterprise survey should be conducted during a single visit. In exceptional cases (for example, if the respondent does not have time to continue or is not at home) it may be necessary to return to a household or enterprise on more than one occasion, but this should not be the norm. For household survey, the questionnaire would preferably administered to household head (or head's spouse depending on the particular module of the questionnaire), and for enterprise survey the respondent should be the owner or the manager of the enterprise. The duties of the enumerators will be:
- Visit the selected households/enterprises and ensure their participation;
  - Conduct face-to-face interviews with the selected respondents, not without first obtaining permission;
  - Record accurately the answers and code them accordingly;
  - Ensure completeness and accuracy of answers and perform accuracy checks on the questionnaires (whenever applies);
  - Take note on any values for categorical variables that are not already defined in the questionnaire;
  - Deliver completed questionnaires to supervisors (paper-based interviews) or transmit them to central server over internet;
  - Safeguard the confidentiality and privacy of the collected information.

The duties of the supervisors will be:

- Explain clearly to each enumerator his/her duties and responsibilities;
- Provide all logistical support and materials to field enumerators;
- Supervise all activities of the enumerators during the data collection process through random spot checks;
- Ensure that the interviewers undertake the survey in the households chosen for the sample without substitution;
- Assess the quality of the work of the enumerators and the quality of the data from each completed questionnaire;
- Ensure that the enumerators did not overlook inconsistencies and skip patterns;
- Provide feedback to enumerators on quality assurance;
- Liaise and report activities to the survey coordinator;
- Check completed questionnaires and approve them for data entry

2) Clean data and archive them in suitable form: After completion of the survey, the firm is responsible for data entry and cleaning as mentioned in the Scope of Work. For tablet-based survey data entry is almost automatic as it only involves transmitting the data from tablets to a central web server and then converting into usable format using a statistical software, such as Stata. Much of the data cleaning can be taken care of with tablet-based questionnaire development as most of the basic value checks can be implemented in questionnaire scripting. At the end of data cleaning, the consulting firm should hand over the data to client in Stata, with all variables labeled and adequately documented.

3) Carry out descriptive analysis of the data: The consulting firm will carry out tier analysis and index calculation for energy access. For this, they will be provided formulas and detailed instructions. They will also conduct data analysis of the cleaned data. This involves reporting means, standard deviations, minimum and maximum values of major variables in each section. Findings should be reported in tables and/or graphs and included in the project completion report.

4) Compile the findings in a project completion report: The consulting firm will write on the findings based on the survey and data analysis. All such findings will be part of the survey completion report. The report will include, among others, detailed description of pre-survey and survey activities, issues rose and the means adopted to resolve them, and findings from the data. The consulting firm will submit a draft version of the report to the client for comments, and will revise it after addressing the comments. The consulting firm is responsible for the overall quality of the report.

5) Delivery of the data: The consulting firm will deliver the data and related documentation to the client. The data and documentation will be the property of the client, and the consulting firm may not use them in any way without the permission of the client.

### **Expected Man-months, deliverables and schedule of works**

The duration of the survey will be approximately for 8 months. Indicative professional staff-months required for the assignment will about 36 man-months. The team composition, task assignment and consultant fielding will be indicated by the consultant in response to the RFP. Following are the deliverables and tentative schedule for submission. They may be revised based on the load of the survey activities after the consulting firm is on board.

**Table 1: Deliverables and submission schedule**

<b>Deliverables</b>	<b>Submission schedule</b>
A. Draft inception report (containing work plan, timetable, and sampling plans)	2 weeks after the award of the contract
B. Revision of survey questionnaires	3 weeks after the award of the contract
C. Feedback/comments from client	4 weeks after the award of the contract
D. Final inception report (based on the comments received from the client)	5 weeks after the award of the contract
E. Hiring and training of interviewers and field Supervisors	6 weeks after the award of the contract
F. Pretesting of the questionnaires	7 weeks after the award of the contract
G. Feedback sessions based on pretesting	7 weeks after the award of the contract
H. Final survey questionnaires	7 weeks after the award of the contract
I. Survey activities start	At the start of the 8-th week after the award of the contract
J. Interim progress reports on survey activities	Every 2 weeks after the start of the survey
K. Survey activities complete	16 weeks after the award of the contract

L. Data entry and cleaning completion	20 weeks after the award of the contract
M. Draft survey report	24 weeks after the award of the contract
N. Feedback on the data and report by the client	26 weeks after the award of the contract
O. Final version of the report	28 weeks after the award of the contract
P. Final version of the data and documentation	28 weeks after the award of the contract

### **Reports:**

- (1) Inception Report: Consultant will prepare and submit an Inception Report within 1 month from signing of the Contract, stating their jobs understanding, concept on the requirements of the assignment, readiness and strategy for undertaking the project.
- (2) Interim Report: Consultants will submit Interim Report within 5 months from the date of Contract signing. Consultants shall incorporate views of the stakeholders in the Interim Report.
- (3) Draft Final Report (DFR): Consultants shall submit Draft Final Report within 6.5 months from the date of Contract signing. Analysis the views of the stakeholders will be incorporated in the DFR.
- (4) Final Report: Consultants shall arrange stakeholders Workshop in a suitable location with all power sector entities and incorporate comments received from the Workshop in the Final Report. Final Report shall be submitted within 8 months from the date of signing of the Contract.

### **Facilitation and Reporting**

Power Cell will ensure access to the available relevant information to the assignment. The Consultant will work in close association with the Power Cell. A coordination mechanism will be in place to review progress, provide guidance and advice. Consultant will work under the guidance of the Power Cell. Day to day work would be monitored by a designated officer Director (Commercial), Power Cell.

### **Logistics Support for the Consultant**

The Power Cell will provide counterpart support. Consultants will be supposed to use their own computers, transports, etc.

### **Key Staff Requirement**

The preferred experience of proposed key staff is mentioned below:

- 1) **Project Manager/ Team Leader:** At least Master degree in Engineering, Urban and Rural/ Regional planning, Remote Sensing and GIS (PhD preferable) with minimum 15 years professional experience in public communication, survey, customer outreach program, GIS and have expertise in Handheld GPS receiver.
- 2) **GIS Specialist:** At least Master degree in Engineering/ Urban and Rural Planning / Urban and Regional Planning (PhD preferable) with at least 15 years professional experience in GIS/RS.

- 3) **Energy Specialist:** At least Graduation in Electrical/ Mechanical Engineering with at least 20 years working experience in power sector out of which minimum 10 years spent in public utility distribution system.
- 4) **Social Impact Analysis Specialist:** At least Masters in Social Science (PhD preferable) with at least 20 years professional experience in SIA.
- 5) **Economist/ Statistician:** At least Masters (PhD preferable) in Statistics with at least 15 years professional experience in data analysis and processing and also familiar with statistical software.
- 6) **Programmer:** At least Graduation in Computer Science / Computer Science & Engineering with minimum 2 years working experience in software development.
- 7) **Survey Coordinator:** At least Bachelor degree with minimum 5 years working experience in survey.