

Request for the Procurement of Consultancy Services

TERMS OF REFERENCE

“QGIS Training”

Project Management Unit

Fleming Fund Project

Department of Medical Services

Ministry of Health

Background

The Ministry of Health seeks to attain universal health coverage by enhancing access to high-quality, equitable health care, bolstering preventive, promotive, curative, rehabilitative, and palliative care and encouraging efficiency and effectiveness in health-care funding and delivery. It aims to create the healthiest country on the planet by providing free basic healthcare services.

Bhutan is witnessing significant health and social developments at the moment. Dramatic changes are taking place around the world in terms of new health technology. Additionally, the Ministry of Health is spending millions of dollars on patient referrals outside of the country. All of these issues may be addressed with the right technology.

Subsequently, significant advances in the evaluation and use of geographic information have had a major effect on key elements of public health. Strides in mapping technology, as well as the availability and accuracy of health information, enable public health practitioners to link and analyze data in new ways at international, regional, national, and even street levels. This geographical perspective generates new approaches in the study of communicable disease control, environmental health protection, health needs assessment, planning and policy, operational public health management, and many other areas.

Geographic Information Systems (GIS) is more than mere technology. It is a science that encompasses the development and application of scientific methods toward solving societal problems, an emerging facet of public health research and practice. GIS is very convenient for directional data analyses and can provide a basic framework for public health research and evaluation.

Nowadays, due to increased public health awareness, the need to quickly detect and evaluate public health problems has become an essential issue. In this regard, GIS with strong analytical capabilities would be critical in the collecting and analysis of health data. As a result, it is possible to assess the incidence of prevalent diseases and describe the significant effects of diseases on quality of life. GIS organizes epidemiological data by gathering information, characterizing disease severity, and assessing prevalence in distinct geographical regions.

Hence, in line with the detailed technical implementation plan of the Fleming Fund Project, the Project Management Unit, Department of Medical Services, Ministry of Health proposes to train

health officials (both animal and human health) on using QGIS software to apply GIS in the field of public health.

Objective

The objectives of this training course are as follows;

- To develop an understanding of the different components of a GIS, the role GIS plays in solving epidemiological and public health problems, and the role of GIS as a decision support system in public health.
- To present to participants all data-related aspects of a GIS, such as the data models in GIS, data input, data editing, data visualization, metadata, and managing a spatial database.
- To carry out advanced analyses of geographical data with specific reference to epidemiological related issues.
- To perform spatial and temporal epidemiological and public health analysis using GIS.
- Establish an understanding of how to work with spatial data and GIS techniques to solve epidemiology and public health problems.

Scope of the consultancy services

The consultancy services to be provided by the service provider will include, but are not limited to the following:

1. Introduction to GIS in public health
 - a. Understanding the basics of GIS in Epidemiology and public health context
 - b. GIS Data sources for Epidemiology and public health
 - c. Explore QGIS interface, data models, and data types
 - d. Working with a QGIS software (Create metadata and import/export different spatial data formats)
 - e. Data manipulation concepts
2. GIS data management
 - a. Public health and epidemiology GIS Database creation
 - b. Data Types and Data Sources in Epidemiology and public health

- c. Working with GIS Data
 - d. Working with data from different sources (databases, shapefiles, and spreadsheets)
 - e. Coordinate reference systems and attribute joins (project and spatially join datasets)
 - f. Geocoding
3. Spatial data collection techniques for health applications
- a. Digitizing and scanning of maps
 - b. Using GPS and Google Earth
 - c. Using GPS utility software for managing and downloading and managing data
 - d. Using Mobile Phones (ODK) for GIS data collection
 - e. Importing GPS data to Quantum GIS
 - f. Extraction of data from GPS
 - g. Bringing ODK data into a GIS
4. Introduction to mapping techniques (Spatial mapping and Visualization)
- a. Mapping Project activities
 - b. Mapping in QGIS using GPS and Google Earth data
 - c. Representing health-related data (creating choropleth map and data classification).
 - d. Visualizing data (creating data visualization with Data Plotly plugin)
 - e. Designing maps (working with symbology and designing layout).
 - f. GIS mapping of priority public health problems (AMR, HIV, and AIDS, Malaria, Tuberculosis)
 - g. GIS mapping of most-at-risk populations
 - h. GIS Mapping of health facilities and health resources
 - i. Geoprocessing
5. GIS for monitoring
- a. Mapping diseases transmission and progression
 - b. Incidence and prevalence maps
 - c. Visualize mortality by regions
 - d. Buffer analysis to identify affected populations
 - e. Participatory mapping for disease outbreaks
6. Spatial analysis of public health data
- a. Spatial analysis and clustering (creating heatmaps and clusters)
 - b. Space-time modelling (animating time series data)

- c. Network and accessibility analysis

Teaching and Learning Activities

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|----------------------------------|-----|
| 1. Theory (Lecture) | 20% |
| 2. Practical (Hands-on training) | 75% |
| 3. Assignment | 5% |

Participant's level and number of participants

Trainees	Number of participants
Microbiologist, Laboratory Officer, Pharmacist, Manager, Veterinary Officer, Regulatory and Quarantine Officer, Program Officer, and Other Officer (P5 onwards).	20 nos.

Meal and Refreshment Menu

The training should be held within Thimphu Dzongkhag and the consultancy services provider shall provide the following.

Sl#	Day	Menu
1	Morning Snacks and Refreshment	Tea, Coffee & Snacks (2 items), Mineral Water
2	Lunch	2 Veg, 2 Non-veg, Dal, Rice, Mixed Salad, Fruits, Mineral Water.
3	Evening Snacks and Refreshment	Tea, Coffee & Snacks (2 items), Mineral Water

Expected Outputs and Deliverables

Sl#	Deliverables/outputs	Target due dates
1	Develop training curriculum and training manuals and submit to PMU, FFP, MoH.	Before training starts.

2	Deliver GIS Training (using QGIS software) based on the training curriculum and corresponding manuals developed	Within 7 days
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The training date will be fixed by PMU, FFP in consultation with the consultancy service provider.

In addition to the key deliverables detailed in the table above, the firm will be required to:

- Coordinate, communicate and cooperate with the wider team that consists of officials from the Ministry of Agriculture and Forests and Ministry of Health.
- Ensure close communication, collaboration, and coordination with staff from PMU, FFP.

The consultancy service provider will be under the direct supervision of the Project Director of the Fleming Fund Project, Department of Medical Services, Ministry of Health.

Institutional Arrangement

Roles of Consultancy Services Provider

- The consultant shall report on/submit the above deliverables to the Fleming Fund Project Management Unit team.
- The consultant needs to maintain daily communication with the PMU Office when problems emerge during the consultancy, especially if they affect the scope of work.

Roles of the Project Management Unit, Fleming Fund Project

- The Project Director will serve as the main contact point for the consultant at PMU, FFP.
- The Project Director, PMU, FFP will review deliverables for release of payment.

Duration of the Training

7 days

Eligibility or Minimum Required Qualifications for Institution

Sl#	Category	Specific Requirements	Supporting Documents Required
1	Entity	Must be a legally constituted institution	Required constitutional documents, Certified copy of the audited financial statements of the last 3 years.

Eligibility or Minimum Required Qualifications for Consultant(s) or Training Facilitator(s) or Expert(s)

Sl#	Category	Requirement
1	Education	<ul style="list-style-type: none"> - Master's Degree in Geographical Information Systems or other related fields. - Additional qualifications in the health-related subject will be desired.
2	Experience	<ul style="list-style-type: none"> - 10 years of professional experience in GIS. - Proven work experience in producing training material and conducting training on GPS/GIS. - Work experience in the health sector and experience in providing training to large groups are strong assets.
3	Competency	<ul style="list-style-type: none"> - Knowledge about the technical aspects of geographical data management and utilization; - Proficiency with GIS software (ArcGIS and Quantum GIS); - Knowledge about data processing, evaluation, and organizing the collection, storage, usage of geographic data and visualization; - Ability to solve GIS-specific problems and convey GIS information to non-GIS people;

		<ul style="list-style-type: none"> - Good communicator - Ability to build relationships - Good attention to detail - Effective time management skills
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Criteria for Evaluation of Level of Technical Compliance of consultant(s) or training facilitator(s) or expert(s) and technical proposal.

Sl#	Technical Evaluation Criteria	Obtainable Score
Consultant(s) or training facilitator(s) or expert(s)		
1	Master's Degree in Geographical Information Systems or other related fields.	10
2	Additional qualification in the health-related subjects.	5
3	10 years' professional experience in GIS.	15
4	Work experience in health sector	15
5	Proven work experience in producing training material and conducting training on GPS/GIS.	20
6	Experience in providing training to large groups.	15
Adequacy of the proposed methodology and work plan in responding to the Terms of Reference		
7	Technical approach and methodology	15
8	Work Plan	5
Total obtainable score		100

The minimum technical score (St) required to pass is:

80 Points

The weights given to the Technical (T) and Financial (F) Proposals are:

T = 0.8

F = 0.2