COMPETENCY BASED FRAMEWORK

For

Survey Engineer

NATIONAL LAND COMMISSION

2021

Core Members:

1. Binay Tamang, CSE, GID
2. Dorji Pelzang, DCSE, Topo Division
3. Kinga Loday, DCSE, Topo Division
4. Gungsang Wangdi, Sr, Planning Officer, PPD
5. Kota, HRO

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1. Background

1.1 About the Department

Although the Department of Surveying and Mapping (DoSM) was created in 2015, the role of surveying and mapping was set up in 1965 as the Land Revenue Survey Office in Samtse. The Land Record and Settlement Office was established under the Ministry of Finance in 1967 and in 1972 the Office of the Chief of Survey was established, primarily for the demarcation of Bhutan-India boundary and topographic base mapping. Since then it has evolved with rich legacy over the years especially in Geoinformatics and cadastral surveying and the scientific principles of surveying and mapping have been augmented by a myriad of disciplines like geodesy, remote sensing (RS) & photogrammetry, digital cartography & map production, coordinated cadastre, Geographic Information System (GIS), Global Navigation Satellite System (GNSS), Total Station (ToS), digital level, National GIS coordination etc to meet the multidisciplinary requirement of data from stakeholders. In addition, NLCS has embraced the art of collecting and updating data in the 21st century by national surveying and mapping agencies.

Organized as one of the departments in National Land Commission Secretariat (NLCS), Department of Survey and Mapping (DoSM), is mainly responsible for the development of geospatial infrastructure of the country. Geospatial Infrastructure covers both soft and hard components such as data, technology, policy, people, collaboration and process improvement.

As the National Surveying and Mapping Organization, NLCS plays a special responsibility to ensure that the surveying and mapping activities have been achieved suitably, provide reliable spatial information to formulate accurate and realistic policies, planning, implementation and monitoring of various socio economic development activities. The department is also assisting in many academic and scientific programs and curriculum development of the Jigme Namgyel Engineering College (JNEC). NLCS's expert advice is being utilized by various ministries and agencies including demarcation and maintenance of international borders, district boundaries and thromde boundaries.

Survey Engineers shape the environments where we live, from our towns and cities to our streets and homes, they help to create safer, better and happier communities. They help to shape our roads, bridges and tunnels, buildings, Airports, stations and stadiums. The consequences of not using the services of experts in surveying and geospatial engineering will lead to loss of time and money, boundary dispute, land disputes, urban chaos and unsustainable management of resources. Other than NLCS, employers of Surveying Engineers include government agencies such as MoWHS, Thromdes, DGM, DGPC, JNEC; UN agencies and for large and small engineering and surveying firms

The national network of geodetic control points spanning across the country, the up-to-date base map, the publication of Nye Atlas and geo-referenced geographical names, the digitization of cadastral records, three rounds of nationwide cadastral survey and online land transaction, establishment of Institute of Surveying and Spatial Science Professional of Bhutan (ISSB) and Geographic Information policy (GI) are some of the best milestones of the department.

1.2 Vision of the Secretariat

A dynamic and professional organization that delivers excellent land governance services and provides reliable land information for the nation's wellbeing.

1.3 Missions of the Secretariat

1. Manage, regulate and administer the ownership and use of land
2. Guarantee the security of land tenure
3. Ensure easy access to reliable land information

1.4 Core Values

1. Integrity,
2. Teamwork,
3. Professionalism
4. Innovation
5. Customer driven

1.5 Core Functions

1. Implement policies, programs, regulations and guidelines issued by the Commission for administering the provisions of the Land Act 2007.
2. Serve as the parent organization for all the agencies responsible for land registration and cadastral survey
3. Be responsible for custody, compilation and maintenance of Chhazhag Sathrams
4. Conduct land cadastre and be the technical agency on cadastral technology in the country
5. Verify and resolve land disputes resulting from boundary and Thrams
6. Process private land acquisition for national interests and provide land substitutes and compensation
7. Facilitate the Local Authority in carrying out their functions according to the provisions of the Land Act
8. Prescribe formats and rules pursuant to the Land Act and amend them as and when deemed necessary
9. Maintain international boundaries
10. Manage National Rehabilitation Program
11. Carry out topographic surveys
12. Carry out geodetic and geophysical surveys
13. Manage national geospatial data repository
14. Establish land surveying, mapping and spatial data standards and policies
15. Coordinate National Spatial Data Infrastructure Development and dissemination of geospatial information
16. Coordinate preparation of macro level land use plans
17. Regulate and monitor land use
18. Maintain inventory of alienable and disposable land

2. Competency-Based Framework for Survey Engineer

2.1 Introduction

The Competency Based Framework of the Survey Engineer has been developed to further enhance the capacity and capabilities of the Survey Engineer to support the goal of the Department of Survey and Mapping to be a professional and dynamic institution committed to excellence, courtesy and service delivery and to safeguard the country's national interest at all times.

2.2 Purpose

The CBF highlights the knowledge, skills and abilities required for Survey Engineers to achieve a high level of professional competence and deliver the highest standard services. The framework is developed with the following aim and objectives:

2.3 Aim

Build a fraternity of Survey Engineers who are highly knowledgeable, skillful and competent in delivering efficient and effective services of the highest standard.

2.4 Objectives

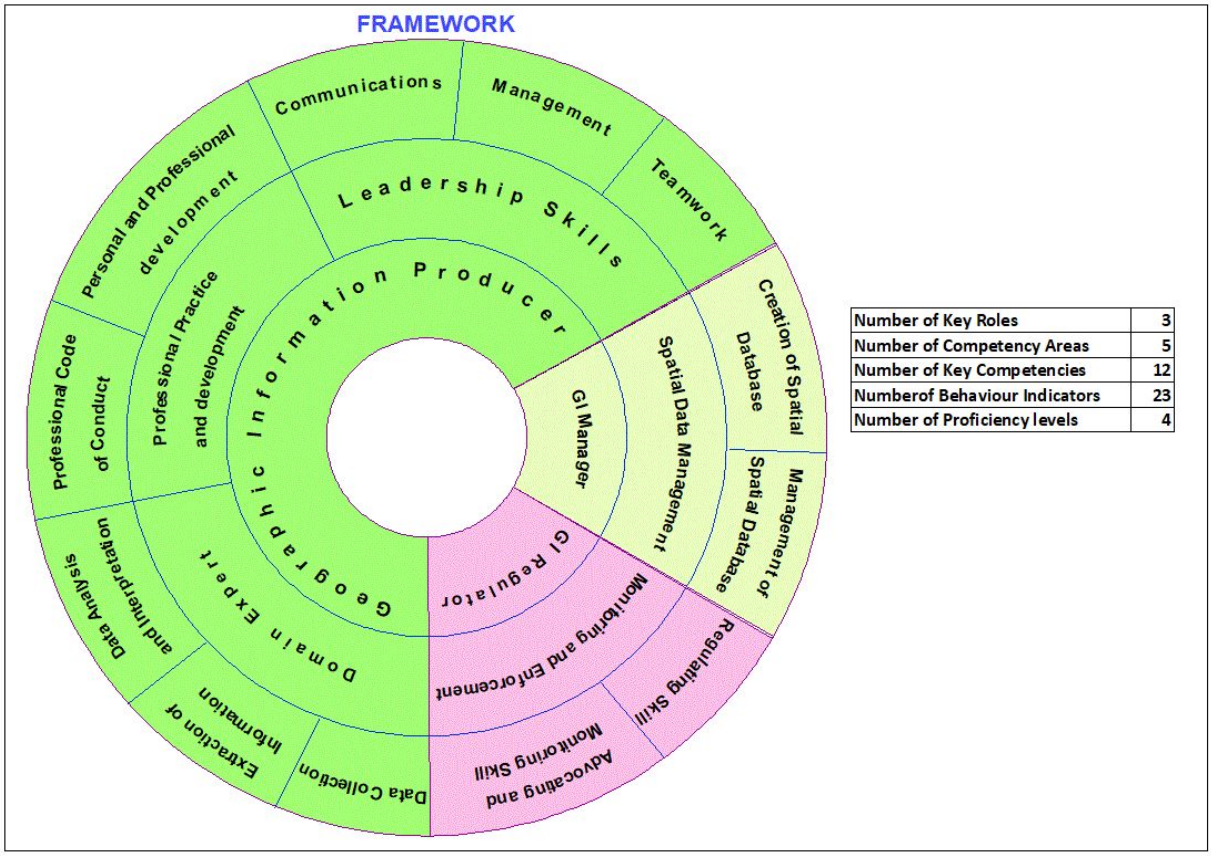
The programme is aimed at strengthening the capacity and capabilities of the civil servants based on their role specific competency to enhance professionalism, growth and development to contribute optimally to nation building.

2.5 Framework Development Processes

The development of the framework involved identifying Role Profiles, Competency Areas, Key Competencies, Behavioral Indicators and Proficiency Levels through a rigorous, consultative and inclusive process with key stakeholders.

2.6 Structure

Brief explanation and diagrammatic (pie chart) overview of the CBF



2.6.1 Identification of Role Profile (Example)

The key role is an organized set of behaviors that are crucial to achieve the current and future goals of the Department of Survey and Mapping. Following are the key roles expected to be performed by the Survey Engineer:

a. Geographic Information (GI) Producer
b. GI Manager
c. GI Regulator

2.6.1.1 Description of Role Profile

The role profile is the description of roles that Survey Engineers are expected to demonstrate in achieving the outcomes of the Department of Survey and Mapping. It defines outcomes and competencies for an individual role. It concentrates on outcomes rather than duties, which provides better guidance than a job description on expectations. It does not constrain Survey Engineers to carry out a prescribed set of tasks.

Role Profile of Survey Engineer

Sl #	Key Role	Role Description
1	Geographic Information Producer	1. Determine accurate geodetic reference frame to establish the standard national system of surveying & mapping for utilization in various surveying activities like cadastral, topographic, engineering and geophysical survey.
		2.Collect, acquire and develop fundamental and thematic spatial data (paper, digital, web service, etc.) through various measurement methods and procedures for data collection and measurement, enhance its efficient utilization by the GIS users ensuring standards and principles of surveying and mapping.
		3.Demarcate boundaries including parcel and national boundaries and collect land information to support an effective cadastre and guaranteed security of land tenure.
2	Geographic Information Manager	1.Compile, design, develop and manage geospatial information management systems, data sources to support the clients and policy makers for GI based decision making, planning and implementation.
		2.Facilitates NSDI activities in collaboration with stakeholders and professional associations to support development, maintenance, and setting of standards.
3	GI Advisor/Regulator	1.Formulate policies, acts, rules and regulations, guidelines, manuals and SOPs with regard to data standards, sharing and pricing to regulate geo information.
		2.Advocate and monitor national standards and methods of surveying and mapping for homogeneity.

2.6.2 Identification of Competency Areas

The competency area is the clustering of key competencies by related behavior and functions of each role. It comprises a set of Knowledge, Skills and Abilities (KSA) that result in essential behaviors expected from Survey Engineers. The framework has identified 5 competency areas as follows:

Role #	Key Role	Competency Area
1	Geographic Information Producer	1.1 Domain Expertise (Having in-depth knowledge on surveying and mapping related subjects
		1.2 Professional Practice and development
		1.3 Leadership skills
2	Geographic Information Manager	2.1.Spatial data Management
3	Geographic Information Advisor/regulator	3.1 Monitoring and regulating skill

2.6.3 Identification of Key Competencies

The key competency is an observable behavior that indicates the presence of the particular competency. Generally, it is broadly divided as core competency, leadership competency and technical or functional competency. The framework has identified 12 key competencies are presented as below:

Role #	Key Role	Competency Area	Key Competencies
1	Geographic Information Producer	1.1 Domain Expertise (Having in-depth knowledge on surveying and mapping related subjects	1.1.1 Data collections
			1.1.2 Extraction of information
			1.1.3 Data analysis and interpretation.

		1.2 Professional Practice and development	1.2.1 Professional code of conduct
			1.2.2 Personal and professional development
		1.3 Leadership skills	1.2.1 Communication
			1.2.2 Management
			1.2.3 Teamwork
2	Geographic Information Manager	2.1.Spatial data Management	2.1.1 Creation of spatial database
			2.1.2 Management of spatial database
3	GI Advisor/regulator	3.1 Monitoring and regulating skill	3.1.1 Regulating skill
			3.1.2 Advocating and monitoring skills

2.6.4 Identification of Behavioral Indicators

The Behavioral Indicators is the description of competencies based on various proficiency levels. It outlines a collection of desired and observable motives, traits and behaviors when executing or carrying out the assigned task. It serves as a tool to guide evaluations of employee performance. The framework has identified 23 behavioral indicators.

Competency Area	Key Competencies	Behavior Indicators
Key Role 1: Geographic Information Producer		
1.1 Domain Expertise (Having	1.1.1 Data collections	1.1.1.1 Identifies, reviews and applies best technology, innovative systems and effective methodology to collect spatial data.

in-depth knowledge on surveying and mapping related subjects		1.1.1.2 It covers understanding, employing and endorsing measurements are legitimate and in line with the survey standards and surveying principles for collection of reliable data.
	1.1.2 Extraction of information	1.1.2.1 Extracts information from relevant databases, and repositories to develop reliable spatial information.
	1.1.3 Data analysis and interpretation.	1.1.3.1 Understand, develop and utilize efficient and relevant information communication technology components of a GIS.
		1.1.3.2 Examines the integrity and value of stored spatial data for data analysis
		1.1.3.3 Adds value to data to enhance data interpretation and meet client's demand.
1.2 Professional Practice and development	1.2.1 Professional code of conduct	1.2.1.1 Establishes and promotes conducive relationships with clients to understand their needs to ensure satisfaction
		1.2.1.2 Demonstrates increasing level of professionalism in all aspects and understands policy to uphold the standards of surveying and mapping profession.
		1.2.1.3 Practice and enforce correct occupational health and safety procedures.
	1.2.2 Personal and professional development	1.2.2.1 Demonstrates willingness to acquire, learn and apply new knowledge and skills to keep abreast with the advancing technologies.
		1.2.2.2 Conducts training and development programs to enhance professionalism.
		1.2.2.3 Performs research and development for professional enhancement
1.3 Leadership skills	1.3.1 Communication	1.3.1.1 Effectively communicates, shares information and ideas, listens carefully, clarifies, and understands, taking into consideration different viewpoints.
	1.3.2 Management	1.3.2.1 Demonstrates effective management of resources for achieving the agency's goals and objectives

	1.3.3 Teamwork	1.3.3.1 Demonstrates teamwork, leadership, inspires others, serves as a role model and provides clear direction to achieve the Agency's mandate and priorities. Motivates and empowers staff, and recognizes individual and team contributions to the Agency's success.
Key Role 2: Geographic Information Manager		
2.1. Spatial data Management	2.1.1 Creation of spatial database	2.1.1.1 Comprehends principles of spatial database to enable data classification and conceptualization of database design
		2.1.1.2 Identifies and adopts appropriate DBMS software to build the database.
		2.1.1.3 Utilizes appropriate interfaces to develop physical databases.
	2.1.2 Management of spatial database	2.1.2.1 Administers, maintains and regulates Geospatial databases for security, integrity, currency, reliability and accessibility.
		2.1.2.2 Upgrades the database to cope with the emerging needs and technology.
		2.1.2.1.3 Facilitates collaboration for easy accessibility of GI to reduce data redundancy.
Key Role 3: Geographic Information Advisory/Regulator		
3.1 Monitoring and regulating skill	3.1.1 Regulating skill	3.1.1.1 Demonstrates sound understanding of existing legal frameworks and displays ability to work within the frameworks.
	3.1.2 Advocacy & presentation skills	3.1.2.1 Advocates national standards and methods of surveying and mapping for homogeneity.

Summary of behavior indicators (number of BI against each Key Role)

2.6.5 Classification of Proficiency Levels

The proficiency level is categorized based on the level of expertise. It describes the levels of a competency required to perform a specific job successfully. There is a progression of proficiencies at each level. The proficiency level of Survey Engineer is categorized into four levels as i) Foundation (P5-P4), ii) Experienced (P3) and iii) Mid (P2) and iv) Advance (P1). The framework has identified 25 behavioral indicators across four levels of proficiency.

The proficiency will enable individual officials to distinguish the type of competencies expected in their career path, which will give them an opportunity to enhance competency in achieving current as well future career goals. As the officials in position levels of P5 & P4 play similar roles, their proficiency levels are merged together. Further, the proficiency level will set a benchmark for the recruitment and deployment. The proficiency levels of each key competency are detailed below:

Key Role 1: Geographic Information Producer			
Competency Area: 1.1 Domain Expertise (Having in-depth knowledge on surveying and mapping related subjects			
Key Competency: 1.1.1 Data collections			
Behavior Indicator: 1.1.1.1 Identifies, reviews and applies best measuring technology, innovative systems and effective methodology to collect spatial data.			
Foundation	**(Experienced)**	**Mid**	**Advance**
Recognizes various measuring techniques available and employs for collecting spatial data.	Assess the measuring technology available and its applicability.	Explores state-of-the-art surveying technology, including the "Field To Finish" computerized systems, Global Navigation Satellite System (GNSS) receivers, and extensive mapping equipment and develops innovative techniques	Evaluates and selects measuring technology and leads adaptation to changes brought in by new technologies and helps subordinates to rate the value and benefits of new technology.

Behavior Indicator: 1.1.1.2 It **covers understanding, employing and endorsing measurements are legitimate and in line with the survey standards and surveying principles for collection of reliable data.**			
Understands the basics of legitimate measurements in line with the survey standards and surveying principles for collection of reliable data.	Proactively ensures and complies with the existing survey standards and surveying principles in discharging the duty.	Critically formulates technical framework, surveying standards and SOPs	Reviews, refines and approves the technical framework like Survey Standards, classification, specifications etc.
Key Competency: 1.1.2 Extraction of information			
Behavior Indicator: 1.1.2.1 Extracts information from relevant databases, and repositories to develop reliable spatial information.			
Foundation	**Experienced**	**Mid**	**Advance**
Extracts required information from relevant databases and repositories.	Illustrates and Interprets extracted information from relevant general repositories.	Develops SOPS for extraction of information from relevant databases and general depositories.	Endorses SOPS and guides extraction and development procedures of GI as per the relevant regulations and laws.
	Determines relevance and authenticity of information.	Evaluates the relevancy and authenticity of information and optimizes its uses.	Validates the extracted information and approves its uses.
Key Competency: 1.1.3 Data analysis and Interpretation			
Behavior Indicator: 1.1.3.1 Understand, develop and utilize efficient and relevant information communication technology components of a GIS.			

Foundation	Experienced	Mid	Advance
Identifies the information technology components of a GIS, such as databases, software programs, application servers, data servers, SAN Devices, workstations, switches, routers, and firewalls	Compares the capabilities, limitations, and the ability to integrate different types of geospatial softwares.	Develops alternatives for customization and automation, such as APIs, SDKs, scripting languages	Coordinates opportunities to leverage information and communication technology for efficient creation of various end-use applications like web and mobile maps
Behavior Indicator: 1.1.3.2 Examines the integrity and value of stored spatial data for data analysis			
Recognizes and understands the integrity and value of stored data and information, and identifies possible uses. Identifies data quality and integration process	Appraises and qualifies the elements of geospatial data integrity, and quality, including geometric accuracy, thematic accuracy, resolution, precision, and fitness for use. Explains the difference between quality control and quality assurance.	Assesses and interprets the integrity and value of stored data and information and determines new usages.	Judges and evaluates quality, standards and applicability of data analysis.
Behavior Indicator: 1.1.3.3 Adds value to data to enhance data interpretation and meet client's demand.			
Transfers data from existing databases and understands different processes of value addition	Collects, collates and adds value to data from existing database by using relevant methodology	Examines and develops sops for value addition to data and explains the various techniques	Strategies to design and develop a system for processing and integrating geospatial data from diverse sources to achieve final product needs

Competency Area: 1.2 Professional Practice and development			
Key Competencies: 1.2.1 Professional code of conduct and ethics			
Behavior Indicator: 1.2.1.1 Establishes and promotes conducive relationships with clients to understand their needs to ensure satisfaction.			
Foundation	**Experienced**	**Mid**	**Advance**
Recognizes the needs and expectations of the client.	Responds to client needs and expectations in a timely, professional, helpful and courteous manner.	Anticipates constraints in the delivery of services and identifies solutions or alternatives in compliance with the Agency's regulations, rules and policies	Leverages a network of senior level contacts and decision makers to pursue and implement innovative approaches, while at the same time taking into account client needs and the Agency's strategic priorities.
Demonstrates openness and helps clients to define their needs and provides advice and assistance.	Identifies solutions for clients and advocates actions to address those needs.	Provides potential solutions in response to client needs in his/her area of work and reports back in a timely and efficient manner	Ensures that all solutions/services provided by the team are in compliance with the Agency's regulations, rules and policies and supports the unidentified, underlying, upcoming and long term client needs and ensures continued service excellence
Behavior Indicator: 1.2.1.2 Demonstrates increasing level of professionalism in all aspects and understands policy to uphold the standards of surveying and mapping profession.			
Understands and complies with the relevant rules and regulations for conducting duty of Survey Engineer and practices professionalism	Complies with the relevant rules and regulations for conducting duty of Survey Engineer and practices professionalism and contributes to promote surveying professional standards.	Defines and interprets legal requirements and obligations. Defines roles and responsibilities and promotes surveying professional standards	Reviews and recommends relevant laws, regulations, guidelines, code of conduct, standards and ensures compliances.

Behavior Indicator: 1.2.1.3 Practice and enforce correct occupational health and safety procedures.			
Understands and practices correct occupational health and safety procedures standards.	Practices and guides correct occupational health and safety standards	Prepare and contributes to improving occupational health and safety standards	Reviews and ensures correct occupational health and safety standards. Examines and recognizes the limits of personal skills and expertise. Critically reviews and approves the work to be undertaken.
Key Competencies: 1.2.2 Personal and professional development.			
Behavior Indicator: 1.2.2.1 Demonstrates willingness to acquire, learn and apply new knowledge and skills to keep abreast with the advancing technologies.			
Foundation	**Experienced**	**Mid**	**Advance**
Demonstrates interest and embraces learning and skill development	Applies learning in the work and participates in knowledge sharing activities	Identifies critical areas and develops learning methods and share knowledge in accordance with the Agency's knowledge management guidelines	Encourages, supports and manages knowledge sharing across the Department/Division.
Participates in exchanging knowledge and information with peers and colleagues	Acknowledges others' skill sets and expertise, encourages and contributes to the sharing of knowledge, and creates learning opportunities for others	Encourages staff members to participate in coaching, cross-training and knowledge sharing activities, and facilitates the required resources	Ensures relevant learning and training opportunities, uses feedback and integrates lessons learned to increase the Department/Division's efficiency.
Behavior Indicator: 1.2.2.2 Conducts training and development programs to enhance professionalism.			
Participates in training and	Contributes in training	Develops training and	Reviews and validates training and

educational programs	and educational programs	educational programs	educational programs
Behavior Indicator: 1.2.2.3 Performs research and development for professional enhancement			
Understands basic (General) research methodology, collects and compiles data as per the prescribed format.	Comprehends and explores for better research methods and approaches based on the experience gained and applies them in their work area	Analyzes, justifies, and discerns the advantages and limitations of the various research approaches that best suits the research area and applies them	Envisions, develops, and recommends a research method that best suits the research area. Visualizes the policy implications of carrying out various research areas.
Comprehends different research areas pertaining to a subject matter.	Understands and explores critical research areas that may or may not be conspicuous. Formulates research proposals and cost estimates.	Compares and conducts research in respect to particular research areas.	Reviews and endorses research topics and questionnaires. Mobilizes research funds and seeks approval for conducting research.
Competency Area: 1.3 Leadership skills			
Key Competencies: 1.3.1 Communication			
Behavior Indicators: 1.3.1.1 Effectively communicates, shares information and ideas, listens carefully, clarifies, and understands, taking into consideration different viewpoints.			
Foundation	**Experienced**	**Mid**	**Advance**
Possesses basic skills of effective communication	Demonstrates good command in language and has good skills to communicate the information	Understands the issues and articulates in communicating the information	Comprehends and addresses pertinent issues and tailors the mode of communication that delivers the information effectively.

Uses factual information to convey the intended messages clearly to stakeholders.	Verifies factual information for effective communication with the stakeholders	Develops trust among various parties involved in a negotiation process by providing factual information.	Convinces stakeholders involved for achieving common goals.
Key Competencies: 1.3.2 Management			
Behavior Indicators: 1.3.2.1 Demonstrates effective management of resources for achieving the agency's goals and objectives			
Foundation	**Experienced**	**Mid**	**Advance**
Understands and utilizes resource requirements adhering to organization's goals and objectives.	Effectively assesses and uses resources required to implement action plans and achieve desired results.	Effectively coordinates and uses resource mobilization to implement action plans and achieve desired results.	Allocates resources to contribute overall performance for achieving the agency's goals and objectives
key Competencies: 1.3.3 Teamwork			
Behavior Indicators: 1.3.3.1 Demonstrates teamwork, inspires others, serves as a role model and provides clear direction to achieve the Agency's mandate and priorities. Motivates and empowers staff, and recognizes individual and team contributions to the Agency's success.			
Knows the strengths and areas for development, aligns performance with organizational goals and supports the overall performance of the team	Proactively nurtures the potential of individuals and creates opportunities for peers, colleagues, and stakeholders to contribute toward enhancing service quality	Fairly delegates the responsibilities and manages the performance of the team and ensures compliance with the Agency's regulations, rules and policies	Acts as a role model, persuades others to adapt to changes and champions to better manage Programmes and increase efficiency by demonstrating strong leadership skills.

Key Role 2: Geographic information Manager			
Competency Area: 2.1 Spatial data Management			
Key Competency: 2.1.1 Creation of spatial database			
Behavior Indicator: 2.1.1.1 Comprehends principles of spatial database to enable data classification and conceptualization of database design			
Foundation	**Experienced**	**Mid**	**Advance**
Demonstrates understanding of principles of spatial database system, data classification and database concept.	Participates in classification of data and designing the database system.	Coordinates the development of conceptual design of database and data categorization.	Reviews and approves the conceptual designs and recommends data categories.
Behavior Indicator: 2.1.1.2 Identifies and adopts appropriate DBMS software to build the database.			
Comprehends various components of the database.	Recognizes appropriate components of the database.	Selects appropriate DBMS for the database.	Reviews and approves the appropriate database DBMS.
Behavior Indicator: 2.1.1.3 Utilizes appropriate interface to develop physical database.			
Understands various interfaces and contributes in building physical databases.	Explores the efficacy of various interfaces and makes recommendations.	Evaluates the physical database and develops appropriate interfaces.	Monitors, reviews and approves physical databases.
Key Competency: 2.1.2 Management of spatial database			

Behavior Indicator: 2.1.2.1 Administers, maintains and regulates Geospatial database for security, integrity, currency, reliability and accessibility.			
Foundation	**Experienced**	**Mid**	**Advance**
Understands the basics of geospatial database administration, maintenance and regulation.	Evaluates the security requirements and backup plans, integrity, currency, reliability and accessibility of the database and maintains it.	Develops and reviews SOPs, provides the access rights and recommends efficient administration and maintenance of databases.	Approves SOPs and monitors database administration and maintenance. Ensures the security of the database.
Behavior Indicator: 2.1.2.2 Upgrades the database to cope with the emerging needs and technology.			
Explores emerging trends of database technology and requirements.	Experiments and recommends emerging technologies in databases to meet agency's requirements.	Adopts the appropriate database technologies.	Reviews and approves the implementation of adopted database technologies and provides directions for necessary evolutions.
Behavior Indicator: 2.1.2.3 Facilitates collaboration for easy accessibility of GI to reduce data redundancy			
Lists, communicates and compiles GI producers, users and data availability.	Coordinates meetings, workshops, seminars and conferences of GI community for data sharing and integration.	Reviews, examines and discusses geospatial data sharing protocols and platforms, and data gaps.	Draws MOUs and builds collaborations with relevant agencies for facilitating easy data sharing and reducing data redundancy.

Key Role 3: Geographic information Advisor/Regulator
Competency Area: 3.1 Monitoring & Regulating skills
Key Competency: 3.1.1 Regulating skill

Behavior Indicator: 3.1.1.1 Demonstrates sound understanding of existing legal frameworks and displays ability to work within the frameworks.			
P4 (Foundation)	**P3 (Experienced)**	**P2 (Mid)**	**P1 (Advance)**
Understands existing legal frameworks and works within the framework	Proactively applies policies, acts, rules and regulations and ensures compliance based on careful discussion	Develops program to sensitize legal frameworks to subordinates.	Evaluates and recommends legal framework concerning geospatial structure based on advanced understanding of law and technical implications
Understands monitoring systems, implements monitoring guidelines and prepares reports.	Drafts monitoring procedures and supports in developing and reporting of the implementation and compliances of legal frameworks.	Proactively ensures that relevant monitoring systems are developed for implementation and compliance. Gives feedback on monitoring reports.	Provides technical insights in the advancement of the monitoring system. Review legal frameworks and recommend amendments. Verify monitoring reports.
Key Competency: 3.1.2 Regulating skill			
Behavior Indicator: 3.1.2.1 Advocates national standards and methods of surveying and mapping for homogeneity.			
Displays sound presentation skills and learns various methods of advocacy.	Selects appropriate channels and disseminates national standards and methods of surveying and mapping.	Coordinates and evaluates efficiency of dissemination methods and channels.	Approves and delegates relevant resources for efficient advocacies on standards and methods of survey and mapping.

2.7 Training Needs Analysis

The Training Needs is the differences between desired capability and current capability. The Training Needs Analysis is the process of recognizing the skills gap and needs of training. It is the procedure to determine whether the training will

bring out the solution to the problem. It ensures that training is targeting the correct competencies, the correct employees and the needs of the Department. The training can reduce, if not eliminate, the gap by equipping the Survey Engineers with knowledge and skills. It should be the shared responsibility of the employee and Department to build and enhance their capability and competency.

The training needs analysis is carried out in consultation with the stakeholders through interview, survey and FGD. The questionnaire consists of both closed and open-ended questions. The questionnaire is based on 23 behavioral indicators of three proficiency levels on Likert Scale of "Competent" and "Not Competent" followed by open-ended questions asking the likely reasons for 'Not Competent" and suggesting interventions to address the gap. The behavioral indicators were assessed by proficiency level to identify the performance gaps.

The assessment is consolidated as **NOT COMPETENT** when more than **70%** (as per the guidebook of RCSC) of the respondents do not exhibit the particular behavioral indicator.

2.7.1 Training Needs Assessment at Foundation level

Role 1: Geographic Information Producer					
Key Competencies	**Behavior Indicators**	**Current performance (competent/ Not competent)**	**Likely reason for performance gap**	**Competency development intervention**	**Learning Objectives**
	1.1.1Identifies reviews and applies best technology, innovative systems and effective methodology to collect spatial data.		1.Recruitment of Civil Engineer and Planner as Survey Engineer due to which there is lack of	1.Recruitment of SE 2. e-learning, OJT, demonstration and attachment in the field	Foundation level Survey Engineer would be able to: 1. know the basic principles of surveying. 2. Recognize and
	1.1.2It covers understanding, employing and endorsing				

1.1Data collection	Ensures measurements are legitimate and in line with the survey standards and surveying principles for collection of reliable data.	Not competent	basic knowledge in collection, extraction and analysis of spatial data. 2. Lack of monitoring and supervising 3. Lack of a dedicated resources and systematic training program for beginners	work, coaching, mentoring 3. certified survey engineering/Geoinformatics course	handle various techniques available for spatial data collection. 3. Enhance capability to extract spatial data and information through evolving technology that are legitimate and reliable. 4. Enhance abilities, recognizes and understands the integrity and value of stored data and information 5.identify value additions to the data and its uses.
1.2Extraction of information	1.2.1 Extracts information from relevant databases, and repositories to develop reliable spatial information.				
1.3 Data analysis and interpretation.	1.3.1Understand, develop and utilize efficient and relevant information communication technology components of a GIS.				
	1.3.2 Examines the integrity and value of stored spatial data for data analysis				
	1.3.3 Adds value to data to enhance data interpretation and meet client's demand.				
	1.4.1 Establishes and promotes conducive relationships with clients to understand their needs to ensure satisfaction	Not competent	lack of knowledge and skill to recognize and advice the needs of	Training on dealing with the clients and customer care services	The Foundation level Survey Engineer will be able to have conducive relationship with clients

			the clients		
1.4 Professional code of conduct and ethics	1.4.2 Demonstrates increasing level of professionalism in all aspects and understands policy to uphold the standards of surveying and mapping profession.	Not competent	Lack of knowledge on rules and regulations in survey engineering & Geoinformatics purposes	Orientation and induction programs to familiarize on rules & regulations	Familiarize and apply rules & regulations in performing survey engineering services
	1.4.3 Practice and enforce correct occupational health and safety procedures.	Not competent	No existing practice of Occupational Health Safety Standards (OHS).	Develop OHS and orient on it	Aware of OHS and practices correct occupational health and safety procedures standards.
1.5 Personal and professional development	1.5.1 Demonstrates willingness to acquire, learn and apply new knowledge and skills to keep abreast with the advancing technologies.	Competent	NA	NA	NA
	1.5.2 Conducts training and development programs to enhance professionalism.	Not competent	No formal training in surveying and Geoinformatics	Training on surveying and Geoinformatics	Provide exposure and introduce to best practices related to surveying and Geoinformatics

	1.5.3 Performs research and development for professional enhancement	Not competent	No exposure and experience in research techniques	Training on basic research methods	Understand different research method
1.6 Communication	Effectively communicates, shares information and ideas, listens carefully, clarifies, and understands, taking into consideration different viewpoints.	Not competent	Inexperience and lack of effective communication skills	Training on effective communication & presentation	Learn effective communication skills.
1.7 Management	1.3.2.1 Demonstrates effective management of resources for achieving the agency's goals and objectives	Not Competent	Lack required management of resources knowledge and skill	Training on management of resources	Build capacity to effectively manage the resources
1.8 Teamwork	Demonstrates teamwork, leadership, inspires others, serves as a role model and provides clear direction to achieve the Agency's mandate and priorities. Motivates and empowers staff, and recognizes individual and team contributions to the Agency's success.	Not Competent	Inexperience and lack of knowledge and skill about teamwork and leadership	Training on teamwork and its benefits	Will be able to understand the value of teamwork and the role of leadership
Role 2: Geographic Information Manager					
Key Competencies	**Behavior Indicators**	**Current performance (competent/Not competent)**	**Likely reason for performance gap**	**Competency Development Intervention**	**Learning Objectives**

2.1 Creation of spatial database	2.1.1Comprehends principles of spatial database to enable data classification and conceptualization of database design	Not competent	Mismatch in job/role and profession(recruitment of civil engineers and urban planners as survey engineers) Inadequate knowledge in spatial databases. Lack of proper professional orientation program and systematic training program for beginners. No succession plan in the agency	Right profession for right job/role (recruitment of survey engineers as survey engineers). Provide basic Geo-informatics /Surveying courses. e-learning, OJT, coaching and mentoring.	Understands principles of spatial database and its applications. Comprehends various components of data and database. Understands various interfaces and technology to build physical databases. Understand basic administration and management of spatial database system
	2.1.2 Identifies and adopts appropriate DBMS software to build the database.				
	2.1.3 Utilizes appropriate interfaces to develop physical databases.				
2.2Management of spatial database	2.2.1Administers maintains and regulates Geospatial databases for security, integrity, currency, reliability and accessibility.	Not competent			
	2.2.2Upgrades the database to cope with the emerging needs and technology.				
	2.2.3 Facilitates collaboration for easy accessibility of GI to reduce data redundancy.				
Role 3: Geographic Information Advisor/Regulator					
Key Competencies	**Behavior Indicators**	**Current performance (competent/Not competent)**	**Likely reason for performance gap**	**Competency Development Intervention**	**Learning Objectives**

3.1Regulating skills	3.1.1Demonstrates sound understanding of existing legal frameworks and displays ability to work within the frameworks.	Not competent	Lack of knowledge and skill on regulation	Orientation and induction programs	Will be able to understand and apply legal framework
3.2 Advocacy and presentation skills	Advocates national standards and methods of surveying and mapping for homogeneity.	Not competent	Lack required knowledge and skill	Orientation and induction programs	Build capacity to understand standards and advocate effectively

Summary of Performance Gap at Foundation Level

Key Role 1: Geographic Information Producer			
Key Competencies	**Behavior Indicators**	**Competent**	**Not Competent**
1.1Data collection	1.1.1Identifies reviews and applies best technology, innovative systems and effective methodology to collect spatial data.		Not Competent
	1.1.2It covers understanding, employing and endorsing Ensures measurements are legitimate and in line with the survey standards and surveying principles for collection of reliable data.		Not Competent
1.2Extraction of information	1.2.1 Extracts information from relevant databases, and repositories to develop reliable spatial information.		Not Competent
1.3 Data analysis and Interpretation	1.3.1Understand, develop and utilize efficient and relevant information communication technology components of a GIS.		Not Competent
	1.3.2 Examines the integrity and value of stored spatial data for data analysis		Not Competent

	1.3.3 Adds value to data to enhance data interpretation and meet client's demand.		Not Competent
1.4 Professional code of conduct and ethics	1.4.1 Establishes and promotes conducive relationships with clients to understand their needs to ensure satisfaction		Not Competent
	1.4.2 Demonstrates increasing level of professionalism in all aspects and understands policy to uphold the standards of surveying and mapping profession.		Not Competent
	1.4.3 Practice and enforce correct occupational health and safety procedures.		Not Competent
1.5 Personal and professional development	1.5.1Demonstrates willingness to acquire, learn and apply new knowledge and skills to keep abreast with the advancing technologies.	Competent	
	1.5.2 Conducts training and development programs to enhance professionalism.		Not Competent
	1.5.3 Performs research and development for professional enhancement		Not Competent
1.6 Communication	Effectively communicates, shares information and ideas, listens carefully, clarifies, and understands, taking into consideration different viewpoints.		Not Competent
1.7 Management	1.3.2.1 Demonstrates effective management of resources for achieving the agency's goals and objectives		Not Competent
1.8 Teamwork	Demonstrates leadership, inspires others, serves as a role model and provides clear direction to achieve the Agency’s mandate and		Not Competent

	priorities. Motivates and empowers staff, and recognizes individual and team contributions to the Agency's success.		
Key Role 2: Geographic Information Manager			
Key Competencies	**Behavior Indicators**	**Competent**	**Not Competent**
2.1 Creation of spatial database	2.1.1Comprehends principles of spatial database to enable data classification and conceptualization of database design		Not Competent
	2.1.2 Identifies and adopts appropriate DBMS software to build the database.		Not Competent
	2.1.3 Utilizes appropriate interfaces to develop physical databases.		Not Competent
2.2Management of spatial database	2.2.1Administers maintains and regulates Geospatial databases for security, integrity, currency, reliability and accessibility.		Not Competent
	2.2.2Upgrades the database to cope with the emerging needs and technology.		Not Competent
	2.2.3 Facilitates collaboration for easy accessibility of GI to reduce data redundancy.		Not Competent
Key Role 3: Geographic Information Advisor/Regulator			
Key Competencies	**Behavior Indicators**		
3.1Regulating skills	3.1.1Demonstrates sound understanding of existing legal frameworks and displays ability to work within the frameworks.		Not Competent

3.2 Advocacy and presentation skills	Advocates national standards and methods of surveying and mapping for homogeneity.		Not Competent

2.7.2 Training Needs Assessment at Experienced Level

Role 1: Role 1: Geographic Information Producer					
Key Competencies	**Behavior Indicators**	**Current performance (competent/ Not competent)**	**Likely reason for performance gap**	**Competency development intervention**	**Learning Objectives**
1.1Data collection	1.1.1Identifies reviews and applies best technology, innovative systems and effective methodology to collect spatial data.	Incompetent	Non exposure to emerging technology. Non availability of resources in the agency	Short term training, webinar, seminar, workshops etc.	Professionals are up to date with emerging technologies.
	1.1.2It covers understanding, employing and endorsing measurements are legitimate and in line with the survey standards and surveying principles for collection of reliable data.	Competent	NA	NA	NA
1.2 Extraction of information	1.2.1 Extracts information from relevant databases, and repositories to develop reliable spatial information.	Incompetent	Non exposure to emerging technology. Non availability of resources in the agency	Build relevant resources available. Short term training, webinar, seminar, workshops etc.	Professionals become efficient in extraction, And interpretation of data from

					various sources.
1.3 Data analysis and Interpretation	1.3.1Understand, develop and utilize efficient and relevant information communication technology components of a GIS.	Not competent	Limited exposure and subscription of standard softwares	Subscription of standard softwares and attachment programmes analysis of different softwares	Carry out application oriented research Understand, develop and utilize efficient and relevant information communication technology components of a GIS.
	1.3.2 Examines the integrity and value of stored spatial data for data analysis	Not competent	Nature of profession is technology driven and requires up-to-date skill for efficient service delivery	Attachment programmes	Would be able to carry out application of various correction techniques of spatial data.
	1.3.3 Adds value to data to enhance data interpretation and meet client's demand.	Not competent	Lack of knowledge and skill in data analysis	Long term training in geospatial science and geodesy	Able to develop and use GIS tools for data analysis, complex analysis, Geodetic

					application and geodetic models
1.4 Professional code of conduct and ethics	1.4.1 Establishes and promotes conducive relationships with clients to understand their needs to ensure satisfaction	Competent	NA	NA	NA
	1.4.2 Demonstrates increasing level of professionalism in all aspects and understands policy to uphold the standards of surveying and mapping profession.	Competent	NA	NA	NA
	1.4.3 Practice and enforce correct occupational health and safety procedures.	Incompetent	Not existing practice of Occupational Health Safety Standards (OHS).	Develop OHS and orient on it	Aware of OHS and practice correct occupational health and safety procedures standards.
1.5 Personal and	1.5.1Demonstrates willingness to acquire, learn and apply new knowledge and skills to keep abreast with the advancing technologies.	Competent	NA	NA	NA
	1.5.2 Conducts training and development programs to enhance professionalism.	Competent	NA	NA	NA

professional development	1.5.3 Performs research and development for professional enhancement	Not Competent	Lack of research skills	Attend basic research training	Should be able to understand methods and perform research in critical areas
1.6 Communication	Effectively communicates, shares information and ideas, listens carefully, clarifies, and understands, taking into consideration different viewpoints.	Competent	NA	NA	NA
1.7 Management	1.3.2.1 Demonstrates effective management of resources for achieving the agency's goals and objectives	Competent	NA	NA	NA
1.8 Teamwork	Demonstrates leadership, inspires others, serves as a role model and provides clear direction to achieve the Agency's mandate and priorities. Motivates and empowers staff, and recognizes individual and team contributions to the Agency's success.	Not competent	Limited skill on teamwork	Workshop on team building	Would be able to create opportunities for teamwork with peers, colleagues, and stakeholders
Role 2: Geographic Information Manager					
Key Competencies	**Behavior Indicators**	**Current performance (competent/Not competent)**	**Likely reason for performance gap**	**Competency Development Intervention**	**Learning Objectives**

2.1 Creation of spatial database	2.1.1Comprehends principles of spatial database to enable data classification and conceptualization of database design	Competent	NA	NA	NA
	2.1.2 Identifies and adopts appropriate DBMS software to build the database.	Competent	NA	NA	NA
	2.1.3 Utilizes appropriate interfaces to develop physical databases.	Incompetent	Inadequate ICT knowledge	Short term training on administration and maintenance of spatial database	Competent to administer, maintain and regulate Geospatial databases for security, integrity, currency, reliability and accessibility upgrade/migrate the database to cope with the emerging needs and technology.
2.2 Management of spatial database	2.2.1Administers maintains and regulates Geospatial databases for security, integrity, currency, reliability and accessibility.	Incompetent	unavailability of technical resources and it's also fast evolving technology		
	2.2.2Upgrades the database to cope with the emerging needs and technology.	Competent	NA	NA	NA
	2.2.3 Facilitates collaboration for easy accessibility of GI to reduce data redundancy.	Not Competent	No data sharing and	Workshop on development of data NSDI	Would be able to collaborate by conducting

			integration policy		regular meetings
Role 3: Geographic Information Advisor/Regulator					
Key Competencies	**Behavior Indicators**	**Current performance (competent/Not competent)**	**Likely reason for performance gap**	**Competency Development Intervention**	**Learning Objectives**
3.1Regulating skills	3.1.1Demonstrates sound understanding of existing legal frameworks and displays ability to work within the frameworks.	Not Competent	No survey or relevant act	Develop relevant act	Would be able to understand and apply legal framework
3.2 Advocacy and presentation skills	Advocates national standards and methods of surveying and mapping for homogeneity.	Competent	NA	NA	NA
		Competent	NA	NA	

Summary of Performance Gap at Experienced Level

Role 1: Role 1: Geographic Information Producer			
Key Competencies	**Behavior Indicators**	**Competent**	**Not competent**
	1.1.1Identifies reviews and applies best technology, innovative systems and effective methodology to collect spatial data.		Not competent

1.1Data collection	1.1.2It covers understanding, employing and endorsing measurements are legitimate and in line with the survey standards and surveying principles for collection of reliable data.	Competent	
1.2Extraction of information	1.2.1 Extracts information from relevant databases, and repositories to develop reliable spatial information.		Not competent
1.3 Data analysis and Interpretation	1.3.1Understand, develop and utilize efficient and relevant information communication technology components of a GIS.		Not competent
	1.3.2 Examines the integrity and value of stored spatial data for data analysis		Not competent
	1.3.3 Adds value to data to enhance data interpretation and meet client's demand.		Not competent
1.4 Professional code of conduct and ethics	1.4.1 Establishes and promotes conducive relationships with clients to understand their needs to ensure satisfaction	Competent	
	1.4.2 Demonstrates increasing level of professionalism in all aspects and understands policy to uphold the standards of surveying and mapping profession.	Competent	
	1.4.3 Practice and enforce correct occupational health and safety procedures.		Not Competent
1.5 Personal and professional development	1.5.1Demonstrates willingness to acquire, learn and apply new knowledge and skills to keep abreast with the advancing technologies.	Competent	
	1.5.2 Conducts training and development programs to enhance professionalism.	Competent	

	1.5.3 Performs research and development for professional enhancement		Not Competent
1.6 Communication	Effectively communicates, shares information and ideas, listens carefully, clarifies, and understands, taking into consideration different viewpoints.	Competent	
1.7 Management	1.3.2.1 Demonstrates effective management of resources for achieving the agency's goals and objectives	Competent	
1.8 Teamwork	Demonstrates leadership, inspires others, serves as a role model and provides clear direction to achieve the Agency's mandate and priorities. Motivates and empowers staff, and recognizes individual and team contributions to the Agency's success.		Not competent
Role 2: Geographic Information Manager			
Key Competencies	**Behavior Indicators**	**Competent**	**Not Competent**
2.1 Creation of spatial database	2.1.1Comprehends principles of spatial database to enable data classification and conceptualization of database design	Competent	
	2.1.2 Identifies and adopts appropriate DBMS software to build the database.	Competent	
	2.1.3 Utilizes appropriate interfaces to develop physical databases.		Not competent
2.2 Management of spatial database	2.2.1Administers maintains and regulates Geospatial databases for security, integrity, currency, reliability and accessibility.		Not competent
	2.2.2Upgrades the database to cope with the emerging needs and technology.	Competent	

	2.2.3 Facilitates collaboration for easy accessibility of GI to reduce data redundancy.	Not Competent	
Role 3: Geographic Information Advisor/Regulator			
Key Competencies	**Behavior Indicators**	**Competent**	Not competent
3.1Regulating skills	3.1.1Demonstrates sound understanding of existing legal frameworks and displays ability to work within the frameworks.		Not Competent
3.2 Advocacy & presentation skills	Advocates national standards and methods of surveying and mapping for homogeneity.	Competent	

2.7.3 Training Needs Assessment at Mid Level

Role 1: Role 1: Geographic Information Producer					
Key Competencies	**Behavior Indicators**	**Current performance (competent/Not competent)**	**Likely reason for performance gap**	**Competency development intervention**	**Learning Objectives**
1.1Data collection	1.1.1Identifies reviews and applies best technology, innovative systems and effective methodology to collect spatial data.	Incompetent	Lack of advanced skill. Resource gap	Long term training, Workshop and seminar	Advance level Survey Engineer would be able to advance technology like UAV, Gravimeter, HP Digital level, GNSS equipment, plotters, GeoPortal

					infrastructure, Geonet working and establishment of calibration center. Develop geodetic reference frame, geoid model, 3D cadastre, CORES, and innovative techniques
	1.1.2It covers understanding, employing and endorsing Ensures measurements are legitimate and in line with the survey standards and surveying principles for collection of reliable data.	Incompetent	Lack of expertise. Non enactment of Survey Act	Convention, seminar, training, workshop,	Develop reliable technical framework, standards and SOPs.
1.2Extraction of information	1.2.1 Extracts information from relevant databases, and repositories to develop reliable spatial information.	Competent	NA	NA	NA
Data analysis and Interpretation	1.3.1Understand, develop and utilize efficient and relevant information communication technology components of a GIS.	Competent	NA	NA	NA
	1.3.2 Examines the integrity and value of stored spatial data for data analysis	Incompetent	Lack advance skill	Advance course in Photogrammetry and RS	Would be able to carry out advanced analysis in photogrammetry and RS

	1.3.3 Adds value to data to enhance data interpretation and meet client's demand.	Competent	NA	NA	NA
1.4 Professional code of conduct and ethics	1.4.1 Establishes and promotes conducive relationships with clients to understand their needs to ensure satisfaction	Competent	NA	NA	NA
	1.4.2 Demonstrates increasing level of professionalism in all aspects and understands policy to uphold the standards of surveying and mapping profession.	Competent	NA	NA	NA
	1.4.3 Practice and enforce correct occupational health and safety procedures.	Incompetent	No existing practice of Occupational Health Safety Standards (OHS).	Develop OHS and orient on it	Aware of OHS and practices correct occupational health and safety procedures standards.
1.5 Personal and	1.5.1Demonstrates willingness to acquire, learn and apply new knowledge and skills to keep abreast with the advancing technologies.	Competent	NA	NA	NA
	1.5.2 Conducts training and development programs to enhance professionalism.	Competent	NA	NA	NA

professional development	1.5.3 Performs research and development for professional enhancement	Not Competent	Lack of advance research skills	Training on advanced research methods.	Would be able to update new approaches to research and publish in critical areas
1.6 Communication	Effectively communicates, shares information and ideas, listens carefully, clarifies, and understands, taking into consideration different viewpoints.	Competent	NA	NA	NA
1.7 Management	Demonstrates effective management of resources for achieving the agency's goals and objectives	Competent	NA	NA	NA
1.8 Teamwork	Demonstrates leadership, inspires others, serves as a role model and provides clear direction to achieve the Agency's mandate and priorities. Motivates and empowers staff, and recognizes individual and team contributions to the Agency's success.	Competent	NA	NA	NA
Role 2: Geographic Information Manager					

Key Competencies	**Behavior Indicators**	**Current performance (competent/Not competent)**	**Likely reason for performance gap**	**Competency development intervention**	**Learning Objectives**
2.1 Creation of spatial database	2.1.1Comprehends principles of spatial database to enable data classification and conceptualization of database design	Competent	NA	NA	NA
	2.1.2 Identifies and adopts appropriate DBMS software to build the database.	Competent	NA	NA	NA
	2.1.3 Utilizes appropriate interfaces to develop physical databases.	Competent	NA	NA	NA
2.2Management of spatial database	2.2.1Administers maintains and regulates Geospatial databases for security, integrity, currency, reliability and accessibility.	Competent	NA	NA	NA
	2.2.2Upgrades the database to cope with the emerging needs and technology.	Incompetent	Migration of database according to emerging technology and need	Customized training	Learn new technology and migrate database

	2.2.3 Facilitates collaboration for easy accessibility of GI to reduce data redundancy.	Incompetent	The shift of GI sharing platform and technology.	Long term/Short term training for development of web and mobile application, IT skills	Learn the architecture of the web and mobile application. Learn programming skills.
Role 3: Geographic Information Advisor/Regulator					
Key Competencies	**Behavior Indicators**	**Current performance (competent/Not competent)**	**Likely reason for performance gap**	**Competency Development Intervention**	**Learning Objectives**
3.1Regulating skills	3.1.1Demonstrates sound understanding of existing legal frameworks and displays ability to work within the frameworks.	Not Competent	No survey act	Develop act	Would be able conversant with legal framework
		Not Competent	Inadequate monitoring system	Advanced training in carrying out Regulatory skill	Should be able to provide Expert Advice to peers and clients in carrying out Regulatory programmes
3.2 Advocacy and presentation skills	Advocates national standards and methods of surveying and mapping for homogeneity.	Not Competent	Inadequate national standards and methods of surveying for dissemination	Training in preparation of national standards and methods of surveying for dissemination	Should be able to coordinate dissemination methods

Summary of Performance Gap at Mid Level

Role 1: Role 1: Geographic Information Producer			
Key Competencies	**Behavior Indicators**	**Competent**	**Not Competent**
1.1Data collection	1.1.1Identifies reviews and applies best technology, innovative systems and effective methodology to collect spatial data.		Not competent
	1.1.2It covers understanding, employing and endorsing Ensures measurements are legitimate and in line with the survey standards and surveying principles for collection of reliable data.		Not competent
1.2Extraction of information	1.2.1 Extracts information from relevant databases, and repositories to develop reliable spatial information.	Competent	
Data analysis and Interpretation	1.3.1Understand, develop and utilize efficient and relevant information communication technology components of a GIS.	Competent	
	1.3.2 Examines the integrity and value of stored spatial data for data analysis	I	Not competent
	1.3.3 Adds value to data to enhance data interpretation and meet client's demand.	Competent	
1.4 Professional code of conduct and ethics	1.4.1 Establishes and promotes conducive relationships with clients to understand their needs to ensure satisfaction	Competent	
	1.4.2 Demonstrates increasing level of professionalism in all aspects and understands policy to uphold the standards of surveying and mapping profession.	Competent	

	1.4.3 Practice and enforce correct occupational health and safety procedures.		Not competent
1.5 Personal and professional development	1.5.1Demonstrates willingness to acquire, learn and apply new knowledge and skills to keep abreast with the advancing technologies.	Competent	
	1.5.2 Conducts training and development programs to enhance professionalism.	Competent	
	1.5.3 Performs research and development for professional enhancement		Not competent
1.6 Communication	Effectively communicates, shares information and ideas, listens carefully, clarifies, and understands, taking into consideration different viewpoints.	Competent	
1.7 Management	Demonstrates effective management of resources for achieving the agency's goals and objectives	Competent	
1.8 Teamwork	Demonstrates leadership, inspires others, serves as a role model and provides clear direction to achieve the Agency's mandate and priorities. Motivates and empowers staff, and recognizes individual and team contributions to the Agency's success.	Competent	
Role 2: Geographic Information Manager			
Key Competencies	**Behavior Indicators**	**Competent**	**Not competent**
2.1 Creation of spatial database	2.1.1Comprehends principles of spatial database to enable data classification and conceptualization of database design	Competent	
	2.1.2 Identifies and adopts appropriate DBMS software to build the database.	Competent	

	2.1.3 Utilizes appropriate interfaces to develop physical databases.	Competent	
2.2 Management of spatial database	2.2.1Administers maintains and regulates Geospatial databases for security, integrity, currency, reliability and accessibility.	Competent	
	2.2.2Upgrades the database to cope with the emerging needs and technology.		Not competent
	2.2.3 Facilitates collaboration for easy accessibility of GI to reduce data redundancy.		Not competent
Role 3: Geographic Information Advisor/Regulator			
Key Competencies	**Behavior Indicators**	**Competent**	**Not Competent**
3.1Regulating skills	3.1.1Demonstrates sound understanding of existing legal frameworks and displays ability to work within the frameworks.		Not Competent
			Not Competent
3.2 Advocacy and presentation skills	Advocates national standards and methods of surveying and mapping for homogeneity.		Not Competent

2.7.4 Training Needs Assessment at Advance Level

Role 1: Role 1: Geographic Information Producer					
Key Competencies	**Behavior Indicators**	**Current performance (competent/Not competent)**	**Likely reason for performance gap**	**Competency development intervention**	**Learning Objectives**

1.1Data collection	1.1.1Identifies reviews and applies best technology, innovative systems and effective methodology to collect spatial data.	Not Competent	Lack of exposure to new technology	Seminar and workshop	Would be able to adapt to new technology and guide the subordinates
	1.1.2It covers understanding, employing and endorsing Ensures measurements are legitimate and in line with the survey standards and surveying principles for collection of reliable data.	Competent	NA	NA	NA
1.2 Extraction of information	1.2.1 Extracts information from relevant databases, and repositories to develop reliable spatial information.	Competent	NA	NA	NA
1.3 Data analysis and Interpretation	1.3.1Understand, develop and utilize efficient and relevant information communication technology components of a GIS.	Competent	NA	NA	NA
	1.3.2 Examines the integrity and value of stored spatial data for data analysis	Not Competent	Lack experience	Seminar and workshop	Enhance the capacity to lead, guide and mentor junior officials
	1.3.3 Adds value to data to enhance data interpretation and meet client's demand.	Not Competent	Lack adequate knowledge and skill on data standards and	Seminar and workshop	Would be able to enhance the capacity to lead junior

			analysis		officials in data analysis
1.4 Professio-nal code of conduct and ethics	1.4.1 Establishes and promotes conducive relationships with clients to understand their needs to ensure satisfaction	Competent	NA	NA	NA
	1.4.2 Demonstrates increasing level of professionalism in all aspects and understands policy to uphold the standards of surveying and mapping profession.	Competent	NA	NA	NA
	1.4.3 Practice and enforce correct occupational health and safety procedures.	Competent	NA	NA	NA
1.5 Personal and professional development	1.5.1Demonstrates willingness to acquire, learn and apply new knowledge and skills to keep abreast with the advancing technologies.	Competent	NA	NA	NA
	1.5.2 Conducts training and development programs to enhance professionalism.	Incompetent	No existing practice of Occupational Health Safety Standards (OHS).	Develop OHS and orient on it	Aware of OHS and practices correct occupational health and safety procedures standards.

	1.5.3 Performs research and development for professional enhancement	Competent	NA	NA	NA
1.6 Communi-cation	Effectively communicates, shares information and ideas, listens carefully, clarifies, and understands, taking into consideration different viewpoints.	Competent	NA	NA	NA
1.7 Management	Demonstrates effective management of resources for achieving the agency's goals and objectives	Competent	NA	NA	NA
1.8 Teamwork	Demonstrates leadership, inspires others, serves as a role model and provides clear direction to achieve the Agency's mandate and priorities. Motivates and empowers staff, and recognizes individual and team contributions to the Agency's success.	Incompetent	Non exposure	Seminar and refresher courses	Would be able to guide and act as a role model
Role 2: Geographic Information Manager					
Key Competencies	**Behavior Indicators**	**Current performance (competent/Not competent)**	**Likely reason for performance gap**	**Competency development intervention**	**Learning Objectives**
2.1 Creation of spatial database	2.1.1Comprehends principles of spatial database to enable data classification and conceptualization of database design	Competent	NA	NA	NA

	2.1.2 Identifies and adopts appropriate DBMS software to build the database.	Competent	NA	NA	NA
	2.1.3 Utilizes appropriate interfaces to develop physical databases.	Competent	NA	NA	NA
2.2 Management of spatial database	2.2.1Administers maintains and regulates Geospatial databases for security, integrity, currency, reliability and accessibility.	Competent	NA	NA	NA
	2.2.2Upgrades the database to cope with the emerging needs and technology.	Competent	NA	NA	NA
	2.2.3 Facilitates collaboration for easy accessibility of GI to reduce data redundancy.	Competent	NA	NA	NA
Role 3: Geographic Information Advisor/Regulator					
Key Competencies	**Behavior Indicators**	**Current performance (competent/Not competent)**	**Likely reason for performance gap**	**Competency Development Intervention**	**Learning Objectives**
3.1Regulating skills	3.1.1Demonstrates sound understanding of existing legal frameworks and displays ability to work within the frameworks.	Competent	NA	NA	
		Competent	NA	NA	
3.2 Advocacy and	Advocates national standards and methods of surveying and mapping for homogeneity.	Competent	NA	NA	

presentation skills					

Summary of Performance Gap at Advance Level

Role 1: Role 1: Geographic Information Producer			
Key Competencies	**Behavior Indicators**	**Competent**	**Not Competent**
1.1Data collection	1.1.1Identifies reviews and applies best technology, innovative systems and effective methodology to collect spatial data.		Not Competent
	1.1.2It covers understanding, employing and endorsing Ensures measurements are legitimate and in line with the survey standards and surveying principles for collection of reliable data.	Competent	
1.2Extraction of information	1.2.1 Extracts information from relevant databases, and repositories to develop reliable spatial information.	Competent	
Data analysis and Interpretation	1.3.1Understand, develop and utilize efficient and relevant information communication technology components of a GIS.	Competent	
	1.3.2 Examines the integrity and value of stored spatial data for data analysis		Not Competent
	1.3.3 Adds value to data to enhance data interpretation and meet client's demand.		Not Competent
	1.4.1 Establishes and promotes conducive relationships with clients to understand their needs to ensure satisfaction	Competent	

1.4 Professional code of conduct and ethics	1.4.2 Demonstrates increasing level of professionalism in all aspects and understands policy to uphold the standards of surveying and mapping profession.	Competent	
	1.4.3 Practice and enforce correct occupational health and safety procedures.	Competent	
1.5 Personal and professional development	1.5.1Demonstrates willingness to acquire, learn and apply new knowledge and skills to keep abreast with the advancing technologies.	Competent	
	1.5.2 Conducts training and development programs to enhance professionalism.		Not Competent
	1.5.3 Performs research and development for professional enhancement	Competent	
1.6 Communication	Effectively communicates, shares information and ideas, listens carefully, clarifies, and understands, taking into consideration different viewpoints.	Competent	
1.7 Management	Demonstrates effective management of resources for achieving the agency's goals and objectives	Competent	
1.8 Teamwork	Demonstrates leadership, inspires others, serves as a role model and provides clear direction to achieve the Agency's mandate and priorities. Motivates and empowers staff, and recognizes individual and team contributions to the Agency's success.		Not Competent
Role 2: Geographic Information Manager			
Key Competencies	**Behavior Indicators**	**Competent**	**Not competent**
2.1 Creation of spatial database	2.1.1Comprehends principles of spatial database to enable data classification and conceptualization of database design	Competent	

	2.1.2 Identifies and adopts appropriate DBMS software to build the database.	Competent	
	2.1.3 Utilizes appropriate interfaces to develop physical databases.	Competent	
2.2Management of spatial database	2.2.1Administers maintains and regulates Geospatial databases for security, integrity, currency, reliability and accessibility.	Competent	
	2.2.2Upgrades the database to cope with the emerging needs and technology.	Competent	
	2.2.3 Facilitates collaboration for easy accessibility of GI to reduce data redundancy.	Competent	
Role 3: Geographic Information Advisor/Regulator			
Key Competencies	**Behavior Indicators**	**Competent**	**Not competent**
3.1Regulating skills	3.1.1Demonstrates sound understanding of existing legal frameworks and displays ability to work within the frameworks.	Competent	
		Competent	
3.2 Advocacy and presentation skills	Advocates national standards and methods of surveying and mapping for homogeneity.	Competent	

2.7.5 Outcomes of the Training Needs Assessment

The likely reasons for the performance gap were listed below based on the findings: -

a) No training needs assessment carried out;
b) No training impact assessment carried out;
c) Lack of Standard Induction/Orientation Program;
d) Limited Capacity Building Opportunity;
e) Lack of monitoring and supervising;
f) Mismatch in recruitment of SE;
g) No Succession planning;
h) Shortage of Resources;
i) Non alignment of vision, mission of the organization
j) No Survey Acts and policies to support standards, technical specifications, manuals, CBF etc for SE
k) Inefficient coordination & Collaboration of GIS community
l) Passive professional – under utilization and unable to convince about marketing GI.
m) Limited/Lack of Knowledge and Skills: The following are the list of areas where there is limited or lack knowledge and skills:
    i) Surveying and Geoinformatics
    ii) Advance knowledge in Geodesy, Photogrammetry & RS, Web GIS;
    iii) Advanced technology (UAV, aerial/terrestrial scanner, 3D cadastre, etc)
    iv) Database and data analysis
    v) Survey Engineering and Technology skills
    vi) Research and Analytical Skills:
    vii) Skills to Deal with Client and Person with Disability;
    viii) Rules and regulations in survey engineering & Geoinformatics;
    ix) Practice of Occupational Health Safety Standards (OHS).
    x) Regulating and Advocacy Strategy
    xi) Information Communication and Technology Skills
    xii) Leadership and soft skills
    xiii) NSDI

2.7.6 Methods of Intervention

Based on the findings from TNA, following methods of intervention can be adopted to build the competency and address performance gaps:

a) Recruit Survey Engineer and Geospatial Analyst;
b) Develop succession planning
c) Develop legal framework
d) Institute Monitoring and Evaluation System;
e) Establish Institutional Capacity Building Program;
f) Encourage Joint Ownership for Continuous Professional Development (CPD);

g) Promote Collaboration and Linkages;
h) Promote research culture;
i) Provide Short Term Training (STT)
    i. Surveying and Geoinformatics;
    ii. Advocacy Strategy and Approach;
    iii. Training on Client Orientation;
    iv. Leadership and soft skills;
    v. Training on surveying engineering and calibration of surveying equipment;
    vi. ICT, database and data analysis;
    vii. Research and Analytical Skills:
    viii. OHS
    ix. NSDI

2.7.7 List of Mandatory Competency Development Interventions (CDI)

The list of mandatory competency development intervention includes formal classroom short-term training, induction programme, workshop and seminars, conference, coaching and mentoring, online learning, attachment, On-the-job training etc. These are determined from the training needs analysis (section 2.7.1, 2.7.2, 2.7.3 of this document).

Foundation Level			
Key Role	**Name of CDI**	**Duration**	**Methods of Intervention**
Geographic Information Producer	Training on data collection, extraction and analysis	1 week to3 months	e-learning, OJT, demonstration and attachment in the field work, coaching, mentoring,
	Training on Acts, rules & regulations etc	1 week to1 month	Induction programme
	Training on OHS	1 week	In-house orientation
	Training on soft skills	1 to 3 weeks	workshop
GI Manager	Training on creation of database	1 to 2 months	e-learning, OJT, demonstration and attachment in the field work, coaching, mentoring, In-house orientation
	Training on management of data	1 to 2 months	
GI Advisor/Regulator	Training on Advocacy Strategy and Approach	4 weeks	Workshop and orientation programs
Experienced Level			
Geographic Information Producer	Training on emerging technology (UAV, Calibration & Survey Engineering)	2 weeks to 1 month	Short term training
	Training on interpretation and extraction of data	2 months	Short term training, webinar, seminar, workshops etc.
	Training on soft skills	3 weeks	workshop

	Training on OHS	2 weeks	In-house orientation
GI Manager	Training on creation of database	3 months	e-learning, OJT, demonstration and attachment in the field work, coaching, mentoring, In-house orientation
	Training on management of data	2 months	
GI Advisor/Regulator	Training on Advocacy Strategy and Approach	1 week	Workshop and seminar
Mid Level			
Geographic Information Producer	Training on development of innovative techniques and standards	3 months	STT training
	Training on legal framework	1 month	Workshop, seminar
	Workshop on leadership and soft skill	1 month	Workshop, seminar
	Training on emerging technology (UAV, Calibration & Survey Engineering)	1 month	Short term training
GI Manager	Training database management	3 months	STT training
	Training on data analysis	1 month	Workshop, seminar
GI Advisor/Regulator	Training on monitoring strategy	1 week	Workshop, seminar
	Training on Advocacy Strategy and Approach	1 week	Workshop, seminar
Advance Level			
Geographic Information Producer	Training on new technology	1 week	Workshop, seminar
	Training on leadership	1 week	Workshop, seminar
GI Manager	Training on database	1 week	Workshop, seminar
	Training on data analysis	1 week	Workshop, seminar
GI Advisor/Regulator	Training on Advocacy Strategy and Approach	1 week	Workshop, seminar

2.7.8 List of Mandatory Long Term Training (Specialization)

Course Title	Priority			Number of Slots
	Immediate (2020-21)	Medium (2021-22)	Long-term (2023++)	
MSc in Geodesy	NA	1	1	2
MSc in Spatial Science	NA	1	1	2
MSc in RS and Photogrammetry	NA	1	1	2
MSc in Web GIS	NA	1	1	2
PhD in spatial science/RS and Photogrammetry/Geodesy	NA	1	1	2
Msc. in GeoNetworking and ICT	NA	1	1	2

2.7.9 Developing Learning Objectives

The framework has highlighted the likely reasons for the gaps and interventions were proposed above. In order to provide a capacity building program, the following are the expected learning objectives. The respective proficiency level officials will be able to achieve the objectives mentioned against each of the training.

Foundation level		
Sl. #	Training/CDI	Learning Objectives
1	Training on data collection, extraction and analysis	Would be able to know: a) The basic principles of surveying. b) Recognize and handle various techniques available for spatial data collection. c) Enhance capability to extract spatial data and information through evolving technology that is legitimate and reliable. d) enhance abilities, recognize and understand the integrity and value of stored data and information e) Identify value additions to the data and its uses.

2	Training on dealing with the clients and customer care services	The Foundation level Survey Engineer will be able to have conducive relationship with clients and deal efficiently with clients and deliver prompt public service
3	Orientation and induction programs to familiarize on rules & regulations	Familiarize and apply rules & regulations in performing survey engineering services
4	Training on OHS	Aware of OHS and practices correct occupational health and safety procedures standards.
5	Training on surveying and Geoinformatics	Provide basic exposure and introduce to best practices related to surveying and Geoinformatics
6	Training on basic research methods	Understand different research method
7	Training on effective communication & presentation	Learn effective communication skills.
8	Training on management of resources	Build capacity to effectively manage the resources
9	Training on teamwork and its benefits	Will be able to understand the value of teamwork and the role of leadership
10	Coaching basic Geo-informatics/Surveying courses.	a) Understands principles of spatial database and its applications. b) Comprehends various components of data and database. c) Understands various interfaces and technology to build physical databases. d) Understand basic administration and management of spatial database system
11	Orientation and induction programs on legal framework	Will be able to understand and apply legal framework

12	Orientation and induction programs on advocacy program	Build capacity to understand standards and advocate effectively
Experienced Level		
Sl. #	Training/CDI	Learning Objectives
1	Short term training, webinar, seminar, workshops etc	Professionals are up to date with emerging technologies
2	Short term training, webinar, seminar, workshops etc.	Professionals become efficient in extraction, And interpretation of data from various sources.
3	Subscription of standard softwares and attachment programmes analysis of different softwares	Carry out application oriented research Understand, develop and utilize efficient and relevant information communication technology components of a GIS.
4	Attachment programmes	Would be able to carry out application of various correction techniques of spatial data.
5	Long term training in geospatial science and geodesy	Able to develop and use GIS tools for data analysis, complex analysis, Geodetic application and geodetic models
6	Develop OHS and orient on it	Aware of OHS and practice correct occupational health and safety procedures standards.
7	Attend basic research training	Should be able to understand methods and perform research in critical areas
8	Workshop on team building	Would be able to create opportunities for teamwork with peers, colleagues, and stakeholders

9	Short term training on administration and maintenance of spatial database	Competent to administer, maintain and regulate Geospatial databases for security, integrity, currency, reliability and accessibility upgrade/migrate the database to cope with the emerging needs and technology.
10	Workshop on development of NSDI	Would be able to collaborate by conducting regular meetings
11	Develop relevant act	Would be able to understand and apply legal framework
Mid Level		
Sl. #	**Training/CDI**	**Learning Objectives**
1	Long term training, Workshop and seminar	Advance level Survey Engineer would be able to advance technology like UAV, Gravimeter, HP Digital level, GNSS equipment, plotters, GeoPortal infrastructure, Geonet working and establishment of calibration center. Develop geodetic reference frame, geoid model, 3D cadastre, CORES, and innovative techniques
2	Convention, seminar, training, workshop,	Develop reliable technical framework, standards and SOPs.
3	Advance course in Photogrammetry and RS	Would be able to carry out advanced analysis in photogrammetry and RS
4	Develop OHS and orient on it	Aware of OHS and practices correct occupational health and safety procedures standards.
5	Training on advanced research methods.	Would be able to update new approaches to research and publish in critical areas
6	Customized training	Learn new technology and migrate database

7	Long term/Short term training for development of web and mobile application, IT skills	Learn the architecture of the web and mobile application. Learn programming skills.
8	Develop act	Would be able conversant with legal framework
9	Advanced training in carrying out Regulatory skill	Should be able to provide Expert Advice to peers and clients in carrying out Regulatory programmes
10	Training in preparation of national standards and methods of surveying for dissemination	Should be able to coordinate dissemination methods
Advanced Level		
Sl. #	**Training/CDI**	**Learning Objectives**
1	Seminar and workshop	Would be able to adapt to new technology and guide the subordinates
2	Seminar and workshop	Enhance the capacity to lead, guide and mentor junior officials
3	Seminar and workshop	Would be able to enhance the capacity to lead junior officials in data analysis
4	Develop OHS and orient on it	Aware of OHS and practices correct occupational health and safety procedures standards.
5	Seminar and refresher courses	Would be able to guide and act as a role model

2.8 Implementation of Competency based Framework

The implementation of training and other CDI has been based on the mandatory CDI listed under section 2.7.6 of this document. The mandatory list of CDI includes all the interventions that are found to be "Not Competent" under the Training Needs Analysis. However, for implementation, it has been prioritized based on the following:

a. Most critical area of intervention without its intervention will lead to non-performance
b. Interventions which are reflected as "Not Competent"
c. Availability of the resource allocation

For implementation, the prioritization has to be done on the annual basis by the concerned department/division and the HR Division of the agencies.

Training List for Survey Engineers for 2021-22

Priority	Proficiency level	No. of Participants	Training	Provider
1	Foundation	7	Training on Surveying, Mapping and Geoinformatics	NLCS or JNEC
2	ALL levels	27	Training on familiarization on legal framework, OHS	NLCS
3	All except Foundation	3	Training on emerging technology	NLCS or Foreign country
4	All except Foundation	3	Workshop/ seminar on Advocacy Strategy & Approach	NLCS or Foreign country
5	All except Foundation	6	Training on survey engineering	Foreign country
6	All except Foundation	3	Training on equipment calibration	Foreign country
7	Mid & Advanced	18	Training on leadership	Expert from Bhutan

2.9 Recommendations

The following recommendations are made based on the current situation and in line with the key considerations like how the capacity building program can be implemented in a very efficient and cost effective manner, institutional capacity building and any other findings which is expected to ensure effective implementation of the CBF and thereby enhance their competency:

a) Disseminate the competency framework developed for the SE by a dedicated focal person
b) Based on TNA at various position levels, implement training plan in a planned manner with provision of adequate resources
c) Professionalize SE in specific areas of Survey Engineering and Geoinformatics
d) Mandatory training on soft skills for all proficiency levels.
e) Develop and implement structured orientation, coaching, mentoring, and e-learning programs focusing on priority needs to be learned
f) Develop and implement assessment of the impact of the training
g) Develop successive planning

2.10 Conclusion

The CBF for Survey Engineers has been developed to build a fraternity of Survey Engineers who are highly knowledgeable, skillful and competent in delivering the highest standard of services. In the process of developing the CBF for Survey Engineers 3 key roles have been identified with 5 competency areas, 12 key competencies and 23 behavioral indicators. The proficiency levels have been categorized into 4 level, viz. foundation, experienced, mid and advanced level.

This CBF has been developed by a Task Force team of 5 members who were trained on CBF by the RCSC from 10-14 June 2019 at Financial Institutions Training Institution (FITI). The first draft CBF for Survey Engineer was developed in the first week of October 2019 and distributed to stakeholders on 16th October 2019 for comments. Subsequently, it was presented to the technical team and the management on 18th October 2019. The final draft CBF for Surveyor Engineer was developed during the workshop conducted from 2-7 November 2020 in Wangdue Phodrang and then it was presented to the technical committee on 18th December 2020 at ECH, NLCS and virtually on 3rd January 2021. This framework was endorsed by the 144th HRC, NLCS convened on 18th February 2021.

The CBF would greatly contribute to enhance and strengthen the capacity and capabilities of Survey Engineers by providing the required training and professional development interventions as per the gaps identified. It was observed that no training needs assessment was conducted in the past. There have been limited capacity building opportunities due to lack of training institutes within the country as well as due to lack of resources. Furthermore, due to lack of qualified Survey Engineers available

some Civil Engineers have been employed as Survey Engineers which created mismatch of the job and their qualification. It was also found that there is a slim line of differentiation in performance at various levels of proficiencies especially the workplace demands undertaking the same job by Survey Engineers at experienced and mid levels for most of the time.

Based on the framework, the Secretariat may prioritize and implement interventions to strengthen competency of Survey Engineers to build reliable geospatial infrastructure. The training programs could be prioritized with adequate financial resources to implement these interventions within the 12th Five Year Plan. This framework could be supported by developing the Survey Act and defining the vision and mission of the department.

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