Empowering Development through Data-driven Innovation and Information Technology Solutions

Resource Materials for Base IMIS Readiness Assessment

(DRAFT)

Integrated Municipal Information System (IMIS)

Innovative Solution Pvt. Ltd (ISPL)

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1. CONTEXT

IMIS readiness assessment is a structured evaluation process designed to assess the Local Government's readiness for implementing IMIS to enhance planning, management, and monitoring and evaluation of sanitation systems and services, following the Citywide Inclusive Sanitation (CWIS) approach. IMIS readiness assessment serves as a valuable feasibility analysis tool to make informed decision about IMIS implementation that for developing investment plan, strategies to mitigate potential obstacles or challenges that may arise in the process of implementing IMIS. Three distinct aspects of readiness are assessed, each of which holds equal importance.

- Data readiness
- e-Governance Initiatives and IT readiness
- IMIS-driven sanitation service delivery readiness

During IMIS readiness assessment, pertinent information is primarily collected through Key Informant Interview (KIIs) supplemented by a thorough analysis of relevant documents and reports. Information gathering is performed by a person who have in-depth knowledge on IMIS. Collection of information for IMIS readiness must be guided by the requirement framework illustrated in Appendixes. During the process, general information about the city and relevant documents are also acquired (Appendix A). Each requirement (Data, e-Governance Initiatives and IT and IMIS-driven sanitation service delivery) has been categorized based on its importance, indicating whether it is mandatory (M) or desirable (D). Desirable requirements, while not essential, can either significantly enhance IMIS system efficiency, capabilities for decision-making or increase the likelihood of successful adoption and implementation of IMIS. Subsequently, IMIS readiness assessment and evaluation must be carried out by team consisting of System Analyst, GIS Expert, and Sanitation. It is preferrable that IMIS readiness assessment team possess prior experience in the complete IMIS implementation cycle, including data collection, customization/development of IMIS, and capacity building, for at least one city. The readiness assessment of city for IMIS implementation considers only the mandatory requirements. However, the level of readiness of IMIS and way forward for implementing IMIS is based on the decision made by the assessment team.

2. DATA READINESS

Data readiness assessment will be performed based on the availability of the data required for IMIS. The data requirements for IMIS were initially identified during the conceptualization phase and have since been continuously updated, incorporating insights gained from the preparation of CWIS planning TA (Technical Assistance) for different International Financial Institutions (IFIs) in Bangladesh (ADB, AIIB, IsDB, WB) and Nepal (WB). Data Requirements for IMIS (Appendix B) comprises a comprehensive list of data sets along with their descriptions, value proposition, data type (spatial/non-spatial), and usefulness for the outcomes

and functions of the CWIS (Citywide Inclusive Sanitation). Additionally, the importance of each data set is categorized as either mandatory or good to have for effective planning, management, and monitoring of sanitation systems and services. The listed data sets required for IMIS are further divided into four main categories:

- Urban data: Data about the city's urban pattern, topography, environmental data, and related aspects.
- Sanitation data: Data pertaining to the sanitation system and services.
- Revenue data: Data related to revenue collection associated with sanitation services.
- Business operation data: Micro-level containment database and data generated during the process of delivering sanitation services.

These data sets are considered essential for fulfilling the core purpose of CWIS. However, it is important to note that data sets related to Solid Waste Management (SWM), is not included. During the data readiness assessment, available data layers (spatial/non spatial) will be scrutinized for presence/absence of required necessary attributes as well. All spatial data layers will be examined in GIS software to ascertain if data layers need further update or must be created again through a survey.

3. E-GOVERNANCE INITIATIVES AND IT READINESS

The requirements related to e-Governance Initiatives & IT have been carefully curated based on the IMIS implementation experiences in various towns in Nepal and Bangladesh. Information aspects relevant to different e-governance initiatives undertaken by LGs, availability, and sufficiency of IT infrastructure in LGs, and willingness/commitment to share required financial resources for IMIS implementation are assessed in this part (Appendix C).

4. IMIS-DRIVEN SANITATION SERVICE DELIVERY

The requirements related to and IMIS-driven sanitation service delivery, have been carefully curated based on the IMIS implementation experiences in various towns in Nepal and Bangladesh. Information aspects relevant to necessary enabling environment that facilitates the successful implementation and adoption of IMIS for effective institutionalization of IMIS as well as details status of existing sanitation service delivery in LG are captured (Appendix D).

APPENDIX A. GENERAL INFORMATION OF THE CITY

1. Name of town:
2. Total Area (Sq. Km):
3. Population:
4. Number of Holdings:
5. Name of organizations (NGO/INGO) currently active in sanitation:
6. Presence of any master plan with GIS data (Yes/No):
7. Date of creation of master plan:
8. Format of unique house ID (holding ID):
9. Department responsible for assigning unique house ID:
10. Number of houses constructed per year:
11. Desludging status (min, max, average per month):
12. Proportion of tax collection per year:

13. Number of years since emptying service is operational:
14. Please collect the following information, if available.

SN	Particulars	Yes	No
1	Master plan report		
2	Available GIS dataset		
3	Organogram of the town		
4	Profile of LG		
5	FSM by-laws or sanitation plan		
6	Sample bill receipt that includes the Unique ID e.g. tax bill, water bill		
7	Tariff structure for desludging service		
8	Forms used during providing emptying service		
9	Sample logbooks being maintained in sanitation value chain		

APPENDIX B. DATA REQUIREMENT OF IMIS

	SN	Dataset	Description	Value Proposition	Data Type	CWIS Outcome (O)/Function (F)	Dataset Creation Year	Planning	Management, Monitoring & Evaluation
URBAN DATA	1	Ward Boundary	Ward level administrative boundary.	Helps in planning, assessing, and monitoring the sanitation situation in ward level.	Spatial	Resource planning & management (F)		M	M
	2	Administrative Zone Boundary	Boundary of administrative zones (wards organized into zones) for delivery of services.	Helps in planning, assessing, and monitoring the sanitation situation in zone level.	Spatial	Resource planning & management (F)		M	M
	3	Land use	Provides urban agglomeration of the town and the mapping across the town of the purposes the land serves.	Provides urban agglomeration of the town which helps to identify the areas which are environmental or public health sensitive but vulnerable if sanitation system is not managed properly. Guides the prioritization of the areas for interventions/ systems/ technologies, identification of areas for treatment plants that have minimum impact in environment and public health, located at an optimal distance from service area with affordable cost structures and opportunity areas for green-infrastructure development in the town based on land use.	Spatial	Safety (O), Sustainability (O), Resource planning & management (F)		M	M
	4	Soil	Soil map image in raster that shows types of soil in different part of the town	Provides information on the permeability rates and safe bearing capacity of the soils that will guide the planning and design of sanitation infrastructure systems.	Spatial	Safety (O), Resource planning & management (F)		D	D

	5	Contour	Presents topography of the town with clear elevation levels	Guides the choice of sanitation solution and the planning and design of the solution with optimal investments.	Spatial	Safety (O), Sustainability (O), Resource planning & management (F)		M	D
	6	Water table	Water table map in raster image that shows ground water table in different parts of the town	Provides geographic information of areas where groundwater is susceptible to pollution due to insanitary/unsafe containment units, unregulated discharge of wastewater. Groundwater table information guides the strategies for improved wastewater management of sensitive zones/locations, helps in the strategic planning and design of containment units, sewer network, and treatment plants	Spatial	Safety (O), Sustainability (O), Resource planning & management (F)		D	D
	7	Waterlogged area	Areas in town where water gets logged frequently	Guides in developing risk reduction and preparedness strategies when planning, designing, and managing the sanitation systems and services as well as storm water management	Spatial	Safety (O), Sustainability (O), Resource planning & management (F)		D	M
	8	Area where environmental sensitive activities have been taken	Areas in town which have been used to manage or dispose municipal solid waste such as landfill sites, waste collection points, waste disposing site, dens toilet effluent discharged area, open defecation area, etc.	Helps to demarcating buffer zones around these areas where residential habitations need to be avoided and implementing environmental safeguards while planning, designing the location of sanitation treatment plant should be in conformity of such environment sensitive area.	Spatial	Safety (O), Sustainability (O), Resource planning & management (F)		D	D
	9	Population density	Mapping of the population density in different parts of the town.	Helps in planning and making decisions for sanitation system – sewered or non-sewered and technology selection	Spatial	Equity (O), Safety (O), Sustainability (O), Resource planning & management (F)		M	D

	10	Settlements	Planned (formal) / unplanned (informal) residential areas including slums and low-income settlements, with their demographic, socio-economic status.	Provides detailed geographical information of the planned / unplanned residential areas, which supports in contextualizing the sanitation solutions vis-a-vis their settlement pattern	Spatial	Equity (O), Safety (O), Sustainability (O), Resource planning & management (F)		M	G
	11	Low Income Settlement Area	Low Income Settlement Area with attributes information such as economic condition, households, population, sanitation situation, drinking water situation and waste management situation, public finance support received for settlement development, gender intentional initiatives for sanitation service, incentives received, etc.	The demographical, socio-economic, and baseline status of sanitation and other basic services in low-income settlements will help with the prioritization of the interventions, planning, design & management of the gender intentional and socially inclusive solutions and strategizing the sustainable solutions.	Spatial	Equity (O), Safety (O), Sustainability (O), Accountability (F), Resource planning & management (F)			
	12	Building Footprint	Building footprints with its information such as house number, property ID, Tax code, owner name, Contact Number, SWM customer code, FSM customer code, sewerage customer code, water supply customer code, road network code, sewerage network code, drainage network code, SWM service sector code, code of the associated containment, ward number, structure type (pucca, kachha,	Provides detail information about buildings – where a building is located and how much area has been occupied, building topology, functional use, the types of sanitation system (sewerage or onsite), municipal services receiving, access road, associated sewerage, storm drain, water supply line and corresponding service area if connected to sewer, water and drain, associated SWM service area, associated containment, status of tax and other municipal fee, number if people living, etc. Building's in-depth information helps city authority in assessing	Spatial	Equity (O), Safety (O), Sustainability (O), Accountability (F), Resource planning & management (F)		M	M

			semipucca), floor counts, functional use of building, tax & other fee payment status, public finance support received for sanitation, building permit status, the status of sanitation system, service charge payment status.	quality and quantity of wastewater and solid waste generated from a particular ward, area, and the city as a whole. Building footprints with various attribute information helps to understand city's settlement pattern and calculate built up density. Historical data about building footprints together with different attribute information regarding building will help to understand the city's development trend and land use change in a particular area of a town, ward, or city. Helps to identify the areas with significant number of defaulters of municipal taxes and service fees which will help to reason behind this and fixing the tax and service fee and developing strategies for efficient collection of tax and service fee. Building data together with other data layers helps in selecting appropriate sanitation systems and the technologies with its CAPEX and OPEX and develop good investment plan in line with CWIS principle. Provides information required for pricing slabs and collection status					
	13	Road Network	Information about roads such as road name, hierarchy, surface type, width, etc.	Helps with planning and design of sewer network, desludging route, storm water management, and green infrastructure.	Spatial	Safety (O), Sustainability (O), Resource planning & management (F)		M	M

	14	Point of Interests (POIs)	Locations and name of city offices, ward office, public places, market, postal service, hospital, health post, buildings, public toilet, rehabilitation center, fire brigade, tourist information center, business complex, shopping mall, police station, parking place, health and fitness, office, etc.	Helps in assessing the need to provide public sanitation facilities in these public places. Helps to understand the concentration of floating populations and design the sanitation facility. Helps in exploring and promoting technology option (e.g., development of DEWATs facility to cater the treatment of large volume wastewater generations, particularly if the area has not been served by a sewer system).	Spatial				
	15	Water bodies	Water bodies area covered by Rivers, Lakes, Ponds, etc.	Guides in developing risk reduction and preparedness strategies when planning, designing, and managing the sanitation systems and services as well as storm water management.	Spatial	Safety (O), Sustainability (O), Resource planning & management (F)		M	M
SANITATION	16	Containments	Location of containment with its unique id, associated building, containment type (septic tank/ holding tank/ pit), containment size(m^3), associated road code, last desludging date, population served, public finance support received, etc.	Provides detailed information about every containment in a town, which helps in understanding the number of containments by their types, the total number of populations being served, estimated volume of fecal sludge generated, population served, etc. Understanding the spatial coverage of sanitary that complies with all requirements.	Spatial	Equity (O), Safety (O), Sustainability (O), Resource planning & management (F)		D	M
	17	Strom water network	Strom water network with structure type (Pucca, Katcha), width, status (closed, open), and its outfalls	Provides information on the areas that are served with sewer network which helps in assessing the areas which are not connected to sewer where interventions need to be planned for inclusive sanitation. In conjunction with building data, it helps to understand how many buildings by type, households and	Spatial	Safety (O), Sustainability (O), Resource planning & management (F)		M	M

				population are being served or unserved and helps in estimating the volume of wastewater generated from the served or unserved areas. Provides the geographic location of the sewerage outfall which will help to understand where sewage flows and how it is getting discharged and managed.					
	18	City water supply areas	Areas in town which are covered by the city water supply.	Provides information about areas served and unserved by city water supply, which will help to understand the quantity and quality of wastewater generated in those areas.	Spatial	Safety (O), Sustainability (O), Resource planning & management (F)		D	D
	19	Public/Community Toilets (PT/CT)	Public services (PT/CT) in the towns with the types of services provided, capacity, users (male/female), service provider, public finance support received, gender intentional initiatives in design, service fee, incentives received, etc.	Provides location information about centers that deliver public services which will also help in assessing the need to provide public sanitation facilities in these public places. Help to understand the concentration of floating populations and design the sanitation facility. Helps in exploring and promoting technology options (e.g., development of DEWATs facility to cater to the treatment of large volume wastewater generations, particularly if the area has been not served by a sewer system)	Spatial	Equity (O), Safety (O), Sustainability (O), Resource planning & management (F)		M	M
	20	Treatment Plants	Locations, capacity, etc. of WWTP and FSTPs.	Provides geographic location and information about Treatment Plants and helps in proximity understanding of treatment plants from town settlements and various land uses.	Spatial	Equity (O), Safety (O), Sustainability (O), Resource planning & management (F)		M	M

				Helps in planning and decision-making processes such as planning co-treatment of FS in the STP.					
	21	Landfill site	Landfill sites with their area, capacity, etc.	Provides information such as collection frequency and service providers of areas. Service area in conjunction with building data helps to estimate the volume of waste generated from the service area. Helps to conduct a feasibility study for implementing different technologies such as co-composting of SW with FS is feasible based on the demand for Dried FS compost. Provides geographic location with various information about Landfill Sites, which will help to analyze distance economics for waste management in town. Helps to assess whether an existing site is enough for an integrated waste management system. Helps to understand on area conflict of land-fill location with potential urban growth patterns and further guides the authority in case any alternative location needs to be explored for future uses.	Spatial	Safety (O), Sustainability (O), Resource planning & management		D	M
	22	Water borne disease hotspot	Hotspot of water-borne diseases that occurred in the town in last 5 years.	Helps to know areas vulnerable to unmanaged sanitation and monitor and evaluation of sanitation intervention.	Spatial	Safety (O), Responsibility (F), Accountability (F)		D	D

REVENUE	23	Tax zone	Tax zone with tax rate and status of revenue collection in different tax and services provided by Pourashava.	Provides tax rates for the different areas in the town. Tax zone in conjunction with the status of property tax collection, service fee collection, and settlement data help in fixing the tariff for service and developing strategies for collecting service fees for efficient and sustainable service delivery.	Spatial	Equity (O), Sustainability (O), Resource planning & management (F), Responsibility (F), Accountability (F)		D	D
SANITION BUSINESS DATA	24	Service provider	Town inhouse unit or outsourced companies providing sanitation service and the gender intentional policy, benefits, and incentives of service providers.	Provides information about service providers that are in-house units or sections of LG or outsourced companies including their information about their coverage, capacity, infrastructure available for providing service incentives, penalties. Provides information about targets, the status of performance, incentives, penalties, etc. received by each service provider of LG to monitor the service authority performance.	Spatial	Equity (O), Safety (O), Responsibility (F), Accountability (F), Sustainability (O),		D	M
	25	Emptying and Transportation Infrastructure and Services	Service provider's information including human resources and vehicle inventory (quantity, size, service status).	Helps to understand the transportation infrastructure available and their status.	Non-spatial	Equity (O), Safety (O), Sustainability (O), Resource planning & management (F), Accountability (F)		M	M
	26	Customer data	Database of houses that are receiving sanitation services, water supply services, SWM services, etc.	Provides information about the buildings and containments which have received service. Helps in planning and developing different strategies for planning, managing, and M&E of the systems and services.	Non-spatial	Equity (O), Safety (O), Sustainability(O)		D	M

	27	Customer feedback data	Customer's feedback about service after desludging the containment.	Helps in management and M&E of the sanitation service.	Non-spatial	Equity (O), Safety (O), Sustainability (O), Responsibility (F), Accountability (F)		D	M
	28	Public/Community Toilets (PT/CT) service feedback	User's feedback on PT/CT	Helps in management and M&E of the public service	Non-spatial	Equity (O), Safety (O). Sustainability (O), Responsibility (F), Accountability (F), Resource planning & management (F)		D	M
	29	Desludging service feedback	Customer's feedback about the desludging service	Helps in formulating strategies for increasing efficiency of service delivery	Non-spatial	Equity (O), Safety (O), Sustainability (O), Resource planning & management (F), Accountability (F)		D	M
	30	Fecal Sludge Data	Fecal sludge collected, treated, and reused records maintained by the town for different sites		Non-spatial	Equity (O), Safety (O), Sustainability (O), Resource planning & management (F), Accountability (F)		D	M

APPENDIX C. E-GOVERNANCE INITIATIVES & IT REQUIREMENT OF IMIS

Aspects	SN	Requirements	Importance (M=Mandatory, D= Desirable)	Availability (Yes/No)	Remarks
e-GOVERNANCE	1	Is LG currently using any software applications (e.g., Tax Collection System, MIS, etc.), or are they in the process of implementing any?	D		
	2	Does LG employ any online payment mechanisms to deliver municipal services?	D		
	3	Is LG utilizing any mobile apps to provide information to its citizens or deliver municipal services?	D		
IT INFRASTUCTUR E	4	Does LG have an in-house IT department, outsource IT services, or hire temporary IT personnel to support IT-related issues?	M		
	5	If not, is LG willing to hire IT personnel to support IMIS operation within its own budget?	M		
	6	Do LG staff members possess good computer skills?	M		

	7	Does LG have sufficient computers and accessories in relevant departments, such as revenue, building, infrastructure, and sanitation departments, to support IMIS?	M		
	8	Does LG have reliable fast internet access within its office premises?	M		
	9	Are personnel responsible for sanitation service delivery, such as desludging vehicle drivers and treatment plant operators, capable of using computers and mobile applications?	M		
	10	Does LG have any Annual Maintenance Contracts (AMCs) with private companies to maintain any of its software applications?	D		
	11	Are there any restrictions on hosting software with a commercial hosting service provider, whether it be a national or international provider?	M		
SUSTAINABILITY	11	Is LG willing to make a partial investment in the required dataset if the dataset as per the IMIS framework is not entirely available?	D		
	12	Is LG willing to designate a focal person with clear mandates to oversee the implementation and operation of IMIS?	M		
	13	Is LG willing to share the cost of hosting IMIS on the cloud if there is no provision for hosting it on the government cloud?	M		
	14	Is LG aware that regular investment is necessary for the maintenance and hosting of any software application once it is implemented? Will LG be prepared for this investment?	M		
	15	Are there any urban planner staff (permanent/temporary) employed by LG?	D		

APPENDIX D. IMIS-DRIVEN SANITATION SERVICE DELIVERY

	SN	Requirements	Importance (M=Mandatory, D= Desirable)	Availability (Yes/No)	Remarks
Enabling Environment	1	Has the LG officially endorsed and adopted the CWIS (Citywide Inclusive Sanitation) approach?	M		
	2	Does LG have any specific plans or strategies focused on sanitation, such as a CSP (City Sanitation Plan), sanitation strategy, or FSM (Fecal Sludge Management) by-laws? If not, is the LG currently working on developing such plans?	D		
	3	Are there any clearly defined mandates assigned or established for various aspects of the sanitation value chain within the LG's policy or official documents?	M		
	4	Has LG established a central-level committee to oversee sanitation activities?	D		
	5	Does LG have a dedicated unit responsible for FSM (fecal sludge management)? If not, has the LG assigned the responsibility of FSM to any specific department or staff?	M		
	6	Has the LG allocated a specific budget for sanitation purposes?	D		
	7	Dees LG already formulate any established model for sanitation service delivery (e.g., process, payments, information collection)?	M		
	8	Does LG need to submit annual/quarterly report of progress to higher bodies? If yes, are there any sanitation related indicators in the report?	D		
	9	Does LG address inclusive sanitation services targeting poor, vulnerable communities in its policy, planning and budgeting process s? Is there any defined LICs areas within municipality?	D		

	10	Does LG conduct periodic promotion for safe sanitation, behavior change and community engagement?	D		
	11	Are there any policies that require households to regularly empty containments? Is there a plan for moving towards scheduled desludging?	D		
	12	Are there any policy mandates for safe disposal?	M		
Sanitation Service Delivery	13	Is there a mechanism in place for citizens to request emptying services through the LG or private operators?	M		
	14	Does LG enforce licensing mechanism for private operators?	M		
	15	Is there standard tariff set for emptying by LG?	M		
	16	Are there desludging vehicles and other necessary infrastructure available for the emptying service?	M		
	17	Does a formal system for citizens to request emptying services exist?	M		
	18	Does the LG periodically monitor service providers?	M		
	19	Does customer database available for sanitation services?	M		
	20	Does customer database available in digital format?	D		
	21	Does a mechanism for customers to provide feedback on the emptying service exist?	M		
	22	Is there a provision of transfer stations for buildings that are not directly accessible due to narrow roads? (Yes/No)	D		
	23	Does the LG or private operator manage public toilets (PT) and community toilets (CT) within the city?	M		
	24	Is there a feedback system in place to monitor the condition and usage of PTs and CTs?	D		
	25	Is there a presence of FSTP or any designated area for the disposal of sludge?	M		

	26	Are there potential buyers identified for treated wastewater and sludge?	D		
	27	Does the LG currently have a building permit process in place to issue and verify building permits?	D		
	28	Is there a step within the building permit process to verify the sanitation system?	D		
	29	Does the LG monitor the quality and standards of the existing sanitation systems?	D		