मसौदा भारतीय मानक

नगरपालिका प्रशासन –
भाग 3: जल और सीवरेज –
अनुभाग 5: वर्गिकी

Draft Indian Standard

Municipal Governance –
Part 3: Water and Sewerage –
Section 5: Taxonomy

ICS 33.020, 35.020

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FOREWORD

This Draft Indian Standard (Part 3/Sec 5) will be adopted by the Bureau of Indian Standards, after the draft finalized by the Smart Infrastructure Sectional Committee, will be approved by the Electronics and Information Technology Division Council.

In the last two decades, India has recognized the significant impact of technology in facilitating progress and development, particularly in its urban areas. As a result, India is poised to lead the digital revolution with a focus on its cities. By embracing emerging technologies in urban governance, India aims to transform its journey to economic power. To achieve this, the Ministry of Housing and Urban Affairs (MoHUA) launched the National Urban Digital Mission (NUDM) in February 2021. The mission seeks to establish a shared digital infrastructure that strengthens the capacity of the urban ecosystem to address complex problems efficiently and at scale. This initiative aims to enhance citizens' ease of living through inclusive, accessible, efficient, and citizen-centric governance in India's 4800+ towns and cities. To drive this effort, the National Institute of Urban Affairs has established the Centre for Digital Governance (CDG) to bring together the MoHUA's digital initiatives and to help drive urban standardisation effort The NUDM builds on the guiding principles outlined in MoHUA's 2019 National Urban Innovation Stack (NUIS) - Strategy and Approach paper, which was developed to accelerate urban transformation. .

The CDG has been working on a set of standards on Taxonomy, Data Models and APIs, and process lists for few domains such as Property Tax, Municipal Grievance Redressal, Building Plan Approval, Trade License, Water and Sewerage etc. to enable integrated e-governance and digital delivery of municipal services.

The taxonomy for Water and Sewerage was initially created by the Centre for Digital Governance (CDG) at National Institute of Urban Affairs (NIUA).

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0   INTRODUCTION

The terminology and vocabulary used for municipal governance differ among ULBs across India due to the federal structure of governance, state-specific laws, and varying eGovernance system implementations. Non-standardized interfaces and storage also result in challenges related to data interpretation and interoperability. As a consequence, measuring municipal performance can lead to significant inconsistencies not only from city to city but also from state to state. Therefore, without clear definitions, vocabulary, specifications, and benchmarks for municipal governance, it is challenging to enable 'Data-Driven Governance.'

The municipal governance standards are being designed to include minimum base data elements common across municipal services in ULBs/development authorities or parastatals to ensure interoperability, harmonization, and data-driven governance. ULBs with more complex processes can adopt and expand on these initiatives. The Knowledge Standards will help,

   a)   identifying and categorizing important data elements for a domain
   b)   resolving differences in terminology for Urban Governance
   c)   to analyse current city domain models, processes, reports & KPIs; thus, retrofitting existing data models with missing data

The water and sewerage taxonomy defined in this standard includes common water and sewerage entities, channels, processes, stakeholders, reports and KPIs and their definitions. All definitions in this standard are notional definitions for conceptual purposes. The actual definition of entities for water and sewerage purposes should be considered as per state and local legislations. The taxonomy structure in this document is scalable both vertically and horizontally to accommodate ULB specific complexities as well as change in people, process and technology over time.

Water and Sewerage Taxonomy will be used in developing Water and Sewerage Data Models and API Specifications as well as for creating metadata specifications. Few sample parameters and specification are also given in Annex A for understanding purpose.

Together these standards will ensure semantic and syntactic interoperability among all eGovernance systems in India.

The audience for this standard includes but is not limited to government organisation, industry, academics, architects, customers, users, tool developers, regulators, auditors and standards development organizations. Water and Sewerage Taxonomy is developed as an open standard under National Urban Digital Mission by National Institute of Urban Affairs. No part(s) of the document can be sublicensed further by any other organisation. Any attempted sublicense, whether voluntarily or otherwise, shall be null and void, and will attract penal actions

This document is also interrelated with other Indian standards for eGovernance such as SP7: 2016, IS 18000, IS 18006 (Part 1) and IS 18006 (Part 3/Sec 1): 2021.

0.1 Governing Principles in the Design of Knowledge Standard

To ensure this taxonomy fits the needs of interested stakeholders the following principles have been followed in designing it.

0.1.1 Minimalist

The standards are designed to have minimum base elements common across ULBs to ensure interoperability, harmonization and data driven governance. These can then be adopted and built upon by some ULBs with higher process complexities.

0.1.2 Evolvable

The standard is designed to evolve over a period of time thereby adapting to changing needs and emerging technologies thus making the system comprehensive progressively.

0.1.3 Modular

The classifications and categorizations in the knowledge standard are designed modularly, yet they function together as a whole. They are independent and self-contained and may be combined and configured with similar units to suit separate contexts. E.g., The Property "Use" element and its sub classifications can be easily reapplied in the context of any Building Plan Approval System or Trade License System.

0.1.4 Extendible

The standard is designed to be exhaustive and the elements of Urban Governance are positioned in a hierarchy which can accommodate both horizontal and vertical additions. This leaves room for wider adoption and innovation to suit contexts of any ecosystem. The end goal is to build a knowledge practice that supports Open Standards with the Data Element taxonomy as a base.

0.1.5 Open

The standard is designed to be 'open' to enable wider ecosystem participation and use. The standard is intended to be used by State Governments, Urban Local Bodies, industry and technology providers, academia and civil society organizations who are either working in the domain or are providing services to the ULBs in any manner.

0.1.6 *Accessible & Inclusive*

The standard is designed to be inclusive and accessible in nature for all types of stakeholders. The standard will enable the technology to reach every section of society. For e.g.: Interactive Voice Responses and non- digital channels as included in the section 2 will enable the marginalized and differently abled citizen to use the service in a more efficient manner. Also, stakeholders such as intermediators can also help in building capacities or creating awareness.

0.2 Sample Use Cases

Samples of Water and Sewerage Taxonomy use cases are mentioned below for reference.

0.2.1 Direct application

By storing, generating and using these important data elements (entities, stakeholders, processes & reports) in day-to-day operations.

a) Designated ULB officials can use this to add channels and ULB type (such as Nagar Panchayat, Municipal Corporation or Municipal Council) in the W&S system. This will help the ULBs to assess the application while acknowledging and processing the Application/ Assessment request.

b) While submitting the application form for the connection, the property Id is also captured. This PID can be used to fetch property details like use, location, ownership, payment details which will help in eliminating redundant or bulky forms. This will also result in re-use and harmonization of data across departments.

c) Monitoring of applications by their status, SLB adherence and channels by which the transaction happens, empowers ULB Officials to take corrective and preventive steps as needed.

d) Timely updating and monitoring of DCB registers also enable ULBs to better plan and revenue management.

0.2.2 Indirect application

By using these data elements in evidence-based governance and long-term planning

a) Analyzing W&S applications by the purpose may help the ULB in regulating land use, preventing revenue leakages and planning water conservation subsidy policies. It can also help in planning the inspection schedules better with respect to the types of regulations needed.

0.2.3 Information consistency

By using these data elements while using and sharing data (via Metadata tags in reports and dashboard)

a) Consistent use of Data elements, processes, KPIs and their definitions from this Knowledge Standard helps in implementing Information consistency across ULBs. To ensure information consistency, ULBs may use new or existing platforms for delivering W&S services. They should use Metadata tags from the data elements defined in this knowledge standard.

1 SCOPE

This Indian standard provides a unified view of the Water and Sewerage data and processes in urban local bodies and introduces common and widely accepted terminologies and semantics that can be used across multiple systems.

2 REFERENCE

The standards given below contain provisions which, through reference in this text, constitute provisions of this standard. At the time of publication, the editions indicated were valid. All standards are subject to revision, and parties to agreements based on this standard are encouraged to investigate the possibility of applying the most recent editions of these standards.

SP 7:2016 National building code of India (Third Revision)

IS 18006 (Part 1) Municipal Governance - Reference Architecture

IS 18006 (Part 3/Sec 1): 2021 Municipal Governance - Part 3 Property Tax - Section 1 Taxonomy

3 TERMINOLOGY AND ABBREVIATIONS

3.1 Terminology

For the purpose of this standard, the definitions given in IS 18006 and IS 18006 (Part 3/Sec 1): 2021 shall apply, in addition to the following:

i. *Aadhaar*

Aadhaar is a verifiable 12-digit identification number issued by Unique Identification Authority of India (UIDAI) to the resident of India.

ii. *Application Programming Interface (API)*

The term Application Programming Interface (API) means any mechanism that allows a system or service to access data or functionality provided by another system or service. The API is generally used to interact (like query, list, search, sometimes submit & update) directly with the specific information on a system, to trigger some action on other systems, or to perform some other action on other systems.

iii. *Consumer/Customer*

A Consumer is a person who purchases a product or avails a service for a consideration, either for his personal use or to earn his livelihood by means of self- employment. It also includes a beneficiary of such goods/services when such use is made with the approval of such person. The term Consumer or Customer may be used interchangeably as per the State/ULB requirement.

iv. *Data Elements*

Data Element is a Logical definition of Data. Any unit of Data defined for processing is a Data Element. The basic principle of data modelling is the combination of an Object class and an Attribute to form a more specific 'data element concept'. For E.g.: Application ID, name, address, ULB, building

details that are associated with a Data Entity (Such as Trade License, W&S, Fire NOC etc.).Data Entities.

v. *Data Entities*

Entities were created to help users to locate their data elements from the entire list. However, this grouping should not be confused with data sets. Data sets are list of data elements required for a certain program or application to function and should be created choosing relevant data elements from various entities e.g. BPA, Trade License, Property Tax etc.

vi. *DigiLocker*

DigiLocker is a secure cloud based platform for storage, sharing and verification of documents & certificates

vii. *Domain*

A sub-category under an Information Technology field is a Domain; specific purpose within a "Domain" is known as "Area". For example, "Document type for Web publishing content" is one Area under the "Presentation" domain.

viii. *E-governance*

A procedural approach in which the Government and the citizens, businesses, and other stakeholders are able to transact all or part of their activities using Information and Communication Technology tools.

ix. *Interoperability*

The ability of different information technology systems and software applications to communicate, exchange data, and use the information that has been exchanged.

x. *Metadata*

Metadata is data about data. Metadata describes how and when and by whom a particular set of data was collected. Metadata is essential for understanding the information stored.

3.2 Depicted Symbols

Domain is depicted as [ ] for e.g. Fire NOC

Data Entities are depicted as [ ] for e.g. Building Details

Channels are depicted as [ ] for e.g. Fire NOC Channels

Stakeholders are depicted as [ ] for e.g. Stakeholder Matrix

Processes are depicted as [ ] for e.g. Application Creation, Acknowledgement

Reports & KPIs are depicted as [ ] for e.g. Demand Balance Collection Register

In processes section (section 5.4),

a) Input criteria (whether from citizen or ULB) of the process is shown in *italics text* (For Example "*5.4.1.1 Applicant Details*")
b) Output of the process is shown in Bold text (For example "5.5.1.1 Connections Register")
c) Direct sub-classifications or sub-components are shown as normal text (For Example 5.4.3.1.1 Issue of New Connection, which is sub-classification under Section 5.4.3.1 Types Of Assessment)

3.3 Abbreviations

AMRUT	Atal Mission for Rejuvenation and Urban Transformation
CAA	Constitution Amendment Act
CDG	Centre for Digital Governance
CSC	Common Service Centre
DTMF	Dual Tone Multi-Frequency
ICT	Information and Communication Technology
ID	Identification Document/Number
IVR	Interactive Voice Response
JNNURM	Jawaharlal Nehru National Urban Renewal Mission
KPI	Key Performance Indicators
MoHUA	Ministry of Housing & Urban Affairs
NIUA	National Institute of Urban Affairs
NOC	No Objection Certificate
NUDM	National Urban Digital Mission
NUSP	National Urban Sanitation Policy

PID	Property Identification Number
SLB	Service Level Benchmark
SLG	Service Level Guarantee
SMS	Short Message Service
UFW	Unaccounted-for Water
ULB	Urban Local Body/Bodies
UPYOG	Urban Platform for delivery of Online Governance
W&S	Water & Sewerage
AMRUT	Atal Mission for Rejuvenation and Urban Transformation
CAA	Constitution Amendment Act
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NIUA	National Institute of Urban Affairs
NOC	No Objection Certificate

NUDM	National Urban Digital Mission
NUSP	National Urban Sanitation Policy
PID	Property Identification Number
SLB	Service Level Benchmark
SLG	Service Level Guarantee
SMS	Short Message Service
UFW	Unaccounted-for Water
ULB	Urban Local Body/Bodies
UPYOG	Urban Platform for delivery of Online Governance
W&S	Water & Sewerage

4 WATER AND SEWERAGE

The urban water supply and sewerage (W&S) sector in India is often characterized by inefficient delivery of services (including high-unaccounted water and intermittent water supplies) and inadequate coverage of piped water supply and sewerage connections, especially for the urban poor. In addition, poor cost recovery has rendered most of the water utilities in the country as financially unsustainable. Even though the city level function of water supply is to be devolved to municipalities and other urban local bodies under 74th CAA of 1992, very few have been assigned this function by state governments. A few metropolitan cities like Delhi, Chennai, Hyderabad and Bangalore have statutory water supply and sewerage (W&S) boards with limited functional autonomy. In cities of Ahmedabad, Amritsar, Kolkata and Mumbai, separate departments of the ULB handle W&S capital and operations. In some cities like Hubli-Dharwad, Mysore, Varanasi, and Kanpur, the ULBs handle the operations and maintenance of W&S while the capital works are the responsibility of the state level parastatal.

"Sewage" means night-soil and other contents of latrines, urinals, cesspools or drains, and polluted water from sinks, bathrooms, stables, cattle sheds and other like places, and includes trade effluents and discharges from manufactories of all kinds.

"Sewerage" means all the components of a system to collect, transport and treat sewage (including pipes, pumps, tanks etc.).

Fecal sludge (Septage) is the slurry that contains both solid and liquid waste that accumulates in onsite sanitation systems (OSS) e.g., septic tanks. It is raw or partially digested slurry that results from the collection, storage or treatment of combinations of excreta and blackwater, with or without greywater. "Fecal sludge (septage) management" involves collection, treatment and proper disposal/ reuse. Efficient fecal sludge (septage) management includes safe disposal of the treated septage. Water connection includes,

(i) any tank, cistern, hydrant, stand pipe, meter or tap situated on any private property and connected with a water main or pipe belonging to the Municipality; and

(ii) the water pipe connecting such tank, cistern, hydrant, stand pipe, meter or tap with such water main or pipe;

"Watercourse" means and includes any river, stream or channel whether natural or artificial; "water for domestic purposes" shall include water for domestic requirement including drinking water purposes and shall not include water for any trade, manufacture or business or for building purposes, or for watering gardens or for fountains or for any ornamental or mechanical purposes;

MoHUA has initiated a number of programs and activities to address the issues in W&S Sector such as;

a) Reforms under JNNURM including transfer of Urban W&S functions to ULBs as per 74th CAA
b) Atal Mission for Rejuvenation and Urban Transformation (AMRUT) to ensure that every household has access to a tap with assured supply of water and a sewerage connection
c) Service level Benchmarks defined in citizen charters to improve efficiency in the functioning of W&S systems, including governance, finance and institutional capacities etc.
d) National Urban Sanitation Policy (NUSP) covering all aspects of urban sanitation and sewerage management

The 74th Constitutional Amendment had substantially broadened the range of functions to be performed by the elected urban local bodies (ULBs). The Constitution envisages urban local bodies as being totally responsible for all aspects of development, civic services, and environment in the cities, going far beyond the traditional role.

Water and Sewerage is an important revenue source for the Urban Local Bodies (ULB) and is maintained by various departments at state and ULB Level. The authorities are responsible to provide water and sewerage connection in the designated territory, issue the demand to the owner for making the necessary payment and collection of water and sewerage charges. Once water and sewerage charges are accomplished the collection process is followed up through appropriate notifications to the citizens. The implementation of water and sewerage service by ULBs comprises providing new connection, name transfer, usage change, generating demand notice, defaulter notice. In case the citizen fails to pay the W&S charges, the revenue department can disconnect the W&S connection temporarily. Moreover, if the citizen wishes they can request for disconnection as temporary/ permanent disconnection. If the underground drainage connection is disconnected temporarily by the citizen or disconnected by the revenue department, they can pay the arrear amount & other charges and request for reconnection.

Water being a state subject, the State Governments have primary responsibility for use and control of this resource. The administrative control and responsibility for development of water shared by various state departments, parastatals and urban local bodies. For e.g., Delhi Jal Board and Delhi Municipal Corporations.

As part of National Urban Digital Mission (NUDM), NIUA is also offering a platform UPYOG to states which offers Water License Connection Management functionality using the Water & Sewerage (W&S) module.

Taxonomy for Water and Sewerage tries to capture the most important entities, their properties, categories, subcategories, parameters, and specifications within this domain as well as other associated areas. Subsections in Section 2 also define all the key terms in the water and sewerage domain comprehensively.

A well-structured W&S taxonomy helps by:

e) Identification and regulation of water supply and sewerage connections enabling effective enforcement and regulation
f) Building accountability and ensuring transparency
g) Identification and process key data elements to enable evidence-based decision & policy making

5   TAXONOMY FOR WATER AND SEWERAGE

While building the knowledge models for water and sewerage systems, it is imperative to consider entities that are interlinked with water and sewerage. **Water and Sewerage** is a fee-based **Municipal Revenue** charged against permission for the water or sewerage connections**, Assessment**, **Inspection** and **Billing and Payment** are the processes that operationalise the Revenue mobilization within a ULB. Hence, taxonomy for water and sewerage cannot be built in a silo and needs to be accompanied by entities like water and sewerage, Channels, Stakeholders, associated processes reports and KPIs.
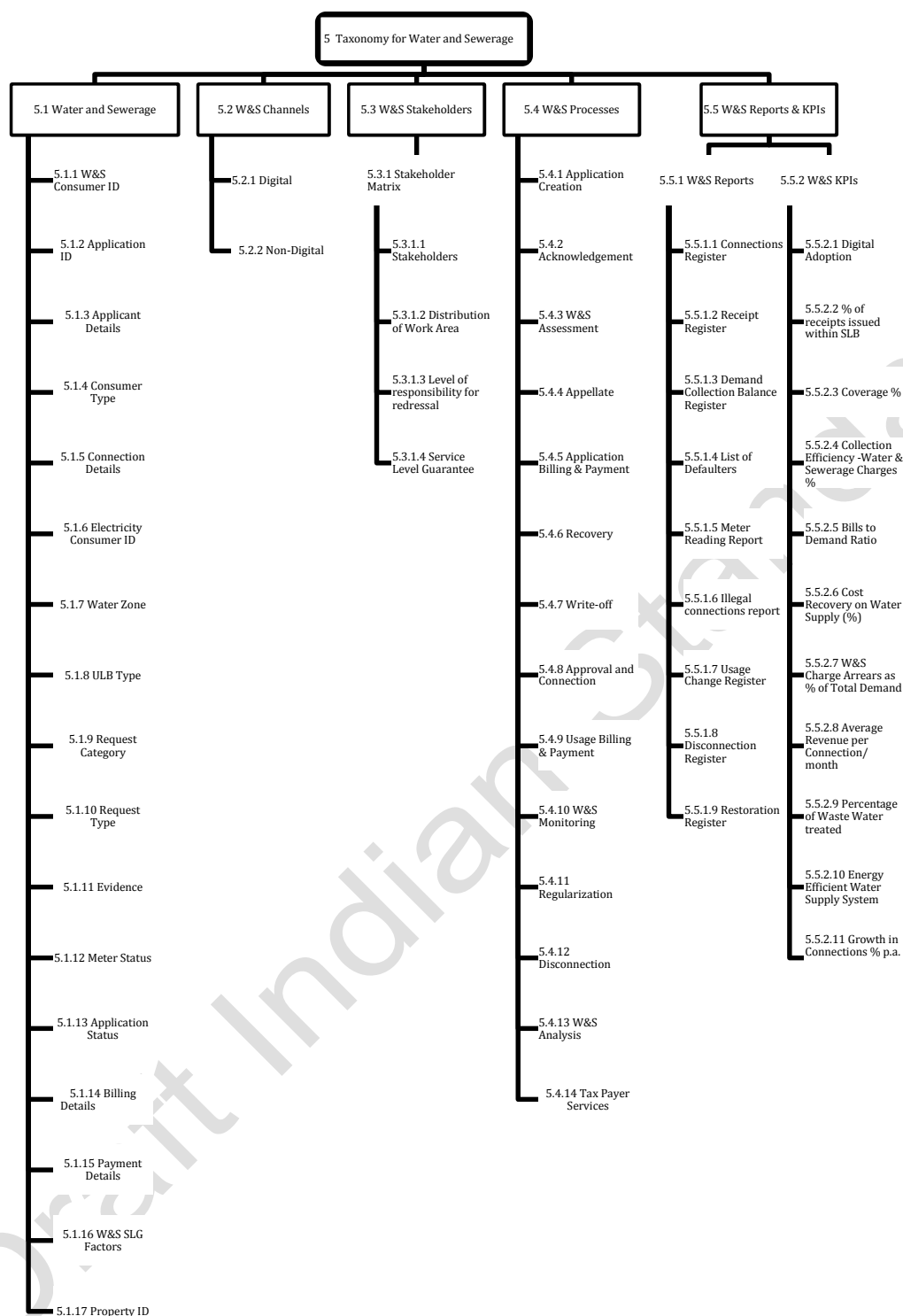
Fig. 1   Taxonomy of Water and Sewerage

The categorizations and sub-categorizations of terms used in Water and Sewerage taxonomy are summarized in **5.1** to **5.5**. The categorizations and classifications primarily establish hierarchical relationships, and as a whole yield the taxonomy around Water and Sewerage.

5.1 Water and Sewerage

Water & Sewerage is a basic service provided to the citizen by the ULBs or city/state owned parastatals or agencies of providing new connection, disconnection, reconnection, billing and revenue collection etc. according to relevant rules and regulations. Sub-components in this section describe important components of a water & sewerage data entity.

5.1.1   W&S Consumer ID

Water & Sewerage (W&S) Consumer ID is a unique connection identifier for every individual consumer. Consumer ID may be used to check the bill amount or request a duplicate copy of their bill.

5.1.2   Application ID

An Application ID is an automatic unique application number that will be generated after submitting the application form successfully. The Application ID can be used to check the status of the filled application (until the sanction of the connection), get duplicate bills, receipts etc.

5.1.3   Applicant Details

Applicant details means the details of the person or organization filling the application form. In terms of water and sewerage connection application, the applicant is the user who needs to fill connection details such as name, age, address, mother's name, father's name, mobile number, email id, billing address, connection address, daily consumption and seasonal peak consumption (in case of organization) etc. There could be applicants for temporary connections during construction of a building or functions or public fairs etc. which are either provided with temporary service connection or supplied by tankers. It is recommended that automated authentication be incorporated with other government documents and services such as Aadhaar, PAN, etc.

5.1.4   Consumer Type

Consumer type is the classification of W&S connections based on property use of the plot/ property. This may also be fetched from 'Use' details of the property from the property database using PID.
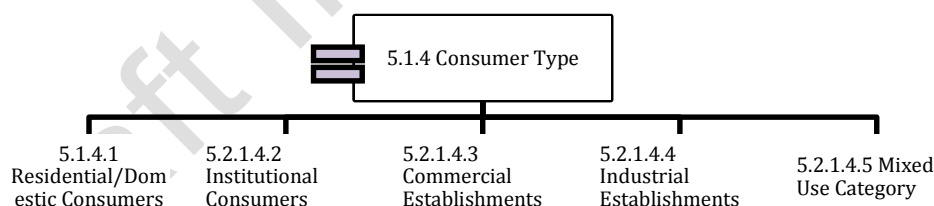

Fig. 2 Taxonomy of Consumer Type

5.1.4.1 Residential/ Domestic Consumers
Connection to such plot/property which is used purely for residential purpose (human and/or pet consumption) and include following:

1) Premises used for residence of families with kitchen facility
2) Hostels of Educational Institutions, working women's hostels

3) Govt. recognized destitute homes, orphanage homes, charitable homes, blind schools, and schools for physically challenged handicapped persons, spastic children.
4) Place of worship, cremation grounds, cemetery, etc.

5.1.4.2 Institutional Consumers

Connection to plot/property having no residential use and/or in all cases where water is used for human consumption such as research institutes, hospitals, schools, public offices, office complexes, railway stations/yards, police stations, airport, bus stand, hostels, dhobi ghats etc. and other similar activities with high footfall.

5.1.4.3 Commercial Establishments

Connection to plot/property having no residential use and/or in all cases where water is used as input either in processing or in manufacturing or intensive use of water or high footfall of public is in envisaged such as airports, bus stand, petrol pumps, hostels, restaurants, clubs, marriage halls, and other similar activities with high footfall.

5.1.4.4 Industrial Establishments

Connection to plot/property having no residential use and/or in all cases where water is used as input either in processing or in manufacturing industry like cooling plants, bottle water plants, power plants, chemical industries, factories, aerated water or ice cream factories.

5.1.4.5 Mixed Use Category

A category applicable to such premises where a part of the premises under residential use is also used for commercial purposes provided the water use is for non-intents and purposes such as house with a doctor's clinic, a lawyer's home with practice chambers, a home with a software company, a house of teacher running tuitions, a house with a ground floor groceries or sweet shop etc.

5.1.5 Connection Details

Connection details means the details of the connection which are captured/ created during the lifecycle of the application and W&S connection.
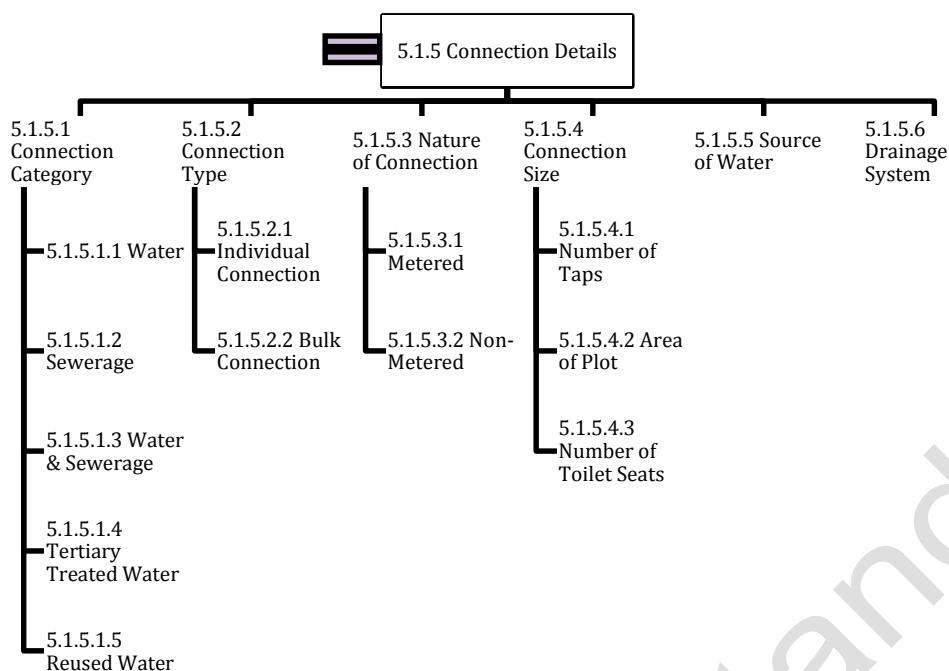
Fig. 3 Taxonomy of Connection Details

5.1.5.1 Connection Category

Connection category is the classification based on type of connection for which an applicant is applying for example, either a water connection or a sewerage connection, or both or tertiary treated water connection.

5.1.5.1.1 **Water**

Water means service requests related to water supply such as new water connection, water disconnection, user charge etc.

Water connection includes,

(i) any tank, cistern, hydrant, stand pipe, meter or tap situated on any private property and connected with a water main or pipe belonging to the Municipality; and

(ii) the water pipe connecting such tank, cistern, hydrant, stand pipe, meter or tap with such water main or pipe;

5.1.5.1.2 **Sewerage**

Sewerage means all the components of a system to collect, transport and treat sewage (including pipes, pumps, tanks etc.). In the context of W&S Knowledge Standard, Sewerage means service requests related to sewerage such as new sewer connection, sewer disconnection, etc.

5.1.5.1.3 **Water & Sewerage**

Water & Sewerage means service request related to both water & sewerage.

5.1.5.1.4   **Tertiary Treated Water**

Tertiary Treated Water means service request related to supply of tertiary treated water, its disconnection, user charges etc.

5.1.5.1.5   **Reused Water**

Reused water is the wastewater received at the treatment plant that is recycled or reused after appropriate treatment for various purposes. Here, reused water means service request related to supply of reused water, its user charges etc[1] (Ministry of Urban Development, 2009).

5.1.5.2 Connection Type

Connection type is the classification of W&S connection based on a property served by the connection.

5.1.5.2.1   **Individual Connection**

Individual connection is when one water connection is sanctioned per property with an independent house or multiple households sharing the connection.

5.1.5.2.2   **Bulk Connection**

Any connection of ferrule size of more than three-quarter of an inch (20mm) is technically called a bulk connection. In case of Co-Operative Group Housing Societies, apartments, commercial complexes having multiple units, offices/ properties, hospitals/ institutions etc. requiring high quantity of water, only a bulk connection is provided for all dwelling units/ multiple units in the same complex.

5.1.5.3 Nature of Connection

Nature of connection is the classification based on the consumption usage of connection.

5.1.5.3.1   **Metered**

In a metered connection, your water usage is measured by a mechanical or electronic meter and you are charged based on the amount of water used.

5.1.5.3.2   **Non-Metered**

In a non-metered connection, you are usually charged a flat fee, regardless of the water consumption level.

5.1.5.4 Connection Size

Connection size is the classification of connection based on size such as pipe size, number of taps, area of plot and sump capacity for which the connection is applied. Some of these parameters help in connection charge calculation while others help in regular usage charge calculation. The general connection sizes are 15mm, 20mm, 25mm, 32mm, 40mm, and 50mm

5.1.5.4.1   **Number of Taps**

Number of taps means the total number of taps for which the connection is applied.

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[1] Ministry of Urban Development. (2009). *Handbook of Service Level Benchmarking*. Retrieved from CPHEEO:
http://cpheeo.gov.in/upload/uploadfiles/files/Handbook.pdf

5.1.5.4.2 **Area of Plot**

Area of plot means the area of the plot of the property for which the connection is applied.

5.1.5.4.3 **Number of Toilet Seats**

Number of toilet seats means the total number of toilet seats in the property or an area (in case of community toilets) for which the connection is applied.

5.1.5.5 Source of Water

Source of water means the channel through which water has been supplied to the property such as bore well, tube well, or water supplying agency such as ULB, City Water Board, State Water Board, PHED or any government sanctioned agency.

5.1.5.6 Drainage System

Drainage system refers to the type of system used to collect, treat and discharge waste water from a property. Drainage systems in a property could be the sewerage system or storm water drainage system including surface systems, subsurface systems, natural slope systems or gutters. The type of drainage systems could be defined as follows,

- Natural Drainage - The inlet and outlet point of the natural drain system should be maintained with adequate size of channel for ensuring unrestricted flow of water.
- Closed drain - forms a complex network underground. The primary refuse from individual areas is collected and transported to the main network which finally goes to a treatment plant.
- Open-drain - is mostly used to collect wastewater that is not sewage.

5.1.6 Electricity Consumer ID

Electricity Consumer ID is a unique connection identifier for electricity connection of a building. A W&S Consumer ID may be linked with electricity consumer ID to fetch relevant details from the municipal electricity registry and vice versa. This linking may also be used to identify revenue leakages and assess electricity consumption.

5.1.7 Water Zone

Water Zone or 'W&S Zone' means the classification of different areas or streets into value zones for the purpose of determining the unit of measurement value of a water tariff.

5.1.8 ULB Type

Type of Urban Local Body as per the definition of MoHUA such as Nagar Panchayat, Municipal Council or Municipal Corporation[2] (Ministry of Housing and Urban Affairs, 2014).

5.1.9 Request Category

Request category is the classification of applications based on the duration of connection.

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[2] Ministry of Housing and Urban Affairs. (2014). Urban and Regional Development Plans Formulation and Implementation (URDPFI) Guidelines. Ministry of Housing and Urban Affairs.
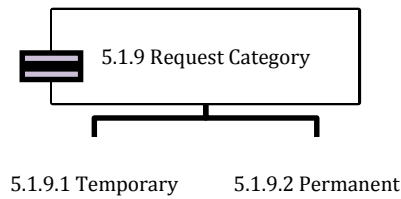
Fig. 4 Taxonomy of Request Category

5.1.9.1 Temporary

Temporary is the request category which is applied for the short duration of time i.e., less than a financial year.

5.1.9.2 Permanent

Permanent is the request category which is applied for a longer duration of time.

5.1.10 Request Type

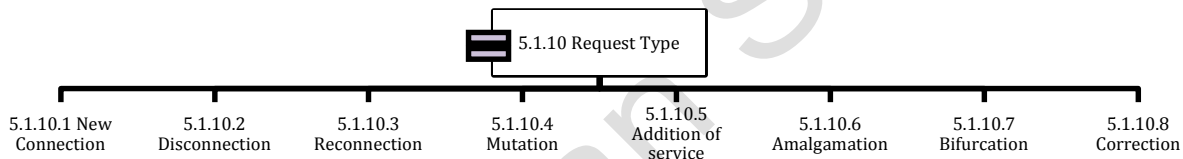Request type is the classification of application is applied based on the nature of application.

Fig. 5 Taxonomy of Request Type

5.1.10.1   New Connection

New connection means an application for registration for new water and/or sewerage connection is to be submitted with requisite documents and registration & processing fee along with applicable one-time fees.

5.1.10.2   Disconnection

The application type to permanently disconnect the water and/or sewerage connection. The disconnection of the connection has to be done in a specific time frame as per the ULB.

5.1.10.3   Reconnection

The application type to restore the previous water and/or sewerage connection. The restoration of the connection has to be done within a specific time frame as per the ULB. Citizen might use their old application ID and consumer ID in their application.

5.1.10.4   Mutation

Mutation means an application type for transfer of title of existing water and/or sewerage connection from one property owner to another.

5.1.10.5   Addition of Service

Addition of service means an application type for addition of any other service into the services provided under a consumer ID.

5.1.10.6   Amalgamation

Amalgamation means an application type for merging two or more consumer connections into a single connection.

5.1.10.7   Bifurcation

Bifurcation means an application type when one consumer connection is split into two or more connections for e.g.: two children can apply for bifurcation of a single connection belonging to the father into two separate connections.

5.1.10.8   Correction

Correction means an application type for correction of address or applicant related information or usage slabs of an existing water and/or sewerage connection.

5.1.11 Evidence

Proof of the owner details submitted during application of water and/or sewerage connection. These can be

- Address proof of the property
- ID proof of the applicant
- Aadhaar card
- Electricity bill
- Property tax receipt
- Layout Plan
- Plumber drawings
- Or any other related document

5.1.12 Meter Status

Meter status is the status of the meter as per the inspection of the meter. Billing can be different as per the meter status. ULBs may apply a specific extra charge in case of meter replacement or it is locked.
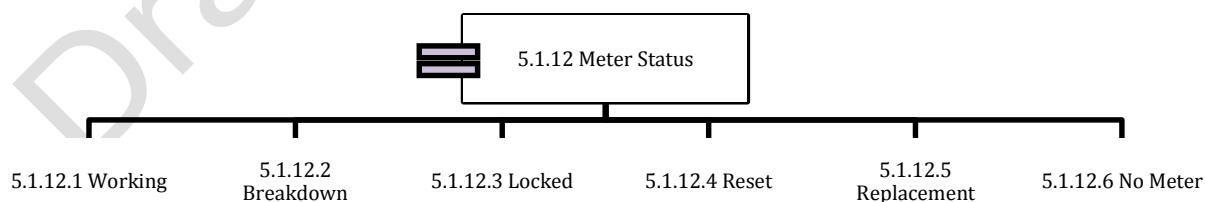

Fig. 5 Taxonomy of Meter Status

5.1.12.1   Working

It is the status applicable when the meter is working and the inspection officer is able to collect the meter reading.

5.1.12.2   Breakdown

It is the status applicable when the meter is not functional, not working, damaged, broken, tempered etc. and the inspection officer cannot collect the meter reading.

5.1.12.3   Locked

It is the status applicable when the inspection officer cannot collect the reading due to inaccessibility to meter, meter in the house or occupant not available, etc. This status covers all the scenarios when the meter is working fine but the reading cannot be taken.

5.1.12.4   Reset

It is the status assigned by the inspection officer when the max count of meters is reached.
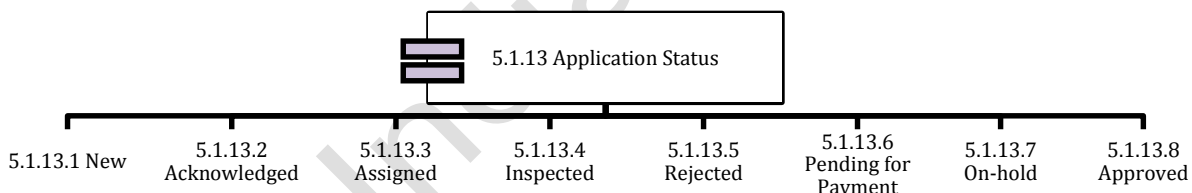
5.1.12.5   Replacement

It is the status applicable when the request for meter replacement is lodged by the citizen.

5.1.12.6   No Meter

It is the status applicable when the connection is not assigned any meter or in case of non-metered connections.

5.1.13 Application Status

This is the current status of water and/or sewerage connection applications.

Fig. 6 Taxonomy of Application Status

5.1.13.1   New

It indicates the status of a water and/or sewerage connection application, which means that a new water and/or sewerage connection application has been filed.

5.1.13.2   Acknowledged

It indicates the status of a water and/or sewerage connection application, which means that the water/sewerage connection application has been received and acknowledged by the municipal department.

5.1.13.3   Assigned

It indicates the status of water and/or sewerage connection application, which means that water and/or sewerage connection application is assigned to the inspection team and the inspection is in process.

5.1.13.4   Inspected

It indicates the status of water and/or sewerage connection application, which means that the property for which water and/or sewerage connection is applied is inspected.

5.1.13.5   Rejected

It indicates that the application for water and/or sewerage connection is rejected after inspection.

5.1.13.6   Pending for Payment

It indicates the status of water and/or sewerage connection application, which means that the water and/or sewerage connection on inspection is eligible for sanction and the customer is advised to remit the connection charges which are pending for payment.

5.1.13.7   On-hold

It indicates the status of a water and/or sewerage connection application, which means that the water and/or sewerage connection application is put on hold for a reason.

5.1.13.8   Approved

It indicates the status of water and/or sewerage connection application, which means that the water and/or sewerage connection application is approved by the ULB or respective water utility on payment of connection charges by the property owner.

5.1.14 Billing Details

These are the details of bills generated against an application ID or consumer ID.
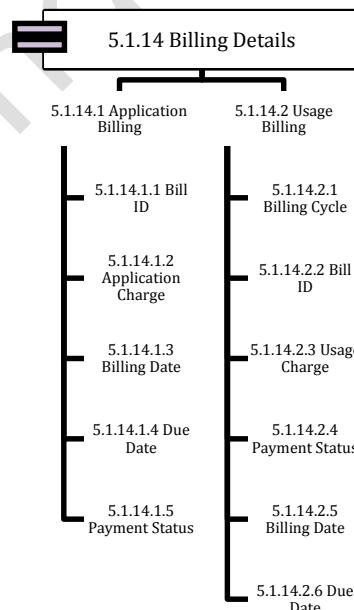
Fig. 7 Taxonomy of Billing Details

5.1.14.1   Application Billing

These are the details of payment made during the process of application for a new connection or while renewing an old connection. This includes application charge, bill id, billing date, due date and payment status.

5.1.14.1.1 **Bill ID**

Bill ID is a unique identifier that identifies an applicant's bill for accounting purposes.

5.1.14.1.2   **Application Charge**

This is the amount charged during the new application. This may include:

  a. Application fee
  b. Attachment fee
  c. Inspection charges (depending on number of visits)
  d. Sewer connection charge
  e. Connection security
  f. Road restoration charges
  g. Development charges for water & sewer
  h. Meter charge
  i. Disconnection fee

5.1.14.1.3 **Billing Date**

Billing Date is the date on which a bill is generated during the application process.

5.1.14.1.4 **Due Date**

Due Date is the date on which the bill for a particular application is due for the new application. Upon non-payment of bill by the given due date, a surcharge may be levied on the initial demand by the imposition of a penalty.

5.1.14.1.5 **Payment Status**

Payment status is the status of payment against a raised bill.

5.1.14.2   Usage Billing

These are the details of payment made during the regular billing cycle.

5.1.14.2.1 **Billing Cycle**

Billing cycle means the period for which the bill is issued. It may also be called the billing period.

5.1.14.2.2 **Bill ID**

See Clause 5.1.14.1.1.

5.1.14.2.3 **Usage Charge**

Usage charge is the amount that an applicant needs to pay in order to avail continuous water and/or sewerage service as per their usage. It may consist of:

  a. Water Consumption Charge: - Based on the volumetric consumption on monthly basis (only for water connection). This may be a fixed value for non-metered connections

b. Service Charge: - Fixed access charges as per the slabs based on the monthly consumption
c. Sewerage Charge
d. Meter Rent if meter has been installed by the ULB
e. Arrears, if any
f. Surcharge, if payment is not deposited within stipulated time
g. Other charges as specified in the bill
h. Deductions & rebates

5.1.14.2.4   Payment Status

It is the status of payment against the water and/or sewerage connection demand generated.

5.1.14.2.5   Billing Date

Usage bill billing date is the date on which a bill is generated during the billing cycle.

5.1.14.2.6   Due Date

Usage bill due date is the date on which the bill for a particular connection is due for the current billing cycle. Upon non-payment of bill by the given due date, a surcharge may be levied on the initial demand by the imposition of a penalty.

5.1.15 Payment Details

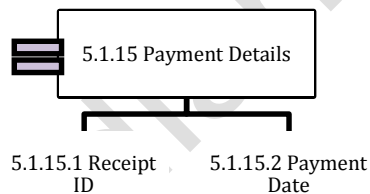These are the details of payment made by the applicant/ consumer to be captured on the accounting system.

Fig. 8 Taxonomy of Payment Details

5.1.15.1   Receipt ID

Receipt ID is a unique identifier which is generated once payment is completed and payment details are captured on the accounting system.

5.1.15.2   Payment Date

The date on which the W&S user charges (application or usage) is paid by the applicant.

5.1.16 W&S SLG Factors

These are important time factors associated with a water and/or sewerage connection application that determine the timeliness aspect of connection request against Service Level Guarantee (SLG) for that ULB. This includes time when application first registered, inspection days, SLG (Service level Guarantee), actual turnaround time, connection installation date and meter reading date.
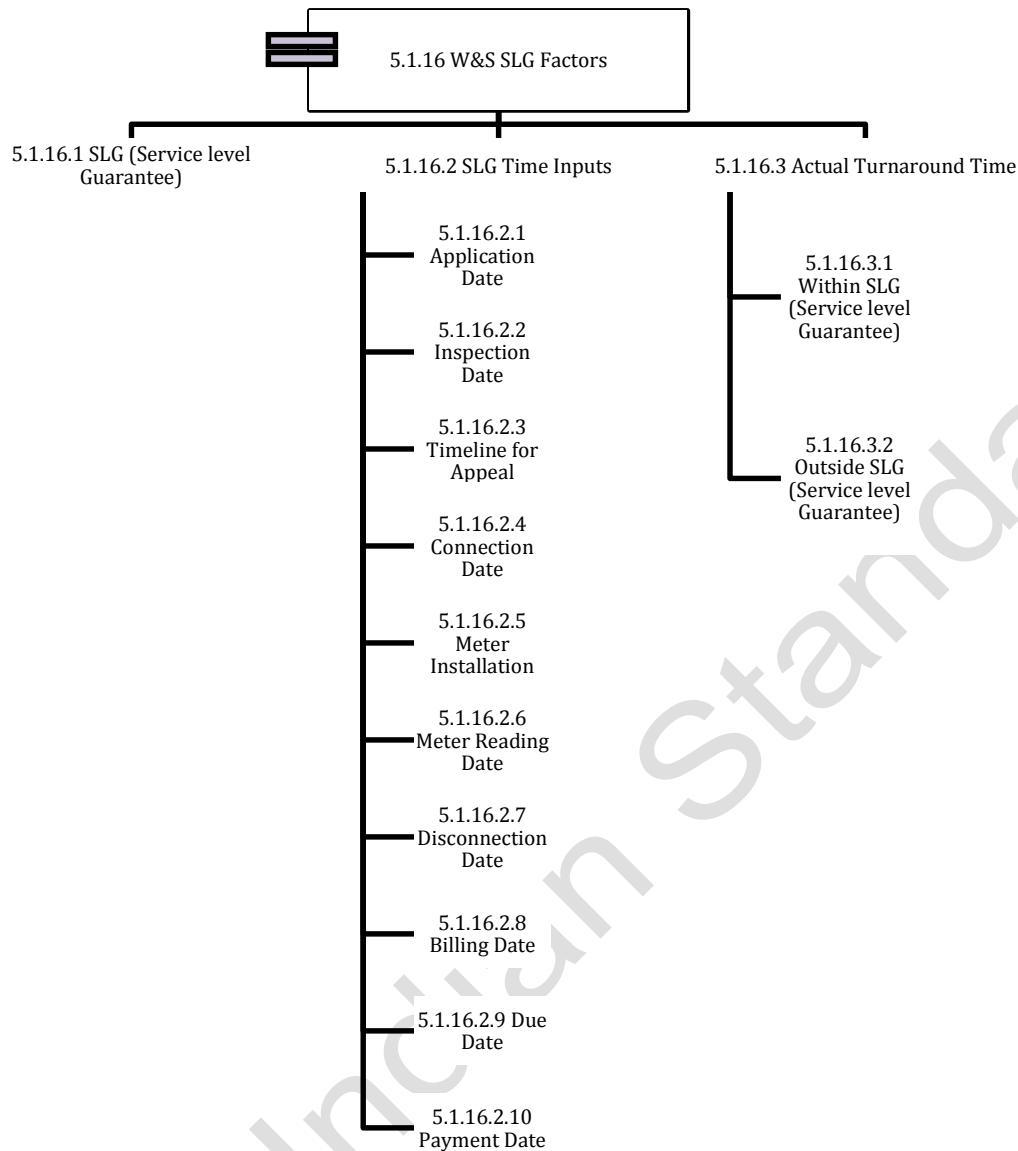
Fig. 9 Taxonomy of W&S SLG Factors

5.1.16.1   SLG (Service level Guarantee)

The maximum time that service departments are expected to take for attending W&S service requests. Also called expected compliance time set by the ULB in citizen charter or any public disclosed document for a service in which it should be issued or managed. Public sharing of a comparative picture of various SLG in the municipal corporation may ensure accountability and introduce competition to improve performance.

5.1.16.2   SLG Time Inputs

These are important dates that help capture service level compliances.

5.1.16.2.1   **Application Date**

The application date is the date on which the application is first submitted by the citizen.

5.1.16.2.2 **Inspection Date**

It is the date on which site inspection is conducted by the ULB inspector.

5.1.16.2.3 **Timeline for Appeal**

This is the timeline mentioned in an assessment notice within which an aggrieved person can appeal to the appellate authority.

5.1.16.2.4 **Connection Date**

Connection date is the date on which consumer ID is issued to the property owner by the ULBs and other government W&S service providers.

5.1.16.2.5 **Meter Installation Date**

Meter installation date is the date when a connection is approved and a meter is installed by the plumber as per the request by the ULBs and other government W&S service providers.

5.1.16.2.6 **Meter Reading Date**

Meter reading date is the date on which the meter reading is captured by the ULB or other government official as per the billing cycle.

5.1.16.2.7 **Disconnection Date**

Date and time of disconnection means recording the time at which the water and/or sewerage connection is disconnected or the service is discontinued by the ULBs and other government W&S service providers.

5.1.16.2.8 **Billing Date**

Billing date is the date on which bill is generated during the application process or during billing cycle of service usage (See Clause 5.1.14.1.3 & 5.1.14.2.5)

5.1.16.2.9 **Due Date**

Due date is the date on which the bill for a particular connection is due during the application process or for the billing cycle as part of regular usage payment. See Clause 5.1.14.1.4 and 5.1.14.2.6.

5.1.16.2.10 **Payment Date**

The date on which the W&S application fee or usage charges against a bill is paid by the applicant.

5.1.16.3 Actual Turnaround Time

Actual Turnaround Time is the actual time taken by the ULBs and other government W&S service providers for providing W&S service.

5.1.16.3.1 **Within SLG (Service level Guarantee)**

When a W&S service is provided by the ULB within the given SLG (Service Level Guarantee) i.e., without exceeding the time period defined.

5.1.16.3.2 **Outside SLG (Service level Guarantee)**

When a W&S service is provided by the ULB beyond the SLG (Service Level Guarantee) i.e., exceeding the time period defined.

5.1.17 Property ID

A property ID (PID) or property tax identification number (PTIN) or Unique Property Identification Code (UPIC) is the unique identification number allotted to a property by the ULB for the purpose of property tax records. Typically, the PID/ PTIN is generated after the first-time enumeration of the property and its verification by the ULB officials. A water/sewerage connection may link with property ID to fetch relevant details from municipal property register appropriately and vice versa as well as to identify revenue leakages.

5.2 W&S Channels

Channel / Mode / Method through which water/sewerage connection application is being registered by the citizen or information and response is shared by the ULBs.
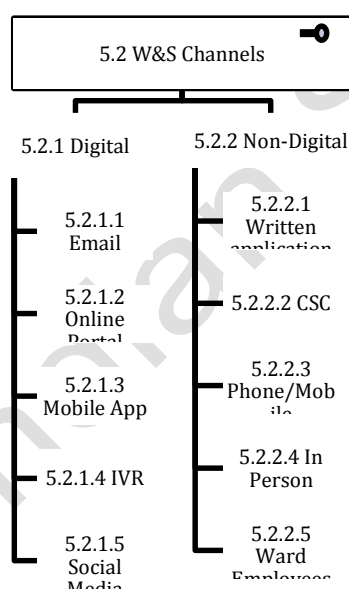
i.

ii. Fig. 10 Taxonomy of W&S Channels

5.2.1 Digital

Digital means an electronic way to collect, store, process and transmit data in the desired form. In the context of water/sewerage connection, this refers to processes and corresponding data used by the authority and the individual for water/sewerage connection which is requested or generated in digital form for the purpose of recording, allocation, assessment, follow up, and appeal.

5.2.1.1 Email
Electronic media for transfer of messages and information through the internet.

5.2.1.2 Online Portal
Web portals or web application refers to the websites developed for water/sewerage management. This broadly includes an assessment calculator, W&S data, owner's information and facility to pay the water/sewerage charge through payment gateways linked to the portals. These portals also include the websites developed by the National, State or ULB for e-governance service delivery.

5.2.1.3 Mobile App
A mobile application, also referred to as a mobile app or simply an app, is a computer program or software application designed to run on a mobile device such as a phone, tablet, or watch.

5.2.1.4 IVR
Interactive Voice Response (IVR) is a technology that allows humans to interact with a computer-operated phone system through the use of voice and DTMF tones input via a keypad. The call center operator will listen to the IVR recorded water/sewerage connection request and register the same in the system. The call center operator may contact the citizen in case information provided is insufficient or any clarification required.

5.2.1.5 Social Media
Social media are interactive technologies that allow the creation or sharing/exchange of information, ideas, interests, and other forms of expression via virtual communities and networks such as Twitter, WhatsApp, Facebook etc.

5.2.2   Non-Digital

These are other means (non-digital) by which a request for W&S is captured.

5.2.2.1 Written application
A written application refers to a channel for water and/or sewerage connection which includes an application in a prescribed Form/Format, addressed to Municipal Commissioner, requesting for new or renewal of water and/or sewerage connection.

5.2.2.2 CSC
Common Service centers are the access points for delivery of various services using Information and Communication Technology (ICT). CSCs were created under the National E-government Project by the Government of India.

5.2.2.3 Phone/Mobile
Mobile telephone, also called mobile, is a portable device for connecting to a telecommunications network in order to transmit and receive voice, video, or other data.

5.2.2.4 In Person
A person/s can walk in to the municipal office/ ward office to submit their water and/or sewerage connection application.

5.2.2.5 Ward Employees
Ward employees are the employees of municipal council or municipal authority, concerned with administrative wards of the city. In terms of water and/or sewerage connection an application can be submitted through the respective ward employees when they visit an applicant.

5.3 W&S Stakeholders

W&S stakeholders are the stakeholders involved in planning, implementation and maintenance of W&S function. Participation by all relevant stakeholders ensures sharing a common understanding and involvement in the decision-making process as well as accountability in urban governance. Participation by all stakeholders leads to empowerment and to joint ownership and harmonized access to information connecting multiple urban departments to serve citizens better.
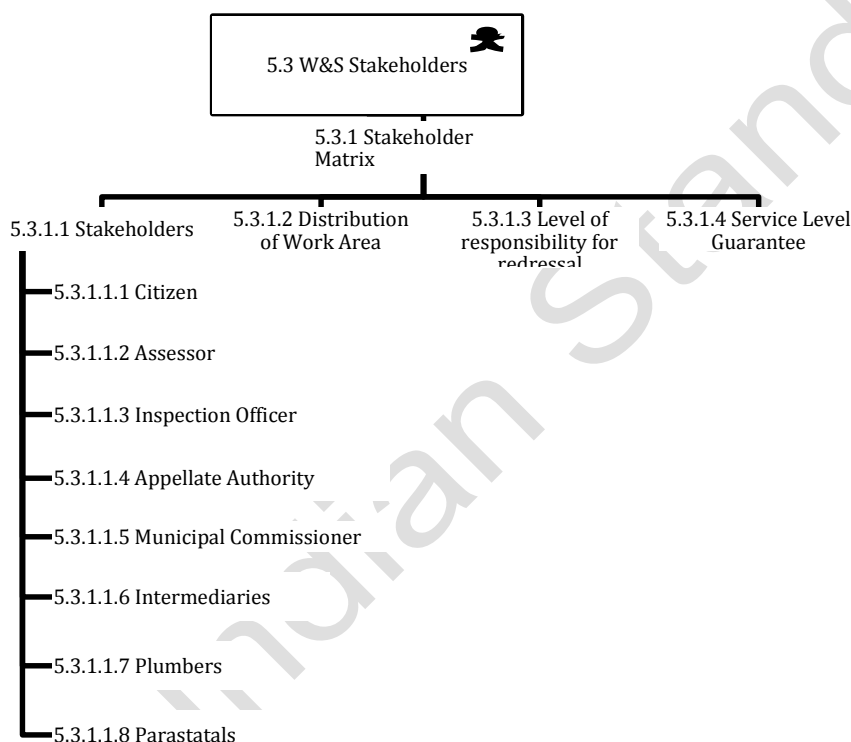

Fig. 11 Taxonomy of W&S Stakeholders

5.3.1 Stakeholder Matrix

Stakeholder matrix captures distribution of work area, level of responsibility and Service Level Guarantee of various stakeholders within the ULB and/ or contracted organizations based on ward / locality/jurisdiction, service / issue category.

5.3.1.1 Stakeholders
This refers to the types of stakeholders who are involved in a W&S system such as the citizen, assessor, inspectors, appellate authority and Municipal Commissioner.

5.3.1.1.1 **Citizen**

Citizen means the originator of the water and/or sewerage connection application who requests the service.

5.3.1.1.2 **Assessor**

An assessor is a ULB official or any other service provider (state government, utility board, parastatal) employee, who determines the value of a water/sewerage charge for revenue purposes. The figures that assessors derive are used to calculate future water/sewerage tariff rate.

5.3.1.1.3 **Inspection Officer**

Inspection officer is the ULB or any other service provider (state government, utility board, parastatal) officially assigned to inspect property with respect to conformance to the inspection checklist.

5.3.1.1.4 **Appellate Authority**

Appellate Authority is the authority or representative of the authority assigned to review the procedures and decisions or assessment of water/sewerage charge to make sure that the proceedings were fair and that the proper law/regulation are applied appropriately.

5.3.1.1.5 **Municipal Commissioner**

Commissioner of the ULB or municipal body means an officer appointed by the Government, and includes an Additional Director, a Joint Director, Deputy Director, or any other officer of the Government authorized by it to perform the functions of the Commissioner and Director of Municipal Administration.

5.3.1.1.6 **Intermediaries**

Intermediary is the individual, group of persons (Volunteers) or organizations (NGOs, Trusts etc.) who initiated the W&S request or application on the behalf of the originator who lacks the capacity to use any channels which are provided by the ULB. These Intermediaries should be registered with the ULBs in order to provide their services to the originator (who is either from marginalized section, illiterate or differently abled) and should not charge extra money from the originator.

The application submitted by the intermediaries for the originator who is capable of filling their own request will not be considered by the ULBs.

5.3.1.1.7 **Plumbers**

Plumbers means a person whose job is to put in or repair water pipes, baths, toilets, meters etc. post approval of connection requests. A list of plumbers is maintained by the ULB for day-to-day operations.

5.3.1.1.8 **Parastatals**

Parastatals are institutions/organizations, which are wholly or partially owned and managed by the government (either autonomous or quasi-governmental).

5.3.1.2 Distribution of Work Area
This refers to the water supply or sewerage zones or ward and/or sectors within ULB or any other government service provider for which each of the stakeholders are responsible for.

5.3.1.3 Level of Responsibility for Redressal
In order to ensure that applications are resolved within the prescribed time norm, escalation levels of responsibility for redressal are mapped.

5.3.1.4 Service Level Guarantee
See Clause 5.1.16.1.

5.4 W&S Processes

W&S Processes are a series of actions or steps taken in order to achieve a timely delivery of water/sewerage connections by the ULBs such as water and/or sewerage connection application creation, acknowledgement, assessment, disconnection, restoration, appellate, billing & payment, approval & allocation.
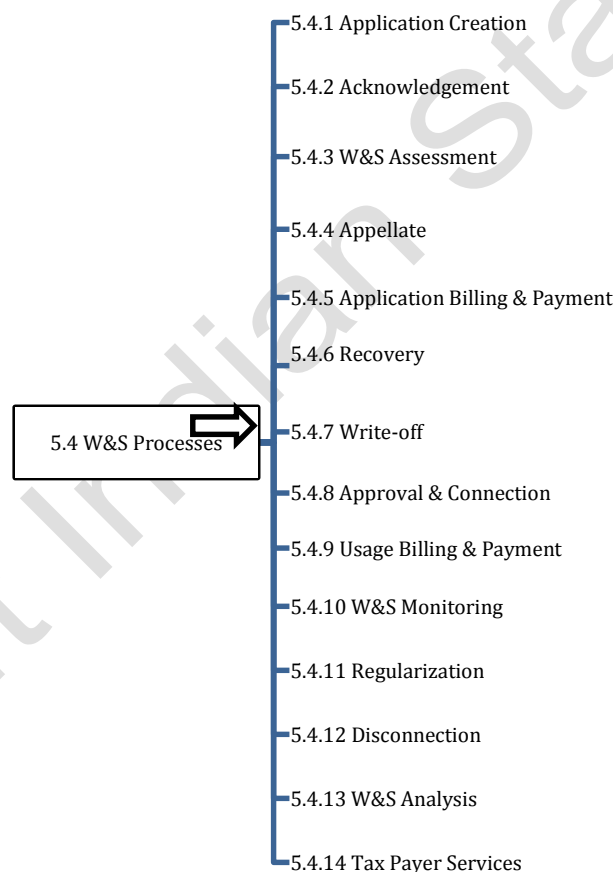

Fig. 12 Taxonomy of W&S Processes

5.4.1   Application Creation

A process by which an application is created for water and/or sewerage connection at the municipal authority such as new water and/or sewerage connection, renewal of water and/or sewerage connection or transfer of water and/or sewerage connection.
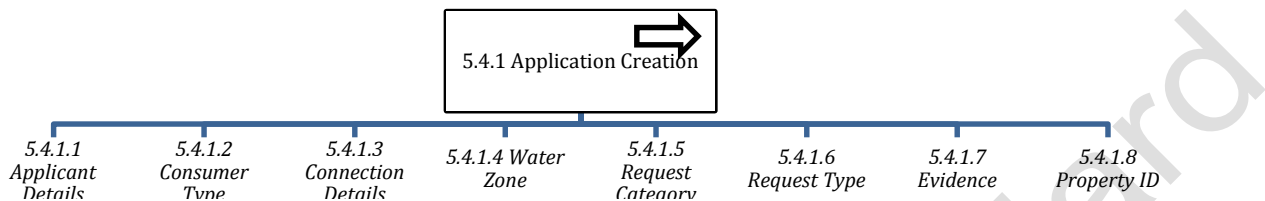

Fig. 13 Taxonomy of Application Creation

5.4.1.1 Applicant Details
See Clause 5.1.3.

5.4.1.2 Consumer Type
See Clause 5.1.4.

5.4.1.3 Connection Details
See Clause 5.1.5.

5.4.1.4 Water Zone
See Clause 5.1.7.

5.4.1.5 Request Category
See Clause 5.1.9.

5.4.1.6 Request Type
See Clause 5.1.10.

5.4.1.7 Evidence
See Clause 5.1.11.

5.4.1.8 Property ID
See Clause 5.1.17.

5.4.2   Acknowledgement

The process to acknowledge the new registration/renewal by the ULBs. An acknowledgement slips or receipt is generated post acknowledgement of the application.
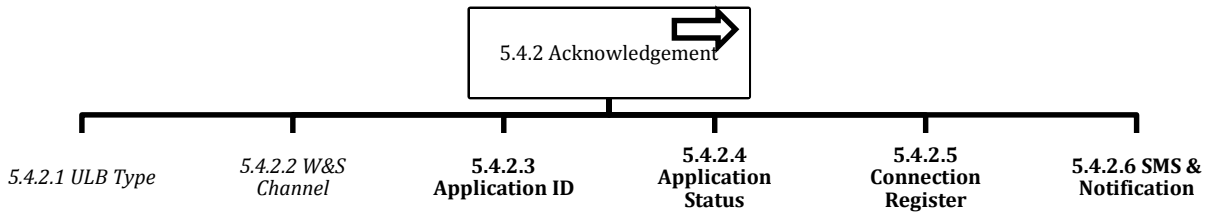
Fig. 14 Taxonomy of Acknowledgement

5.4.2.1 ULB Type
See Clause 5.1.8.

5.4.2.2 W&S Channel
See Clause 5.2.

5.4.2.3 Application ID
See Clause 5.1.2.

5.4.2.4 Application Status
See Clause 5.1.13.

5.4.2.5 Connection Register
See Clause 5.5.1.1.

5.4.2.6 SMS & Notification
These are the notifications sent to citizens informing them about the connection request being submitted on system.

5.4.3   W&S Assessment

The process by which the documents were scrutinized by the revenue/water/sewerage department with the support of other related departments.
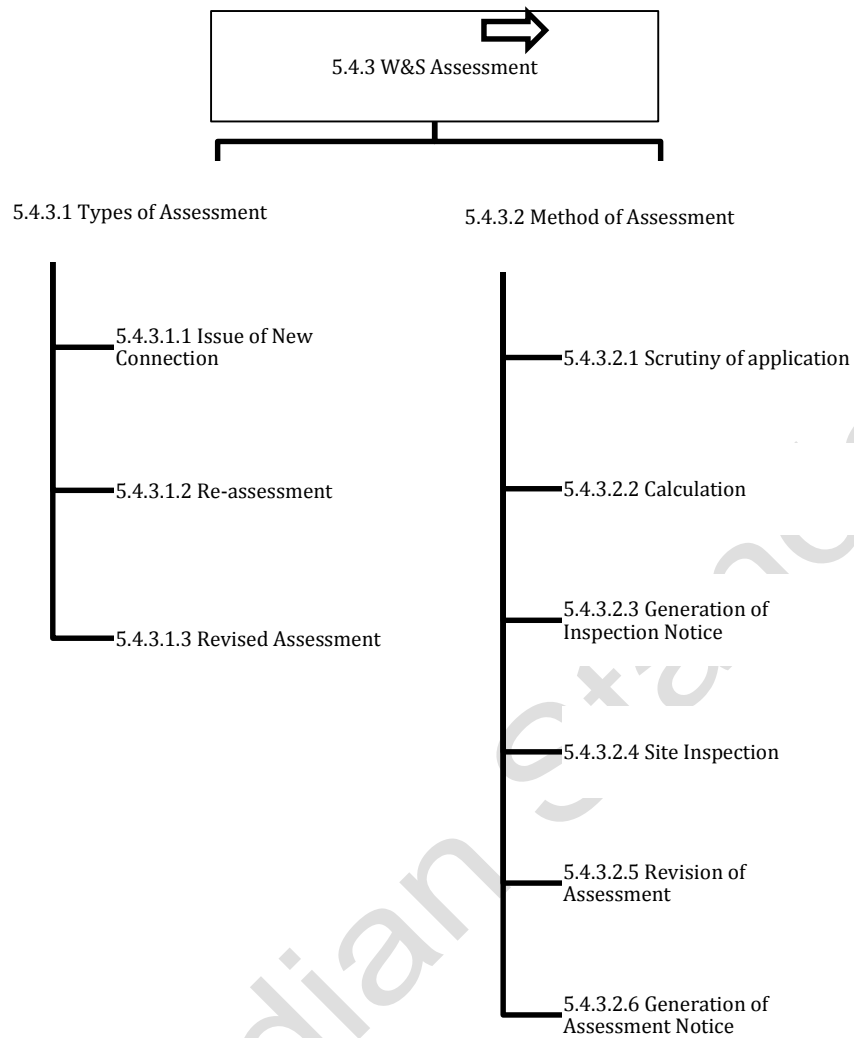
Fig. 15 Taxonomy of W&S Assessment

5.4.3.1 Types of Assessment

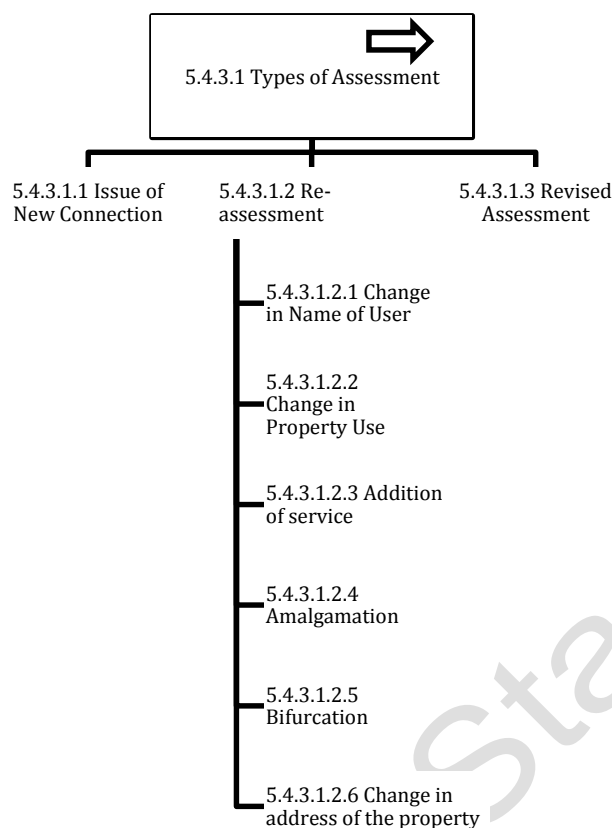Types of assessment is the classification of assessment processes undertaken to provide water and/or sewerage service.

Fig. 16 Taxonomy of Types of Assessment

5.4.3.1.1   **Issue of New Connection**
Assessment process undertaken while approving a connection for the first time.

5.4.3.1.2   **Re-assessment**
Assessment process undertaken to determine new charge based on the change in the usage of an existing connection or change in the applicant details.

5.4.3.1.2.1.   **Change in Name of User**
Assessment process undertaken during change in name of user.

5.4.3.1.2.2.   **Change in Property Use**
Assessment process undertaken during change in type of property use which is mentioned in the application.

5.4.3.1.2.3.   **Addition of Service**
Assessment process undertaken during addition of any other service.

5.4.3.1.2.4.   **Amalgamation**
Assessment process undertaken when two or more consumer connections are merged into a single connection.

5.4.3.1.2.5.   Bifurcation

Assessment process undertaken when one consumer connection is split into two or more connections.

5.4.3.1.2.6.   Change in Address of the Property

Assessment process undertaken when there is change in address of the property which is mentioned in the application.

5.4.3.1.3   Revised Assessment

Assessment process undertaken during changing the usage value for a water and/or sewerage connection based on the periodic increase in rates (based on Local acts) or based on noticed changes in the W&S factors. Revised assessment may also take place after appellate decision to change the W&S usage amount.

5.4.3.2 Method of Assessment

This means different methods undertaken by the assessor to assess the water and/or sewerage connection application based on W&S factors.
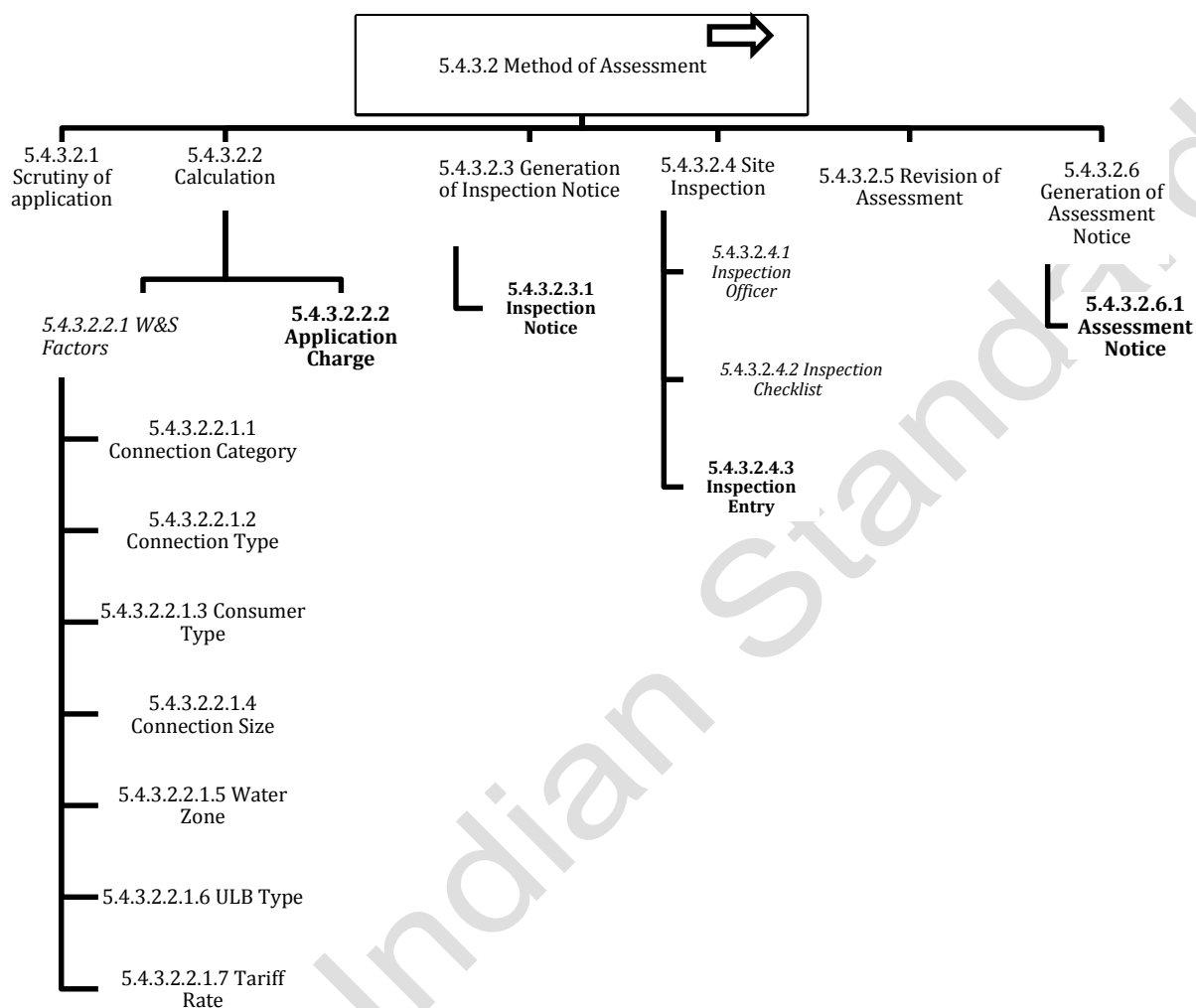
Fig. 17 Taxonomy of Method of Assessment

5.4.3.2.1   **Scrutiny of Application**

It is the assessment conducted on the application as soon as it is been applied by the citizen and the scrutiny is conducted by the assessing officer. During the initial assessment, scrutiny of documents may be done by the ULB officials and appropriate inspection fees, application charge and inspection notice are generated.

5.4.3.2.2   **Calculation**

Calculation is the process of calculating the fees for applied connection based on the specified criteria as mention in their Municipal Act or as decided by the Municipal Commissioner for water

and/or sewerage connection requests. W&S calculation process comprises the use of any one or combination of methods using various W&S factors such as connection type, connection size, connection category etc.

5.4.3.2.2.1. W&S Factors
These are the factors associated with a water and/or sewerage connection and used in W&S assessment for calculation of application charge amount.

5.4.3.2.2.1.1. Connection Category
See Clause 5.1.5.1.

5.4.3.2.2.1.2. Connection Type
See Clause 5.1.5.2.

5.4.3.2.2.1.3. Consumer Type
See Clause 5.1.4.

5.4.3.2.2.1.4. Connection Size
See Clause 5.1.5.4.

5.4.3.2.2.1.5. Water Zone
See Clause 5.1.6.

5.4.3.2.2.1.6. ULB type
See Clause 5.1.8.

5.4.3.2.2.1.7. Tariff Rate
Tariff rate is the per unit charge determined for the water and/or sewerage connection. It is one of the factors that determine water and/or sewerage bills.

5.4.3.2.2.2. Application Charge
See Clause 5.1.14.1.2.

5.4.3.2.3 Generation of Inspection Notice
This is the process in which Inspection notices are generated and shared with citizens.

5.4.3.2.3.1. Inspection Notice
Inspection notice is the notice served to the citizen notifying them about the planned time of inspection-by-inspection officer.

5.4.3.2.4 Site Inspection
It is the ground inspection conducted post initial assessment, an ULB Inspector (water or sewerage inspector) is assigned to verify the application.

5.4.3.2.4.1. Inspection Officer
See Clause 5.3.1.1.3.

5.4.3.2.4.2.   Inspection Checklist

Inspection checklist is used by ULB inspectors or any other service provider (state government, utility board, parastatal) to check conformance to relevant rules, safety measures and guidelines, any illegal activity, etc.

5.4.3.2.4.3.   Inspection Entry

It means reporting the details of inspection post ground inspection by the inspector such as inspection time, details, notes etc.

5.4.3.2.5   **Revision of Assessment**

Revised assessment notice is the notice served to the citizen indicating the revised usage value of water and/or sewerage connection assessed on the basis of the actual ground inspection. Thereafter a revised assessment notice is shared with the citizen.

5.4.3.2.6   **Generation of Assessment Notice**

This is the process in which assessment notice is generated and shared with citizens.

5.4.3.2.6.1.   Assessment Notice

Assessment notice is the notice served to the citizen indicating the application charge value of water and/or sewerage connection post inspection of property. This notice is not considered as the final bill. The assessment notice is the interim notice to confirm the charges of the water and/or sewerage connection.

5.4.4   Appellate

Appellate is the process followed after the assessment are presented and the citizen is aggrieved by the fixation or the charging of the water and/or sewerage charge. The appeal process is initiated with a simple appeal letter or through grievance redressal application.
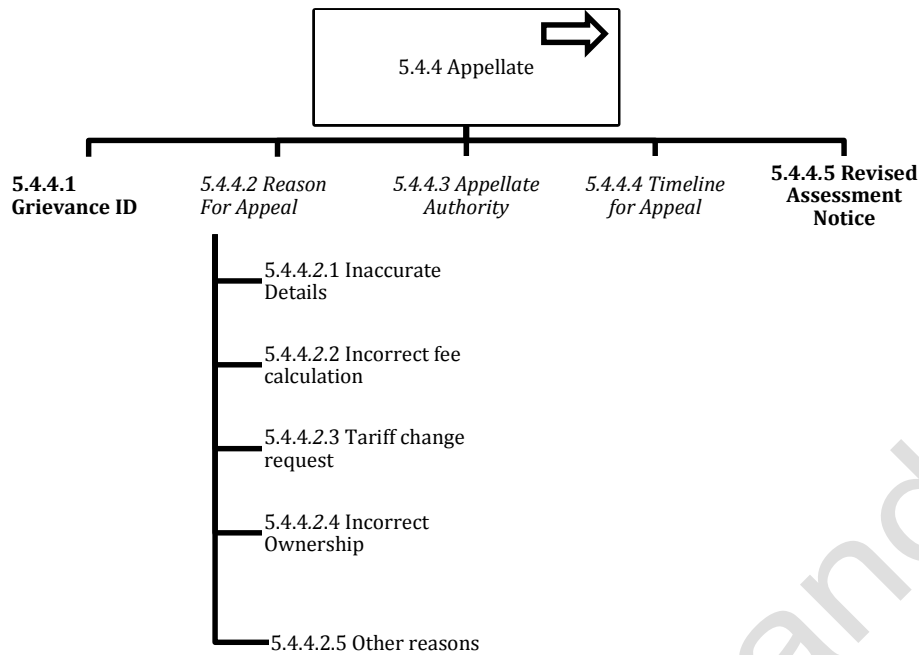
Fig. 18 Taxonomy of Appellate

5.4.4.1 Grievance ID
Grievance ID is a unique identification number allotted to the grievance by the ULB for the purpose of grievance recording, allocation, assessment, follow up, and appeal.

5.4.4.2 Reasons for Appeal
Reason for appeal is the reasons as captured in assessment notice or usage bill because of which an aggrieved person appeals to the appellate authority for necessary redressal.

5.4.4.2.1   **Inaccurate Details**

This means the aggrieved person has appealed given the reason for inaccurate details such as incorrect name, owner name, incorrect address in an assessment notice.

5.4.4.2.2   **Incorrect Fee Calculation**

This means the aggrieved person has appealed given the reason for incorrect charge calculation in an assessment notice.

5.4.4.2.3   **Tariff Change Request**

This means the request to change the tariff if the tariff mentioned in the usage bill is different from the tariff published or applicable by the citizen.

5.4.4.2.4   **Incorrect Ownership**

This means the aggrieved person has appealed given the reason for incorrect ownership in an assessment notice.

5.4.4.2.5   **Other Reasons**

This means the aggrieved person has appealed given any other reason as per the assessment notice.

5.4.4.3 Appellate Authority

Appellate Authority is the authority or representative of the authority assigned to review the procedures and decisions or assessment of W&S to make sure that the proceedings were fair and law/ regulation are applied appropriately.

5.4.4.4 Timeline for Appeal

See Clause 5.1.16.2.3.

5.4.4.5 Revised Assessment Notice

Revised assessment notice is the notice served to the citizen indicating the revised usage value of water and/or sewerage connection assessed on the basis of the revised assessment.

5.4.5 Application Billing & Payment

Application Billing & Payment is the process of generating bill (demand) against the calculated W&S application charge by the ULB and subsequent payment of the same by the citizen.
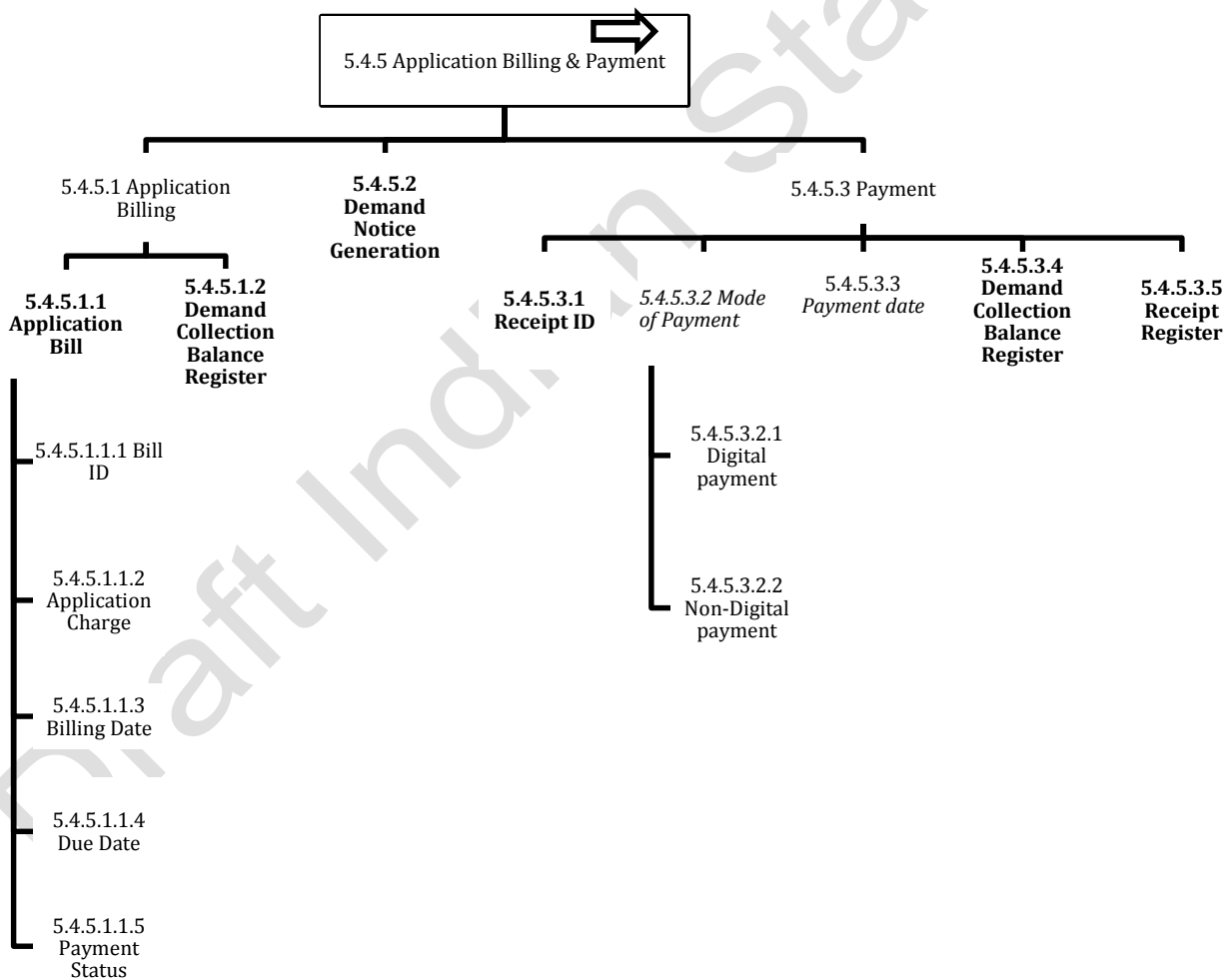
Fig. 19 Taxonomy of Application Billing & Payment

5.4.5.1 Application Billing
The process by which a connection fee bill is generated before scrutiny of application.

5.4.5.1.1 Application Bill

It is the initial bill generated for the application/connection for the applied water and/or sewerage connection. Application bill constitutes of application processing fee and inspection fee amount.

5.4.5.1.1.1. Bill ID
See Clause 5.1.14.1.1.

5.4.5.1.1.2. Application Charge
See Clause 5.1.14.1.2.

5.4.5.1.1.3. Billing Date
See Clause 5.1.14.1.3.

5.4.5.1.1.4. Due Date
See Clause 5.1.14.1.4.

5.4.5.1.1.5. Payment Status
See Clause 5.1.14.1.5.

5.4.5.1.2 Demand Collection Balance Register

See Clause 5.5.1.3.

5.4.5.2 Demand Notice Generation
This is the process in which a bill (demand) is generated and served to the citizen.

5.4.5.3 Payment
Payment is the voluntary tender of money or its equivalent paid by the citizen against the bill generated.

5.4.5.3.1 Receipt ID

See Clause 5.1.15.1.

5.4.5.3.2 Mode of Payment

It means mode of payment of bill amount by the citizen.

5.4.5.3.2.1. Digital Payment
A digital payment occurs when the payment for processing the application and water and/or sewerage charge could be done via digital and electronic medium, such as using debit card, credit card, payment gateway etc.

5.4.5.3.2.2. Non-Digital Payment
Non-digital payment refers to the mode of payment of money in physical form like cash, demand draft, cheque etc.

5.4.5.3.3 **Payment Date**
See Clause 5.1.15.2.

5.4.5.3.4 **Demand Collection Balance Register**
See Clause 5.5.1.3.

5.4.5.3.5 **Receipt Register**
See Clause 5.5.1.2.

5.4.6 Recovery

Recovery means, recovery of charge from the citizen or defaulters. In some cases, recovery may be in terms of impounding any movable or immovable asset of the defaulter. Few methods of recovery in water and/or sewerage are:

a)   by presenting a bill
b)   by serving a written notice of demand
c)   by a suit
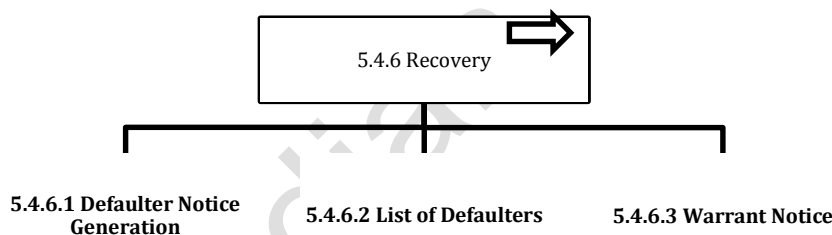
Fig. 20 Taxonomy of Recovery

5.4.6.1 Defaulters Notice Generation
This means generation and service of notice to the defaulters who have not paid the bill by the due date. In these cases, bills are amended to include penalties or late fee for defaulting.

5.4.6.2 List of Defaulters
See Clause 5.5.1.4.

5.4.6.3 Warrant Notice
Warrant notice is the repeat bill that is served by the authority on the service seeker for recovery.

5.4.7 Write-off

Write-Off of water/sewerage charge is the process of deductions or exemptions of charge, in compliance with any law, or through the guidelines of the ULB or the court of law.

5.4.8   Approval and Connection

The process of approving the applied application for water and/or sewerage connection post assessment and inspection and allocation of connection by the municipal commissioner of the ULBs.

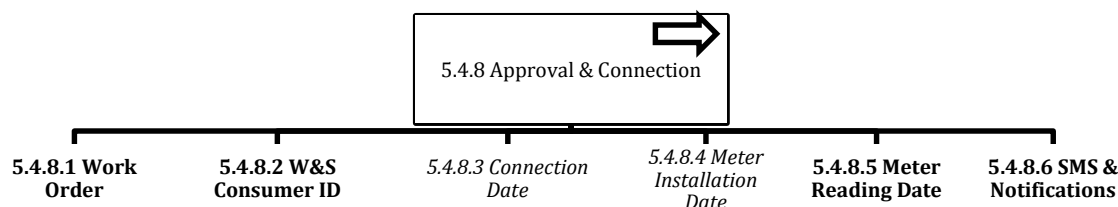Fig. 21 Taxonomy of Approval & Connection

5.4.8.1 Work Order

A work order is a document describing an authorized task to be completed by a field service, maintenance, or inspection worker. Work orders provide basic information such as a description of the task, the estimated completion date, and the name of the individual assigned to the task. A work order for installation of meter is intimated post approval of water and/or sewerage connection request. It is recommended that the work order should be digitally or manually signed by the relevant ULB officer such as Commissioner or Deputy Commissioner etc. along with water marked with ULB or relevant logo as per the ULB rules and/or regulations. It is also recommended to add digitally signed work orders into DigiLocker to make it easier to access and integrate with other services.

5.4.8.2   W&S Consumer ID
See Clause 5.1.1.

5.4.8.3 Connection Date
See Clause 5.1.16.2.4.

5.4.8.4 Meter Installation date
See Clause 5.1.16.2.5.

5.4.8.5 Meter Reading Date
See Clause 5.1.16.2.6.

5.4.8.6 SMS & Notifications
See Clause 5.4.2.6.

5.4.9   Usage Billing & Payment

Application Billing & Payment is the process of generating bill (demand) against the calculated W&S application charge by the ULB and subsequent payment of the same by the citizen.
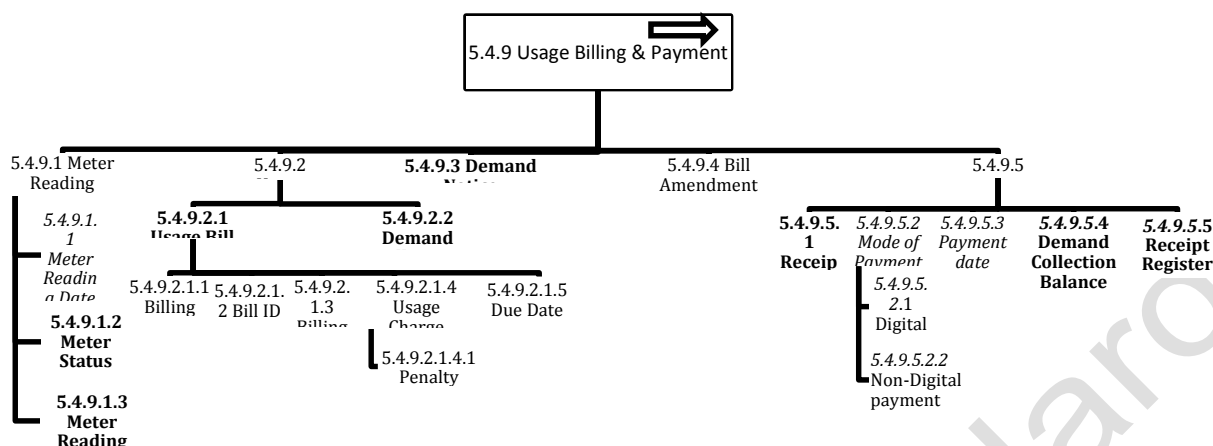
Fig. 22 Taxonomy of Usage Billing & Payment

5.4.9.1 Meter Reading

Meter reading means the reading taken by the ULB inspector during their inspections as per the billing cycle. The reading is taken from the meters at the billing address. This may be skipped for non-metered connections.

5.4.9.1.1 **Meter Reading Date**

See Clause 5.1.16.2.6.

5.4.9.1.2 **Meter Status**

See Clause 5.1.11.

5.4.9.1.3 **Meter Reading Report**

See Clause 5.5.1.6.

5.4.9.2 Usage Billing

The process by which a usage bill is generated based on water and/or sewerage usage post.

5.4.9.2.1 **Usage Bill**

It means the final bill generated in reference to water and/or sewerage connection based on the usage value for the connection.

Sewerage charge for own water source such as borewell, tube wells is calculated based on average discharge (which is calculated based on HP of Motor, Average number of hours the motor is running. Also, the sewerage charge for metered connection is based on the meter status and water usage or as may be defined in specific rules and regulations by the ULBs.

5.4.9.2.1.1. Billing Cycle
See Clause 5.1.14.2.1.

5.4.9.2.1.2. Bill ID
See Clause 5.1.14.1.1.

5.4.9.2.1.3. Billing Date
See Clause 5.1.14.2.5.

5.4.9.2.1.4. Usage Charge
See Clause 5.1.14.2.3.

5.4.9.2.1.4.1. Penalty
The amount of extra money the citizen has to pay for failing to adhere to water & sewerage rules and/or/laws, timelines. For e.g.: Misuse of water resources or wastage of water, polluting the sewerage channels such as drains. The challans can be generated at the time of billing or on spot during inspection.

5.4.9.2.1.5. Due Date
See Clause 5.1.14.2.6.

5.4.9.2.2 Demand Collection Balance Register
See Clause 5.5.1.3.

5.4.9.3 Demand Notice Generation
See Clause 5.4.5.2.

5.4.9.4 Bill Amendment
Bill amendment is the process of amending connection user bill when applicant notices a discrepancy in the calculation of the bill and submits a request for amendment or when the ULB realizes discrepancy in the calculation of bill and amends it. There can be following reasons for bill amendments,

b) Court Case Settlement
c) Arrear Write-off
d) DCB Correction
e) One Time settlement
f) Use of Rainwater Harvesting

5.4.9.5 Payment
See Clause 5.4.5.3.

5.4.9.5.1 Receipt ID
See Clause 5.4.5.3.1.

5.4.9.5.2 Mode of Payment
See Clause 5.4.5.3.2.

5.4.9.5.2.1.   Digital Payment

See Clause 5.4.5.3.2.1.

5.4.9.5.2.2.   Non-Digital Payment

See Clause 5.4.5.3.2.2.

5.4.9.5.3   **Payment Date**

See Clause 5.1.16.2.10.

5.4.9.5.4   **Demand Collection Balance Register**

See Clause 5.5.1.3.

5.4.9.5.5   **Receipt Register**

See Clause 5.5.1.2.

5.4.10 W&S Monitoring

W&S monitoring is the monitoring process undertaken by the ULB officials from the time a water and/or sewerage connection request application is lodged on system until it's approved and remains valid. The water and/or sewerage charge and associated revenue are monitored based on purpose of water and/or sewerage, Service Level Benchmarks, regulation purpose and need for renewal.
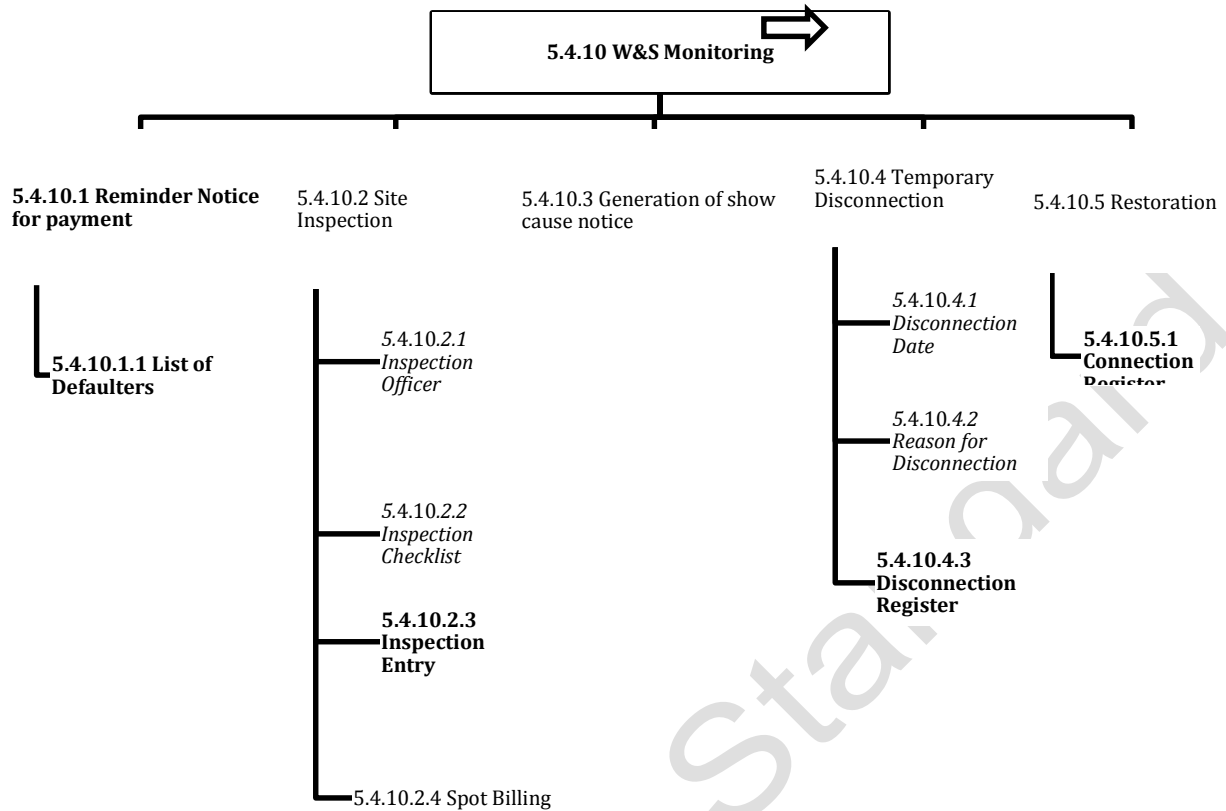
Fig. 23 Taxonomy of W&S Monitoring

5.4.10.1   Reminder Notice for payment
The process of issuing a notice for renewal by the ULBs to the applicant for payment of overdue water/sewerage bills. The notice may be issued via SMS, Email, or by sending physical letter to the citizen.

5.4.10.1.1 **List of Defaulters**
See Clause 5.5.1.4.

5.4.10.2   Site Inspection
Site Inspection is the process by the ULB officials to check that the connection is not illegal and is as per the relevant rules, safety measures and guidelines. This form of inspection may occur whenever the ULB find suitable. Show Cause Notice can be issued to following citizen if citizen violates the rules or if a complaint is raised against it.

5.4.10.2.1 **Inspection Officer**
See Clause 5.3.1.1.3.

5.4.10.2.2 **Inspection Checklist**

See Clause 5.4.3.2.4.2.

5.4.10.2.3 **Inspection Entry**

See Clause 5.4.3.2.3.1.

5.4.10.2.4 **Spot Billing**

Spot Billing is done for taking penalty against non-compliance during inspection. Similar bill is generated with its bill ID, bill date and bill amount. This only goes under Miscellaneous Receipts of Receipt Register in ULB Accounts and not in DCB Register. The spot billings can be associated with Meter Status (Section 5.1.11) or/and Penalty (Section 5.4.9.2.1.4.1).

5.4.10.3 Generation of Show Cause Notice

The process of issuing a show cause notice to trade owners who have offended any rule and/or regulations as per the ULB. The notice is served to give an opportunity to defend the charges made against the consumer by explanations and reasons in writing and/or by personal hearing. If the offender justified the charges/actions then the charges will be dropped. Connections of consumer who fail to justify the charges will be suspended by the ULB.

5.4.10.4 Temporary Disconnection

The process by which a water and/or sewerage connection is disconnected for the short period of time as per the rule /law by the ULB or as requested by the citizen. The temporary disconnection can be restored post clearing the reason for disconnection.

5.4.10.4.1 **Disconnection Date**

Time of disconnection means recording the time at which the water and/or sewerage connection is disconnected or the service is discontinued.

5.4.10.4.2 **Reason for Disconnection**

This means recording the reason for which the water and/or sewerage connection is disconnected by the ULB or other water service providers.

5.4.10.4.3 **Disconnection Register**

See Clause 5.5.1.9.

5.4.10.5 Restoration

The process by which a disconnected water and/or sewerage connection is restored.

5.4.10.5.1 **Connection Register**

See Clause 5.5.1.1.

5.4.11 Regularization

The process by which an unauthorized connection can be regularized, subject to the technical legal feasibility and a payment of following charges: -

a) Penalty
b) Average User Charges for the respective Category for the past three years.

c) Water/ Sewerage Development Charges, as applicable.

d) Usual initial charges such as opening fee, advance and Road Restoration Charges, dues on property etc.
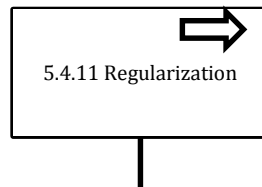
5.4.11.1 Connection Register

Fig. 24 Taxonomy of Regularization

5.4.11.1   Connection Register
See Clause 5.5.1.1.

5.4.12 Disconnection

The process of disconnection the water and/or sewerage connection for the citizen. The disconnection of the water and/or sewerage connection is done when there is no satisfactory response received from the citizen for which show-cause notice was issued.
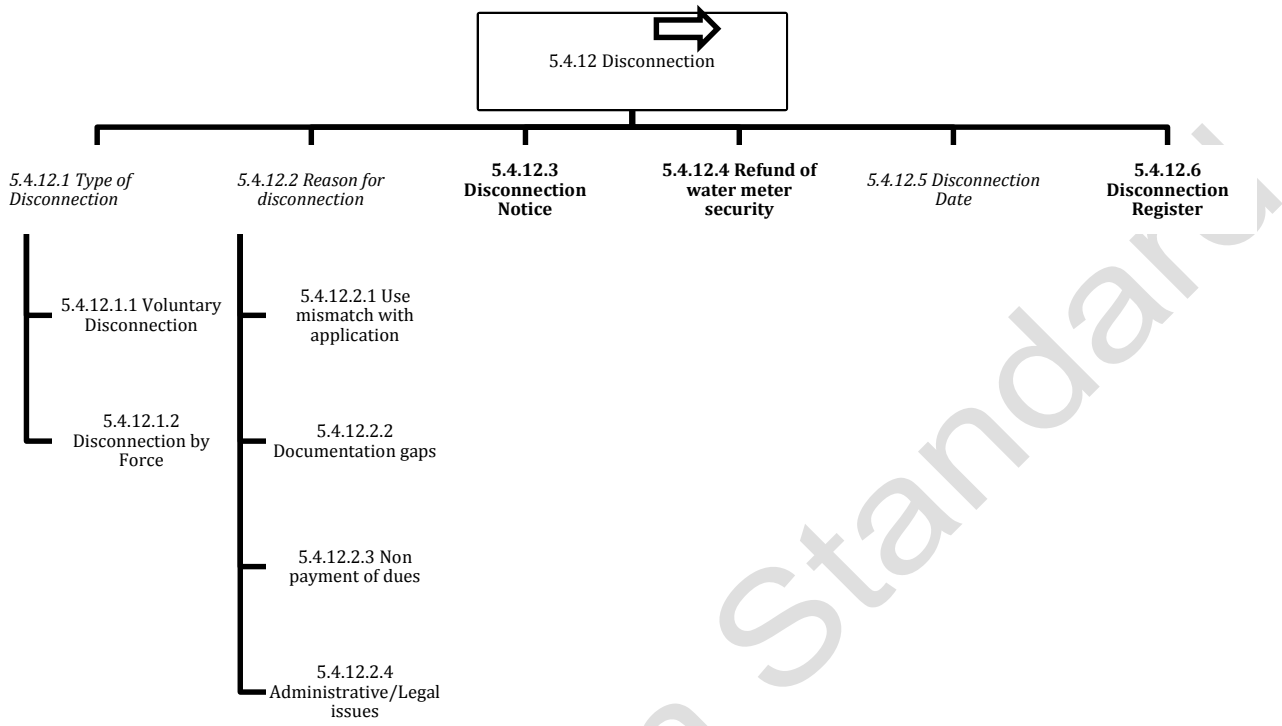
Fig. 25 Taxonomy of Disconnection

5.4.12.1   Type of Disconnection

Type of disconnection captures classification of disconnection such as voluntary cancellation or cancellation by force.

5.4.12.1.1 **Voluntary Disconnection**

This means disconnection of water and/or sewerage connection by the citizen.

5.4.12.1.2   **Disconnection by Force**

This means disconnection of water and/or sewerage connection by force by giving reason for disconnection such as non-payment, legal issues, documentation gaps, or any other reason.

5.4.12.2   Reason for disconnection

See Clause 5.4.10.4.2.

5.4.12.2.1 **Use Mismatch with Application**

ULB may disconnect the connection if the use of the property mentioned in application didn't match the use of the property during site inspection.

5.4.12.2.2 **Documentation Gaps**

ULB may disconnect the connection if there are any documentation gaps in the application submitted post show cause notice.

5.4.12.2.3 **Non-Payment of Dues**

ULB may disconnect the connection if there are any dues pending as per the bills generated post show cause notice.

5.4.12.2.4 **Administrative/Legal Issues**

ULB may disconnect the connection if there are any administrative/legal issues.

5.4.12.3   Disconnection Notice

Disconnection notice is issued to defaulters who have not paid the W&S charges within the given time limit mentioned in the defaulter notice. The notice has information about date from which the connection will be disconnected.

5.4.12.4   Refund of Water Meter Security

This means the request to refund the meter security deposit post disconnection by the citizen.

5.4.12.5   Disconnection Date

See Clause 5.1.16.2.7.

5.4.12.6   Disconnection Register

See Clause 5.5.1.9.

5.4.13 W&S Analysis

W&S analysis is the process through which all water and/or sewerage connection requests are analyzed to check quality of service and become aware of (and eventually rectify) any deficiency in services. This helps in improving the efficiency, accountability, responsiveness and transparency of a ULB, ultimately leading to improvement in service delivery.
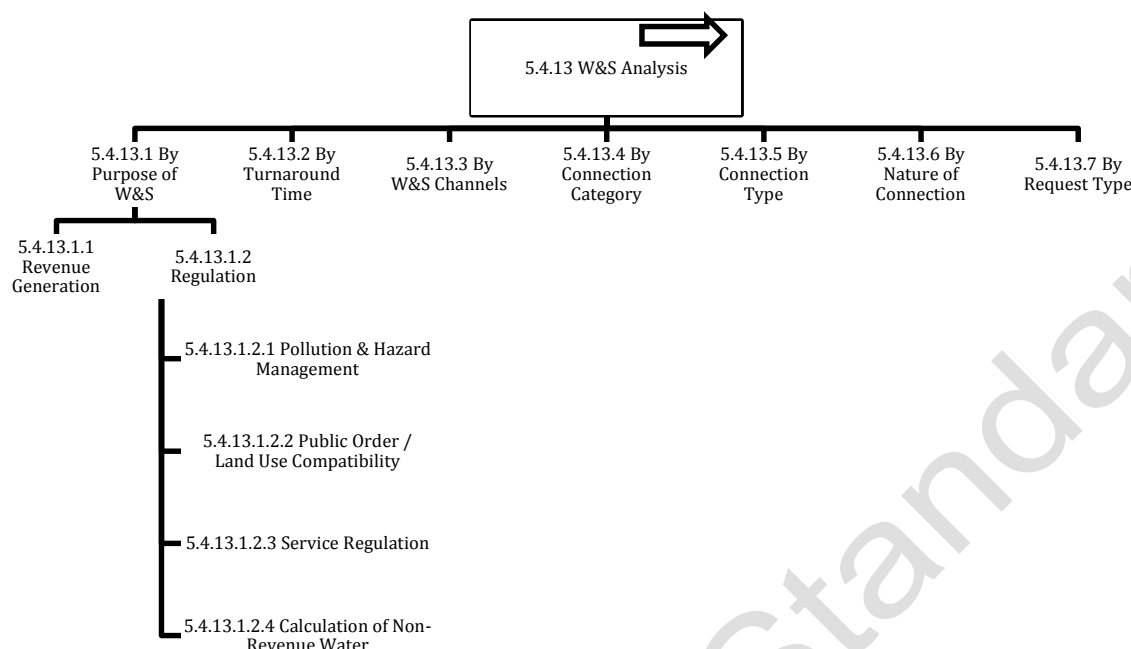
Fig. 26 Taxonomy of W&S Analysis

5.4.13.1   By Purpose of W&S

This means analysis of W&S connection requests based on the aim or intention of issuing connections by the ULBs for e.g., Revenue Generation, Regulation and Service Regulation.

5.4.13.1.1 **Revenue Generation**

ULBs generate revenue through various sources such as trade license, building plan/license approval fees, rent from shops/markets/commercial establishments, water charges, parking fee, cable laying charges etc. to provide timely services and basic infrastructure. Water and sewerage charges is one of the key sources of revenue generation for the ULB and monitoring user charges from W&S helps ULBs in improving its self-sufficiency.

5.4.13.1.2 **Regulation**

Regulation is the management of offensive and dangerous practices by the ULBs

5.4.13.1.2.1. **Pollution & Hazard Management**

Regulating water and sewerage related pollution and hazard management by conducting timely inspections. There are many approaches that could be adopted in water and sewerage pollution control and management. It could be through prevention, practice efforts or join a project/program; Regulation and monitoring or engaging in control measures by reducing or minimizing waste.

Prevention of overflow, contamination, dispose of waste, use of chemicals, wastage of water, etc. This analysis is done by mapping inspection entries and grievances with W&S maps.

5.4.13.1.2.2.   Public Order / Land Use Compatibility

Regulation and enforcement as per public order and land use defined by the rule of law. This analysis may be done by mapping W&S connections with different land use cartogram maps.

5.4.13.1.2.3.   Service Regulation

Regulation of service as per the rule or law of the ULB. This analysis is done by checking ULB performance against different SLB criteria.

5.4.13.1.2.4.   Calculation of Unaccounted for Water

Unaccounted-for Water (UFW) is the difference between the quantity of water supplied to a city's network and the metered quantity of water used by the customers. UFW has two components: (a) physical losses due to leakage from pipes, and (b) administrative losses due to illegal connections and under registration of water meters. While every case is different, often both components contribute roughly equally to UFW[3] (The World Bank Group, 2022).

5.4.13.2   By Turnaround Time
See Clause 5.1.16.3.

5.4.13.3   By W&S Channels
See Clause 5.2.

5.4.13.4   By Connection Category
See Clause 5.1.5.1.

5.4.13.5   By Connection Type
See Clause 5.1.5.2.

5.4.13.6   By Nature of Connection
See Clause 5.1.5.3.

5.4.13.7   By Request Type
See Clause 5.1.10.

5.4.14   Taxpayer Services

These are the services availed to all tax payers in a municipality. In the context of water/sewerage service, these are grievance redressal, no due certificate, NOCs, duplicate bills, extension of temp connections, change of defective meter, tariff change request, refund of water meter security, transfer of connection and apply for property creation.

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[3] The World Bank Group. (2022). *The World Bank*. Retrieved from Unaccounted for Water:
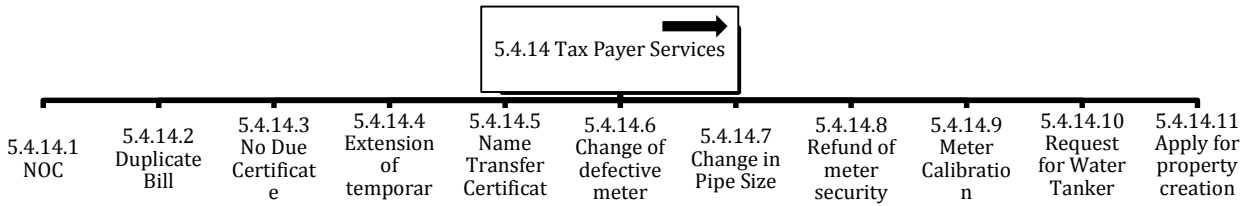http://web.worldbank.org/archive/website00857/WEB/OTHER/6C586003.HTM?OpenDocument

Fig. 27 Taxpayer Services

5.4.14.1   NOC
No Objection Certificate (NOC) is a legal document, issued by the ULB or an individual to say that they have no objection to the mentioned details in the document. Following NOCs may be needed for water and/or sewerage connection:

        a)   NOC from finance department
        b)   NOC from landlord
        c)   NOC from property tax department

5.4.14.2   Duplicate Bill
These are duplicate copies of W&S bills that an applicant can ask for.

5.4.14.3   No Due Certificate
This certificate is issued to the consumers who have duly paid their charges for the W&S connection.

5.4.14.4   Extension of Temporary Connection
This is a request to extend the temporary connection, which was approved and is working by the citizens.

5.4.14.5   Name Transfer Certificate
The name transfer certificate is authorized confirmation provided by the ULBs to the consumer on change of ownership from old owner to new owner.

5.4.14.6   Change of Defective Meter
This means the request to change the meter if the meter installed is defective by the citizen.

5.4.14.7   Change in Pipe Size
This means to request the change in installed pipe size if the water pressure is not as per the requirement.

5.4.14.8   Refund of Meter Security
See Clause 5.4.12.4.

5.4.14.9   Meter Calibration
Meter Calibration means the act of checking or adjusting (by comparison with the BIS standard for Water Meter Specifications) the accuracy of a meter. This means to request the ULBs for meter calibration if it is not as per the BIS Standards.

5.4.14.10   Request for Water Tanker

This means the request for water tankers by the citizens in case of unavailability of watery supply or usage of source of water other than the piped water. ULBs may charge for providing water tankers as per the prescribed rules and regulations.

5.4.14.11   Apply for Property Creation

This means the request to create a PID in case there is no existing PID against the mentioned address as per the connection application by the citizen.

5.5   Water and Sewerage Reports & KPIs

W&S Reports and KPIs are documents that present information in an organized format for various stakeholders, especially in the form of an official document, after thorough investigation or consideration by an appointed person or body at the ULB.
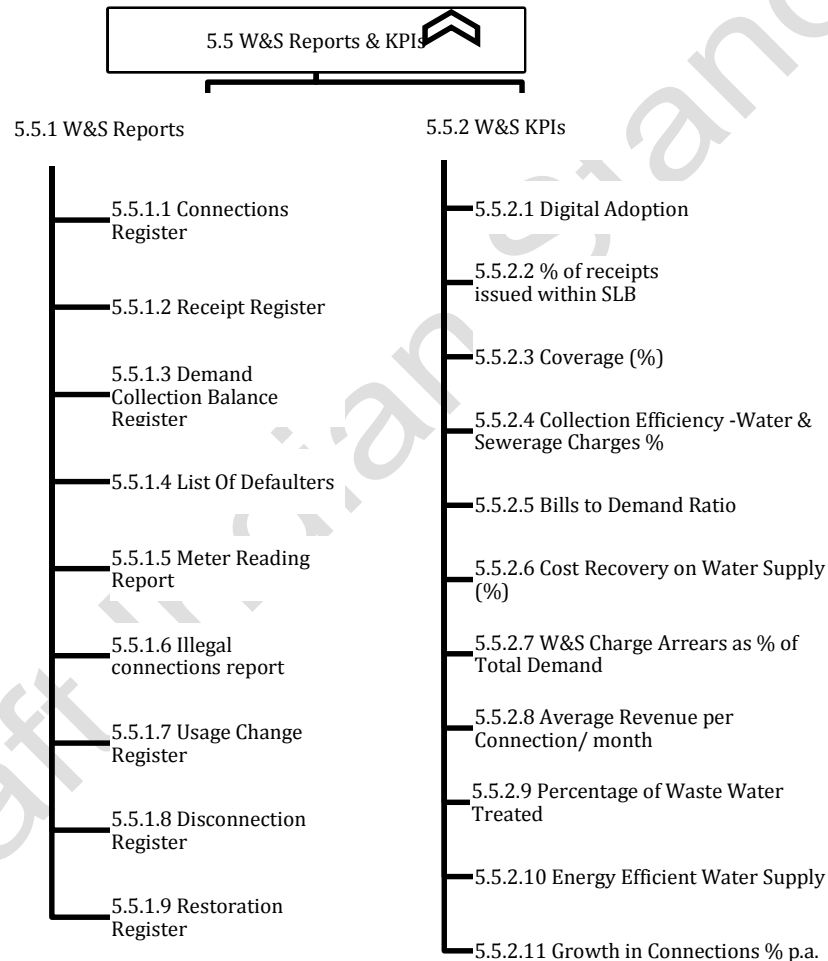

Fig. 28 Taxonomy of Reports & KPIs

5.5.1   Water and Sewerage Reports

The W&S Reports notifies the Urban Local Body or other service providers about the complete information of all water and/or sewerage connections which are applied through various governance channels. These reports should be maintained by the ULBs.

5.5.1.1 Connections Register
Connection Register provides the information about the total number of existing connections that are registered to their respective ULBs or other service providers, the number of new connection applications, and number of connections that are approved but pending installation. The data would be generated category wise, connection size wise, spatial distribution (zone or ward wise). The data shall also include the number of disconnections, and new connections. The connections allocated are categorized based on the connection type and this report gives an idea about the details like connection type, applicant details, applicant location, total number of connections, pending connections, disconnected connections, temporary disconnections, renewals and amount collected.

5.5.1.2 Receipt Register
Receipt Register provides the details from all cash receipts, such as deposit date, consumer ID, connection category, request type, amount, status and any information that has been entered in the comments field.

5.5.1.3 Demand Collection Balance Register
This report provides details about demand, collection, balance and collection percentage details of revenue from W&S services.

5.5.1.4 List of Defaulters
List of Defaulters or Defaulters register provides the details of defaulters who have failed to remit the payments due for water or sewerage services within the stipulated due-date.

Defaulter is a person or body that has not paid last or previous years property tax. This covers assessment number, owner details, property details, demand year and arrears

5.5.1.5 Meter Reading Report
This report provides details about meter reading, date of meter reading, unit, usage, number of defective meters etc.

5.5.1.6 Illegal Connections Report
This report provides details about the number of illegal connections by location, size, area, type etc.

5.5.1.7 Usage Change Register
This register enlists the information about the consumers whose usage has been changed.

5.5.1.8 Disconnection Register
The register provided information about the consumers whose W&S connection has been disconnected. The disconnection may be on the request from consumers or the revenue department.

5.5.1.9 Restoration Register
The Restoration Register provides information about the list of restorations in the ULB. The restoration is based on the consumer request.

5.5.2   W&S KPIs

This refers to Key Performance Indicators (KPIs) that should be captured continuously by the water utility management and disclosed through public communication channels.

5.5.2.1 Digital Adoption

Digital Adoption means attaining a state where an individual is capable enough to utilize an application, software, or tools to its fullest capacity or the potential to carry out a variety of digital processes. Digital adoption of W&S can be measured in the following terms:

a)   Percentage of citizens using digital channels for W&S charge payment
b)   Percentage of citizens using digital channels for accessing services
c)   Percentage Volume of applications from different channels
d)   Percentage of connections allocated digitally within SLG

5.5.2.2 Percentage of Receipts Issued within SLB

This means percentage of receipts (connection usage bills) issued within the agreed SLB parameters (time, priority, others as needed).

5.5.2.3 Coverage Percentage

Total number of households in the service area that are connected to the water supply network with direct service connections, as a percentage of the total number of households in that service area. Service area implies a specific jurisdiction in which service is required to be provided.

This is also referred to as 'universal coverage' and is covered as part of ULB service level benchmarking.

5.5.2.4 Collection Efficiency -Water & Sewerage Charges Percentage

This means percentage of revenue collected out of the total amount of bills generated and issued to the consumers/customers for the water and sewerage services during the billing period.

5.5.2.5 Bills to Demand Ratio

This means comparing the number of generated bills with respect to the number of demands generated for the applied connection request to account collections by the W&S charges.

5.5.2.6 Cost Recovery on Water Supply (percentage)

This means percentage of total annual revenue collected over the total expenditure incurred for operations and maintenance of water and sewerage services within the assigned time frame.

5.5.2.7 W&S Charge Arrears as percentage of Total Demand

This mean percentage of water & sewerage charge arrears with respect to total demand raised within the assigned time frame.

5.5.2.8 Average Revenue per Connection/ Month

This means average revenue obtained by dividing the total revenue billed by the total number of connections in a month.

5.5.2.9 Percentage of Wastewater-Treated
This means the ratio of the amount of wastewater treated in a ULB to the total amount of waste water generated.

5.5.2.10   Energy-Efficient Water Supply System
Energy efficient equipment for water supply in the city leads to reduction in GHG emissions (CO_2 emissions) per KwH of electricity consumed[4] (National Institute of Urban Affairs, 2020).

5.5.2.11   Growth in Connections Percentage Per Annum
This means the percentage of increase of water & sewerage connections in a year.

6. COMPLIANCE ASSESSMENT AND PERFORMANCE EVALUATION FRAMEWORK (CAPE)

6.1 Overview

The objective of the framework is to provide a roadmap to Indian cities in combating the challenge of data inconsistencies and interoperability. The Compliance Assessment and Performance Evaluation Framework (CAPE) consists of module-specific indicators defined in Standards under two parameters namely **Terminology Assessment** and **Process Assessment** across 5 sections (i) Data Entities, (ii) Channels, (iii) Stakeholders, (iv) Process and (v) Reports and KPIs. The framework provides an assessment of both terminology and process (functionality) compliance. The indicators are progressive in nature to support cities in assessing where they stand and encourage them to adopt appropriate actions enabling them to improve their score in the future and consequently enable data-driven governance.

1) **Compliance Assessment of Services:** To periodically assess the maturity of service functionality on a digital platform and its process harmonisation.
2) **Knowledge Exchange:** To enable peer-to-peer learning and allow cities to replicate success, use the learnings of others.
3) **The standard frame of reference through Benchmarking:** To help in developing common understanding and standardisation on Digital municipal services solutions, architecture, and components among various stakeholders viz. equipment manufacturers, system integrators, startups, domain experts, consultants, and city administration
4) **Gap Assessment:** To help Cities identify gaps in capabilities across municipal services dimensions.
5) **Catalyse Scalable Model:** To help in replicating the successes and avoiding redundancy in data, reduce the burden on administrators, harmonise terminology and processes and increase syntactic and semantic interoperability. It will also act as a launch pad for the cities which are yet to commence their digital platforms solution design, and system integration, monitor city operations, and prepare SRS, FRS and Model RFPs for implementation.

This document has been designed to help States/UTs or Cities find answers to the following questions through assessment activities:

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[4] National Institute of Urban Affairs. (2020). ClimateSmart Cities Assessment Framework 2.0. New Delhi: Ministry of Housing and Urban Affairs.

Terminology Assessment	Asses the difference in terminologies and their definitions for urban governance services a) Is the city will be able to use the same data across services? b) Are the data entities captured in services being used in the processes? c) Asses the redundancy in data collection?
Process Assessment	Asses the process flow in urban governance services a) Ensuring convergence of applications/systems/databases b) Leveraging all available data entities in the process flow/analysis/monitoring? c) Asses the functionality of establishing interlinkages with various related departments d) Asses the capability of automating the reports and use of KPIs

6.2 Key Parameters

The various components and key parameters under the two dimensions are explained below in detail:

6.2.1   Terminology Assessment
The terminologies should be assessed over the following components;

1) **Accuracy:** The taxonomy should accurately reflect the meaning of the concept it represents. It should be free from ambiguity and provide precise and unambiguous definitions.
2) **Completeness:** The taxonomy should cover all relevant concepts related to the domain it represents. It should include all necessary terms and definitions required to describe the domain.
3) **Consistency:** The taxonomy used should be consistent in its use of terms and definitions across different parts of the domain it represents and various services. It should avoid using different terms or definitions to describe the same concept in various services or processes.
4) **Clarity:** The taxonomy should be easy to understand and use. It should be accessible to a wide range of users.
5) **Relevance:** The taxonomy should be relevant to the context in which it is used.

Key Parameters
1. Data Entities Compliance - verification of the data entities captured in a module
2. Channels Compliance - mapping the various channels to provide service to enhance the accessibility among citizens
3. Stakeholder Engagement Compliance- mapping the stakeholders involved in the service and assessing the ease of communication
4. The process to Data Entities Compliance - mapping input and output in the process flow and assessing any redundancy during the process

5. Reports and KPIs Compliance - mapping basic minimum reports and KPIs required for analysis and monitoring

6.2.2   Process Assessment

1) **Accuracy:** The taxonomy should accurately reflect the meaning of the concept it represents. It should be free from ambiguity and provide precise and unambiguous definitions.
2) **Completeness:** The taxonomy should cover all relevant concepts related to the domain it represents. It should include all necessary terms and definitions required to describe the domain.
3) **Consistency:** The taxonomy used should be consistent in its use of terms and definitions across different parts of the domain it represents and various services. It should avoid using different terms or definitions to describe the same concept in various services or processes.
4) **Clarity:** The taxonomy should be easy to understand and use. It should be accessible to a wide range of users.
5) **Relevance:** The taxonomy should be relevant to the context in which it is used

Key Parameters

1. Process Flow Compliance - mapping the existing processes and gap identification
2. Interoperability Between Departments - mapping the use of various related data entities in services between different departments
3. Functionality Interlinkage - mapping integration with Aadhaar/ DigiLocker-like initiatives of other ministries and departments
4. Platform Compliance - mapping the availability of the functionalities available on the platform such as auto fetch, generate reports, escalation etc.

6.3 Methodology

The Compliance Assessment and Performance Evaluation Framework (CAPE) assess the readiness of the municipal digital service on data across Terminology and Process Compliance. The State/UT or Cities modules are scored on a scale of 0 to 1.

6.3.1   CAPE Scoring

The final score is a combination of the following assessment based on the respective Standard Module.

Table 1 CAPE SCORING

Parameter	Weightage	Objective
Terminology Assessment	40%	To assess the difference in terminologies and their definitions for urban governance services
Process Assessment	60%	To assess the process flow harmonisation in urban governance services

CAPE Score = (0.4* terminology assessment score) + (0.6* process assessment score)

The following weights will be applicable for assessment scoring

TABLE 2 WEIGHTAGE OF TERMINOLOGY AND PROCESS SCORING

Parameter	Sections of Standards	Weightage
Terminology Assessment	Data Entities	25%
	Channels	5%
	Stakeholders	10%
Process Assessment	Processes	40%
	Reports	10%
	KPIs	10%

Terminology Assessment Score = (0.25 * Data Entities Assessment Score) + (0.05 * Channels Assessment Score) + (0.10* Stakeholders Assessment Score)
Process Assessment Score = (0.40* Process Assessment Score) + (0.10* Reports Assessment Score) + (0.10* KPI Assessment Score)

7. SELF-ASSESSMENT TOOLKIT

For Terminology Assessment, each indicator needs to be mapped with the following response viz.: Yes/No. For each "Yes" response, 1 (One) mark should be allotted and for each "No" response, 0 (zero) mark should be allotted. "Yes" means exact terminology available.

For Process Assessments, each indicator shall be mapped with the following responses -Yes, No, or NA (Not Applicable). For each "Yes" response, 1 (One) mark should be allotted and for each "No" response, 0 (Zero) mark should be allotted. For NA response, mapped indicator should not be considered for assessment. If 30% or more of responses are NA, then the State/UTs or city should assess low compliance for the respective component. The cumulative of each process shall be marked further with the following responses – Fully Available, Partially Available and NA (Not Available). For Fully Available (100%), 1 (One) mark should be allotted, for Partially Available (≥50%), 0.5 mark should be allotted and for NA 0 (Zero) mark should be allotted.

7.1 CAPE Compliance Classification

State/UTs or ULBs will be ranked by cumulating the marks obtained in 2 parameters against the total marks. Ranking will be allocated as per below mentioned criteria (marks will be converted into percentages).

Table 3: CAPE Levels

Criteria	Upto 30% Compliance	30%-60% Compliance	60%-80% Compliance	80% & above Compliance
Levels	0	1	2	3
Labels	Not Compliant	Partially Compliant	Compliant	Fully Compliant

ANNEX -A

(Clause 5.1)

SAMPLE PARAMETERS AND SPECIFICATIONS IN PROPERTY

A-1 Sample Parameters and Specifications for Location

Attribute Name	Locational Specification	Data Type	Mandatory (Yes/No)
Address	House No, Building Name, Plot/Survey No, Street Name, Locality, Zone/Ward, City/Town, District, Region, State, Country, Pin code	Varchar (256)	No
Geo Location	Latitude, Longitude, Polygon	Numeric (9,6)	Yes
Other evidences	This can include Geo tagged images of Property, DDN, QR codes etc.		No

a) **Address:** The address of the property provides the particulars of the place as per the administrative boundaries or norms defined by the local governing body.
b) **Geo Location:** Geolocation is the identification or estimation of the real-world geographic location of property. This refers to the latitude and longitude coordinates of a particular location where property is located.
c) **Digital Numbers:** Property Numbers defined using scientific methods and often assigned with QR code for traceability and usability.

A-2 Service Level Benchmarks

1	Indicator Benchmark - Water Supply Service	
1.1	Coverage of water supply connections	100%
1.2	Per capita supply of water	135 lpcd
1.3	Extent of metering of water connections	100%
1.4	Extent of non-revenue water (NRW)	20%
1.5	Continuity of water supply	24Hrs
1.6	Quality of water supplied	100%
1.7	Efficiency in redressal of customer complaints	80%
1.8	Cost recovery in water supply services	100%
1.9	Efficiency in collection of water supply-related charges	90%
2	Indicator Benchmark - Sewerage Management	

2.1	Coverage of sewage network services	100%
2.2	Collection efficiency of the sewage network	100%
2.3	Adequacy of sewage treatment capacity	100%
2.4	Quality of sewage treatment	100%
2.5	Extent of reuse and recycling of sewage	20%
2.6	Efficiency in redressal of customer complaints	80%
2.7	Extent of cost recovery in sewage management	100%
2.8	Efficiency in collection of sewage charges	90%

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