COMPENDIUM OF PRIMERS

FOR

UNDERTAKING REFORMS

AT

ULB LEVEL

FOR

THE SCHEME OF URBAN INFRASTRUCTURE DEVELOPMENT IN SATELLITE TOWNS AROUND SEVEN MILLION PLUS CITIES


TOWN AND COUNTRY PLANNING ORGANISATION
GOVERNMENT OF INDIA
MINISTRY OF URBAN DEVELOPMENT

CONTENTS

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1. e-Governance

ULB Level Reform

SOURCE: NIUA

1. The Reform

e-Governance is a form of public administration making "use of information and communication technologies (ICT) to enhance the access and delivery of government services to benefit citizens, employees and management of urban local bodies." It aims to "help strengthen government's drive toward effective governance and increase transparency to better manage social and economic resources for development."

Government of India (GoI) has launched a National e-Governance Plan (NeGP). NeGP intends to institute and enable mechanisms to improve the system of governance and thus provide better services to the citizens by effective use of ICT. e-Governance in municipalities is one of the Mission Mode Projects under the NeGP, which is expected to result in improved service delivery by local governments for the citizens. Implementation of e-Governance reform is one of the mandatory reforms under Jawaharlal Nehru National Urban Renewal Mission (JNNURM).

The broad aim for implementing e-Governance in municipalities is to:

- Focus on clearly identified citizen services that would be covered with clearly laid down service levels and outcomes to be achieved.
- Improve efficiency and effectiveness in interaction between local government and its citizens and other stakeholders.
- Improve quality of internal local government operations and management information systems to support and stimulate good governance.
- Bring about transparency and accountability in urban local body operations.
- Help improve reach of the delivery of services to citizens.

Following services are to be covered under this reform:

- *Basic citizen services*: Birth and death registration and health programs.
- *Revenue earning services*: Property tax and licenses.
- *Development services*: Water supply and other utilities, building plan approval.
- *Efficiency improvement services*: Procurement and monitoring of projects.
- *Back office improvements*: Accounting and personnel management system.
- *Monitoring*: Citizen grievance redressal.

The key objectives of the e-Governance initiative are to:

- Provide single window system for delivery of services and information to citizens.
- Provide integrated and simplified services to citizens on any time, anywhere basis.
- Decentralize service delivery and improve accessibility of information to citizens.
- Increase the efficiency and productivity of ULBs.
- Re-engineer processes for better service delivery.
- Integrate data and services of various departments.
- Enhance efficient inter-departmental coordination.
- Provide timely and reliable management information relating to municipal administration for effective decision-making.
- Adopt a standards-based approach to enable integration with other related applications.

2. Rationale for the reform

The recent advances in ICT and the Internet provide opportunities to transform the relationship between governments and citizens, as well as contribute to the achievement of good governance goals. e-governance will ensure that the interface between citizens and ULBs is made smooth and resolves the problems encountered by people at present. The use of ICT can help greatly in improved service delivery, decentralization, better information management and transparency, citizen involvement in government and overall improvement in urban governance across departments and at all levels. The benefits of e-Governance will be for citizens, ULBs and management:

For Citizens

- Single-window access to various services of ULBs.
- Better delivery of services and information.
- Quick service delivery at a decentralized level.
- Improved communications.
- Simplification of procedures.
- Streamlining of the approval process.
- Opportunity for greater participation in decision-making.
- Improved interaction with municipal government at different levels.
- Track the performance of ULBs.
- Transparency and accountability in ULB functioning.
- Quick redressal of grievances.

For ULBs

- Common information base across departments on a single integrated platform.
- Better co-ordination between departments and agencies.
- Improved communications.
- Creation of effective management information system (MIS).
- Better mobilization and utilization of resources.
- Improvement in revenue collection.
- Efficient citizen grievance redressal.
- Overall improvement in governance, delivery of services and citizen interface.
- Objectiveness in decision-making.

For Management *(Mayor, Commissioner, Standing Committee)*

- Availability of standardized and meaningful MIS on timely basis across all departments
- Appropriate and timely analysis and decision-support mechanism.
- Ability to monitor and track programs, services, and revenues effectively and on a timely basis.

3. Reform components

ULBs need to exploit the advantages of ICT to transform the quality and cost effectiveness of their services, to align and integrate them with those of other public bodies, and to collect and manage data in ways that make it possible to provide information and services in an integrated manner at the local level.

While implementing e-Governance the following broad principles should be kept in mind:

- Adopt a state-wide approach for designing the systems and in planning implementation of the e-Governance project. This will not only bring uniformity across the state, but also will result in cost and time optimization.

- Focus should not be on just procurement of hardware or software, but primarily on a critical study of the existing system and processes for delivery of services to citizens and in providing easy access to information in a transparent manner.

- Focus should be on creating a centralized and unified database across various services.

- Integrate with other IT initiatives in the state and leverage core infrastructure, rather than create separate infrastructure thus bringing down the overall cost.

- Adopt phase-wise approach for implementation based on the need and requirements of ULBs.

- Adopt core standards ensuring applications and projects link across departments and agencies.

- Identify project champions to lead the initiatives.

- Carry out clear assessment and implementation of PPP models to ensure cost effectiveness and sustainability.

- Build flexibility in the system to meet future needs of ULBs.

- System should be able to generate reports at state level for benchmarking and monitoring ULBs.

A comprehensive e-Governance roll out strategy at state level should comprise the following major components.

Component	**Description**
e-Governance Roadmap	Defining a clear roadmap and implementation plan to avoid duplication, wastage of effort, and chances of mistakes, and which ultimately will lead to the creation of an integrated system. The roadmap should describe: • understanding state's vision, objectives • assessment of current IT environment • assessment & gap analysis of IT initiatives • preparation of e-Governance strategy • develop IT architecture • opportunities for PPP • preparation of revenue model
Institutional Framework	Clearly defined institutional framework will be drawn up at all levels by laying down decision-making processes and responsibilities across departments and at different levels. The institutional framework will: • facilitate in taking empowered decisions and instill autonomy across the organizations to fulfill its roles • address the differing roles required to be played with respect to the

	implementation of projects by different stakeholders
Technology Infrastructure	Technology infrastructure provides information with respect to applications, databases, infrastructure (IT and physical infrastructure), connectivity, etc. The various components should be chosen carefully based on technical feasibility, economic considerations and criticality of requirements. The following considerations should be kept in mind while dealing with technology infrastructure: • adaptable and robust application platform to meet the varying requirements of ULBs • extremely user-friendly interface to reduce the impact of change management • installation and implementation procedures shall be simple, to the extent possible • scalable IT infrastructure to address future requirements of ULBs • capable of execution across different platforms • secure so as to generate confidence among various stakeholders • an appropriate disaster recovery and business continuity plan Maintenance and upgradation should be an integral part of the development of e-Governance solutions.
Business Process Re-engineering (BPR)	Mere injection of technology into the existing processes will not yield the desired result. It would amount to *translation*, rather than *transformation*. It may not also result in enhanced value to the customers or end-users. BPR will involve the following: • study of the existing systems, procedures, organizational, functional and user requirements • map the processes • identify those processes, which will help in simplifying procedures and in quick delivery of services One of the critical factors leading to a high positive impact for an e-Governance project is the extent and rigor of reforms undertaken in process re-engineering. *This exercise should be the starting point for an e-Governance initiative at state level; otherwise, the initiative will result in mere computerization of existing processes and will likely not result in bringing efficiency in the system.*
Delivery Mechanism	Delivery mechanism is the way through which services are delivered to customers. The delivery mechanism should be user-friendly and easily accessible to citizens. This can range from Internet, common service centers, call centers, kiosks, etc. and impacts the following: • technology infrastructure (hardware, software and network) • business processes and procedures organizational structure to manage and deliver the services, i.e., skills, roles and PPPs
Information	Security and privacy of information is one of the challenges and ways to

Security and Privacy	increase citizen confidence in the system. There should be proper security tools so that fraud and sabotage of systems can be avoided. The mechanisms and responsibilities to access information should be clearly defined and proper backup of information should be available at any given point of time. It should include information security management, system security, and access control and address issues relating to information systems auditing and security auditing. Data protection, privacy, and security are integral parts of e-Governance and a challenge for ULBs in e-enabling delivery of services.
Business Continuity Plan and Disaster Recovery Plan	Planning for all types of disruptions in service due to failure of equipment, power cuts, shutting of servers, natural and man-made disasters and ways in which data loss will be prevented and services resumed at the earliest. At state level there should be guidelines for both backup and disaster recovery.
Capacity Building and Change Management:	To create a dedicated and suitable capacity to prioritize, conceptualize, develop and manage e-Governance projects. States should prepare a capacity building plan which describes: • capacity gaps at different levels of functionaries and identification of training needs • the training areas and target groups • institutional framework for building capacity in the states/ULBs
Public Awareness and Communication	Communicating and creating awareness with stakeholders and the public at large on the benefits of e-Governance will help in designing and implementation of required solutions.

4. Steps to implementing the reform

The states and ULBs need to consider the following processes while initiating the implementation of e-Governance reform at State/ULB level:

Processes	Responsibility	Role
Pre-Implementation Phase		
Identify the nodal agency for implementing NMMP in the state	State	• Responsible for managing the implementation, dealing with technology, process and change management-related issues internally, quality assurance, etc. • Selection of project management consultant • Finalize the roadmap • Finalize institutional framework • Finalize revenue models • Define service level agreements • Procurement of various consultants • Monitor projects across ULBs • Finalize the capacity building and change

		management plan for the state • Finalize business model
Selection of project management consultant	State	• Prepare e-Governance roadmap • Prepare appropriate business models • Advise on institutional framework for implementation across state • Prepare service level agreements • Prepare revenue models • Finalize contract documents • Advise in selection and procurement of solution providers • Monitor quality of service of service providers • Advise on security policies and compliance with standards • Develop strategies for rolling out e-Governance across state/ULBs • Design change management program at the state level • Identify the milestones/indicators for monitoring success
Preparation of state-e-Governance roadmap	State	• Services to be provided • Coverage of ULBs • Delivery channels • Technology architecture (hardware, software, networking) • Institutional framework • Service levels • Capacity building requirements • Broad cost estimates
System analysis and process reengineering	State	• Process overview and its functions • Description of key sub-processes • Process parameters for each of these sub-processes • Interface requirements with other modules • Detailed functionality & MIS requirements • Indicative data standards • Create a work plan for the phased implementation of reengineered processes • Monitor the redesigned business processes
Customization of software	State/ULB	• Review the user requirements • Design the system requirement specifications • Design the MIS requirements • Test the application • Deploy the application • Assess hardware requirement

		• Integration with different modules • Finalizing the reporting formats • Operation and maintenance
Preparation of guidelines for creation of IT infrastructure at ULB level	State	• Preparation of the specifications of the required IT infrastructure (PCs, printers, servers, software, etc.) • Finalization of rates for above IT infrastructure components
Implementation Phase		
Creation of a special e-Governance cell at ULB level	ULB	• Finalize the requirements specification • Monitor the project activities • Prepare site for hosting infrastructure • Identification of locations for setting up service centers • Monitor the data entry activities • Support deployment of the application • Design training strategy for the end-users • Test for user acceptance • Report project progress to the state implementation team • Manage change at the ULBs • Support hardware procurement and installation
Preparation and finalization of Detailed Project Report	ULB	• Project description including objectives, service levels and outcomes • Project approach and component detailing • Project costing • Implementation timelines • Developing viable business models
Create technology infrastructure including site preparation	ULB	• Assess the need as per the requirements • Procurement of appropriate infrastructure at ULB level for housing technological solutions • Site preparation including power backup provisions and other requirements
Entry and validation of manual records	ULB	• Appropriate data migration strategy • Migration from manual and legacy system to the new system with reasonably error-free conversion
Pilot and scale up	ULB	• Pilot in one or two ULBs in the state • Go live on selected modules • Scale-up
Training	State/ULB	• Preparation of training modules • Identify various stakeholders including elected representatives • Continuous on-the-job training as well as other training for various end-users

Documentation	State/ULB	• Preparation of documents such as: • Functional requirements document • System design document • User manuals • Operational manual • Maintenance manuals • Other documentation

5. Setting the timeline

Following are the suggested sequencing of steps and timelines to be adopted by states and ULBs to roll out e-governance:

Activity/Timeline	**Q1**	**Q2**	**Q3**	**Q4**
State Level				
Designate a state nodal organization				
Selection of project management consultant				
Preparation of state e-Governance roadmap for ULBs				
Finalize the institutional framework for implementation				
Systems analysis				
Selection of application consultant				
Customization of the application as per functional requirements and e-Governance roadmap				
Formats of standard reports for state level MIS				
Decision on PPP model(s) recommended for adoption				
State-wide web portal				
Creation of policies at state level				
Training to end-users				
CITY LEVEL				
Assess existing IT initiatives				
Formation of project management unit (PMU)				
Assessment of functional requirements				
Preparation of detailed project report (DPR)				
Approval of DPR by the state government				
Tendering, evaluation and selection of data entry vendors				
Application customization (development of the web portal and customization of core modules)				
Data digitization (entry and validation) of the manual records				
Data migration and stabilization				
Site preparation (civil, electrical and infrastructure works, etc.)				
Hardware procurement (tendering and finalization)				
Deployment of the application and hardware at site				
Going live for the computerized ULB-selected modules				

Setting up delivery channels				
Training to end-users				
Documentation				
Project management				

6. Measuring Achievement/Outcomes

The following are the key outcomes of this reform:

- Citizens: Easy access to municipal services, hassle free payment of taxes and user charges, quick redressal of grievances.
- Municipalities: Improvements in efficiency and effectiveness of business processes/functions of ULBs.
- Decision-makers: Improved information for planning and decision-making.
- Employees: Improved efficiency and better delivery of urban services.
- Policy makers: Integrated view of performance of municipalities at the center, state and ULB level.

Key outputs from the reform are:

- Reduction in time-lag in delivery of services, viz. issue of birth and death certificates, assessment & collection of property tax, payment of utility bills, etc.
- Enhanced interface between urban local bodies and citizens.
- Transparency and accountability in the governance of urban local bodies.
- Improvement in quality of internal local government operations to support and stimulate good governance.
- Key performance indicators-based decision-support systems for reports and analysis using intelligent platform.

Key monitoring indicators:

State Level	**ULB Level**
• Institutional framework at state level • Appointment of project management consultant • Preparation of e-Governance roadmap • Business process reengineering carried out • Appointment of solution providers (hardware, software, networking) • Model contracts prepared • Delivery mechanism and revenue models finalized • Formats for MIS prepared and finalized • Coverage (in terms of number of models and number of ULBs) of e-Governance in the state	• Institutional framework at ULB level • Number of functions computerized • Website is operational and updated regularly • Number of services with unified database • Number of services provided through single window system • Access to services has been decentralized • %age of customers using e-Government services • %age of municipal services transformed into e-Government • %age of transactions of each service executed electronically

• Clearly defined service levels for software, hardware and networking	• %age of revenue improvement of ULB due to e-enabled services • %age of birth and death certificates issued through new system • %age of grievances handled through new system

2.Earmarking Land for EWS/LIG

State Level Reform

SOURCE: NIUA

1. The Reform

States / Cities, as part of the sub mission II, Basic Services to the Urban Poor (BSUP) under the Jawaharlal Nehru National Urban Renewal Mission (JNNURM) are required to ***"Earmark at least 20-25 percent of developed land in all housing projects (developed by public and private agencies) for Economically Weaker Section (EWS) and Lower Income Group (LIG) category[1] with a system of cross subsidisation"***. This reform is aligned with the goal of "Affordable Housing for All" in the National Urban Housing and Habitat Policy, 2007 (NUH&HP). The NUH&HP mandates reservation of "10-15 percent land in new public/ private housing projects or 20-25 percent of FAR[2] (whichever is greater) for EWS/ LIG housing through appropriate legal stipulations and special initiatives".

2. Rationale for reform

Of the total housing shortage in a city, a large proportion (nearly 99%) is among the Below Poverty Line (BPL)/EWS and LIG households.[3] The reform on Earmarking Developed Land (EDL) in all housing projects will reduce housing shortage among BPL/EWS and LIG households by increasing supply of land for housing the poor. This reform will ensure that local governments /agencies take active steps to increase supply of land and housing and to make them more affordable for the poor. In the long term, availability of affordable land /housing will discourage squatting by poor on public lands and create slum free cities. It will also sustainably reduce urban poverty by providing legitimate access to better services and economic opportunities.

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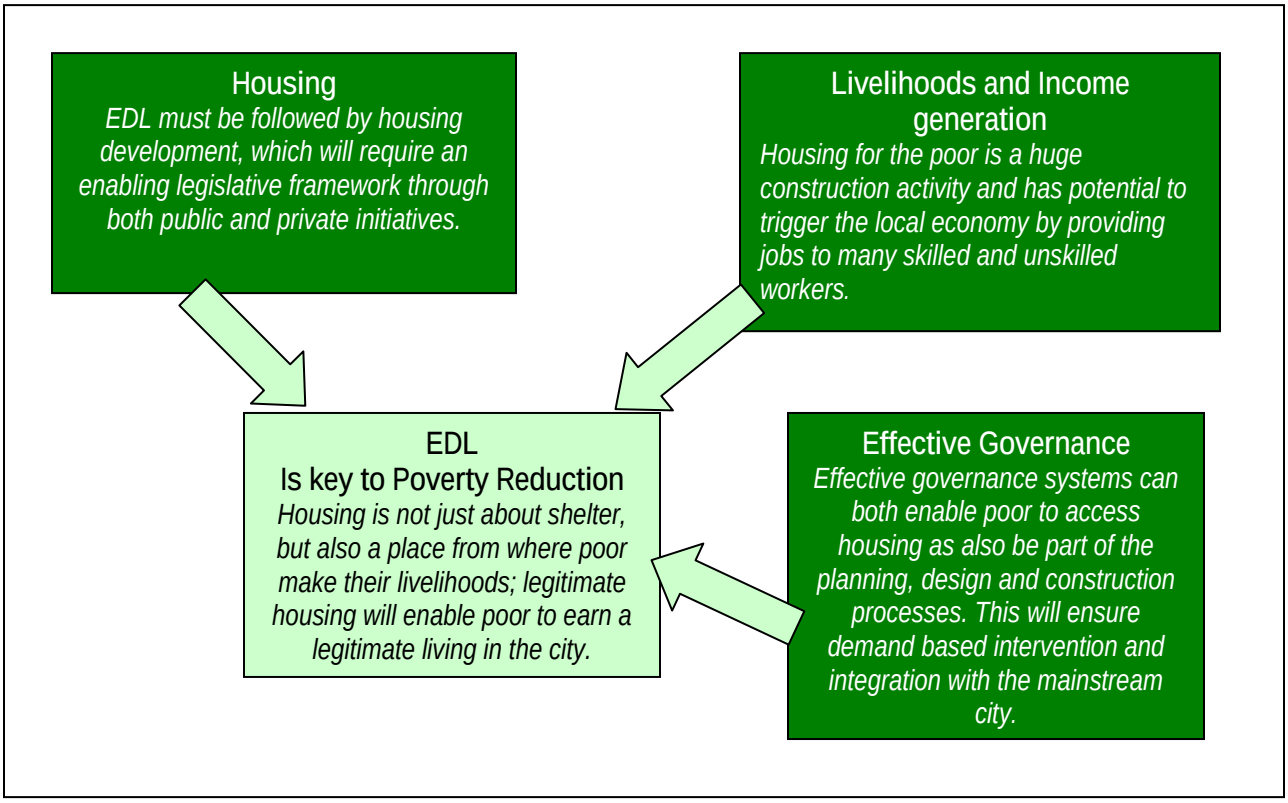
[1] EWS is officially defined as a household with a family income below INR 2100/; BPL families are those with monthly income INR 2000/ or less. By definition EWS encompasses BPL category however as this segment is large it is important to disaggregate by mentioning BPL as a separate category. LIG is officially defined as household with a monthly income between INR 2100/ and 4500/.

[2] The Floor Space Index (FSI) or Floor Area Ratio ((FAR)) is the ratio between the area of a land parcel and the total amount of floor space which can be built on it. For instance, on a parcel of 1000 sq m with FSI 2, a structure with a total floor space of 2000 square meters will be allowed. In the absence off set back and heights requirements, this could be a 2 storied structure covering the entire parcel or, for instance, a 4 storied structure with an area off 500 square meters per floor, or any other combinations which would result in a total floor area equal to product off the land parcel area by the FSI.

[3] Technical Group constituted under the formulation of Eleventh Five-Year Plan estimates housing shortage to be around 24.71million and 99 percent of the demand is from EWS and LIG group. "Urban Infrastructure, Housing, Basic Services and Poverty Alleviation", p- 411, Planning Commission.

3. Reform component

The ultimate objective of EDL is to increase the supply of affordable land for housing the poor with adequate access to basic services. EDL reform however, by itself will not be sufficient to ensure housing for the poor. Housing for the poor will require convergence with other reform components under JNNURM, in particular effective governance and livelihood promotion. This linkage is graphically represented below.



Linkages among the various Reform components

4. Steps to implement the reform

EDL reform needs to be jointly implemented by the ULBs and relevant state level institutions such as the Land and Revenue Department, Town and Country Planning Department and other parastatal agencies. For successful implementation of the reform, these State agencies will need to help create a policy environment by enacting appropriate legislative and policy decisions.

At the local level, ULBs will need to take the following steps for EDL to happen.

A. Decide on the extent of reservation required to accommodate EWS/LIG households

Step 1: Estimate demand for land /housing the urban poor

- Estimating number of households in the BPL/EWS and LIG categories

Most BPL/EWS and LIG households in cities live in informal settlements/slums on encroached public lands. There is no data on numbers of poor families without adequate housing in cities. Census of India provides estimates of number of poor in each city and they also project future population growth for cities using an urban growth rate. City Master Plans etc. make guesstimates on housing demand on the basis of Census information. The Task Group on Housing in the Planning Commission as also NSSO gives rough estimates on city specific housing shortage. ULBs, due to their local presence, are best positioned to assess the real housing need, the supply gap and to project it for the future. Household surveys can be used to estimate housing requirements. These may be done in consultation with NGOs, the District Urban Development Authority (DUDA) and the Urban Poverty Cell in the ULBs. As slums /poor settlements grow faster than the rest of the city, housing estimates must be prepared accordingly.

- Deciding on extent of reservation required in the city

Based on number of BPL/EWS and LIG families in need of housing, the extent of land required to be reserved may be calculated. Most cities have a standard measure for dwelling units for BPL/EWS and LIG categories. This is based on supply of land and demand for housing. For example in Delhi, poor families get between 12.5 sq mts and 18.5 sq mts of land even as minimum recommended in the Master Plan is 25 sq mts whereas in Bhubaneswar, the city is providing 31.12 sq mts to 25 sq mts. Based on estimates of housing needs, Delhi has agreed to earmark between 20-25 percent of developed land in all housing schemes for EWS and LIG categories. Punjab and Haryana have also issued directions to earmark up to 20 percent land for the poor in both public and private housing projects. Uttar Pradesh has issued orders to city authorities to provide free of cost houses for the urban poor [4].

4 All city housing projects to leave space for poor The times of India dated 05/01/2009

- Review city master /spatial plans to identify potential lands for development

City Master Plans or spatial layouts of cities prepared under JNNURM for locating slums can help to identify areas within the city that can be earmarked for housing the poor. Master or Zonal Plan reviews can help identify industrial areas currently not in use, potential growth nodes, or planned private housing projects for pro poor housing. Such a review can help release unproductive lands in the market for development of housing with part of the land reserved for housing the poor.

- Identify tenable slum settlements for development

In most cities, especially the larger ones, a sizeable portion of the land may be under slum occupation. While many slum settlements could be on non-tenable lands i.e. should not be developed for housing due to health and other potential hazards, or on land that is earmarked for development works, many may be on sites that could easily be redeveloped for housing through vertical or virtual development.

- Re-conceptualizing development from horizontal to vertical and virtual

Land is conventionally perceived as horizontal. However, it is not always feasible to extend the city horizontally or unlock fresh lands. Developing housing vertically or virtually using Land Management Tools (LMTs) such as increased FARs, Tradable Development Rights, etc. can increase the housing stock considerably.

i. Vertical land development

Cities expand horizontally by incorporating peripheral areas and changing the land use form, from agriculture to urban residential, commercial, institutional or industrial. Horizontal expansion or sprawl demands transport connectivity, extension of city road networks and infrastructural facilities requiring substantial capital investments. If cities fail to invest in infrastructure, it results in unplanned and haphazard development. Developing land vertically enables cities to create additional housing, including for the poor.

ii. Creating Virtual Land

For economic sustainability cities need to be reorganized through further densification. For example there are special areas like the city core (old part of the city) which are usually densely built with not much possibility of horizontal extensions or areas that are strategically located in the city where people prefer to live as their livelihood is linked to these areas. Additional space in these areas can be generated through modifications in land legislations pertaining to different dimensions of land such as:

- Ownership (Land records, Tenancy Act, Land Ceiling Act and Inheritance laws);
- Use (Town Planning Act, Development Control Regulations – DCRs, including Transfer of Development Rights, Zoning, and Building by laws) ;
- Acquisition and Assembly (Land Acquisition Act, Plot Reconstitution Technique, Negotiated Land Purchases)
- Transfer and registration (Income Tax Act, capital gains Tax, Stamp Duty , NOC from Land Acquisition officer and under Land Ceiling Act and land supply)
- Disposal wherever public agencies are directly involved in land supply[5].

By innovatively modifying these legislations many states have been able to create virtual land within their jurisdiction. For example, most Indian cities have conservative FARs as compared to global standard[6]. Increasing FARs with the objective of increasing density of existing settlements creates the possibility of new housing. In Mumbai new DCRs permitted an increase in FAR from 1.33 to 2.5 under certain conditions. Dharavi Redevelopment Plan, considering the fact that livelihood of large number of people depend on the strategic location of this settlement permits FAR up to 4. In old areas of Nagpur city, to discourage people building dangerously without any specification the permissible FAR was increased to 1.5 for a residential building and 2 for building with mix residential and commercial use. Nagpur is also contemplating permitting additional 50 percent FAR, 1.5 to education, health and charitable buildings.

[5] Please see discussions by J.H. Ansari in "Urban Land Management- Improving policies and Practices in Developing Countries of Asia" , UMP, UNCHS, 1998.

[6] Most large cities of the world the FAR varies by a ratio of 1 to 20 or even 1 to 50 between the core of the city and residential suburbs. It is fixed between 5 and 15 in the core of most metropolis is and typically decrease to around 0.2 in suburban areas. Geoffery Pyne, 2004

B. Amend legislations/ notifications to bring in appropriate changes in Planning Tools

In order to create horizontal, vertical and virtual housing for the poor city governments need to take the following steps.

Step 2: Review and Amend Current Floor Area Ratio (FAR) Permissible in Master Plans/Development Plans

FAR specified in the Master Plan (MP)/Development Plans is the principal tool used by planners to control built densities in cities. Universally, FAR is higher at the city core and lower at the peripheries. This follows the logic that land prices decrease as one goes farther away from the city centre. Contrary to this global trend, most Indian cities have both very low and uniform FAR throughout the city. For example FAR in Mumbai is 1.3 for the entire Mumbai Island City Area. In Ahemadabad, it is 1 except in the old city area where it is 3 (demand for space here is very low) [7]. ULBs may review the existing FAR and decide on an optimum FAR so as to increase supply of developed land in the city. Higher FARs may be considered for areas where large numbers of poor live /have opportunities for their livelihoods. Based on the ground reality, ULBs may suggest specific changes in the FAR to the TCPO that can be incorporated in the MP/ Development Plans through state level notifications. Increasing city density instead of spreading horizontally has been found to be more economic, as it reduced capital investments in infrastructure. It also ensures that the poor stay closer to their work places.

Step 3: Prepare a City Specific Urban Housing Policy /Road Map for Housing the Poor

All States are required to prepare a State Urban Housing and Habitat Policy based on the NUH&HP, 2007, to address the needs for land and housing the poor. On the lines of the State Housing Policy, each city may develop its own policy/strategy and road map for implementing the provisions in the policy. For this, ULBs will need to request the Urban Development Department at the state level to formulate such a policy at the earliest. ULB's can contribute to the development of the Policy through providing their experiences from the ground.

[7] Ahemdabad: Land Use Issues & Recommendations by Alain Bertaud, Sept 26.. 1996,Urban Development Division, The World Bank

Promoting Rental Housing through State's Housing Policy

The government of Maharashtra recognises the importance of rental housing in providing affordable housing to the EWS/ LIG category and this is explicitly reflected in its housing policy. In pursuance of the Maharashtra State Housing Policy 2007, Mumbai Metropolitan Regional Development Authority (MMRDA) formulated a scheme to build small rental tenements targeted towards the LIG category to be made available at a reasonable rent. MMRDA in partnership with a Private builder is taking one such initiative next to Karjat Railway station in Tanaji Malusare city near Mumbai. Under this scheme 6000 tenements are to be provided to MMRDA free of cost which it will use for rental purposes. The developer will get 4 FSI out of which one FSI is stipulated to be used towards building rental housing and the rest three for LIG, HIG housing and commercial purposes.

Step 4: Upgrade the Land Management Information System (LMIS)

Land administration system includes land records, sale and purchase of land records, land titling etc. All cities are required to strengthen these systems as part of a mandatory reform under JNNURM. Under BSUP, cities are expected to /have mapped all slum settlements using GIS. The land maps together with the slum mapping can be used to develop an effective Land Management Information System (LMIS).

An effective land management system will have the following benefits:

- It will strengthen the finances of the local body by identifying and bringing in to the tax net more number of properties and making recovery of tax dues from non-taxed properties;
- Identify settlements that can be regularised through a granting of tenure or released in the market for redevelopment with part reservation for urban poor housing; and
- Help identify spaces /housing sites for housing or land for the poor.
- Eventually an effective LMIS will bring in transparency that will remove the distortions in the land market making land/housing more affordable for everyone.

The ULBs will need technical support for the development of such an LMIS. They must work with town planners and social development experts to develop land maps and LMIS, and with the Land and Revenue Department to get a better understanding of the land administration

system. ULBs can also request for such assistance from GOI to develop skills/systems to manage land records.

Step 5: Inclusion of a database on slum tenure arrangements within LMIS

The LMIS must also include data base on urban poor settlements with information on their land tenure arrangements. Most urban poor lack formal property titles even as they may have paid an informal land developer to get squatting permission. The informal land market has therefore led to various forms of land tenure in each city which need to be understood. ULBs may make an inventory of the current land tenure arrangements to better develop the strategies required to facilitate housing for the poor. For example, if the land occupied by slums is owned by the local government, it may be possible to grant more permanent land tenure status and provide paralegal rights to poor residents to live on the existing sites. Such sanctions /formalization will enable the poor to invest in their own housing or access loans from formal financial institutions for housing development.

Step 6 Review and revise the City Master Plan for making reservations for the poor

ULBs need to rationalise the FAR as discussed above. ULBs may review the city Master Plan to identify the areas (near industrial and commercial zones) where FAR could be increased to create space for housing poor close to work places. This, in addition to provide housing for them will also reduce burden on the city transport infrastructure.

The new legislation on 100 FDI is a useful intervention to attract investors to create integrated townships. However, this may not automatically provide for the housing needs of the poor. ULBs may review the proposed development plans for big residential areas to ensure reservation of land in these areas exclusively for accommodating the poor. For this they may amend the zonal plan regulations that mandate plot /dwelling unit sizes for EWS/LIG households. Master Plans in cities like Indore and Bhopal in Madhya Pradesh, and Ahemdabad in Gujarat, have revised the Master Plan revisions carried out at the state level (see box above).

Step 7: Determine proportion of land that must be reserved and notify reservation of land within private housing projects

Based on the estimation of demand in step 1, city governments may decide to reserve a certain proportion of land under private housing projects and request the state government to notify either through Government Orders or through necessary amendments in the Municipal Acts as done in Andhra Pradesh. (Annex 1). ULBs can take help of the State to decide on the proportion of land to be kept aside for the poor and issue notification. As already mentioned in step 1, Delhi has agreed to reserve between 20 and 25 percent and Punjab 20 percent.

Step 8: Review and revise Building Bye Laws

There will be a need to modify the local building bye laws. New /appropriate guidelines/bye laws may be developed after a review of ground realities. These may include increasing FAR in certain parts of the city or providing incentives to builders to undertake housing slum redevelopment with housing by permitting the setting aside of a proportion of the land for commercial development. Mumbai has used the Slum Redevelopment Scheme (SRS) to rebuild housing for slum dwellers through the latter. In cities like Indore and Bhopal in Madhya Pradesh, and Ahmedabad in Gujarat, the building bye laws have been revised and re-interpreted.

Step 9: Creating incentives to increase supply of land

Land supply can be enhanced using various LMTs. These incentives include arrangements such as Land readjustments, Land pooling, Transferable Development Rights (TDR), creation of Shelter Fund, etc. These are expected to provide incentives to builders for developing housing / increasing supply of land for the poor.

- **Land readjustment:** There are several land development techniques through which urban land could be consolidated / upgraded. One of the techniques is Land Readjustment. Under this arrangement, right of ownership is transferred to an authority notionally with the right to redesign the layout for putting utilities in place. After this is done, new titles are

issued for the developed plots. This is mostly adopted for slum redevelopment where utilities need to be put in place and ownership titles are ambiguous.

- Land pooling: If the city gets land in small parcels that is scattered all over the city, it will need to pool this land together. Under this arrangement the city may legally consolidate land across various parcels by offering alternatives to original owners. This principal was used successfully in Gujarat and Maharashtra while implementing Town Planning Schemes.
- Transferable Development Rights/Incentive Zoning: TDR is aimed at providing to a land owner /builder additional FAR in another property/part of the city in exchange for presently occupied land so that the land could be consolidated. This method has been extensively used in Maharashtra and Hyderabad.

Transferable Development Rights (TDR)

In March 1991, The Maharashtra Government introduced a new Development Control Regulation with regard to TDR. It empowered the local authority to issue Development Right certificate (DRC) to the owner of a land parcel acquired for development purposes, to compensate the loss of the plot. The DRC is issued in pre decided proportion. The plot for which the DRC is issued is called TDR generating plot and the plot where TDR is used or intended to be used is called Receiving plot. The owner looses the right to develop any built up property on the generating plot. In Mumbai there are four kinds of TDRs, Reservation TDR, Raod TDR, Heritage TDR and Slum TDR.

-Urban Land Market and Access of Poor, India – Darshini Mahadevia A report on Urban Poor (draft), NIUA,

Step 10: Ensuring that no building plans are sanctioned without the earmarked land

City engineers/ Civil engineers or architects authorised to sanction the building plans must check if the mandatory requirement for EDL has been adhered to. Building approvals may be granted only after a proper check has been made. In case of non compliance, licences of civil engineers /architects may be cancelled by the competent authority.

ULBs may also like to simplify the current systems for building plan approvals which are both slow and non-transparent. At present only the civil engineers in ULBs are authorised to sanction building plans. With growing cities they may not be able to cope with the increasing

volume of plan approvals. To facilitate the process, ULBs may empanel city architects for sanctioning plans as has been done at Chennai. ULBs must inform the civil engineers/architects about the new rules and regulations for building plan approvals.

Step 11: Creation of Shelter Fund

A Shelter Fund is a dedicated fund earmarked for providing housing to the poor. Through legislative amendments private builders may either contribute a proportion of their land for social housing or equivalent land cost to the shelter fund. This has been quite successfully implemented in Madhya Pradesh. The recent report on "Affordable Housing for All" by the Ministry of Urban Development has also recommended a 0.5 per cent cess on all central government taxes, to be credited to a dedicated shelter fund[8] at the national level. The proposed fund will be managed by the National Housing Bank with an equivalent budgetary support so as to make a long-term impact. Similar efforts can be planned at the state/city level.

Shelter Fund

The concept of Shelter Fund has been in practice in Madhya Pradesh since eighties. In this Private builders have the obligation to contribute a portion of the land developed by them or cash proportionate to the land value to the Ashraya Nidhi (Shelter Fund) for pro-poor housing. This fund that is collected at the state level is redistributed to provide social housing The Municipal laws in the state has been appropriately amended to create this fund. In Madhya Pradesh most builders prefer to contribute land value as against land; this is creating shortage of land and the state government is deliberating if they should make it mandatory for the builders to contribute land only.

Step 12: Set up an Urban Planning Cell in the ULB

All ULBs must set up a dedicated and professionally managed Planning Cell within their organizational structure. Officials of the Planning cell must be aware of the need and importance of earmarking land for the poor. They should be able to use the LMIS along with the GIS to identify land for the poor. They may work closely with the Project Implementation Unit set up in all the ULBs under JNNURM to guarantee implementation of EDL.

8 - Report of the High Level Task Force , MoH&PA , .AFFORDABLE HOUSING FOR ALL December 2008

Step 13: Township Development through Public Private Partnership

In recent times, Public Private Partnerships have proved to be a sustainable way to promote housing for the poor. In March 2005, the Government of India, permitted Foreign Direct Investment (FDI) up to 100 percent for development of Integrated Townships including housing (including housing for the poor), commercial premises, hotels, resorts, city and regional level urban infrastructure facilities such as roads and bridges, mass rapid transit systems and manufacture of building materials. Development of land and allied infrastructure forms an integrated part of township development. Taking advantage of this liberalisation, many states have amended their policy instruments to facilitate developing integrated township in the city periphery well connected with the city core. To attract investors incentives are provided by offering additional FARs, exemption from stamp duty fees and other such benefits. Andhra Pradesh and Gujarat are frontrunners in taking advantage of this initiative. The following two boxes highlight the revisions in the legislations undertaken by the Government of Andhra Pradesh and Gujarat to accommodate the needs of the EWS/ LIG category.

Restructuring the Hyderabad Master Plan

Till August 2008, the Hyderabad Metropolitan Development Authority (HMDA) had prepared nearly 20 Zonal Plans and two Master Plans aimed at promoting affordable housing for the economically weaker sections co-ordinated with building regulations for new and old constructions. Through this process, HMDA managed to identify nearly 50 acres of developed land for EWS housing. Initiatives undertaken in the Master Plan included:

Layout Development:

- 5 percent of total developable land to be returned to HMDA for providing Master Plan facilities. This principle is only applicable for Green Field Areas such as Hyderabad Airport Development Area, Outer Ring Road Growth (ORR) Corridor and extended areas of Hyderabad Development Area.
- At least 5 percent each, of the total project land to be developed for EWS (maximum plot size of 50 sq mts) and LIG (maximum plot size of 100 sq mts) housing; the option of developing EWS instead of LIG plots rests with the developer.
- If the above is not feasible, the developer may provide equivalent number of plots (or equivalent proportion of land) on any developed land within 5 kms radius of the said site to HMDA or any other agency construction of LIG/EWS housing.

Group Housing Schemes:

- At least 5 percent units to be reserved for EWS (plinth area 25 sq mts) and for LIG (plinth area 40 sq mts).The developer has the choice of building these as separate blocks, and in case it is not feasible to provide for such units within the project site then these are to be provided within 5 Kms radius of the project site or hand over equivalent amount of land for the same purpose to HMDA or other such public agency.

Town Planning in Gujarat

The Gujarat Town Planning and Development Act (GTPUDA), 1976 provides for Town Planning Schemes through Private-Public Partnership with reservation of land for housing EWS groups. The Municipal Corporation of Surat has used the provision to secure 394 hectares of land for housing for the poor under the BSUP component of JNNURM. The General Development Control Regulations (GDCRs) under the Act specify details such as density of the settlement (maximum 225 dwellings per hectare), plot size(between 18 sq m to 40 sq m), height (maximum ground plus one structure) etc. so that the housing so created is used by the target group only .

Government of Gujarat has also repealed the Urban Land Ceiling and Regulation Act (ULCRA) and the State Revenue Department has transferred the excess land to the Urban Local Bodies at a nominal rate with the condition that the ULBs use the land to construct low cost housing for socially and economically poor.

C. Engaging with state departments for implementing EDL

For proper implementation of EDL, the city will need proactive support from the state level agencies. The following steps describe the kind of inputs required from the state and what the city can do towards getting that help.

Step 14: Revise the State Town and Country Planning Act

As it is apparent from the discussions in the previous sections urban planning is governed by State Town Planning and other development Acts in each state. For creating incentives for EDL, the State Town and Country Planning Departments will need to implement certain legislative amendments which in turn will empower local bodies to provide incentives such as land pooling, land readjustment or TDR as described in step 9. Town Planning Scheme (TPS) using land pooling techniques have been successfully used in Maharashtra, Gujarat, Tamil Nadu, Punjab etc. They have facilitated the assembly and development of urban land though not necessarily for the poor. Mechanism such as TPS can be used by ULBs to pool land and redistribute these across urban areas to ensure land is earmarked for the poor in those parts of the town where it is most needed.

Step 15: Linking with other urban reforms

Under JNNURM, a large number of reforms have been initiated. These include: simplification of land registration processes and rationalisation of stamp duty fees, land titling and property tax reforms. These have led to an increase in number of legal property owners paying taxes, increasing revenues. So far incentives offered under these reforms have been availed by middle and high income groups only. State may approve innovations incentives such as stamp duty exemptions, tax holidays, fast track building plan approvals and registration processes to builders who agree to earmark land for the city's poor. Government of Andhra Pradesh to incentivise private developers to provide for the poor in the new housing projects exempts EWS plots from all fees or charges and just 25% for the LIG category. In case the Developer provides any alternative land for the EWS/LIG housing no conversion charges are imposed.

D. Increasing access of EWS/LIG households to land /housing

Earmarking land for the poor alone may not be sufficient guarantee that land /housing will be available to the poor. There will be need to help the poor access this land. This will require creating awareness among the poor on where the lands have been allocated, include their development in the Ward Plans, tap potential of local /small private builders for housing the poor, engage with local NGOs to increase the voice of poor in local area planning and access to city resources.

Under the Community Participation Law, ULBs are expected to set up Ward and Area Sabhas with adequate representation of poor people. These may be used as opportunities to proactively disclose the upcoming housing projects for poor within the city. This would also fit in with the provisions of the Public Disclosure Law.

- Facilitating home financing for the poor

Cities must also forge partnerships with Self Help Groups and Micro Finance Institutions both formal and informal to help poor access money to purchase land /houses. Often Financial Institutions prefer to provide loans through NGOs, who works as intermediaries, to disburse loan to beneficiaries. State/ city administration can facilitate this process by standing guarantee or by framing appropriate regulations so that benefits of these transactions reach the target group.

Alliance - NGO - Donor partnership

SPARC, Nirman (the financial and construction arm of SPARC), the National Slum Dwellers Federation and Mahila Milan (known as the 'Alliance') have been working together on infrastructure and housing issues in slum areas for over twenty years. Access to finance emerged as a big obstacle. At this point, Community Led Infrastructure Finance Facility (CLIFF) was set up with funds from DFID (approximately £6.8 million) and SIDA (approximately £1.5 million). CLIFF works closely with the Alliance to implement upgrade programmes in Dharavi slums in Mumbai and in urban Bangalore. Funds from CLIFF are used only as guarantee or as bridge loans. Thus, while CLIFF provide a short-term remedy, funding in the long-term remains an issue.

5. Measuring Achievement / Outcomes

Some indicators for measuring the success of EDL are

- Reduction in slums/ number of people living in slums and illegal housing.
- Percentage increase in land /housing ownership among BPL/EWS and LIG.
- Land for housing projects for poor incrementally reaches required levels in the city.
- Increase in the number of schemes / projects delivering land/ housing targeted specifically to BPL/ EWS and LIG households.
- Increase in the number of building plans pertaining to BPL/EWS and LIG category submitted in the ULB for approval
- More number of BPL/ EWS and LIG households getting institutional loans.
- Improved incomes/ quality of lives of households belonging to BPL/EWS and LIG category.
- Increase in number of housing cooperatives of the poor involved in construction.
- Improvements in the reservation of percentage of land/housing for the households belonging to EWS/ LIG category.
- More number of Civil Societies, NGOs, CBOs and private builders engaged in the city to cater for housing for the poor.
- Increase in number of housing cooperatives with members from the BPL/EWS and LIG category.
- Increase in the job opportunities in the housing construction industry.

6. Time Line

The following time line may be followed for implementing EDL.

Tasks	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7
Decide on the extent of reservation say between 20-25% in all housing projects	Decision is made and appropriate notifications are issued			Achieved 12 % reservation in the all housing projects			Achieved 25 % reservation in the all housing projects
Formulation of State Urban Housing and Habitat Policy		State Urban Housing and Habitat Policy formulated.					
Revise and Amend the TCPO Act			Making appropriate changes in the MP/ Developmental Plans				

Amend the Building By Laws and approval process			Amendments in the Building By Laws notified and city architects empowered to approve building plans				
Set targets to reduce housing shortage for the poor by half with reference to present shortfall							
Enabling environment to provide incentives to construction industry and private builders				Housing shortage for the poor reduced by 25 percent.			Housing shortage for the poor reduced by 50 percent

3. Community Participation Law

State Level Reform

1. The Reform

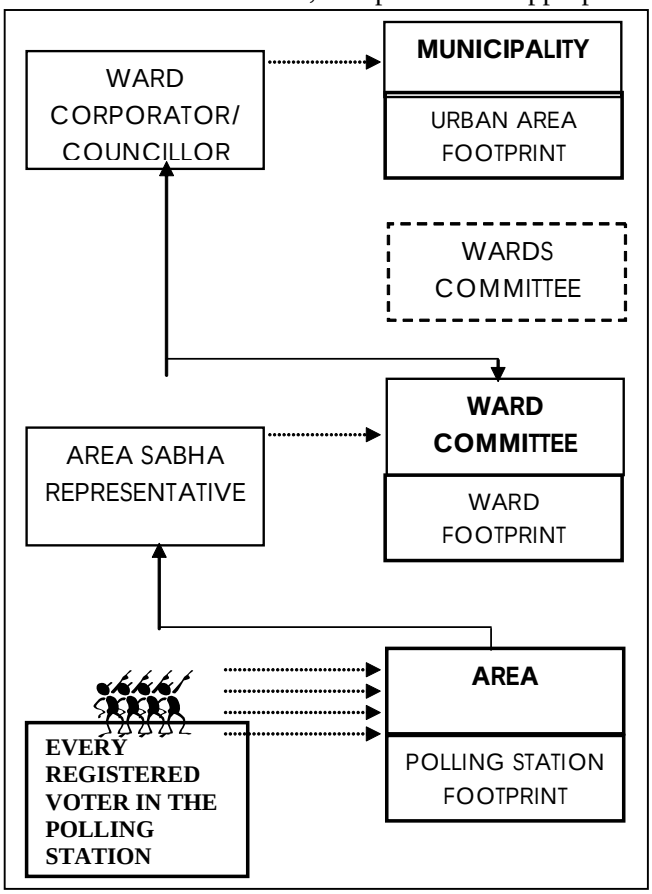
The Community Participation Law (CPL) is aimed at:

- Strengthening municipal governments by:
  - Institutionalizing citizen participation.
  - Introducing the concept of *Area Sabhas* (consisting of all registered voters of a polling booth) in urban areas.
- Involving citizens in municipal functions like setting priorities, budgeting provisions, exerting pressure for compliance of existing regulations, etc.

JNNURM contemplates the creation of another tier of decision-making in the municipality which is below the ward-level, called the *Area Sabha*. All the *Area Sabhas* in a ward will be linked to the ward level ward committee through *Area Sabha* representatives, who will be community representatives. There will thus be a minimum of 3 tiers of decision-making in a municipality, namely, the municipality, the ward committee, and the *Area Sabhas*. In addition, states may choose to have an intermediary level for administrative reasons, clustering multiple wards into a regional structure between the ward and the municipality.

The CPL is a mandatory reform under the JNNURM and it refers to making appropriate provisions in the state-level municipal statute(s) for the establishment of such a three/four tiered structure. The JNNURM makes it mandatory for states to either enact a separate CPL or make appropriate amendments to their existing municipal laws. These enactments will need to ensure clear definition of functions, duties and powers of each of these tiers, and provide for appropriate devolution of funds, functions and functionaries to these levels.

The figure on the right illustrates the proposed structure:



2. Rationale for the reform

Citizen participation is essential for making democratic processes effective and for strengthening them. It provides a platform to citizens to influence policy / program development and implementation. While various platforms and systems for citizen's participation have developed organically there is a need to institutionalize them to make them effective and sustainable. The CPL aims to institutionalize such community participation platforms / systems. If implemented in its true spirit it will have the following advantages:

- It will help deepen democracy, facilitate efficiency and sustained socio-economic growth and promote pro-poor initiatives.
- It will help in improving urban governance and service delivery.
- It will promote transparency and accountability in governance.
- It will improve the quality of the decisions made, as these would be based on knowledge of local realities and requirements.
- It has significance for regional planning structures like the District Planning Committee (DPC) and the Metropolitan Planning Committee (MPC) both of which require citizen participation in planning from the grass roots.
- Citizens will have a say in determining how information is shared, policies are set, resources are used and plans/programs are implemented.

3. Reform components and timelines

Components	***Timelines***
Resolution by the state government expressing commitment to establish a new CPL	To be passed within 6 months of signing of MoA under the Mission and submitting a copy to the Ministry of Urban Development
Interim process for community participation in municipal functions while CPL is being enacted and notified (*See below)*	Within a year of signing the MoA
Progressive devolution of functions to the lower tiers. For e.g., the municipality may devolve monitoring of solid waste management to the lower tiers of *Area Sabha* to provide political education to the grassroots	Within a year of signing the MoA
Enactment of the law by the states according to the timeline committed to by them in the tripartite Memorandum of Agreement (MoA) signed by them	As per the timeline committed to by each state
Notification of the 'Rules' pertaining to the CPL or amendment in legislation	As per the timeline committed to by each state

Interim Processes

The interim process could be any of the following:

- A transitional semi-permanent structure set up across the city that can later blend seamlessly into *Area Sabha* structure when statutes are operationalized.

- Mysore example: A citizen committee created for every polling booth that is represented at the respective zonal committee. The zonal committee members are selected from among the members of the citizen committees present in the zone.

- Temporary citywide structure with a specific intention e.g., development of revised CDP for master planning, etc.

- Undertaking pilot programs in selected pockets of the city for select urban services. For e.g., participative platforms can be created at the polling booth levels for monitoring the segregation of solid waste.

Steps involved in drafting the CPL:

- The state should decide on whether to provide a four-tier (with an intermediary/regional committee) or a three-tier (without the intermediary committee) structure for participation.

- The state should decide whether the provision would be restricted to certain types of ULBs. That is, the structure could depend on the size of the ULB. For example, the legislative provision for a three/four-tier structure could apply to ULBs with population of more than a lakh. The structure could be 2-tiered (at city and ward levels) when the ward population is a manageable size.

- The legislation should provide the link between the different tiers, especially between an *Area Sabha* and a ward committee. This could be through the Area Sabha representatives, who may be either elected by the voters in the area or nominated by the ward councilor.

- The legislation should also specify the manner of selection of the *Area Sabha* representative and provide the voters the right to recall, if they are dissatisfied with their representative.

- The state should decide on the functions that it would devolve to the different tiers below the municipal level. The legislation should provide an activity mapping of functions under each tier.

- The legislation should provide for the responsibilities (based on the activity mapping) and powers of the different tiers.

- Finally, the legislation should also specify the role of the convener of the different tiers of participation, especially *Area Sabha* representative, chairperson of ward committee and zonal committee (if present).

- The rules specified under the law should spell out the guidelines for conducting the business of the different tiers specifying the process for arriving at the business agenda and resolutions and also provide for checks and balances for the optimal functioning of the different platforms.

4. Measuring Achievement / Outcomes

- Resolution by the state governments on establishment of a three/four-tier municipal structure (the municipality, the ward committee and the Area Sabha) in the state along the footprint of the electoral polling station.
  - Measure: Adherence to the timeline: six months from the signing of MoA.

- Introduction of interim participatory platforms mentioned above that will make way for the formal structures upon passing the law.
  - Measure: Number of municipalities in a state with such platforms.

- Devolution of functions.
  - Measure: Number of functions devolved and role of the different tiers with respect to each of them.

- A report documenting the efforts, successes, failures.
  - Measure: Comprehensibility of the document.

- Enactment of law
  - Measure: Extent of conformity with the spirit of the Model Law.

- Empowerment of the different tiers.
  - Measure: Provision of funds and capacity building at the required tier(s).

4.Structural Safety

State Level Reform

SOURCE: TCPO

4.0 STRUCTURAL DESIGN

The structural design of foundation, masonry, timber, plain concrete, reinforced concrete, pre-stressed concrete and structural steel shall be carried out in accordance with Part-VI structural design, section-1 loads, section-2 foundation, section-3 wood, section-4 masonry, section-5 concrete and section-6 steel of National Building Code of India taking into consideration all relevant Indian Standards prescribed by Bureau of Indian Standards including the Indian Standard given in IS-Code 1893-1984, 13920-1993, 4326-1993, 13828-1993, 13827-1993 and 13935-1993 for structural safety.

4.1 QUALITY OF MATERIALS AND WORKMANSHIP

All material and workmanship shall be of good quality conforming generally to accepted standards of Public Works Department and Indian standard specification and codes as included in Part-V Building Materials and Part-VII Construction practices and safety of National Building Code of India.

4.2 ALTERNATIVE MATERIALS, METHODS OF DESIGN AND CONSTRUCTION AND TESTS

4.2.1 The provision of the Bye-Laws are not intended to prevent the use of any material or method of design or construction not specifically prescribed by the bye-law provided any such alternative has been approved. The building materials approved by B.I.S. or any statutory body will form part of the approved building material and technology as part of the Bye-Laws.

5.Rainwater Harvesting / Recycling

State Level Reform

SOURCE: TCPO

5.0 Water Harvesting

Water harvesting through storing of water runoff including rainwater in all new buildings on plots of 100 sq m. and above will be mandatory. The plans submitted to the local bodies shall indicate the system of storm water drainage along with points of collection of rain water in surface reservoirs or in recharge wells.

All building having a minimum discharge of 10,000 L and above per day shall incorporate waste water recycling system. The recycled water should be used for horticultural purposes.

6.Barrier Free Environment

State Level Reform

SOURCE: TCPO

1 Definitions

Ambulant Disabled People:	Disabled who are able to walk but who may depend on prostheses (Artificial Limbs) orthoses (Calipers), Sticks, crutches or walking aids.
Non-Ambulant Disabled People:	Disabled people with impairments that confine them to wheelchair.
Wheel Chair:	Chair used by disabled people for mobility.

(i) Size of small wheel chair: 750 x 1050 mm

(ii) Size of large wheel chair: 800 x 1500 mm

2. Scope

These bye-laws are applicable to public buildings and exclude domestic buildings.

Building which shall provide access to ambulant disable and Non-Ambulant disabled are listed below. Distinction is made for buildings to be designed for the use of large wheel chairs and small wheel chair.

3. Building to be designed for Ambulant Disabled People

Higher Secondary School, Conference Hall, Dance Halls, Youth Centres, Youth Clubs, Sport Centres, Sport Pavilions, Boat Club Houses, Ice Rinks, Bowling Centres, Swimming Pools, Police Stations, Law Courts, Courts Houses, Sport Stadiums, Theaters, Concert Halls, Cinemas, Auditorias, Small Offices (the maximum plinth area 1400 sq.mt) Snack Bars, Cafes and banqueting rooms (for capacity above 50 dinners).

Note:

i) In sport stadiums provisions shall be made for non-ambulant spectators (small wheel chair)

ii) @ 1:1000 up to 10,000 spectators and @ 1:2000 for spectators above 10,000.

iii) In Theaters, Concert Halls, Cinemas and Auditoria provisions shall be made for non-ambulant spectators (Small Wheel Chairs) @ 1/250 up to 1000 spectators and 1/500 for spectators above 1000.

4. Building to be designed for Non-Ambulant Disabled People:

Schools for physically handicapped, cremation, buildings as mentioned in 3, Botanical Gardens, Religious Buildings, Old People Clubs, Village Halls, Day Centers, Junior Training Centres, Post Offices, Banks, Dispensaries, Railway Stations, Shops, Super Markets, and Departmental Stores.

Notes: Large wheel chair criteria shall be applicable on ground floors of the following building, post offices, banks, dispensaries, railway station, shops, supermarkets, and departmental stores.

5. Building to be designed for Non-Ambulant People (using small wheel chairs) Public lavatories in Tourist Sports, Clubs Motels, Professional and Scientific Institution, Museum, Art Galleries, Public Libraries, Laborites, Universities, Collage for further Education, Teachers Training Colleges, Technical College, Exhibition Halls Dentist Surgeries, Administrative Department of the Hospitals, Service Stations, Car Parking, Buildings Airports Terminals, Bus Terminals, Factories Employing Handicapped for Sedentary Works, Large Offices, (with plinth area abode 1400 sq.mt.), Tax Offices, Passport Offices, Pension Offices, and Labour Offices, Cafes, Banqueting Rooms and Snack Bars (For capacity above 100 dinners).

6. Buildings Requirements:

6.1 The following building requirements are to be provided for building mentioned above.

6.2 Site Planning

Access path form plot entry and surface parking to building entrance shall be minimum of 1800 mm wide having regular surface without any steps.

The parking of vehicles of disabled people two equivalent car spaces (ECS) shall be provided near entrance of 30 m from building entrance.

7. Approach to Plinth Level

Ramp shall be provided to enter the building, minimum width of ramp shall be 1800 mm with maximum gradient 1:12, length of ramp shall not exceed 9.0 m having 900 mm high hand rail on both sides extending 300 m on both sides of ramps. Minimum gap from the adjacent wall to the handrail shall be 50 mm.

Entrance landing shall be provided adjacent to ramp with the minimum dimension 1800 X 2000 mm.

Minimum Clear opening for the entrance door shall be 1000 mm.

Threshold shall not be raised more than 12 mm.

For stepped approach size of tread shall not be less than 275 mm and maximum riser shall be 150 mm.

8 Stairways

Height of the riser shall not be more than 150 mm and width of the tread not less than 275 mm, nosing if provided shall not extend beyond 25 mm. Maximum number of risers on a flight shall be limited to 12.

9. Lifts

Whenever lift is required as per bye-laws, provision of at-least one lift shall be made for Non-Ambulant disabled (using small wheel chairs with the following minimum dimensions of lift).

Clear internal depth	1090 mm
Clear internal width	1750 mm
Entrance door width	910 mm

A handrail not less 600 mm long at 1000 mm above floor level shall be fixed adjacent to the control panel.

10. Toilets

10.1 One special W.C. in a set of toilet shall be provided for the use of disabled. No additional provision of W.C. is to be made for disabled.

Size of the W.C. shall depend on the category of disabled for whom it is has been provided.

All doors in W.Cs shall open outside.

The type of W.C. shall be European with seat height as 500 mm.

Handrails, where provided shall have min 25 mm dia.

10.2 Provision of W.Cs in buildings without lift:

Provision of special W.C. shall be made on all floors for buildings designed for ambulant disabled persons.

For buildings designed for non-ambulant disabled special W.C. shall be provided at Ground Floor. Size of W.C. shall depend on the type of wheel chair used by the disabled.

10.3 Provisions of W.Cs in buildings with lift:

Provision of Special W.C. shall be made on all floors. Size will depend on the category of disabled for whom it has been provided.

10.4 Toilet Details

10.4.1 For Toilets Designed for Ambulant Disabled

The minimum size of W.C. shall be 1075 x 1650 mm with a minimum depth of 1450 mm from entry door 900 mm. Long handrail on the side closer to W.C. with a clear width between the handrails shall be 900 mm and height of handrails shall be 800 mm from floor level.

Minimum size of the clear door opening shall be 780 mm.

10.4.2 For Toilets Designed for Non-Ambulant Disabled Small Wheel Chair

The minimum size of W.C. shall be 1350 x 1500 mm with a minimum depth of 1500 mm from entry door. 900 mm long handrail on the side closer to W.C. shall be provided. To provide movement space for wheel chair, W.C. seat shall be fixed towards one side to the opposite adjacent wall. The centerline of W.C. from the adjacent wall shall be 400 mm and minimum 950 mm from the other wall.

Minimum size of the clear door opening shall be 780 mm.

10.4.3 For Toilets Designed for Non-Ambulant Disabled Using Large Wheel Chair

The minimum size of W.C. shall be 1500 X 1750 with a minimum depth of 1750 mm for entry door. 900 mm long handrail on the side wall closer to W.C. shall be provided. To provided movement space for wheel chair, W.C. seat shall be fixed towards one side of the opposite wall. The centerline of the W.C. from the adjacent wall shall be 400 mm and a minimum of 1100 mm from the other wall. Min. size of clear door opening shall be 860 mm.

7.Disaster Management

State Level Reform

SOURCE: Ministry of Home Affairs

1.1 Structural Design

For any building under the jurisdiction of these regulations structural design/ retrofitting shall only be carried out by a Structural Engineer on Record (SER) or Structural Design Agency on Record (SDAR). Proof checking of various designs/ reports shall be carried out by competent authority as per Table-1 wherever applicable.

Generally, the structural design of foundations, elements of masonry, timber, plain concrete, reinforced concrete, pre-stressed concrete and structural steel shall conform to the provisions of part VI Structural Design Section – 1 Loads, Section – 2 Foundation, Section – 3 Wood, Section – 4 Masonry, Section – 5 Concrete & Section – 6 Steel of National Building Code of India (NBC), taking into consideration the Indian Standards as given below:

For General Structural Safety

1. IS: 456:2000 “Code of Practice for Plain and Reinforced Concrete
2. IS: 800-1984 “Code of Practice for General Construction in Steel
3. IS: 801-1975 “Code of Practice for Use of Cold Formal Light Gauge Steel Structural Members in General Building Construction
4. IS 875 (Part 2):1987Design loads (other than earthquake) for buildings and structures Part2 Imposed Loads
5. IS 875 (Part 3):1987Design loads (other than earthquake) for buildings and structures Part 3 Wind Loads
6. IS 875 (Part 4):1987Design loads (other than earthquake) for buildings and structures Part 4 Snow Loads
7. IS 875 (Part 5):1987Design loads (other than earthquake) for buildings and structures Part 5 special loads and load combination
8. IS: 883:1966 “Code of Practice for Design of Structural Timber in Building 9. IS: 1904:1987 “Code of Practice for Structural Safety of Buildings: Foundation”
10. IS1905:1987 “Code of Practice for Structural Safety of Buildings: Masonry

Walls

11. IS 2911 (Part 1): Section 1: 1979 “Code of Practice for Design and
Construction of Pile Foundation Section 1
Part 1: Section 2 Based Cast-in-situ Piles
Part 1: Section 3 Driven Precast Concrete Piles
Part 1: Section 4 Based precast Concrete Piles
Part 2: Timber Piles
Part 3 Under Reamed Piles
Part 4 Load Test on Piles

For Cyclone/Wind Storm Protection

12. IS 875 (3)-1987 "Code of Practice for Design Loads (other than Earthquake) for Buildings and Structures, Part 3, Wind Loads" 13 Guidelines *(Based on IS 875 (3)-1987)* for improving the Cyclonic Resistance of Low rise houses and other building.

For Earthquake Protection

14 IS: 1893-2002 "Criteria for Earthquake Resistant Design of Structures (Fifth Revision)"
15 IS:13920-1993 "Ductile Detailing of Reinforced Concrete Structures subjected to Seismic Forces - Code of Practice"
16 IS:4326-1993 "Earthquake Resistant Design and Construction of Buildings - Code of Practice (Second Revision)"
17 IS:13828-1993 "Improving Earthquake Resistance of Low Strength Masonry Buildings - Guidelines"
18 IS:13827-1993 "Improving Earthquake Resistance of Earthen Buildings - Guidelines",
19 IS:13935-1993 "Repair and Seismic Strengthening of Buildings - Guidelines"

For Protection of Landslide Hazard

20 IS 14458 (Part 1): 1998 Guidelines for retaining wall for hill area: Part 1 Selection of type of wall.
21 IS 14458 (Part 2): 1997 Guidelines for retaining wall for hill area: Part 2 Design of retaining/breast walls
22 IS 14458 (Part 3): 1998 Guidelines for retaining wall for hill area: Part 3 Construction of dry stone walls
23 IS 14496 (Part 2): 1998 Guidelines for preparation of landslide – Hazard zonation maps in mountainous terrains: Part 2 Macro-zonation

Note: Whenever an Indian Standard including those referred in the National Building Code or the National Building Code is referred, the latest revision of the same shall be followed except specific criteria, if any, mentioned above against that code.

1.2 STRUCTURAL DESIGN BASIS REPORT

In compliance of the design with the above Indian Standard, the Structural Engineer on Record will submit a structural design basis report in the Proforma attached herewith covering the essential safety requirements specified in the Standard.

(i) The"Structural Design Basis Report (SDBR)"consists of four parts(**FormNo.**6)
Part-1 - General Information/ Data
Part-2 - Load Bearing Masonry Buildings
Part-3 – Reinforced Concrete Buildings
Part-4 - Steel Buildings
(ii) Drawings and Documents to be submitted for approval of appropriate authorities shall include SDBR as detailed below:
Part - 1 Completed
Part - 2 (if applicable) – completed
Part -3 (if applicable) – undertaking that completed Part 3 will be submitted before commencement of construction.

Part– 4 (if applicable) – undertaking that completed Part 4 will be submitted before commencement of construction.
(iii) SDBR as detailed below shall be submitted to the appropriate authority as soon as design of foundation is completed, but not later than one month prior to commencement of construction.
Part-1 Completed
Part-2, Part-3 or Part-4 (if applicable) Completed

1.3 SEISMIC STRENGTHENING/RETROFITTING

Prior to seismic strengthening/ retrofitting of any existing structure, evaluation of the existing structure as regards structural vulnerability in the specified wind/ seismic hazard zone shall be carried out by a RSE/RSDA. If as per the evaluation of the RSE/RSDA the seismic resistance is assessed to be less than the specified minimum

Seismic resistance as given in the note below, action will be initiated to carry out the upgrading of the seismic resistance of the building as per applicable standard guidelines.
Note: (a) for masonry buildings reference is to be made to IS: 4326 and IS: 13935 and (b) for concrete buildings and structures reference to be made to BIS code on evaluation and seismic strengthening for retrofitting of RCC buildings under preparation at present.

1.4 REVIEW OF STRUCTURAL DESIGN

(i) The Competent Authority shall create a Structural Design Review Panel (SDRP) consisting of senior SER's and SDAR's whose task will be to review and certify the design prepared by SER or SDAR whenever referred by the competent authority.
(ii) The Reviewing Agency shall submit addendum to the certificate or a new certificate in case of subsequent changes in structural design.
(iii) Table-1 gives requirements of SDRP for different seismic zones namely III, IV and V and for structures of different complexities.
(iv) In seismic Zone II, buildings & structures greater than 40m in height will require proof checking by SDRP as per detail at sl. no.03 of Table 1.

TABLE: PROOF CHECKING REQUIREMENTS FOR STRUCTURAL DESIGN

SR NO	TYPE OF STRUCTURE	SUBMISSION FROM SER or SDAR	TO BE PROOF-CHECKED
01	LOAD BEARING BUILDINGS UPTO 3 STOREYS	SDBR*	NOT TO BE CHECKED
02	BUILDINGS UPTO SEVEN STOREYS (R.C.C /STEEL FRAMED STRUCTURE)	SDBR	TO BE CHECKED
		PRELIMINARY DESIGN	TO BE CHECKED
03	BUILDINGS GREATER THAN SEVEN STOREYS (R.C.C /STEEL FRAMED STRUCTURE)	SDBR	TO BE CHECKED
		PRELIMINARY DESIGN	TO BE CHECKED
		DETAILED STRUCTURAL DESIGN AND STRUCTURAL DRAWINGS	TO BE CHECKED
04	PUBLIC BUILDINGS (A) LOAD BEARING BUILDINGS UPTO 3 STOREYS	SDBR	NOT TO BE CHECKED
	(B) R.C.C/STEEL STRUCTURES	SDBR	TO BE CHECKED
		PRELIMINARY DESIGN	TO BE CHECKED
		DETAILED STRUCTURAL DESIGN AND STRUCTURAL DRAWINGS	TO BE CHECKED
05	SPECIAL STRUCTURES	SDBR	TO BE CHECKED
		PRELIMINARY DESIGN	TO BE CHECKED
		DETAILED STRUCTURAL DESIGN AND STRUCTURAL DRAWINGS	TO BE CHECKED

* SDBR – Structural Design Basis Report

Notes:

•Public building means assembly of large number of people including schools, hospitals, courts etc.

• Special structure means large span structures such as stadium, assembly halls, or tall structures such as water tanks, TV tower, chimney, etc. It will be seen from the table that there is a wide range of structure typology, and the requirement by the Competent Authority for third party verification will depend on the type of structure.

1.5 CERTIFICATION REGARDING STRUCTURAL SAFETY IN DESIGN

Structural Engineer on Record (SER) or Structural Design Agency on Record (SDAR) shall give a certificate of structural safety of design as per proforma given in **Form-3** and **Form 14** at the time of completion.

1.6 CONSTRUCTIONAL SAFETY

1.6.1 Supervision

All construction except load bearing buildings upto 3 storeys shall be carried out under supervision of the Construction Engineer on Record (CER) or Construction Management Agency on Record (CMAR) for various seismic zones.

1.6.2 Certification of structural safety in construction

CER/ CMAR shall give a certificate of structural safety of construction as per proforma given in **Form-13** at the time of completio**n.**

1.7 QUALITY CONTROL AND INSPECTION

1.7.1 Inspection

All the construction for high-rise buildings higher than seven storeys, public buildings and special structures shall be carried out under quality inspection program prepared and implemented under the Quality Auditor on Record (QAR) or Quality Auditor Agency on Record (QAAR) in seismic zones IV & V.

1.7.2 Certification of safety in quality of construction

Quality Auditor on Record (QAR) or Quality Auditor Agency on Record (QAAR) shall give a certificate of quality control as per proforma given in **Form-15.** Quality Inspection Programme to be carried on the site shall be worked out by QAR/ QAAR in consultation with the owner, builder, CER/ CMAR.

1.8 CONTROL OF SIGNS (HOARDINGS) AND OUTDOOR DISPLAY STRUCTURES AND PAGING TOWER AND TELEPHONE TOWER AND OUTDOOR DISPLAY STRUCTURES

Following provisions shall apply for telecommunication infrastructure.

a) Location: The Telecommunication Infrastructure shall be either placed on the building roof tops or on the ground or open space within the premises subject to other regulations.
b) Type of structure
(i) Steel fabricated tower or antennae's on M.S. pole.
(ii) Pre-fabricated shelters of fibre glass or P.V.C. on the building roof top/terrace for equipment.
(iii) Masonry Structure/ Shelter on the ground for equipment.
(iv) D.G. Set with sound proof cover to reduce the noise level.
c) Requirement:
(i) Every applicant has to obtain/ procure the necessary permission from the "Standing Advisory Committee on Radio Frequency Allocation" (SACFA) issued by Ministry of Telecommunications.
(ii) Every applicant will have to produce the structural safety & stability certificate for the tower as well as the building from the Structural Engineer on Record (SER) which shall be the liability of both owner and SER.
(iii) Applicant has to produce / submit plans of structure to be erected.
d) Projection: No Pager and/or Telephone Tower shall project beyond the existing building line of the building on which it is erected in any direction.

1.8 STRUCTURAL REQUIREMENTS OF LOW COST HOUSING

Notwithstanding anything contained herein, for the structural safety and services for development of low cost housing, the relevant provisions of applicable IS Codes shall be enforced.

1.10 INSPECTION

The general requirement for inspection of the development shall also include the following regulation.

1.11 General Requirements

The building unit intended to be developed shall be in conformity with Regulation on requirement of site. Generally all development work for which permission is required shall be subject to inspection by the Competent Authority as deemed fit.

The applicant shall keep a board at site of development mentioning the survey No, city survey No, Block No, Final Plot No., Sub plot No., etc. name of owner and name of Architect on Record, Engineer on Record , Developer, Structural Engineer on Record , Construction Engineer on Record .

1.12 Record of Construction Progress

(a) Stages for recording progress certificate and checking:-
i) Plinth, in case of basement before the casting of basement slab.
ii) First storey.
iii) Middle storey in case of High-rise building.
iv) Last storey.
(b) At each of the above stages, the owner / developer / Builder shall submit to the designated officer of the Competent Authority a progress certificate in the given formats **(Form No. 7-10)** This progress certificate shall be signed by the Construction Engineer on Record.
c) The progress certificate shall not be necessary in the following cases:
i) Alteration in Building not involving the structural part of the building.
ii) Extension of existing residential building on the ground floor upto maximum 15 sq mt. in area.
(d) Completion Report
i) It shall be incumbent on every applicant whose plans have been approved, to submit a completion report in **Form No.1**1.
ii) It shall also be incumbent on every person / agency who is engaged under this Development Control Regulations to supervise the erection or re-erection of the building, to submit the completion report
in **Form No.12 and 13** prescribed under these Development Control Regulations.
iii) No completion report shall be accepted unless completion plan is approved by the Competent Authority.

(e) The final inspection of the work shall be made by the concerned Competent Authority within 21 days from the date of receipt of notice of completion report.

1.10.3 Issue of Occupancy Certificate

The Authority issuing occupancy certificate before doing so shall ensure that following are complied from consideration of safety against natural hazard.

(i) Certificate of lift Inspector has been procured & submitted by the owner, regarding satisfactory erection of Lift.
(ii) The Certificate of Competent Authority and or fire department for completion and or fire requirements as provided in these regulations has been procured and submitted by the owner.
(iii) If any project consists of more than one detached or semi detached building / buildings in a building unit and any building / buildings there of is completed as per provisions of D.C.R.. (Such as Parking, Common Plots, Internal Roads, Height of the Building, Infrastructure facilities, lift and fire safety measures), the competent authority may issue completion certificate for such one detached or semi detached building / buildings in a building unit. The occupancy certificate shall not be issued unless the information is supplied by the Owner and the Architect on Record/ Engineer on Record concerned in the schedule as prescribed by the Competent Authority from time to time.

1.13 MAINTENANCE OF BUILDINGS

In case of building older than fifty years, it shall be the duty of the owner of a building, to get his building inspected by a Registered Structural Engineer (RSE) within a year from the date of coming into force of these regulations. The Structural Inspection Report **(Form No.16)** shall be produced by the Owner to the Appropriate Authority. If any action, for ensuring the structural safety and stability of the building is to be taken, as recommended by SER, it shall be completed within five years. For other buildings, the owner shall get his building inspected after the age of building has crossed forty years. The procedure shall be followed as per above regulation.

1.14 PROTECTIVE MEASURES IN NATURAL HAZARD PRONE AREAS

In natural hazard prone areas identified under the land use zoning regulations, structures buildings and installations which cannot be avoided, protective measures for such construction/ development should be properly safeguarded based on the suggestion given in Appendix A.

1.15 REGISTRATION OF PROFESSIONALS

Presently, the legislation for profession of architecture is applicable in the country in the form of Architects Act 1973. Accordingly, the qualifications of architects, competence and service conditions followed in the profession of architecture are in accordance of the provision of the said Act and the rules made there under. Whereas, for other professions and professionals like engineers, developers/promoters for taking up the projects there is no legislative frame available/applicable in the country. In the absence of any such legislation, the appropriate qualifications, service conditions, professional fees and charges in the engineering profession etc.

are varying and are not based on any uniform formula, therefore, the Committee, keeping in view that the responsibility of safety of development/projects, is that of the engineers, the Committee has worked out the detailed qualifications/responsibilities for different type of development which are given in Appendix 'B' under heading Registration, Qualifications and Duties of Professionals, and the professional fees are suggested in 5.14.

1.16 PROFESSIONAL FEES FOR SER/ SDAR AND CER/ CMAR

Keeping in view that presently there is no Act regulating the services of engineers and to determine their professional charges, the committee felt that :
(i) Considering the responsibility of structural safety of a building falls on the shoulders of the "SER/SDAR" for its proper design and the "CER/CMAR" for proper construction, it is imperative that selection and appointment of these professionals is made carefully after verification of their antecedents and past experience.
(ii) The fees to be paid to SER/SDAR for structural design may be specified keeping in view the size and complexity of the project which may vary based on the cost of the items of the structure enumerated below.
"Excavation, dewatering, diaphragm wall, piling, base concrete, waterproofing of basement and other under ground structures, all grades of concrete, reinforcement, pre-stressing cables or tendons, structural steel, load bearing masonry, parts of structural glazing or curtain walls to be designed against earthquake and wind forces, clamps for stone cladding".
(iii) Similarly, fees for construction management to CER/CMAR may be specified keeping in view the size and complexity of the project and the duration for which construction management services have to be provided on the basis of the total cost of the project.
(iv) Proof checking: Fees for Proof checking where carried out may vary based on the cost of the structural items enumerated in (ii) above.

1.17 APPOINTMENT OF PROFESSIONALS

The Owner/Developer shall appoint Town Planner on Record (TPR), Architect on Record (AR), Engineer on Record (ER), Structural Engineer on Record (SER), Structural Design Agency on Record (SDAR), Geotechnical Engineer on Record (GER), Construction Engineer on Record (CER), (CMAR), and Quality Auditor on Record (QAR) and Quality Audit Agency on Record (QAAR) as required. The detail of qualification and requirement of registration is given in Appendix B. A proper written agreement(s), in a standard format(s), should be entered upon with such professional(s) engaged.

PROTECTION AGAINST HAZARDS

A1. PROTECTION OF AREAS FROM EARTHQUAKES

i. In those areas where there are no dangers of soil liquefaction or settlements or landslides, all building structures and infrastructures should be designed using the relevant Indian Standards as provided in the Building Regulations and the National Building Code
ii. Soils subjected to liquefaction potential under earthquake shaking can be improved by compaction to desired relative densities, so as to prevent the possibility of liquefaction.
iii. Buildings and structures could be founded on deep bearing piles going to non-liquefiable dense layers.
iv. Steep slopes can be made more stable by terracing and construction of retaining walls and breast walls, and by ensuring good drainage of water so that the saturation of the hill-slope is avoided.
v. Any other appropriate engineering intervention to save the building structures or infrastructure from the fury of the earthquake.

Note : The protective action given under (ii) to (v) will usually involve large amount of costs and should only be considered in the case of large and costly structures. For ordinary buildings the cost of improvement of the site will usually be uneconomical, hence bad sites should be excluded by Land Use Zoning.

A2. PROTECTION FROM CYCLONIC WIND DAMAGE

i. Buildings, structures and infrastructures in the cyclone prone areas should be designed according to the Indian Standards and Guidelines as provided in the Regulations and the National Building Code.
ii. Light utility structures used for electrical transmission and distribution, and towers for communications, chimney stacks of industrial structures.require special design considerations against the cyclonic wind pressures, suctions and uplifts.
iii. In case the buildings, structures and infrastructures are founded on marine clay deposits it will be advisable to adopt either under-reamed or long piles which should penetrate the marine clay layer and rest on dense sand stratum, or individual column footing with a reinforced concrete beam located at the level of the ground, or a continuous reinforced concrete strip footing, using a very low bearing pressure not exceeding …….
iv. Wherever, the top soil could become slushy due to flooding, the top layer of 30 cm depth of soil should not be considered for providing lateral stability.
v. In storm surge prone areas, it will be preferable to construct the community structures, like schools, cyclone shelters, etc. by raising the level of the ground protected by provision of retaining walls at sufficient distance away from the building, taken to such depth that no erosion takes place due to receding storm surge. Alternatively, construct the community structures on stilts with no masonry or bracing upto the probable maximum surge level.

A3. PROTECTION OF AREAS FROM FLOODS

This may require one or more of the following actions.

i. Construction of embankments against the water spills from the source of flooding like rivers, large drain etc.
ii. Construction of high enough embankments/bund around the planning area.
iii. Raising the planning area above the high flood level.
iv. Construction/improvement of drainage paths to effectively drain the water from the planning area.
v. Construction of buildings and structures on deep foundations going below the depth of scour or on stilts with deep enough foundations under water.
vi. Flood proofing works such as the following:

- Providing Quick Drainage facility, consisting of
- Revitalization of secondary and primary drainage channelsafter establishing the drainage blockage points;
- Provision of additional waterways;
- Clearing of clogged cross drainage works;
- Providing Human and Animal Shelters for population living within embankments in the form of raised platform or use of available high ground.

vii Anti-erosion actions in affected areas
viii. Any other suitable measure.

Note: Similar protection methods could be used against flooding caused in cyclone prone areas by high intensity rains or by the storm surge. The concept of land zoning should be kept in mind for areas where protection works are taken up to decide inter-se priority for location of structures considering possibility of failure of protection works during extreme disaster events.

8.Internal Earmarking of funds for Services to Urban Poor

State Level Reform

SOURCE: NIUA

1. The Reform

JNNURM requires ULBs to undertake reforms aimed at institutionalizing "internal earmarking of funds in their budgets specifically for basic services to the poor". The Mission also seeks commitment from ULBs for:

- Undertaking reforms in budgeting and accounting systems to enable internal earmarking of funds for the urban poor.
- Setting targets for expenditure incurred on delivery of services to the poor.

Internal earmarking of funds refers to the percentage of total estimated municipal income that would be utilized for provision of housing and basic services for the urban poor. While budgeting systems and processes are a key element for efficient functioning of municipalities, it is often the most neglected and underdeveloped barring a few exceptions.

"Internal earmarking, within local body budgets, for basic services to the urban poor", is an important reform required for the attainment of the following larger objectives envisaged under JNNURM:

- Scale-up delivery of civic amenities and services with emphasis on universal access to the urban poor.
- Provision of basic services to the urban poor including security of tenure at affordable prices, improved housing, water supply and sanitation, and ensuring delivery of other existing universal services of the government for education, health and social security.
- Integrated development of slums through projects for providing shelter, basic services and other related civic amenities with a view to providing services to the urban poor.

2. Rationale for the reform

Internal earmarking of funds for the urban poor in ULB budgets will ensure equity, efficiency, transparency and accountability of the local body:

- *Equity:* All cities have some proportion of their population as urban poor. The current practice of a common budget having generic items has failed to provide a proportionate share in resource allocation for urban poor. Though unintentional, this has resulted due to systemic and structural limitations of present municipal budgeting. The mechanism of a separate budget head or entirely separate budget with detailed budget items for urban poor under separate head will facilitate allocation of resources for the urban poor on an equitable basis.
- *Efficiency*: Separate budget head for urban poor welfare and detailed budget items under separate head and other respective service heads will improve efficiency in allocation and utilization of resources for the urban poor. It will also facilitate performance monitoring
- *Transparency*: Separate budget head for urban poor welfare and detailed budget items under this separate head and other respective service heads, including accounting of receipts and payments, will facilitate transparency. With such improved budget structure it would be easy to ascertain how much the ULB is spending on the urban poor and under which head/budget item.
- *Accountability*: Performance monitoring will become easy and will help in fixing accountability for under or non-perf**o**rmance.

Separate budget head for urban poor welfare and detailed budget items under this separate head, and other respective service heads for urban poor or separate budget structure is expected to have benefits for all stakeholders, namely citizens (urban poor) and the ULB.

For Citizens

- Equitable allocation of resources for the poor
- Focused development and efficient delivery of services
- Opportunities for greater participation in decision-making and improved interaction with municipal government
- Better monitoring of budget and progress of ULBs
- Transparency and accountability in resource allocation and utilization by ULB.

For ULBs

- Improved budget systems and procedures
- Enhanced focus on allocation and utilization of resources for urban poor
- Creation of an effective Management Information System (MIS)
- Facilitate objective and timely decision-making
- Better coordination between departments and agencies
- Ability to monitor and track programs, services, and revenues effectively and on a timely basis
- Overall improvement in governance, delivery of services and citizen interface.

For Management

- Availability of MIS on timely basis across all departments about spending on services and development provided to urban poor
- Appropriate and timely decision-making
- Ability to monitor and track programs, services, and revenues effectively and on a timely basis.

3. Reform components

There are three main aspects/components of this reform –

1. Adoption of clear, affirmative policy of earmarking (allocating) certain quantum (MHUPA recommended norm is 25 % of municipal budget including funds flowing from higher level governments[1]) of funds for urban poor by the State and each municipal body of the State.

2. Constitution of 'Basic Services for Urban Poor Fund' and setting the rules/modalities for contribution to and disbursement from funds.

3. Creation and operation of appropriate budgetary mechanism to ensure that funds allocated for urban poor get spent on urban poor.

In response to the internal earmarking, within local body budgets, for basic services to the urban poor reform conditionality, states and ULBs have initiated processes (policy adoption) aimed at earmarking a certain percentage of the budget exclusively for the urban poor. For example, Gujarat state has adopted a policy for earmarking 20 percent of its budget for urban poor and has made it mandatory for ULBs in the state to earmark the same proportion of their budgets for provision of services to the urban poor. Andhra Pradesh State has given policy direction to municipal bodies to allocate 40% of total budget for provision of services to the urban poor.

Though this is a step in the right direction it will be effective only if above mentioned main three aspects/components and various sub-aspects of the reform (explained below) are implemented in a following manner.

[1] DO letter No. ---------- dated May 14th 2007 from Minister for Housing and Urban Poverty Alleviation to Chief Ministers

4. Steps in implementing the reform

Implementing the reform relating to internal earmarking of funds for the urban poor may be based on the concept of Urban Poverty Sub Plan in every city[2] (Urban Local Body) creating a vision poverty free, slum free cities, setting milestones for affordable housing, basic amenities and employment generation etc. estimating requirement funds, developing a legal framework based policy for internal earmarking of funds, ensuring the preparation of separate budget for urban poor, creating BSUP Fund etc.

A comprehensive reform implementation plan for achieving internal earmarking of funds for services is escribed under three main components of reforms - adoption of an affirmative public policy, constitution of non-lapsable BSUP Fund and creation of an appropriate budget structure and mechanism.

Adoption of Policy on internal earmarking for basic services to the urban poor

A local body can adopt internal earmarking of funds for urban poor policy by council resolution but taking in to account bigger picture of this reform it is necessary that the State Government should take lead to formulate and adopt internal earmarking of fund for the urban poor in statutory terms (suitable amendment of Municipal Acts).

Earmarking certain specified percentage of local body budget is the soul of this reform. As mentioned above MHUPA recommended norm is 25 % of municipal budget including funds flowing from higher level governments but this policy decision certainly involves various considerations mentioned below.

Whether to reserve certain percentage of municipal income (and more importantly of which source of income revenue, capital etc.) or of expenditure and that too of which type of expenditure revenue, capital etc.? If it is linked to particular source of income then there exists possibility of missing distributional equity aspect. Instead of earmarking funds for urban poor in a one-dimensional manner, State and local bodies may earmark funds in following multidimensional way in the policy –

% of municipal revenue income for the urban poor out of total municipal revenue income (in case of surplus budget)
% of municipal revenue expenditure for the urban poor of total municipal revenue expenditure (in case of deficit budget)
% of capital expenditure out of total capital expenditure

[2] DO letter No. ---------- dated May 14th 2007 from Minister for Housing and Urban Poverty Alleviation to Chief Ministers

It is important to know that earmarking in itself may not serve any purpose without measures to improve municipal finance and reserving part of various sources (income) for the urban poor in a separate Fund.
Beside how much should be the reservation of funds for the urban poor, public policy should consist following

- Defining clearly who is urban poor? As each State and City is at different of socio-eco infrastructure development, application of blanket poverty definition will not be appropriate. Equally important is the process of identifying and registering an urban poor objectively and transparently to receive basic service under this and future scheme.
- JnNURM scheme has recommended certain basic services to be provided to the urban poor but it is necessary that the State Governments decide the list and the level of basic services to be provided to urban poor in the light of state and city level specific conditions.

Constitution of a 'Basic Services for Poor Fund'

The policy should provide for the constitution of a non-lapsable fund to be known as a BSUP fund and also should set rules and modalities contribution to and disbursement from funds. Rules should also provide that if the earmarked budget is not spent on the urban poor, then the unspent (balance) amounts to be transferred to the non-lapsable BSUP Fund.

Constitution of a separate fund is important aspect of actualizing objectives of internal earmarking of funds for the urban poor. If vehicle of fund is not created then as it has been past experience earmarking may happen in local budget but in actual terms expenditure may not happen. Further Fund serves as an accounting and statutory entity which will facilitates transparency about amount contributed to and disbursed from the fund for the urban poor and will help in big way in ensuring accountability of spending funds for the urban poor.

The BSUP Fund may be created by earmarking portion of following sources[3] of or by providing specific percentage share of total revenue income of Urban Local Body as discussed earlier.
Property Tax, Professional Tax, Entertainment tax
Stamp Duty Surcharge Vacant Land Tax Land Use Conversion Charges
Town Planning Fees/Charges Betterment Levies External Development Charges
Grants from Central and State Government
Recovery of at least 10% of the funds released to implementing agencies under JnNURM through revolving fund

Creation of an appropriate municipal budget structure and mechanism
The last mile necessity for actualizing policy of internal earmarking of specific budget for providing services to urban poor and for operationalising BSUP Fund is of this reform is the creation of an appropriate municipal budget structure and mechanism. Budget is a management tool for planning as well as controlling (monitoring/tracking) the performance. Besides earmarking specific amount in a non-lapsable BSUP Fund it is important to plan appropriate works for providing basic services to the urban poor; to allocate necessary funds for these works and finally to monitor performance (physical and financial) of the works to achieve desired objective of urban poor, slum free cities. It is therefore necessary to create appropriate budget structure and mechanism at local body level keeping following ground realities, operational issues in consideration.

[3] Annexure 3 to the DO letter No. ---------- dated May 14th 2007 from Minister for Housing and Urban Poverty Alleviation to Chief Ministers.

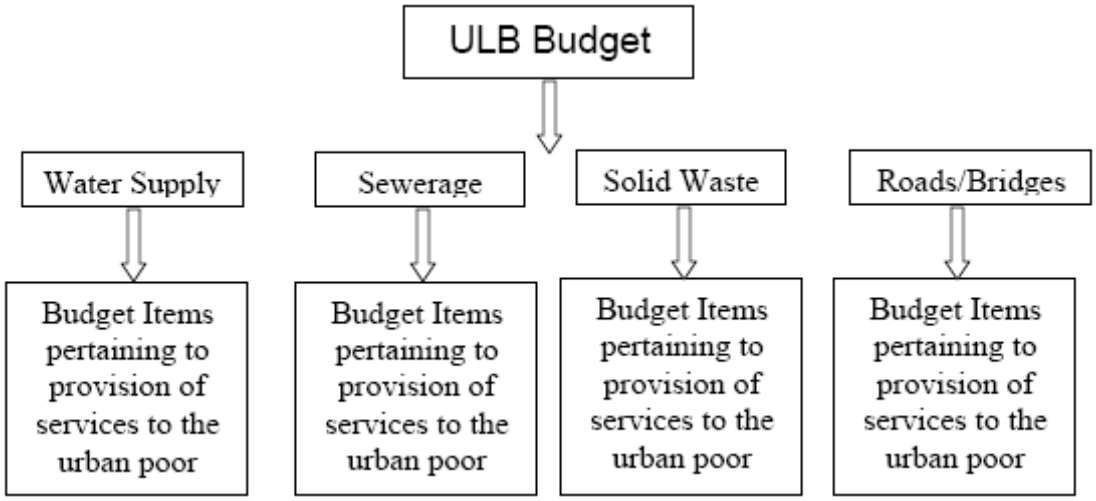
At present budget items earmarking budget for services to poor do exist in municipal budgets but in rudimentary and scattered across the budget manner without any linkage with each other.
(Refer Figure 1) Such type of budget system will not sufficient to achieve objectives of the internal earmarking of funds for the urban poor reform.
There are three ways to restructure municipal budget to actualize this reform –

- Though Figure 1 shows that present municipal budgets have functional classification but that is not the case. As explained in next section municipal budgets lack correct, logical functional classification coupled by scattered around few items for urban poor. So the first way could be adopting functional classification on the lines of Annexure 1 of this primer and then dividing each function and the items falling under the function in to poor and non-poor category (Refer Figure 4) Bangalore Municipal Corporation has attempted this option. Compare to next two options/budget structure this structure allows flexibility in transferring of funds from one function (Road) to another function (Sanitation).
- Creation of a separate functional budget head in both revenue and capital budgets titled '**urban poverty alleviation, basic services to and welfare of urban poor'** with detailed items put under this separate budget head for urban poor. All the items pertaining to provision of basic services and other services to urban poor which stand scattered in the present budget structure to be brought under this separate budget head (Refer Figure 5). This kind of structure will have more flexibility and focus compare to simple functional structure (Figure 4).
- Dividing municipal budget at source (vertically) in to poor and non-poor that is creation of a separate budget for services to the urban poor with all functional budget heads, subheads and budget item under it (Refer Figure 6). Such separate budget structure is most logical for operationalising BSUP Fund. It also allows flexibility in allocation of funds for various services for poor. Such a separate budget can be called as '**P Budget'**.
  Pimpari-Chinchwad Municipal Corporation of Maharashtra has attempted this option.

It will be up to an urban local body and a state government to adopt any one of these three options but adoption of functional classification as per Schedule 12 of the Constitution of India and National Municipal Accounting Manual (see Annexure 1 of the primer) and correcting accounting classification (Figures 2 and 3) will be most fundamental .

Grouping scattered budget items for basic service to urban poor and placing them under each functional budget head in to Poor category (option 1, Figure 4) or adopting a separate budget head for urban poor welfare and detailed budget items under this separate head and other respective service heads (option 2 Figure 5) or a separate budget structure (option 3 Figure 6) doesn't simply mean creation of budget items under two heads or budgets, namely budget for urban poor and budget for non-poor. It will require re-engineering of the entire budgetary process.
The following principles would need to be kept in mind while introducing a separate budget head for urban poor welfare with detailed budget items under this separate head, and other respective service heads or a separate budget structure for urban poor:

Figure 1 – Existing system of internal earmarking of budget for urban poor in overall municipal budget

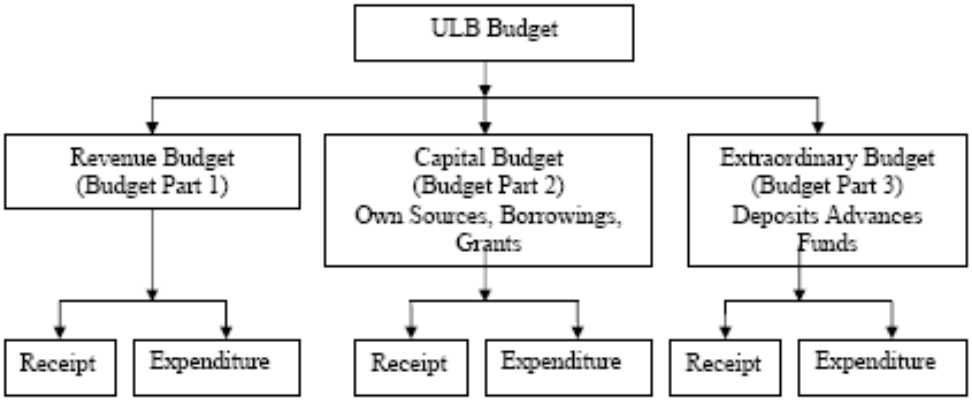


- In the absence of structural guidelines, almost all ULBs have a unique structuring of their budget with great heterogeneity and non-compatibility existing among ULBs. It is necessary to adopt a common basic minimum budget structure as prescribed in the National Municipal Accounting Manual (NMAM).
- Unless the underlying classification is corrected, a separate budget head for urban poor welfare with detailed budget items under this separate head, and other respective service heads for the urban poor or a separate budget reform will not have much utility.
- Since internal earmarking of funds for services (adoption of a separate budget head for urban poor welfare with detailed budget items under this separate head, or a separate budget structure) for the urban poor is also a mandatory reform under the UIDSSMT scheme, as well as JNNURM, a state-wide approach for designing and steering implementation of appropriate budgeting for the urban poor would be necessary. This will result in uniformity across the state and also result in reduced implementation time and savings.
- The state/ULB must undertake a critical study of the existing budgeting system and structure, and explore possibilities of improvement in the structure and Pg 63
- Focus should be on creating separate self-contained budget head for the urban poor under existing budget document or a separate budget structure for the urban poor.
- This reform should be integrated with accounting and e-Governance initiatives being undertaken in the ULB.
- Adopt a flexible phase-wise approach for implementation based on the need and requirements of ULBs.

In the case of most ULBs (with some exceptions) the present budget classification clubs two diametrically opposite accounting items/heads, e.g., deposits and advances along with revenue and capital items. While deposits or funds receipts amount to current liability, advances given amount to current assets. Similarly, deposits refund or fund utilization results in reduction in current liability, while recovery or adjustment of advances given, results in a reduction in current assets. Consequently, it is appropriate to group these items under separate budget parts, including under an extraordinary budget not under revenue or capital budget. With the classification that clubs revenue receipts and expenditure (Budget Part 1) and capital receipts and expenditure from the own resources part of the capital budget (Budget Part 2); it will be easy to assess a ULB's own resource position. Similarly, by clubbing the borrowings and grant parts of the

capital budget (Budget Part 2) and deposits, advances and fund parts of the extraordinary budget (Budget Part 3) the ULB's assets and liability (balance sheet) position can be readily assessed.
A three-part budget classification has been suggested (refer Figure 2).

Figure 2: Basic Budget Classification (as per National Municipal Accounts Manual)

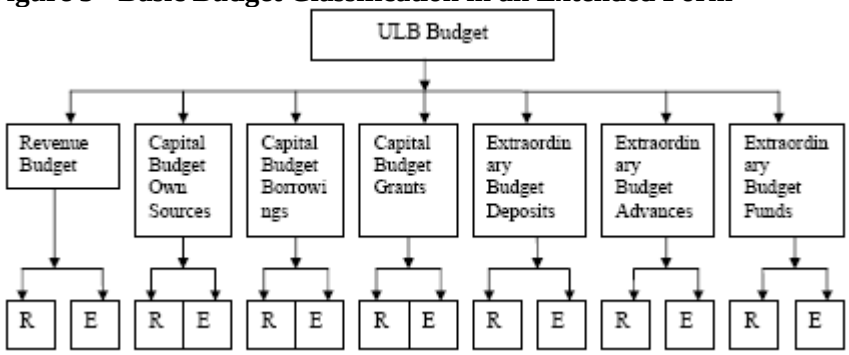


The three-part budget classification will have to be repeated under all the separate budget heads that an Urban Local Body plans to maintain.

Part I – Revenue Budget – Revenue Receipts and Expenditure
Part II – Capital Budget – Capital Receipts and Expenditure but grouped separately under following sub-parts:
Capital (own sources) Budget – Capital Receipts and Expenditure from own sources
Capital (loans & borrowings) Budget – Capital Receipts received in the form of new loans and the expenditure carried out from them.
Capital (grants) – Capital Receipts received in the form of development grants and the expenditure carried out from them.
Part III – Extraordinary Budget – Receipts and Payment of extraordinary nature grouped under following distinct parts:
Deposits and Fund Budget – Deposits and Special Funds receipts and payment made from them.
Advances Budget – New advances given and advances adjusted or recovered.

The classification builds in flexibility to cope up with an increase in volume and sphere of the ULBs. The three-part budget classification can be easily expanded in future into seven parts. For example, the capital budget can be bifurcated into three parts, namely Capital (own sources), Capital (loans and borrowings) and Capital (grants). Similarly, the extraordinary budget can be bifurcated into three parts Deposits, Funds and Advances (refer Figure 3).

Figure 3 - Basic Budget Classification in an Extended Form



Having achieved correct classification and structure as shown in figure 2 & 3 in the light of reform components, ULBs should go for an internal earmarking of funds for services by (adoption of a improved functional budget system as shown in Figure 4 or a separate budget head for urban poor welfare, with detailed budget items under this separate head as depicted in Figure 5, or separate budget structure for the urban poor as depicted in Figure 6.
Any structure selected out of structures shown in the Figures 4 to 6 should be adopted consistently for all the three basic budgets (Figure 2) or seven basic budgets (Figure 3) explained above.

Figure 4 – Dividing Functional Budget in to Poor and Non-Poor category

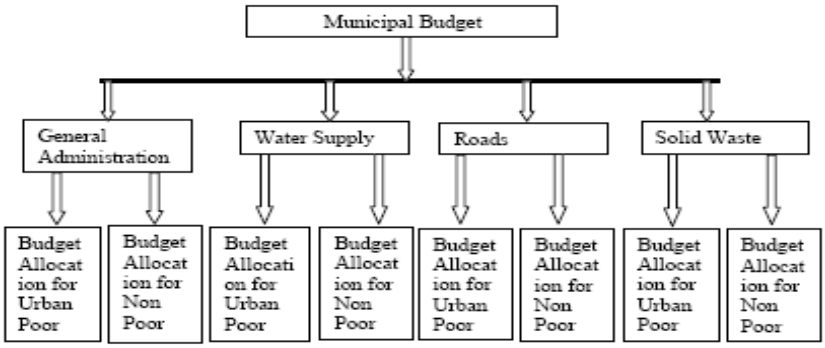


Figure 5 – Separate Budget Head Budget Structure for internal earmarking of funds for urban poor

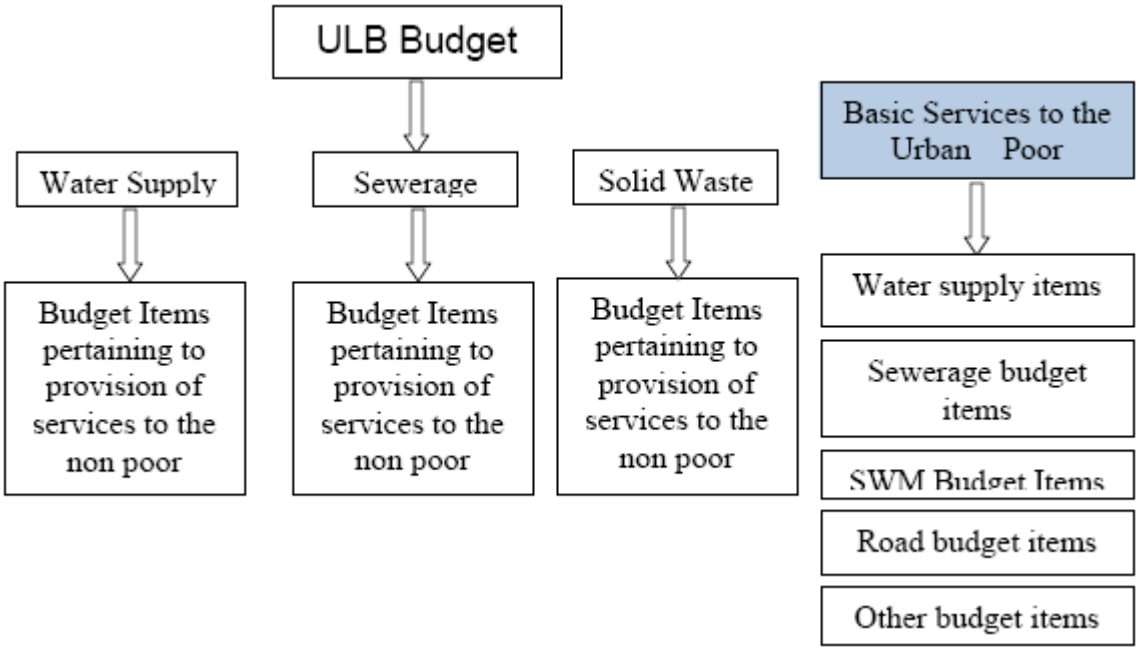
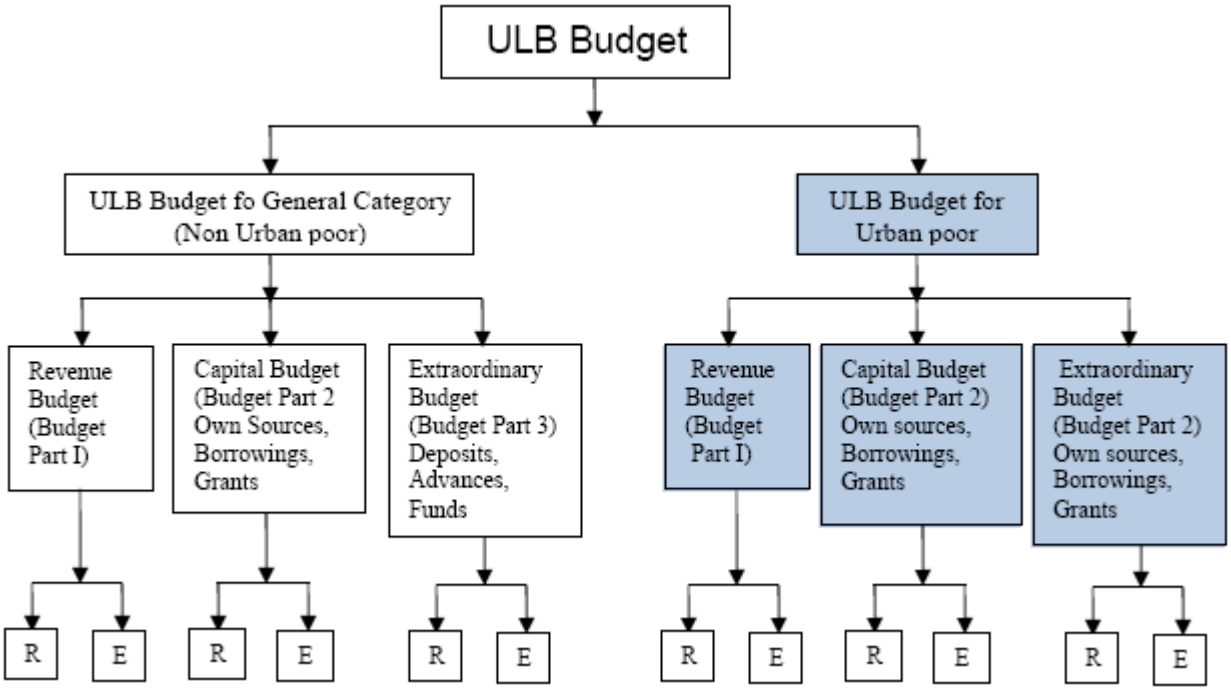


Figure 6 – Separate Budget Structure for earmarking internal funds for urban poor



The National Municipal Accounting Manual (NMAM) has provided a functional classification that is budget code comprising 10 main heads and 9 minor heads under each main budget head.

The NMAM budget structure has been elaborated by adding one more digit to accommodate detailed municipal functions/sub-functions. Taking into account the budget coding structure proposed by NMAM, a model budget coding structure is prepared for ULBs and illustrated in Annexure 1. ULBs should adopt this budget heads/sub-heads appropriately for their proposed separate budget head or separate budget structure for earmarking funds for urban poor welfare.

The final aspect of creation of an appropriate budgetary structure and mechanism to actualize internal earmarking of funds for urban poor reform is regarding treatment of expenditure that is which expenditure should be booked under BSUP Fund and under separate budget or budget head or budget items for the urban poor. The policy document /implementation order of State Government should clearly mention criteria and detailed modalities, accounting treatment for allocation of expenditures to separate urban poor fund and budget on the following lines –

- All directly attributable expenses (revenue and capital) specifically incurred for development and delivery of basic services to the urban poor should be booked under the separate P Budget or separate budget head or under budget for poor category falling under each function (as the case may depending upon selection of a option out of three explained earlier).
- All the expenses which cannot be attributed directly to development and delivery of basic service to urban poor e.g. general administration or expenditure incurred on capital projects which benefit entire city and not particular area or group of people (water source augmentation for bringing additional water for the city, sewerage treatment plants, ring road, sanitary land fill site development, disaster management etc) may be allocated on the basis of ratio of urban poor population to total population of the city.
- If ULB has raised loans and have used those funds specifically for urban poor then only interest payment of that loan amount may be charged to revenue expenditure on urban poor and loan repayment of that particular loan may be charged to capital expenditure on urban poor. The loans which have been spent for the projects benefiting entire city the as explained above capital expenditure may be allocated to urban poor budget in the ratio of population but interest payment

and loan repayment of such loans should not be charged to revenue and capital budget for urban poor respectively.

These are broad guidelines, state and local body should develop detailed accounting guidelines after due considerations.

The above described entire process of implementing internal earmarking of funds reform is summarized in a tabular form as follows –

Component	Description
Roadmap for internal earmarking of local budget for basic services to the urban poor[4]	Defining a clear roadmap and implementation plan, which comprises: • Adoption of concept of Urban Poverty Sub Plan in every city (ULB) • Creating a State's vision for poverty free, slum free cities, • Conducting poverty, slums, livelihood surveys, assessing backlog and current and future growth needs and undertaking prioritization • Preparation of City Development Plan, Urban Poverty Reduction Strategy, Municipal Action Plan, Detailed Project Report etc. • Setting milestones for providing basic services to the urban poor including affordable housing with secured tenure etc. and estimating requirement funds. • Reviewing legislative framework and Adopting a legal framework based public policy for internal earmarking of funds in local budget for urban poor • Constitution of BSUP Fund • Creation of an appropriate municipal budget structure and mechanism o Assessment of state's current municipal budget structure, system, processes and practices o Preparation of municipal budget reform strategy o Revised municipal budget structure and implementation manual using this primer as a base • Setting up of Urban Poverty and Livelihood cell • Capacity building of ULBs and handholding support to ULBs in implementation
Institutional Framework	Realignment and regrouping of staff, administrative processes and other organization resources on the lines of a separate budget head for urban poor welfare with detailed budget items under this separate head, or separate budget structure for the urban poor
Business Process Reengineering	It will be necessary to examine all the budget processes – identification and selection of development works for urban poor, processing and implementation of works, etc.
Opinion Building and Attitudinal Transformation	Mere earmarking of funds or adoption of a separate budget head or separate budget structure for urban poor welfare with detailed budget items under this separate head will not yield the desired result unless it is accompanied by a program of change management in the organization. Opinion building and attitudinal transformation exercises would need to be undertaken.
Participative Budgeting	Budget formulation and implementation processes should be made participatory.
Performance and Outcome Budgeting	Earmarking of funds for the urban poor should be backed by performance and outcome budgeting. Budgets for the urban poor and non-poor (general category) should be expressed in physical terms (planned achievements in physical terms) and also in terms of outcomes expected from each and every budgeted development work or allocation of resources.
Capacity Building and Change Management:	In order to build the capacity of the ULBs to prioritize, conceptualize, develop and implement the development works and provision of services for the urban poor, states should prepare capacity building plans addressing: • Capacity gaps at different levels of functionaries and identification of training needs • Define the training areas and target groups • Institutional framework for building capacity in the states/ULBS
Public Awareness and Communication	Communicating and creating awareness among stakeholders and the public at large regarding the system of a separate budget head or budget structure for urban poor welfare with detailed budget items under this separate head, or structure and its benefits would ensure better participation of the target communities (urban poor) in budget formulation and monitoring.

[4] Based on 7 point charter provided in Annexure 2 of the DO letter No. ---------- dated May 14th 2007 from Minister for Housing and Urban Poverty Alleviation to Chief Ministers.

Processes for Creation of an appropriate municipal budget structure and mechanism

Processes	Responsibility	Role
Pre-Implementation Phase		
Identify the Nodal Agency for Implementing NMAM in the State	State	Responsible for managing the implementation, dealing with technology, process and change management related issues internally, quality assurance, etc.: • Selection of budgetary reform consultant • Finalize the roadmap • Finalize institutional framework • Monitor budgetary reforms across ULBs • Finalize the capacity building and change management plan for the state
Selection of Budgetary Reforms Consultant	State	• Prepare separate budget head or budget structure for urban poor welfare with detailed budget items for urban poor reforms roadmap. • Analysis of existing budgetary system • Preparation of budgetary reforms operational manual for ULBs • Monitor budgetary reforms implementation of ULBs • Develop strategies for rolling out budgetary reforms across states/ULBs • Design change management program at the ULB level • Identify the milestones/indicators for monitoring success
Preparation of Budgetary Reforms Roadmap	State	• Describe changes to be carried out by budget structure, system and processes • Criteria and modalities for allocation of resources for urban poor • Modalities for institutional framework/organizational restructuring for operationalizing separate budget for the urban poor at ULB level • Roadmap for implementing performance and outcome budgeting along with separate budget head or budget
		structure for urban poor welfare with detailed budget items for urban poor • Capacity building requirements • Opinion building and attitudinal transformation strategies • Broad cost estimates
Implementation Phase		
Identify ULB Level Project Management Unit	ULB	• Preparation of budgetary reforms action plan • Monitor the budget reforms activities • Monitor the segregation of budget items, resources and preparation of new budget activity • Support deployment of the application • Design training strategy for the end-users • Report progress to the state implementation team • Manage change at the ULBs
Preparation of Budgetary Reforms Action Plan	ULB	• Prepare reform description including objectives, service levels and outcomes • Reform implementation approach and component detailing • Reforms costing • Implementation timelines • Develop evaluation and monitoring system
Pilot and Scale up	ULB	• Pilot in one or two ULBs in the state • Scale up
Change Management	State/ULB	• Training end-users at state and ULB level
Documentation	State/ULB	Preparation of documents such as: • Functional requirement document • System design document • User manuals • Operational manual • Maintenance manuals • Other documentation

5. Setting the timeline

Activity/Timeline	Q1	Q2	Q3	Q4
State Level				
Adoption of Urban Poverty Sub Plan in every city (ULB)				
Conducting field survey of slums, poverty and livelihood				
Framing of Public Policy on internal earmarking of local budget for basic services to the urban poor				
Setting milestones for providing basic services to the urban poor including affordable housing with secured tenure etc. and estimating requirement funds.				
Reviewing legislative framework and Adopting a legal framework based public policy for internal earmarking of funds in local budget for urban poor				
Constitution of BSUP Fund				
Designate a state nodal organization				
Selection of budgetary reforms consultant or consulting agency				
Preparation of ULB level internal earmarking of budget for poor roadmap				
Government Resolution expressing commitment to internal earmarking of funds for services to urban poor				
Finalize the institutional framework for implementation				
Review legislative framework to identify changes necessary to implement internal earmarking of funds for urban poor				
Analysis of existing budgetary system and analysis				
Preparation of budgetary reforms operational manual for ULBs				
Formats of standard reports for state level MIS				
Creation of policies at state level				
Training to end-users				
City Level				
Assess existing accounting reform initiatives				
Formation of project management unit				
Assessment of functional requirement				
Preparation of budgetary reforms action plan				
Segregation and fine tuning of each and every budget head/item and resource allocation in non-urban poor (general category) and urban poor category				
Data digitization (entry and validation) of the manual records as per new structure				
Preparation of final user-friendly budget documents for non-urban poor and urban poor characterized by performance, outcome budgeting features				
Citizen (poor and non-poor) participation in various annual budget processes				
Training to end-users				
Documentation				
Project management				

6. Measuring Achievement / Outcomes

Key outcomes:

- Increased allocation of ULB resources for urban poor in the city
- Focused and improved implementation of development works for urban poor
- Enhanced interface between ULBs and citizens; increased citizen participation in budget formulation, implementation and monitoring
- Transparency and accountability in ULB budget (resources) allocation and utilization
- Improvements in quality of internal local-government operations to support and stimulate better delivery of services to the urban poor
- Key performance indicators based decision-support systems for reports and analysis

Key Indicators:

State Level

- The state has adopted a Government policy expressing commitment to establish internal earmarking of funds for services to urban poor
- Review legislative framework and adoption of appropriate legislative changes at state level
- Setting up a nodal agency
- Appointment of ULB budgetary reforms consultant
- Preparation of UL B budgetary reforms roadmap
- Carried out business process reengineering
- Formats for MIS prepared and finalized
- Implementation of separate budget head for urban poor welfare and detailed budget items under this separate head and other respective service heads for urban poor in the state/ULBs
- Clearly defined development and service levels for urban poor of the city

ULB Level

- Separate budget head or separate budget structure for urban poor welfare with detailed budget items under this separate head, for the urban poor in ULB
- Well designed, structured, user-friendly budget document for general (non-urban poor) and urban poor category population of the city
- Institutional framework at ULB level for implementing development works and service delivery for urban poor of the city
- Number of budget heads, items segregated and appropriately provided with resources
- % of resources allocated to urban poor (amount budgeted – both revenue and capital accounts)
- % of resources actually utilized for urban poor against resources budgeted for urban poor (actual amount spent – both revenue and capital accounts; % of total budget)
- % participation of citizens in various budgetary processes

Annex 1 - Main & Sub-budget Heads (Functions) Coding for ULBs

Function Group Code first digit	Function -Group	Function Code (second digit)	Function Description	Sub-function Code (third digit)
0	General Administration & Tax Collection			
		1	Municipal Council Office	
		2	General Administration Department	
		3	Finance & Accounts Department	
		4	Audit Department	
		5	Octroi Department	
		6	Tax Assessment & Collection	
		7	Computer (IT) Department	
		8	Legal Department	
		9	Land & Estate and Income from Municipal Properties	
1	Planning & Regulations			
		1	City and Town Planning	
		2	Building Regulation	
		3	Economic Planning	
		4	Encroachment Removal	
		5	Trade License/Regulations	
		6	Land Acquisition	
		7	Heritage Conservation	
2	Water & Sewerage Service			
		1	Water Source Department	
		2	Water Treatment Department	
		3	Water Distribution Network	
		4	Individual Water Connections & Maintenance	
		5	Wells, Ponds, Tanks, etc.	
		6	Sewage Treatment Plants	
		7	Drainage Network (pumping stations, main lines)	
		8	Drainage Connections and their Maintenance	
		9	Public Toilet & Latrine	
3	Health			
		1	Public Health	
		2	Epidemic Prevention/Control	
		3	Family Planning	
		4	Clinical/Primary Health Care	
		5	Secondary Health Care	
		6	Crematoriums and Burial Grounds	
		7	Vital Statistics, Birth and Death Registration	
		8	Prevention and Food Adulteration	
		9	Ambulance Service and Hearse Van	

Function Group Code first digit	Function -Group	Function Code (second digit)	Function Description	Sub-function Code (third digit)
4	**Sanitation and Solid Waste Management**			
		1	Road Cleaning/Scavenging (collection of waste)	
		2	Solid Waste Transportation	
		3	Management of Disposal Sites	
		4	Conversion or Disposal of Waste by Other Methods	
		5	Compost Plant, Waste to Energy Plant	
		6	Public Convenience, Toilets	
		7	Veterinary Service, Management of Stray Dogs	
		8	Cattle Pounding	
		9	Slaughter House and Tanneries	
5	**Public Works and Civic Amenities**			
		1	Roads, Central Divider, Pavements, Footpaths	
		2	Bridges and Flyovers	
		3	Subways & Causeways	
		4	Storm Water Drainage	
		5	Street Lights	
		6	Traffic Signals & Traffic Circles, Island Improvement	
		7	Fire Services	
		8	Public/Office Buildings	
		9	Public Housing (MIG, HIG, etc.), Shopping Centers, Municipal Markets	
6	**Urban Forestry & Recreational Infrastructure**			
		1	Parks & Gardens	
		2	Play Grounds	
		3	Lakes and Ponds	
		4	Urban Forestry, Environment Conservation	
		5	Zoos	
		6	Art & Culture, Fairs and Festivals	
		7	Town Hall/Drama Theatre	
		8	Erection of Statues, Museums	
		9	Amusement & Recreational Infrastructure	
7	**Urban Poverty Alleviation & Social Welfare**			
		1	Welfare of Women	
		2	Welfare of Children	
		3	Welfare of Aged	
		4	Welfare of Handicapped	
		5	Welfare of SC/ST	
		6	Slum Improvements	
		7	Housing for Poor BPL/EWS	
		8	Urban Poverty Alleviation	
		9	Others	

Function Group Code first digit	Function -Group	Function Code (second digit)	Function Description	Sub-function Code (third digit)
8	**Public Education**			
		1	Central Office/General Administration	
		2	Balwadis /Anganwadis	
		3	Primary Schools	
		4	Secondary Schools	
		5	Higher Secondary Education	
		6	Special Schools - for Blind, Deaf and Spastic Children	
		7	Public Library	
		8	Adult Literacy/Sarv Shiksha Abhiyan	
		9	Other Types of Education - Technical, Vocational	
9	**Other Services and Support Functions**			
		1	Electricity	
		2	Transportation	
		3	Vehicle Pool and Workshop	
		4	Press and Public Relations Department	
		5	Security Department	
		6	Vigilance Department	
		7	Quality Control Department	
		8	Election and Census	
		9	Central Records	

9.Water Audit and Leakage Control

ULB Level Reform

SOURCE: CPHEEO

9.1 Introduction

Water Audit of a water supply scheme can be defined as the assessment of the capacity of total water produced by the Water Supply Authority and the actual quantity of water distributed throughout the area of service of the Authority, thus leading to an estimation of the losses.

Otherwise known as non-revenue water, unaccounted-for water (UFW), is the expression used for the difference between the quantity of water produced and the quantity of water which is billed or accounted for (Table-9.1).

TABLE 9.1
Un-accounted for Water

Water accounted for	Residential		Billed water	Revenue water
	Commercial			
	Industrial			
	Institutional			
	Special Consumption + Operational Consumption			
Water not accounted for	Illegal Consumption		Losses	Non-Revenue water
	Loss of water	Over flow		
		Leakage		
		Waste		
	Metering errors	Macro-metering errors		
		Micro-metering errors (House connection meters)		
		Estimation errors		

9.2 Objective of Water Audit

The objective of water audit is to assess the following.
i) Water produced,
ii) Water used,
iii) Losses both physical and non-physical,
iv) To identify and priorities areas which need immediate attention for control.

9.3 Planning and Preparation

Planning and preparation shall include the data collection element and the preparation of sketch plans for the distribution centers and other locations for the installation of the flow meters. Also included within this shall be the confirmation of flow rates for the bulk meter locations which has been carried out by the use of portable ultrasonic flow meters.

9.3.1 Verification and updating of Maps

Mapping and inventory of pipes and fittings in the water supply system: If the updated maps are available and bulk meters are in position network survey can be taken up as a first step.
Otherwise maps have to be prepared and bulk meters fixed.
The agency should set up routine procedures for preparing and updating maps and inventory of pipes, valves and consumer connections. The maps shall be exchanged with other public utilities and also contain information on other utility services like electricity, communications etc. Refer Chapter on "Operations and Maintenance of Distribution System".

9.3.2 Installation of Bulk Meters

The major activity during the overall water audit will be bulk meter installation at those points on the distribution network where water enters the system. It is expected that bulk meters will be required at the following locations:
• All major system supply points.
• All tubewells which supply the system directly.
• Major transfer mains which are expressly required for audit.

At distribution centres, the most appropriate meter position is on the outlet pipe from the service reservoir. Installation of a meter at this point will allow measurement of flows into the system not only if supplies are coming from the service reservoir but also if they are being pumped directly from the clear water reservoir (CWR). Refer Fig 9.1

The size of the meter can be determined by:
• Number of properties served.
• Per capita consumption (litres/person/day).
• Population density.
• Hours of supply.

Meter sizes must be sized according to current supply hours. Future changes to system operation may require the substitution of some bulk meters with those of a smaller size, due to reductions in flow over longer supply hours.
It is expected that bulk meters installed in locations where supply is rationed will tend to over-read. This is because when supplies are turned on, the air present in the pipes can cause the meter to spin. This problem may be overcome through the use of combined pressure and flow loggers. Flow through the

meter will be recorded in the normal way. However, analysis of the pressure and flow plots together will enable the identification of those periods of time when a flow is recorded at zero pressure. This time should correspond to the period when the meter is spinning, and the true flow through the meter over a period of time can therefore be calculated.

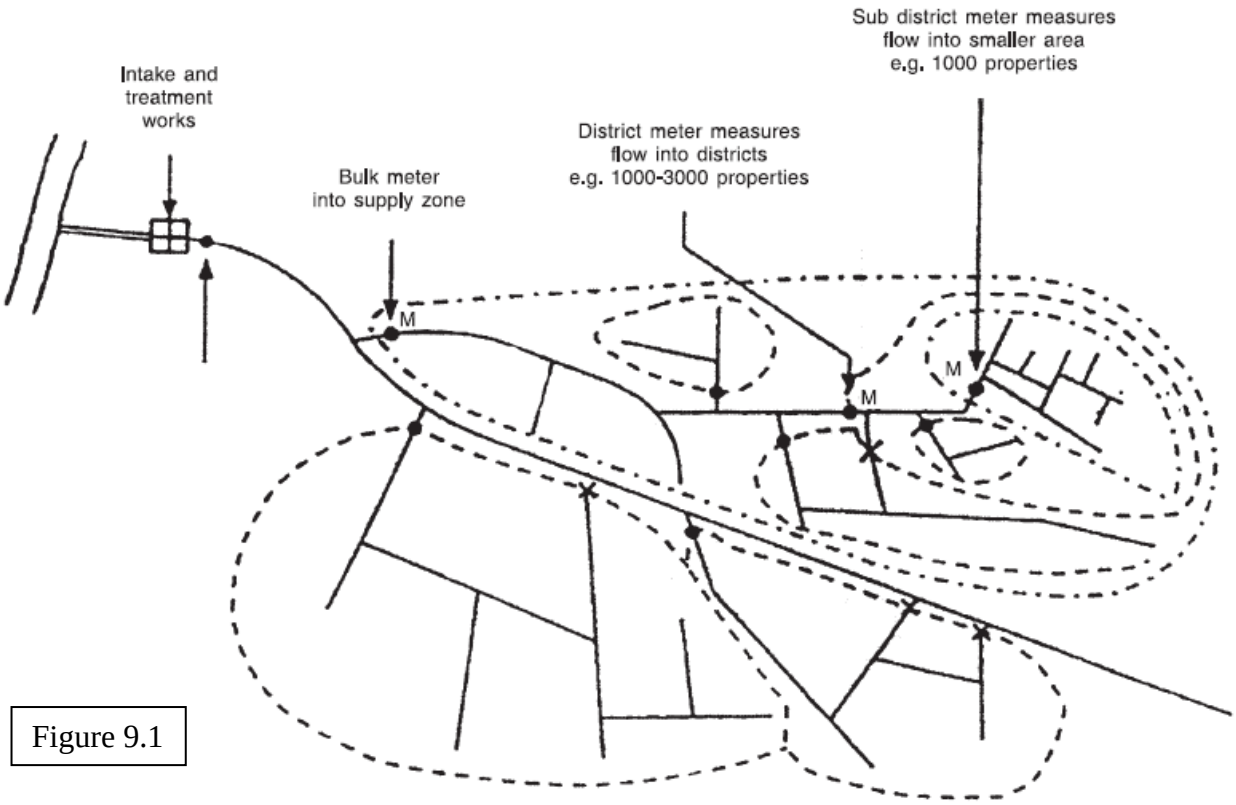


Figure 9.1

9.4 Monitoring of the Production System

The assessment of the leakage rates through the various features of the water supply system should be undertaken. These will include:

- Raw water transmission system.
- Reservoirs.
- Treatment Plant.
- Clear-water transmission system.
- Inter zonal transmission system.
- Tube wells.

9.4.1 Transmission System

The methodology adopted to make an assessment of the level of losses in the transmission system is to install insertion probes/bulk meter at both ends of each section of main being monitored, thus monitoring both the inflow and outflow of the section. This monitoring should be done for a minimum period of 7 days. The difference of inflow and outflow will indicate the losses in the transmission main. The advantage of this method is that the trunk main need not be taken out of service.

Another way to measure leakage is to close two valves on the main. 25mm tapping are made on either side of the upstream valve and a small semi-positive displacement flow meter is connected between the

two tappings. Flow through this meter will indicate the leakage in the main between the two closed valves. It must be ensured that the down stream valve is leak proof.
The approximate position of any leakage measured can be determined by the successive closing of sluice valves along the main in the manner of a step test.

9.4.2 Reservoirs

To reduce or avoid any leakage or consequent contamination in reservoirs, the reservoirs should be periodically tested for water tightness, drained, cleaned, washed down and visually inspected.
The losses in water storage structures can be monitored for a particular period noticing the change in the level gauges when the structure is out of use i.e. there is no inflow and outflow of water during this monitoring period.
The most reliable method for measurement of leakage from a service reservoir is to fill it to full level and isolate it from supply and to measure change in level over suitable time period.

Suitable equipment to measure reservoir levels could be chosen like:
Sight gauges
Water level sensors (as per manufacturer's instruction)
Float gauges
Submersible pressure & level transducers (as per manufacturer's instruction).

9.4.3 Treatment Plant

The losses in treatment plant can be monitored by measuring the inflow into the plant and outflow from the plant with the help of mechanical/electronic flow recorders. The difference of inflow and outflow for the monitoring period will indicate the water losses in the plant.
In case the loss is more than the design limit, further investigation should be carried out for remedial measures.

9.4.4 Tube Wells

In conjunction with the programme of bulk meter installation is the operation to monitor the approximate yield from the tubewells. This exercise can be carried out by the installation of semi-permanent meters to the tube wells on a bypass arrangement similar to that for the bulk meters. This can be affected, utilising the smaller diameter bulk meters. Insertion probes or the portable ultrasonic flow meters will be used for measurement of flows on the common feeder mains.

9.5 Monitoring of Distribution System

Distribution system comprises of service reservoirs, distribution mains & distribution lines including appurtenances, consumer service lines, connections viz. metered, unmetered (flat rate), public stand posts, hydrants, illegal connections. The area of the city is divided into Waste Metering Areas (WMA)/ Sample area zones. Since at one time it is not possible to carry out water audit in all WMAs, it is done for a part of the city at one time followed by other parts of the city in future. This has to be a continuous process managed by a water audit wing or a Leak Detection cell.

Water audit of the distribution system consists of:
i) Monitoring of flow of water from the distribution point into the distribution system (WMA).
ii) Consumer sampling.
iii) Estimating metered use by consumers.
iv) Estimating losses in the appurtenances and distribution pipe line network including consumer service lines.

9.5.1 Monitoring flow into the Distribution System

A bulk meter of the appropriate type and size is installed at the outlet pipe of the service reservoir or at the point where the feeding line to the area branches off from the trunk main.
If water from the WMA flows out into another zone a valve or meter is to be installed at this outlet point.

9.5.2 Customer meter sampling

Water audit is a continuous process. However, consumers' meter sampling can be done on yearly basis by

- Review of all existing bulk and major consumers for revenue. A co-relation between the production/power consumed in the factory vis-a-vis water consumption can be studied.
- Sampling of 10% of all bulk and major consumers.
- Sampling of 10% of small or domestic consumers.
- Series meter testing of large meters suitably according to standard, calibrated meter
- Testing of 1% large and 1% domestic meters.
- Estimating consumption at a representative 5% sample of Public Stand Posts (PSP) and unmetered connections by carrying out site measurements.

All non-functioning and broken meters in the sample areas will be replaced and all meters may be read over a week. This information will be brought together with information derived from the workshop and series testing in order to estimate the average water delivered and correction factors for consumer meters. These factors can then be extrapolated to the rest of the customer meter database

9.5.3 Customer meter sampling

The average consumption per working meter is calculated by dividing the total consumption of all working meters in the WMA by the number of working meters. This average consumption is then multiplied by the meter correction factor derived from the customer meter sampling exercise in which the serial metering test and bench test of meters is done. Average slow or fast percentage of test recording of meters is known as correction factor. This average metered consumption multiplied by the correction factor is known as water used by consumer.
Unmetered connections & illegal connections will also be treated to have same consumption as metered property.
Estimating customer metered use can also be carried out using the customer data obtained from the customer billing records. Consumption analysis will be carried out by:
• Consumer type.
• Revenue zone/sample area/WMA.
• Direct supply zone/sample area/WMA.
• Overall for the city/Water Supply Scheme.
During the analysis the correction factors derived in the sampling exercise will be applied for metered consumption. Default values will be applied to connections with estimated bill.
Public Stand Posts (PSP), unmetered and illegal use will also be treated as metered consumption. Analysis of the billing data will enable the production of:
• A report on overall water delivered.
• An estimate of water delivered to wards/sample areas/WMA.
• UFW i.e., Physical losses and non-physical losses.
• Errors in assessment of water production. (in case of tube wells).

9.5.4 Loses in customer service lines and appurtenances

Losses can be calculated by deducting from the total quantity, the following:
- Metered consumption.
- Unmetered consumption (assuming metered use).
- Illegal connection consumption (assuming metered use).
- PSP use.
- Free supply, fire-hydrants, use in public toilets, parks etc.

9.6 Analyses

The information of the results of monitoring the distribution system together with the results of the bulk metering exercise will be consolidated and brought together to produce the water balance report and the overall water audit report. These results may be interpreted in financial terms.
Further exercise will be done to classify the water consumed/wasted/lost in financial terms with relation to the current and future level of water charges. This exercise will be carried out as a result of the field tests and the review of existing records forming part of the overall water audit.
This water audit will provide sufficiently, accurate area wise losses to prioritize the area into 3 categories viz.
1. Areas that need immediate leak detection and repair.
2. Areas that need levels of losses (UFW) to be closely monitored.
3. Areas that appear to need no further work at the current time.
It is recommended that cursory investigation should be carried out in the areas that appear to have the least levels of losses (UFW), locating any major leaks, followed by the leak repairs would reduce the losses (UFW) levels further.
After water audit of few cities it has been established that the components of UFW may generally be as follows:

i) Leakage (physical losses)	75 to 80%
ii) Meter under-registration	10 to 15%
iii) Illegal/unmetered connections	3.5 to 6%
iv) Public use	1.5 to 3.5%

9.7 Problems faced in water audit

• Proper network details in the shape of maps are not available. If at all some maps are available, these are not updated with proper indication of appurtenances.
• Normally much attention is not paid by the Water authorities to the water audit of the water supply schemes.
• Barring a few major cities, separate Water audit units are not available with the Authority. Wherever these units are available the water audit staff is not motivated enough to carry out the work.
• By and large, water authorities are not equipped with the necessary equipment.
• Proper budgetary provision is not available for carrying out continuous and effective water audit.
• Lack of co-ordination between the Water Audit unit and operational and maintenance staff.
• No emphasis is given on Information Education and Communication (IEC) activities for conservation.
Water audit provides fairly accurate figures of both physical and non-physical losses in the different waste metering areas of city. Accordingly the areas with higher percentage of losses can be identified for carrying out the leakage control exercise for reduction of water losses.
As explained earlier, the reduction in losses will result in saving in the form of:
i) Operational cost
ii) Capital cost
Apart from this, the saving in losses will result in consumer satisfaction, improved water quality and additional revenue to the Water Authority and postponed of augmentation schemes.

9.8 Objective of Leakage control

The overall objective of leakage control is to diagnose how water loss is caused and to formulate and implement action to reduce it to technically and economically acceptable minimum. Specifically the objectives are:

• To reduce losses to an acceptable minimum.
• To meet additional demands with water made available from reduced losses thereby saving in cost of additional production and distribution.
• To give consumer satisfaction.
• To augment revenue from the sale of water saved.

9.9 Water Loss

The water losses can be termed into two categories.

1. Physical losses (Technical losses)
2. Non-physical losses (Non-technical losses/Commercial losses)

9.9.1 Physical losses (Technical losses)

This is mainly due to leakage of water in the net work and comprises of physical losses from pipes, joints & fittings, reservoirs & overflows of reservoirs & sumps.

9.9.2 Non-Physical losses (Non-Technical losses)

Theft of water through illegal, already disconnected connections, under-billing either deliberately or through defective meters, water wasted by consumer through open or leaky taps, errors in estimating flat rate consumption, public stand posts and hydrants.

9.10 Leakage Detection and Monitoring

The major activities in the leak detection work in the distribution system:

• Preliminary data collection and planning.
• Pipe location and survey.
• Assessment of pressure and flows.
• Locating the leaks.
• Assessment of leakage.

9.10.1 Preliminary data collecting and planning

The water distribution drawings are to be studied and updated. The number of service connections is to be obtained and in the drawings of the roads the exact locations of service connections marked. The district and sub-district boundaries are suitably fixed taking into consideration the number of service connections, length of mains, pressure points in the main.

The exact locations of valves, hydrants with their sizes should be noted on the drawings.

The above activities will help in planning the conduct of sounding of the system for leaks or for fixing locations for conduct of pressure testing in intermittent water supply system before commencement of leak detection work or for measuring pressure and leak flow in the continuous water supply system.

9.10.2 Pipe location Survey

Electronic pipe locators can be used during survey. These instruments work on the principle of Electro magnetic signal propagation. It consists of a battery operated transmitter and a cordless receiver unit to

pick up the signals of pre-set frequency. There are various models to choose from. Valve locators are metal detectors that are available which can be used to locate buried valves.

Assessment of pressure and flows

Data loggers are used to record the pressure and flows. It is an instrument which stores the raw data electronically so as to be able to transfer it to the computer with a data cable link.
Two types of portable data loggers are used either with a single channel or dual channel.
Single channel loggers are of the analogue type with built in pressure transducers. A simple push fit connection with the street main enables direct recording of pressure for future retrieval.
Dual channel loggers consist of an analogue type sensor for pressure and a digital type sensor for recording flow reading. A pulse head for picking up a flow reading and its conversion into an electronic pulse is required with this logger. The data of pressure and flows are stored into the data loggers during the test. Subsequent transfer of the data is made electronically into the computers magnetic storage for further processing.
In the absence of electronic equipment, the pressures can be ascertained by tapping and providing a pressure gauge. Flows can be assessed by using meters on a bypass line.

9.10.3 Locating the Leaks

To zero in on the possible location of leakages, the following methods or combination of methods could be adopted.

(a) Walking

Walking over the main looking for telltale signs of presence of water.

(b) Sounding

Sounding is the cheapest and an effective method of detecting leaks in a medium - sized water supply system.

Sounding could be categorized into two types: Direct & Indirect
(a) Direct sounding is made either on the main or fittings on the main such as sluice or air valves, fire hydrants stop taps or any other suitable fittings.
(b) Indirect sounding consists of sounding made on the ground surface directly above the mains for locating point of maximum sound intensity. This method is a good supplement for confirming location of leak noise identified through direct sounding.
Water escaping from a pressurised pipe emits a sound similar to the sound that can be heard when a sea shell is held upto the ear.
The range of frequency of the sound depends upon many factors such as nature of leak, size of hole through which water is escaping, the pipe material, nature of ground in which pipe is laid etc.

The equipment used is:

(a) Non-Electronic Equipment

These are also known as listening sticks. They are simple pieces of equipment consisting of a hollow rod of any material with an ear piece

(b) Electronic

These are electronic listening stick consisting of a metal rod that is screwed on to a combined microphone and amplifier unit. The sound can be amplified by using a volume knob and could be heard through earphones.
There are also ground microphone consisting of a microphone unit and an amplifier unit, the microphone unit is attached to a handle that enables the unit to be placed on top of the ground, the signal received is amplified and passed on to the user through headphones. Some equipment have indicators.

(c) By the use of gas tracer

Sulphur hexafluoride gas tracer is injected into the main and will surface out along with water at point of leak. A detector is used to search for the substance that escapes. This is very suitable in rural areas where bore holes can be made easily at suspected points. The content of each bore hole is sampled in turn using a hand detector to ascertain the presence of gas.

(d) By using a Leak Noise Correlator

The leak noise correlator is an instrument consisting of a Radio transmitter unit and a correlator unit. (Fig. 9.2) Both the units are placed on the test mains at the two ends of the stretch under correlation by attaching their magnetic sensors to the mains.

The correlator unit identifies the various frequencies of leak sounds and calculates automatically the distances of the leak points from the correlator unit

To minimize the possibility of human error, operator involvement in calculation is limited to merely operating the measurement "start key". This initiates the measurement procedure and automatically determines the leak position on the integral display, combined with the measurement curve and the operating conditions.

9.11 Assessment of Leakage

To conduct tests for assessment of leak the following equipment are needed:

- Road measurer.
- Pipe locator.
- Valve locator.
- Listening sticks or sounding rods.
- Electronic sounding rods.
- Leak noise correlator.
- A street water tanker attached to a pump with ease to fabricate pipe assembly with valves to control pressure (Fig 9.3).
- Turbine water meters with pulse head, pressure point and data loggers.
- Leak Locator.

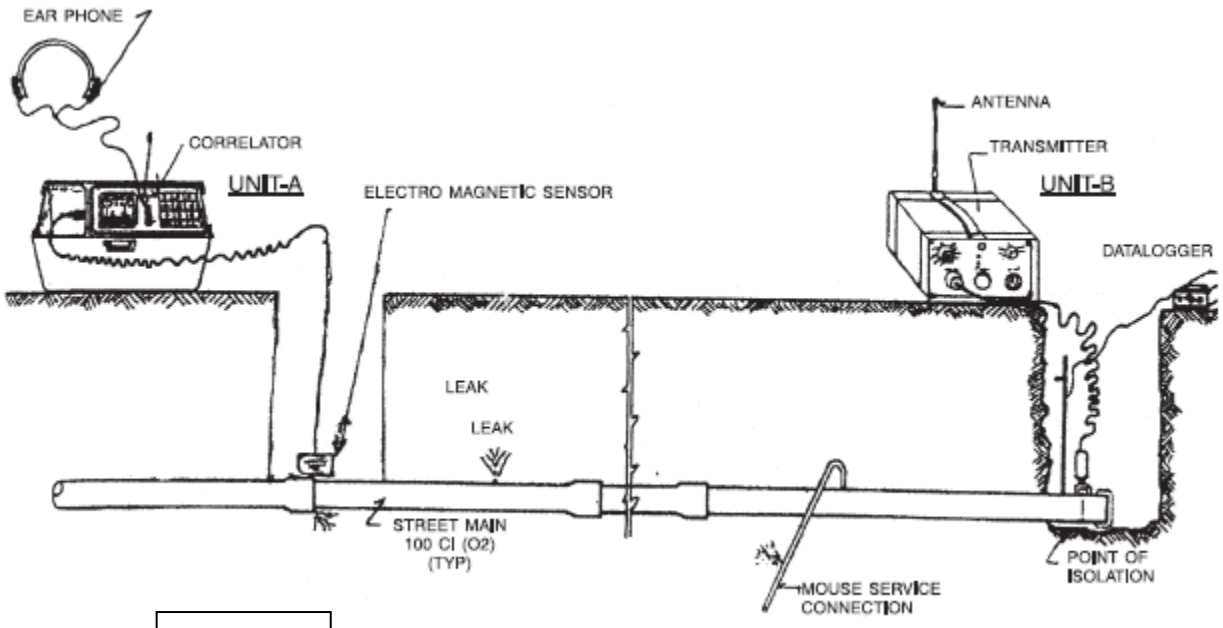


Figure 9.2

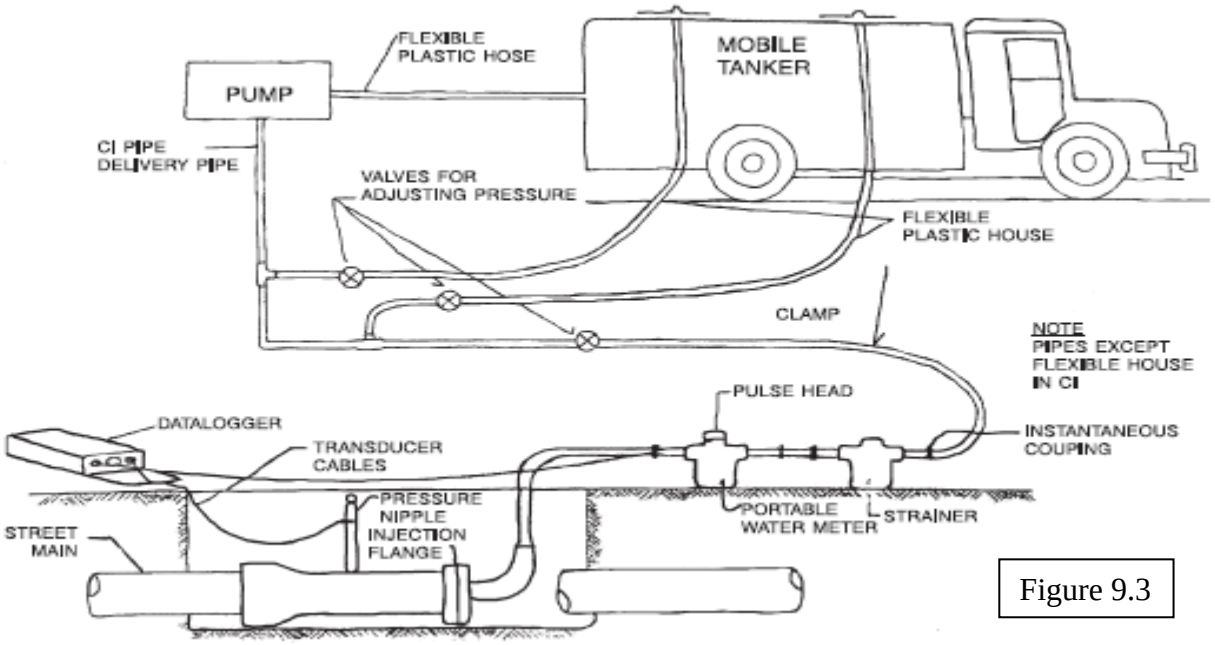


Figure 9.3

The methods for assessment of leaks and location of leaks in cases of water supply system on intermittent basis and on continuous basis are described below separately.

9.11.1 Intermittent Supply

Supply for short hours under low pressure is common in developing countries.
Leak detection equipments and meters do not function effectively under low pressure.
Hence the necessity to increase pressure over a particular duration of time to measure leak flow. To achieve this end, the stop taps at consumers end are closed and the boundary valves of test areas are also closed for isolation of the water mains to be tested. The assessment can be done as under:

In the selected area to be tested, obtain all details of the water supply system such as location and size of mains valves, consumer connections. If they are not readily available utilise road measurers to measurer length; pipe locators to detect the alignment of pipes; valve locators to locate the valves. Study their working condition and restore them to operational level.
Decide the isolation points of test area, either by closing the existing valves or by cutting the main and capping it during test. The consumers connections may be isolated by closing the stop taps. If stop taps are not available they can be provided or connections can be temporarily plugged or capped.
Water is drawn from the tanker and injected into mains of test area by using a pump. A bypass pipeline returns the water partially to the tanker.
By manipulating the valves provided on the pump delivery and on the return lines, the desired pressure is maintained.
The water that is pumped in is measured by a meter with pulse head and a data logger for recording the flow. A pressure transducer is also provided to log the pressure at the injection points. Since all exit points are closed, the amount of water recorded by the meter as flowing is obviously the amount of leakage in the system.
Down loading of loggers is done into a computer and graphs of flow and pressure with time are obtained. Consequent to tests and repairs to leaks the reduction in leak flow and the improvement in pressure can be obtained from typical computer graphs (Fig.9.4 and 9.5).

9.11.2 Continuous Supply with adequate pressure

(a) District Metering

The term district metering is used to describe the method whereby flow meters are installed on all major supply lines and strategic points within the distribution system.

The meters are then used to monitor the overall performance of the system establishing average daily flows into various districts.

District meter areas ideally consists of 2000 to 5000 properties.

Size of the district meter should be such that it is capable of recording night flow without loss of accuracy and also must be capable of supplying peak flow without introducing serious head loss.

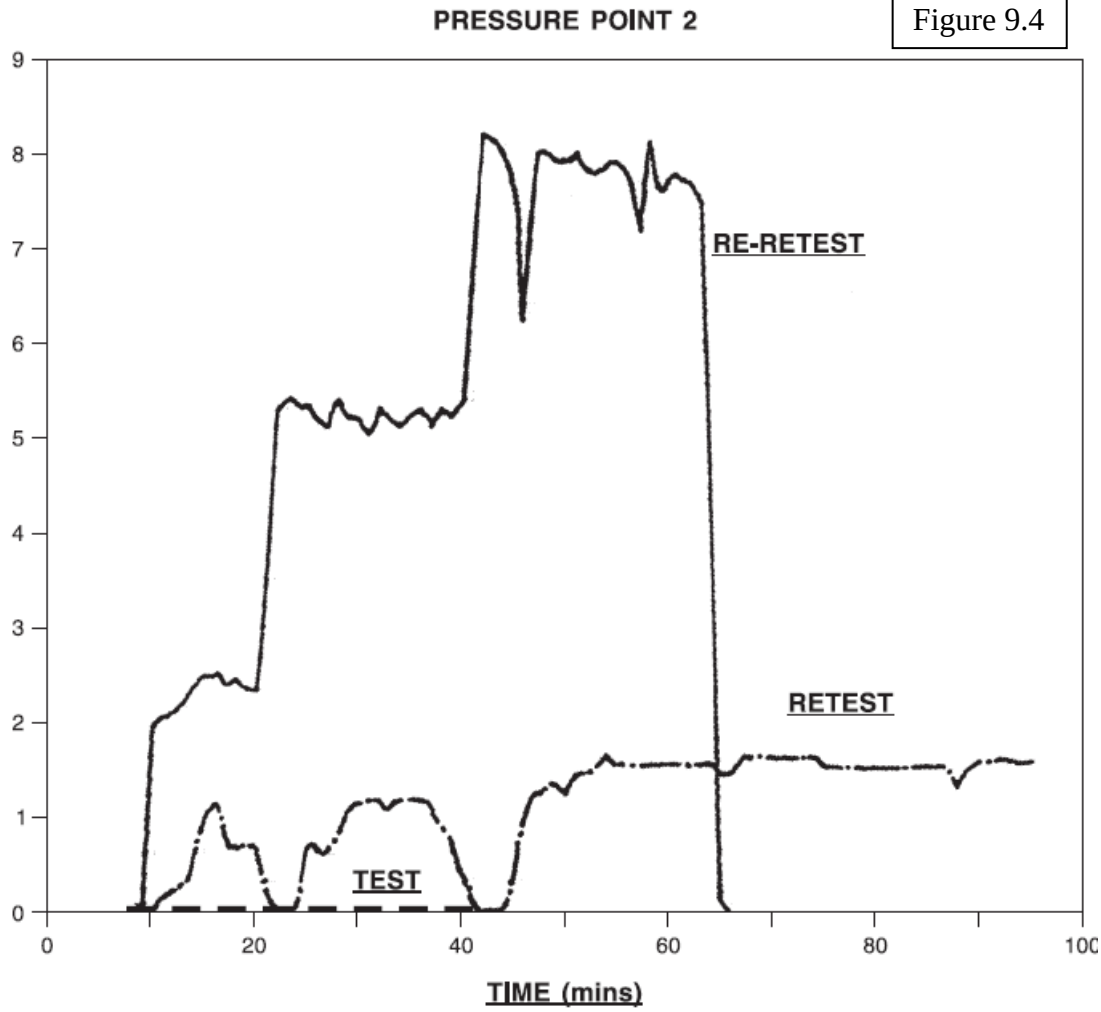
The District Meters should be read at weekly intervals at the same time of day as previous readings of the meter.

Various types of flow meters such as venturi, pitot tube, insertion turbine meters, magnetic, ultrasonic flow meters etc. are available.

Once a district is established, repair of all known and ascertained leaks is undertaken.

The measured flow into the district is then taken as the norms. Any significant variation in the measured flow indicates possible leakage and may be further investigated.

Figure 9.4



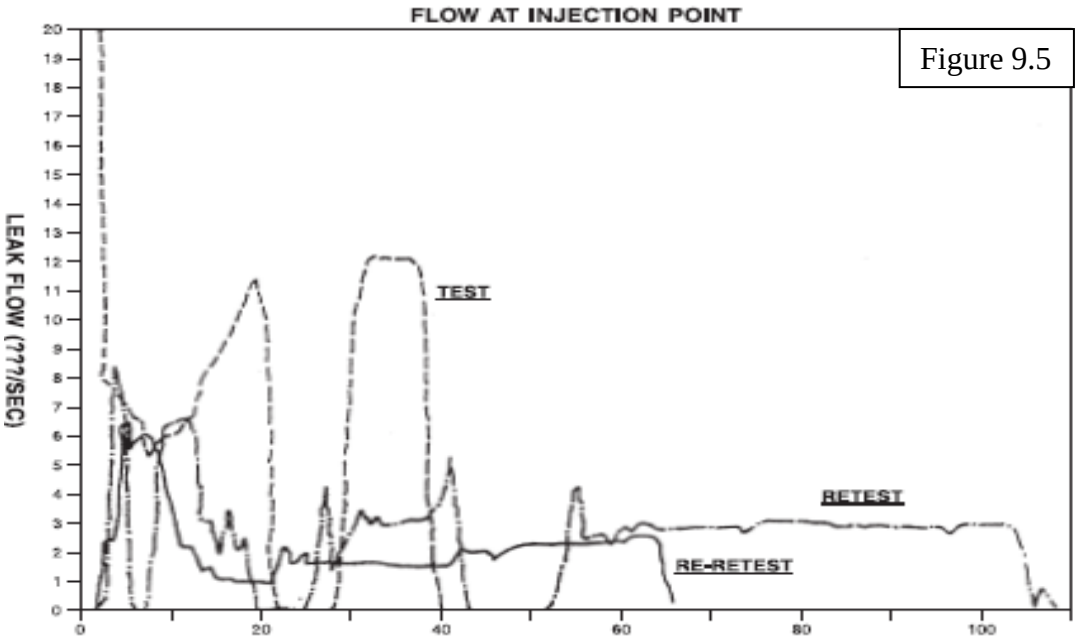


Figure 9.5

(b) Waste Metering

Within the distribution network, each metering district can be sub-divided into waste meter zones. The zone can be isolated by closing any interconnection with adjacent zones or 'boundary valves'. If the flow is then measured at times when there is virtually no normal usage, such as the early hours of 2.00 A.M.to 3.00 A.M. in the morning, then the recorded flow through the meter or 'Minimum Night Flow Method' gives an indication of the leakage level within the zone (Fig 9.6 &9.7).

(c) Step Testing

The method of closing valves within the district so as to successively reduce the size of the district supplied by the meter is known as step testing. This is done by closing intermediate valves or 'step valves', whilst simultaneously monitoring the effect of these alterations at the waste meter. A sudden reduction in night flow corresponding with the closure of a step-valve will indicate leakage on a particular section of main.

This section can be investigated in detail using sounding techniques, the leak noise correlator and the ground microphone. The detected leak points are repaired. The exercise is repeated and reduction in leakage is noted.

Starting furthest from the waste meter, valves are successively closed so that less and less of the district is supplied via. the meter. The sequence of closing valves is followed right up to the meter where upon the flow should drop to zero.

The success of both waste metering and step testing depends to a large extent upon the ability to isolate the waste meter district from rest of the system and this obviously depends upon valves shutting down tight.

Step testing is effective when the step size is approximately 100 properties. In smaller districts of up to 1000 properties the district should be divided into not less than 10 steps.

A detailed record of the inspection and leaks located and repaired should be maintained.

9.12 Accepted norms for Expression of Leakage

Leakage within distribution mains be expressed in terms of night flow rate:

i) Litres/household/hour for urban areas and for whole systems.

ii) Litres/Kilo Meter of main/hour for rural areas.

Leakage from service reservoir may be usually expressed as a percentage of its capacity.

Direct measurement of leakage from trunks mains are best expressed in litres/kilometer of main/hour.

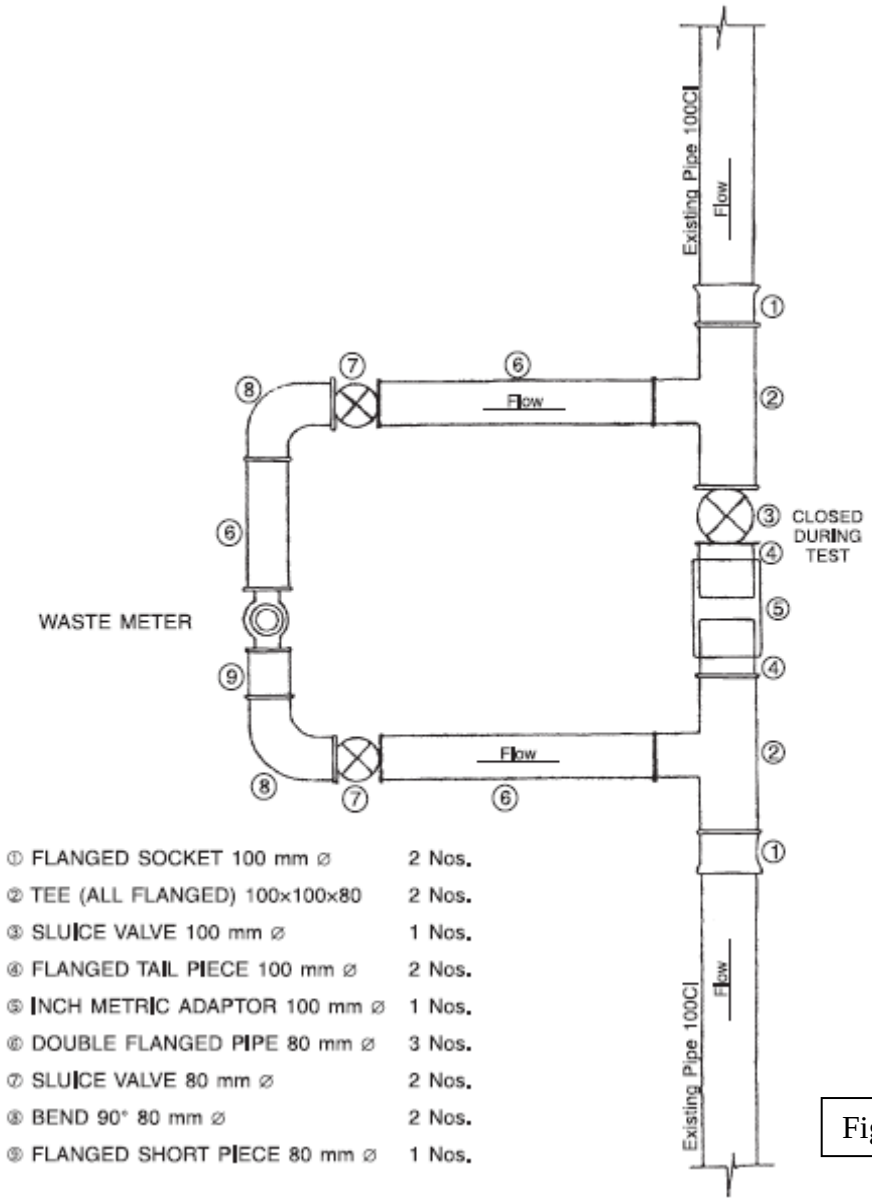


Figure 9.6

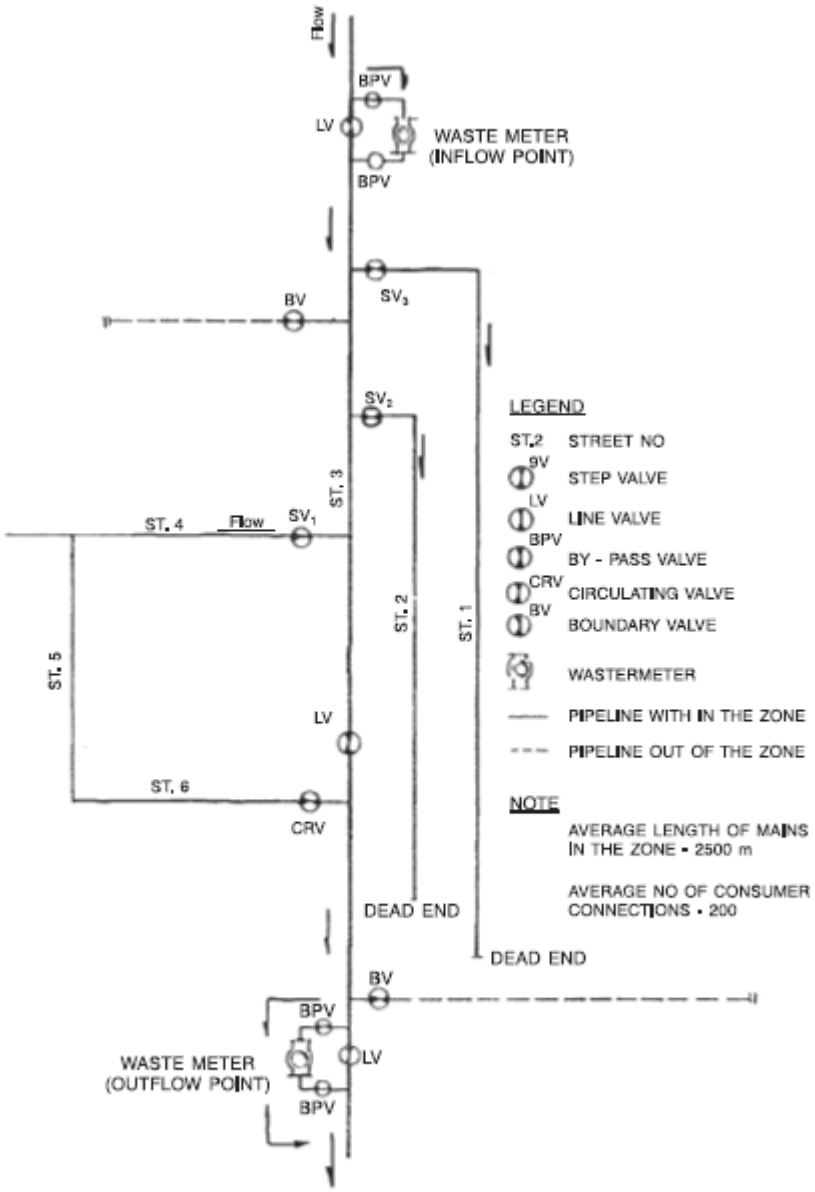


Figure 9.7

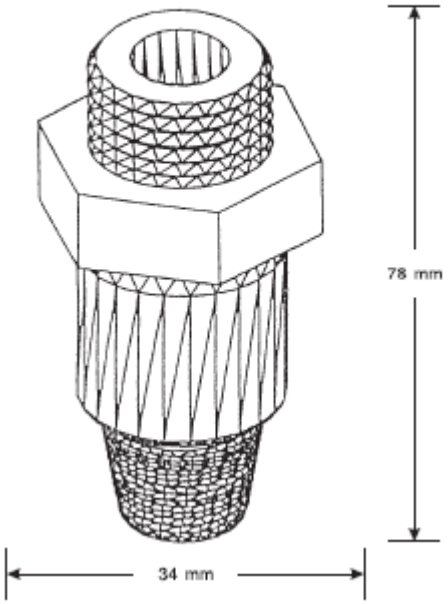
9.13 Prevention of UFW in Consumer Connection

For domestic connection galvanized iron pipes are mainly used. After a period of time these pipes get choked due to corrosion/tuberculation. For house service connection, non-corrosive pipes can be used. The water supply drawing should have correct layout of the pipes, diameter, material, valves etc. This would facilitate proper maintenance. For arresting the illegal drawal of water from the distribution system by way of using small electrical driven motors in consumer connections, a mini Flow Control Valve in the form of a tapered ball drive system fixture, working on float principle, has been developed and found to be very successful in proper control & maintenance of service connection flows, even with supply hours ranging barely between 1-2 hours a day.

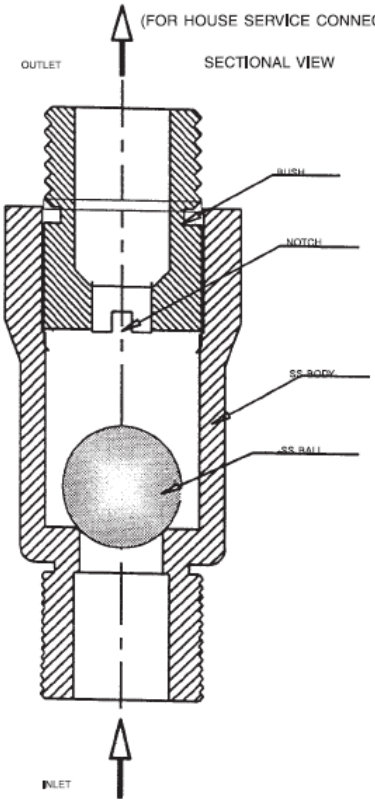
It allows only the designated flows 5lpm (or) 10lpm (or) 15lpm (or) 20lpm (or) upto 25lpm in the house service line beyond it's location irrespective of the incoming quantity of flows in the line and can be protected from external tampering with a sealed box.

This arrangement is simple economical & free from tampering. As the insertion of this device may not be agreeable to the residents, the process of installation of this device needs to be accomplished tactfully.

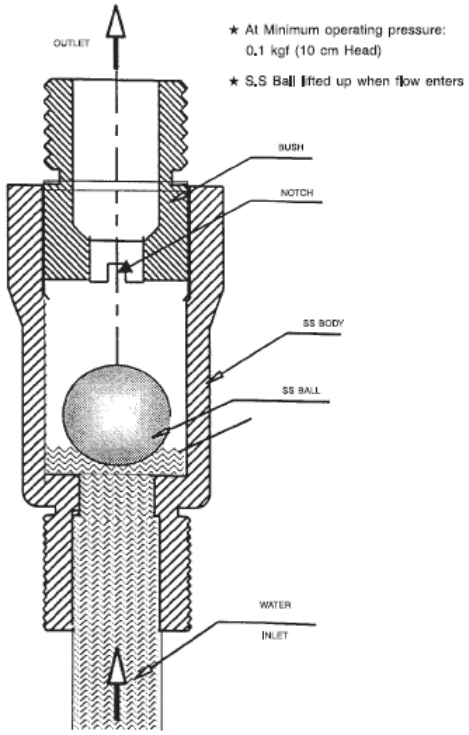
TAPERED TYPE
FLOW CONTROL VALVE
(FOR HOUSE SERVICE CONNECTIONS)



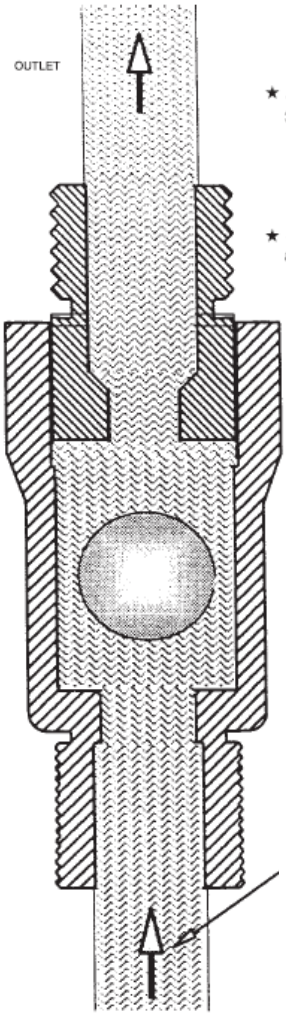
FLOW CONTROL VALVE
(FOR HOUSE SERVICE CONNECTIONS)
SECTIONAL VIEW



WORKING CONDITION 1:



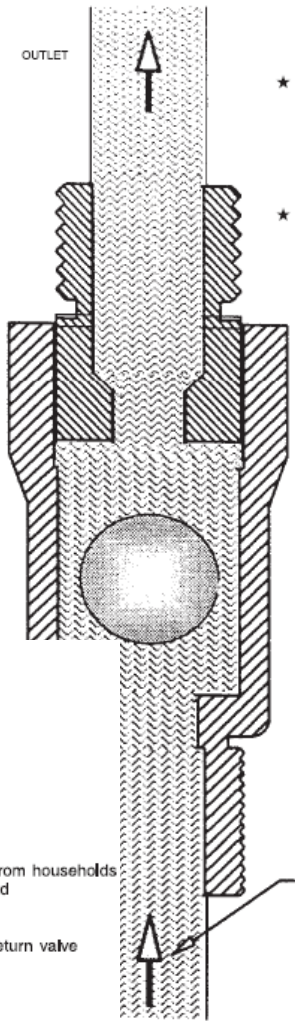
WORKING CONDITION 2:



★ At Normal operating pressure:
3.0 m Head to 6.0 Head

★ S.S. Ball floats at appropriate levels to allow the designed quantity of flow

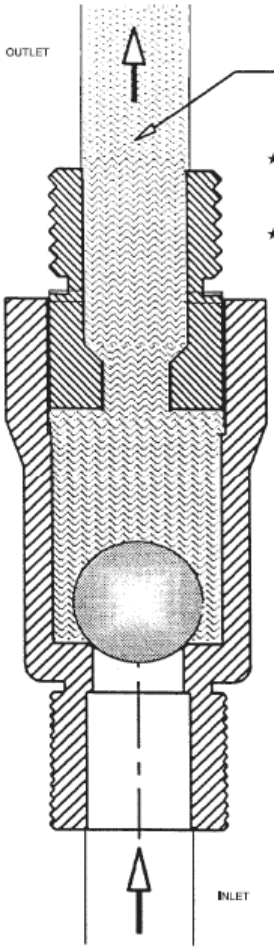
WORKING CONDITION 3:



★ At the pressure Level:
6.0 m Head and above
condition comparable to situation of using electric suction motor

★ Designed Flow allowed only through the Notch

WORKING CONDITION 4:

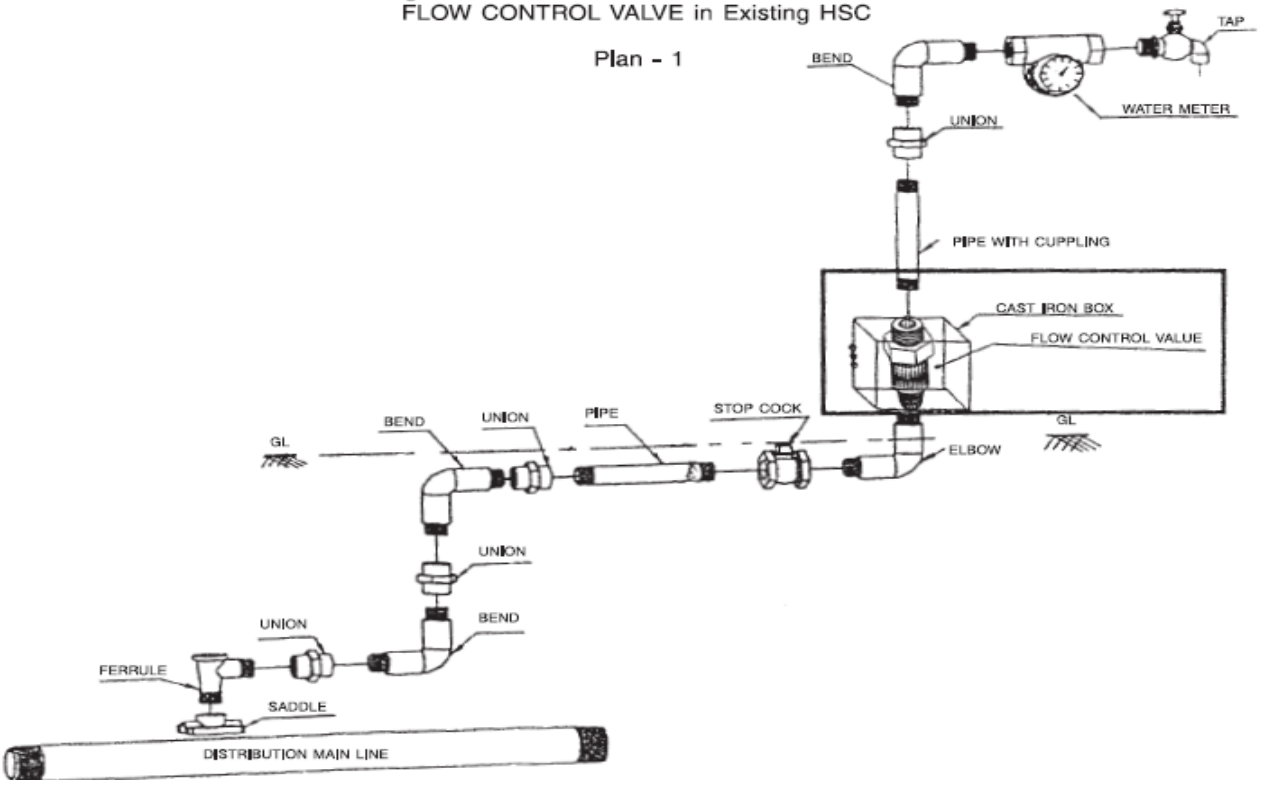


★ Controls return flow from households with distribution closed

★ Functions as a non-return valve

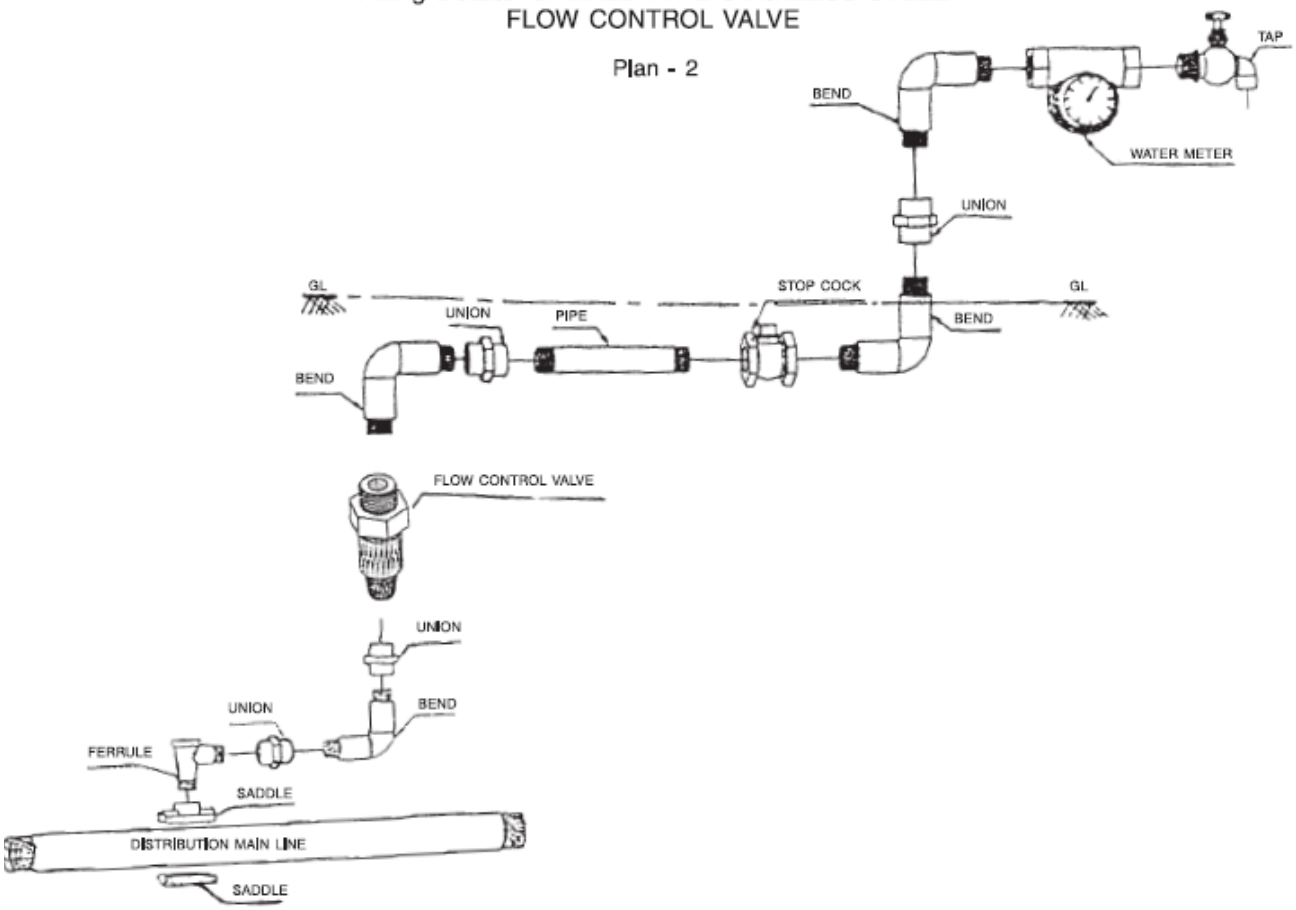
Fixing Details for MALE TYPE STAINLESS STEEL
FLOW CONTROL VALVE in Existing HSC

Plan - 1



Fixing Details for MALE TYPE STAINLESS STEEL
FLOW CONTROL VALVE

Plan - 2



(b) Financial Improvement

A water audit and leak detection programme can increase revenues from customers who have been undercharged, lower the total cost of whole sale supplies and reduce treatment and pumping costs.

(c) Increased Knowledge of the Distribution System

During a water audit, distribution personnel become familiar with the distribution system, including the location of main and valves. This familiarity helps the utility to respond to emergencies such as main breaks.

(d) More Efficient Use of Existing Supplies

Reducing water losses helps in stretching existing supplies to meet increased needs.

This could help defer the construction of new water facilities, such as new source, reservoir or treatment plants.

(e) Safeguarding Public Health and Property

Improved maintenance of a water distribution system helps to reduce the likelihood of property damage and safeguards public health and safety.

(f) Improved Public Relation

The public appreciates maintenance of the water supply system. Field teams doing the water audit and leak detection or repair and maintenance work provide visual assurance that the system is being maintained.

(g) Reduced Legal Liability

By protecting public property and health and providing detailed information about the distribution system, water audit and leaks detection help to protect the utility from expensive law suits.

9.17 Leakage repair techniques

There are a number of different techniques for repairing pipes that leak. These techniques depend on the severity of leak, type of break in the pipe, the condition of the pipe and the pipe material.

A repair clamp to cover the defect.

A cut out of the defective section of pipe work/fittings & replacement with a short length of pipe.

Relay/Renewal of the whole or section of the pipe.

For more details, refer ‘Repairs of Pipelines’.

9.17.1 Leak repair procedural over view

The first consideration will be site safety.

Notify the customer before the commencing the work.

Always locate other utilities before commencement of work.

Always allow a small flow of water to be maintained through the pipe line thus sustaining a positive pressure and reducing the risk of contamination.

Always ensure that the operatives excavate suitable sump hole below the pipe work to ensure no contamination enters the pipe.

TABLE 9.2
Analyses of complaints received in the Division

before and after the UFW Works

		Nature of Complaint	
	Defective Water Supply	**Water Leak**	**Water pollution**
Division	2 months prior to work	2 months prior to work	2 months prior to work
Total No. of connections	Month prior to work	Month prior to work	Month prior to work
No. of connections tested	During work	During work	During work
Month/Year completed	Month after work	Month after work	Month after work
% of Division covered	2 months after work	2 months after work	2 months after work

10.Service Level Benchmarks

ULB Level Reform

SOURCE: Ministry of Urban Development

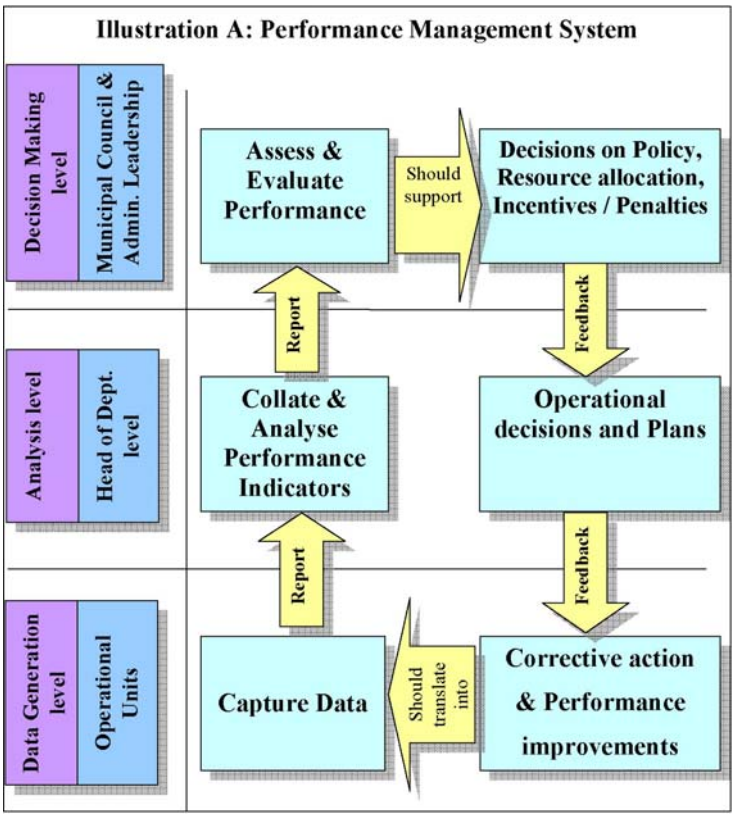
1.0 Introduction to SERVICE LEVEL BENCHMARKS (SLBS)

NEED FOR SERVICE LEVEL BENCHMARKS

In every sector, there are few key perfromance indicators that are understood by most stakeholders in that sector. Similarly, in the urban sector too there have been a number of performance indicators related to urban management and service delivery that have been defined, measured and reported. However, most initiatives in performance management so far have been observed to have some key limitations, viz.

a) Different sets of performance indicators have been defined under different initiatives
b) Even for the same performance indicator, the definition may vary or the assessment method may vary, thus inhibiting inter-city or intra-city comparisons
c) Most measurement exercises have been externally driven (by agencies external to the agency responsible for delivery against those performance parameters), and therefore the key issue of ownership of performance reports
d) Most performance measurement initiatives have been one-off exercises and not been institutionalized, limiting the benefits of monitoring trends in performance over time
e) The process of performance measurement has not been taken further into Performance Management (Refer to illustration A)

All of the above means that systems for measuring performance and taking further action on them have not been institutionalized in urban agencies. It is therefore important that the basic minimum standard set of performance parameters are commonly understood and used by all stakeholders. Depending on the specific need additional performance parameters can be defined and used.



Measuring service levels of civic agencies implies measuring outcomes, and thereby indirectly also reflects on institutional capacity, financial performance and other parameters. **Service level** parameters can be measured either from a utility manager's / planner's perspective or from a citizen's or consumer's perspective. Further, to facilitate comparison between cities / service delivery jurisdictions, and changes in performance over time, it is important that the performance levels are **benchmarked**, and monitored against those benchmarks.

It is in this context, that the Ministry of Urban Development has initiated an exercise to define Service Level Benchmarks (SLBs). MoUD constituted a 'Core Group for SLBs', comprising experts from various institutions to arrive at the SLBs. Drawing on the experiences of various initiatives in measuring service level performance, the Core Group narrowed down the exercise to four basic urban services to begin with, and arrived at sets of indicators in each. After much deliberation, the indicators, their definitions, means of measurement, frequency and jurisdiction of measurement and reporting, etc. were finalized.

The Handbook on Service Level Benchmarks, is a ready reckoner of sorts to enable ULBs and other city level parastatal agencies implement systems for measuring, reporting and monitoring the SSLBs.

2 PERFORMANCE PARAMETERS FOR BASIC URBAN SERVICES

Service level performance parameters have been identified for four basic urban services, viz.

a) Water Supply
b) Sewerage
c) Solid Waste Management
d) Storm Water Drainage

These parameters have been defined primarily from a utility managers' / planners' perspective. In other words, the parameters highlight the performance as would be monitored by the leadership / management of Urban Local Bodies or other civic agencies. These performance measurements will need to be carried out by the service delivery agencies themselves, reported to higher levels of management and also disseminated widely. Clear definitions and methodologies are expected to eliminate bias in measurement and reporting.

Performance from a citizens' or consumers' point of view is better measured by capturing their perception, rather than data from the delivery agency. Measuring citizen's perception can be in addition to reporting by the agency themselves, and can offer interesting insights when compared with one another.

Performance parameters should be applied in a manner across all cities and be regularly used by all stakeholders. Practical considerations will drive frequency of measurement and reporting; and the jurisdiction of measurement and reporting, both critical aspects in performance measurement. Performance will need to be measured at a frequency higher than or at least equal to the frequency at which it will need to be reported. Frequency should be at such interval at which the variables driving the performance parameter will undergo visible change, and thereby reflect change in performance over different time periods.

Also, to the extent practical, performance should be measured at the smallest geographic jurisdiction as possible. Typically, performance measurements at the electoral ward level will be of significant value to decision makers, especially elected representatives. Administrative jurisdictions for service delivery departments should ideally be co-terminus with ward boundaries. Service delivery performance at ward levels, when laid out spatially on the city map may also offer interesting insights. Also from a citizen's perspective, 'ward boundaries' are the sub-ULB level jurisdictions that they can possibly relate to.

However, on the other hand, in case of network utilities such as water supply and sewerage, all network management data is ideally reported by Zone / District Metering Area (DMA); which typically represent major branches in the network.

It will therefore be relevant to examine 'network management' related performance indicators by Zone / sub-jurisdictions of the network (for eg. Continuity of water supply), while service delivery as experienced by the citizen is measured by civic ward as the smallest jurisdiction (for e.g. coverage of water supply connections).

For purposes of internal management of the ULB / utility, performance should be reported at the lowest level of jurisdiction and at maximum frequency possible. However, frequency may reduce and city-wide level performance may be reported to higher level of Governments and other external stakeholders.

3 ROLES OF DIFFERENT STAKEHOLDERS

For the service level performance parameters to come to be accepted as a standard, all stakeholders will need to play their part. The role of different stakeholders and the next steps they will need to pursue are briefly mentioned below.

a) ***Central Government***: The Ministry of Urban Development, Government of India will take the lead disseminating these service level performance parameters and building wider acceptance. Further SLBs will also be institutionalized through the Jawaharlal Nehru National Urban Renewal Mission (JNNURM) and other [programmes of this Ministry through more ways than one, viz.

- SLBs will be an integral part of City Development Planning processes, both for assessment of current situation, and for setting targets under their plans.
- Where ever appropriate, SLBs will be dovetailed with the commitment on reforms, and subsequent process of appraisal of reforms
- The relevant SLBs should be part of Detailed Project Reports for concerned sectors, indicating both the current situation and what change the project will bring about. Subsequent processes of monitoring implementation of the project will also examine these SLBs.
- Under the JNNURM, support may be extended to enable ULBs and other civic agencies to establish systems in their respective institutions for periodic measurement, reporting and analysis of SLBs.

b) ***State Governments and its agencies***: State Governments and its nodal agencies in the urban sector have a critical role in driving performance of ULBs and city level civic agencies. State

Government will need to periodically examine the SLBs as an input for its decisions related to policy, resource allocations, providing incentives and penalties, channelising technical and manpower support, and regulatory considerations amongst others. The Directorate of Local Bodies / Department of Municipal Administration will need to play a key role in this process through constant inter-city comparisons. These departments should leverage the power of information technology to build and operate systems that periodically capture and report on SLBs. Web-based technologies should be leveraged for managing information flow. For other nodal state level agencies, the SLBs will provide specific inputs for their programs and interface with the ULBs and other civic agencies. SLBs will also be an important input to State Finance Commissions in the course of their work.

c) ***Urban Local Bodies***: ULBs are the most important stakeholders for institutionalization of SLBs.

- *As service delivery institutions*, ULBs will find it useful to institutionalize systems for performance management using SLBs. Performance data at the sub-ULB level (zone or ward level) is particularly useful for the ULB for taking appropriate decisions and monitoring performance of the various field units. Benchmarking with other cities within the State, or with similar cities facilitate a healthy competitive environment for continuous improvement.
- *As the principal elected institution for self-governance in the city*, ULBs will need to examine performance of other para-statal civic agencies, even if the ULBs are not directly responsible for service delivery in those areas.

Performance management data using SSLBs should be included in the set of information disseminated under mandatory public disclosure, as required by the reforms mandate under JNNURM.

The key next steps for ULBs are to generate performance reports on SLBs periodically beginning FY 08-09. Data can be captured either regularly through systems on the ground (For e.g. weighbridge at the composing plant or land fill site, water meters capturing flow at designated points, demand collection registers for water charges, etc.), or through specific surveys carried out at defined intervals. In parallel, the ULBs will also need to institutionalise systems for the entire cycle of performance management, as depicted in Illustration A. This would imply the following:

i. Systems for Capturing Data: Design and implement data collection systems for data to be captured at the most disaggregated level. Such data will typically be from field level staff such as sanitary supervisors, water pump operators, accounts clerks, etc. Simple data formats should be designed and provided to them to capture the data and report the same upwards within the organization for collation and determination of the service level performance.
ii. Systems for Collation and analysis of Performance Indicators: Specific persons should be designated with the mandate to collate the data received from the field and generate the performance reports. Working directly under supervision and guidance from officers at the Head of Department level, young professionals with good analytical skills and moderate level of technical skills should be able to execute these tasks.

iii. Systems for Assessment and Evaluation of Performance: In most cases, multiple indicators need to be examined to obtain a holistic picture of service levels in a particular sector. Performance indicators reported by department level should be closely examined at the management level of the ULB. Such reviews by the Mayor / Municipal Commissioner should be at defined periodicity, say monthly.

iv. Systems for decision making: All ULBs do have systems for decision making, however, many decisions end up being considered in the absence of quality data. To address such gaps, systems such as - periodically tabling the performance reports in the Council / to the Standing Committees should be instituted. Typically, reporting ward level performance parameters wherever applicable will be useful.

v. Systems for Operational decisions and plans: Decisions and plans will need to be periodically reviewed in light of the performance achieved and follow-on decisions taken up. Additional capital or revenue expenditure may need to be taken up, contracting decisions taken, remedial action taken with respect to deployment of staff, etc. A process of monthly review and follow-up decisions will need to be instituted.

vi. Systems to take corrective action for performance improvement: To enable the operational staff implement the corrective action on the ground, they will need to be adequately empowered to implement the decisions taken without lengthy approval processes. For networked infrastructure services, which is the case for most urban services, significant efficiency improvements can be brought about through operational improvements without significant capital investment.

A system of incentive and penalties must be instituted for attaining targeted performance levels. This is critical for the field functionaries to respond for making quick operational improvements. Similarly, the system of penalties for errant staff who have lead to poor performance should be institutionalized.

d) ***Other parastatal agencies***: The significance of SLBs and the next steps parastatal agencies need to undertake is very similar to that for ULBs. Parastatal agencies too need to put in place all the systems for performance management as mentioned above. The need for periodic reporting of SLBs to ULBs concerned and its public disclosure is further highlighted in this case, thereby bringing in higher intensity of accountability of parastatal agencies to elected bodies and public at large.

e) ***Bi-lateral / Multi-lateral aid agencies and other stakeholders***: Various urban governance and infrastructure improvement programs of bi-lateral and multi-lateral aid agencies can dovetail and further strengthen this initiative, mainly in two ways:

- Enabling State Governments and cities design and implement performance management systems, with a focus on the SLBs defined.
- Extensively using the SLBs defined in the design, implementation and monitoring of the urban programs supported by them. Benchmarking service levels and achieving targets for each of these SLBs can be built into the design of these programs.

Institutions such as City Manager's Associations, public administration training institutions, Office of the Comptroller and Auditor General (CAG), other external and internal audit agencies, financial institutions and whole range of external stakeholders should commonly examine these SLBs in the course of their interactions with the ULBs.

f) ***Citizens and civil society at large***: While the SLBs have not been defined from the citizen's perspective as such, the parameters considered provide reasonable indication of performance of the ULB / civic agency. Citizens' should engage with ULBs through Area Sabhas, Resident Welfare Associations and other such civil society organizations, in examining the SLBs and suggesting remedial actions.

4 LIMITATIONS AND CHALLENGES IN IMPLEMENTING PERFORMANCE MANAGEMENT SYSTEMS USING SLBS

It is recognized that this initiative has a number of limitations. Performance management in ULBs is being triggered from the Central Government, however, the acceptance and capacity at the State and city levels is what will sustain this initiative.

While this handbook has attempted to address issues of definition and methodology for the SLBs, it is anticipated that a number of complexities will arise in the course of actual implementation. Field level experience in implementing service delivery performance management systems may also throw up the need for monitoring additional parameters. All of such experience should then provide the feedback for improving the SLBs and preparing the second version of this handbook.

Challenges involved in implementing performance management systems using SLBs will be many. They will include:

- Systems for capturing key data elements identified for the SLBs are not present in many cases at the field level. Ideally data is always captured at the lowest level. Interpreting and understanding performance is always easier at an aggregate level, while the same is not possible at the disaggregated level, if data has not been captured at that level. Also the data at city / ULB level can be credible and reasonably accurate, only if it has been captured at lower levels, such as ward level. For e.g. if ward level data is captured on hours of water supply, the same can be aggregated at a ULB level. However, if the number of hours is only assessed and reported at the city level, ward-wise variances cannot be examined.
- To measure input parameters for a performance indicator, there may be a tendency to measure it through ad hoc systems, which can be a one-off exercise. However, to generate data from the field level on a regular basis to sustain periodic performance measurement, sustainable systems need to be put in place.
- In some cases, there may be resistance of field staff or other stakeholders to collect and report correct information, as vested interests may be involved. Such vested interest may also want to prevent transparent disclosure of the performance measured. Such hurdles will need to be overcome.
- As mentioned earlier, definition and measurement methodology issues will continue to exist, which should get refined with experience. Also, some other indicators may seem important, or more SLBs may seem to be necessary for interpreting performance.
- The entire loop of performance management will be sustainable only if - disclosure, reporting, monitoring and performance management feedback, incentives and disincentives are also brought into the cycle. Else the system of measurement and disclosure of SLBs may not sustain itself.

5 STANDARDISATION OF SERVICE LEVEL BENCHMARKS

With a view to the definition and computation methodology of the select SLBs (performance indicators), each of these indicators has been detailed out in a standardized template in the following pages. For each of the selected indicators, the following details have been provided:

a) ***Title, Units and Definition***: The specific name, the unit of measurement in which the performance is to be measured, and definition for the indicator is provided.

b) ***Data requirements***: The specific elements of data that need to be captured is identified, and its corresponding unit of measurement. Each data element is described, point and frequency of data capture is mentioned. The specific formulae that should be used to arrive at the performance indicator are mentioned.

c) ***Rationale for the indicator***: For each performance indicator, the overall significance and rationale for assessing and monitoring the performance indicator has been provided. The benchmark value has been specified in most cases.

d) ***Reliability of measurement***: The performance measurement is only as reliable for meaningful management decisions, as much as the systems that generate the data to compute the performance. Typically, four levels of reliability of the data systems have been specified, viz. 'A', 'B', 'C', and 'D' with 'A' being highest reliability and 'D' being lowest.

Reliability of measurement highlights a hitherto ignored aspect in performance management of urban services. This highlights the need to designing, implementing and institutionalizing robust systems and processes that will provide data of high reliability, on a repeated basis, and in a consistent manner. ULBs / urban utilities are advised to institute systems corresponding to the level 'A' specified. Such a transition will not happen in a short time period. Thus, while performance levels are improved over time, so should the data systems through which data is captured. The goal therefore is reaching the benchmark performance level as arrived at by 'A' level reliability of measurement.

e) ***Frequency of measurement***: Frequency of measurement of the performance indicator refers to the frequency at which the performance level will be assessed and not the frequency at which the data elements will be measured. For each indicator, the minimum frequency at which the performance should be measured is mentioned. The same can then be reported at the same frequency or a lower frequency. The frequency at which performance is measured is very critical since:

a) There should ideally be visible change or potential for changing performance level between two consecutive time periods. [For e.g. it may not be possible to change availability of treatment plant capacity in a few months; therefore it should be measured and reported on annual basis. However, hours of water supply may vary with season and can be improved during the year, therefore it should be reported at quarterly and annual frequency.]
b) If the time period is set too large, the performance measured cannot effectively feed back into making operational improvements.
c) If the time period is set too small, significant time will be lost in only measuring and reporting performance.
d) Performance cannot be reported at a frequency higher than at what it has been measured.

Performance should be reported more frequently within the organization, and at lower frequency to higher levels of government. For e.g. performance reports should be tabled to the Standing Committees and Municipal Councils at monthly or quarterly frequency. However, they may be reported at annual frequency to State and Central Governments.

e. ***Jurisdiction of measurement***: This refers to the geographic jurisdiction for which performance should be measured, and not the point of data collection. Typically, measuring urban service delivery performance at a sub-city level makes more sense for city level stakeholders, than only city-level performance indicators. For e.g. for an urban citizen or municipal councilor, it would be useful to know the performance of a particular service in that ward, especially in relation to other wards. Also measuring performance only at the city level, will disguise huge differences in service levels that exist between different localities in one city, a phenomenon common in most Indian cities.

Similarly, for stakeholders at the State and Central level, it is useful to have citylevel performance indicators, as the same would be useful to compare and contrast cities. Such information will then be useful for formulation of State level and National strategies and policy responses.

Measuring performance at a lower level jurisdiction enables aggregation of the data to indicate performance at a larger jurisdiction. Thus, if ward level performance is known for all wards, ULB level performance can also be reported.

It may be noted that with respect to geographic jurisdictions for the performance indicators, the terms ‘ULB’ and ‘city’ have been used inter-changeably. This is since, in larger cities / urban agglomerations there are multiple ULBs within the city; while in smaller cities, the ULBs typically cover the entire urban boundaries.
In many cities, certain services such as water supply, waste water management may be provided and / or managed by a parastatal utility for a larger urban jurisdiction, rather than the limits of the ULB/s. In such cases, the data and performance indicators may pertain to the jurisdictions of the parastatal utility. Therefore, the unit of ULB / city should be interpreted as appropriate to the given context.

6 STRUCTURE OF THE HANDBOOK

Section II of the handbook provides details regarding each of selected SLBs. The list of indicators has been chosen after taking into account experiences in pilot initiatives in implementing SLBs across ULBs / utilities. Quality of available data, effort required in data collection and significance of the indicator has been considered in arriving at this set of indicators.

Section III of the handbook provides guidance on how the SLBs can be operationalised.
Samples of performance reports of SLBs that ULBs / civic agencies can use to set and track their performance improvement are provided.

11. Public Disclosure Law

State Level Reform

1. The Reform

The goal of public disclosure is to institute transparency and accountability in the functioning of municipalities through publication of information pertaining to various facets of municipal governance, namely, personnel, particulars of administrative structure, finances and operations. The JNNURM envisages the enactment of a Public Disclosure Law (PDL) to ensure release of quarterly performance information to all stakeholders.

The core objectives of Public Disclosure Law are:

- To provide appropriate financial and operational information on various municipal services to citizens and other stakeholders.
- To promote efficiency and consistency in the delivery of public goods and services by the municipality.
- To enable comparison over time (of a particular ULB) and space (between ULBs) by disseminating information in a structured, regular and standardized manner.

The JNNURM reform toolkit clearly states that "JNNURM requires that municipalities and parastatal agencies will have to publish information about the municipality and its functioning on a periodic basis. Such information includes, but is not limited, to statutorily audit quarterly statements of performance covering operating and financial parameters and service levels for various services being rendered by the municipality."

The enactment of Public Disclosure Law refers to making appropriate provisions in the state-level municipal statute(s) and/or other state-level statutes to ensure that these disclosures are mandatory.

2. Rationale for the reform

Public disclosure is essential for accountability within as well as outside the municipal system.

- First, this criterion builds a channel between the local, state and the union levels of India's federal government structure for effective communication through voluntary disclosure of information. This aids the audit of finances and operational performance of ULBs. It also helps create an environment of healthy competition between different ULBs in the delivery of good quality of life to their citizens.

- Second, by making information accessible to the citizenry, it plays a lead role in enabling them to effectively use the participatory platforms to influence municipal policies. This reform can also be seen as supplementing another key reform criterion of JNNURM, namely, enactment of Community participation law by helping it achieve informed participation. Thus, public disclosure makes ULBs more accountable not only within the federal structure but also outward to the citizen.

- Third, the PDL also allows ULBs to be accountable to a variety of other stakeholders with which it must increasingly interact including lenders, credit rating agencies, donors, private contractors and so on. The creation of a robust platform for the disclosure of municipal finances will facilitate easier evaluation of municipalities in accessing funding from lenders and capital markets, as well as reduce the cost of borrowing over time. This is especially important given that ULBs may need to access market-based financing for at least some portion of their capital investment requirements.

Some of the advantages of a law on Public Disclosure are:

- A PDL will make it mandatory for municipalities to publish information suo motu.
- A well drafted PDL will provide clear guidelines to the ULBs /parastatals on the areas and manner of disclosure and hence prevent inconsistencies and conflicts.
- It will enhance transparency and accountability in government processes and in the process check corruption.
- It will help citizens to play an effective role in their local governance through informed participation, thus strengthening citizen-state partnership.
- Access to information will enhance the ability of citizens to exercise a whole range of other rights. In this sense, public disclosure supplements the Right to Information (RTI) Act, 2005, by making available regular information on ULB activities suo motu.
  - This will ease the load on the Information Department by reducing the number of RTI requests on such matters.
  - This will ensure the periodicity of suo motu disclosure (*see Annex 1).*
  - The reform also provides for the structuring of large volumes of information in an easily comprehendible format.
- Disclosure of information will bring the different critical issues to the fore and exert pressure on all stakeholders to resolve it. In other words, such a law will enable an informed and sound analysis of urban challenges, thereby assisting in indentifying and implementing sustainable solutions.

3. Steps to implementing the reform

Processes/steps involved in implementing Public Disclosure include:

- Passing a resolution that is in conformity with the checklist filled by the state government at the time of signing the Memorandum of Agreement (MoA) with Government of India.
- Institution of the legislation drafting committee.
- Constitution of a state-level monitoring agency, namely, Public Disclosure Committee, to ensure adherence to the principles of public disclosure across ULBs. This role can be played by the existing SLNA under JNNURM, although it is recommended that an independent committee be established either within the State Information Commission or within the Directorate of Municipal Administration/Department of Local Self Government that would monitor the disclosure of financial and operational information of the municipalities until the process becomes routine.
- Identification of select ULBs to implement public disclosure on a pilot basis. This may begin with the cities under JNNURM. This step of piloting public disclosure is highly recommended before the onset of the year of commitment or during the legislation cycle. This provides an opportunity for the state to test the impact of public disclosure and to incorporate the learning into the draft legislation/policy.
- Operationalization of public disclosure in the identified pilot ULBs. The pilot would provide a great understanding of the minute details of operationalizing disclosure. They will also provide case studies for peer-sharing – across cities as well as across states.

- Documentation of challenges and success stories under the pilot on a continuous basis.
- Preparation of draft legislation by the drafting committee.
- Enactment of draft legislation.
- Notification of rules and regulations.
- Implementation of public disclosure across all ULBs.
- Institute a public monitoring system by raising awareness among citizens regarding mandatory disclosure by ULBs and parastatal service providers.
- Constitution of service benchmarking advisory committee with experts from different sectors to provide assistance to the ULBs and parastatals in arriving at benchmarks for the respective urban services. This is of great importance, particularly, to arrive at effective benchmarks. For example, experts from the water sector will be able to provide invaluable insights into the desired service quality of water supply. They may also be consulted on international benchmarks on water supply as well as on methods for modifying such benchmarks to fit the local scenario.
- Preparation of service level benchmarks (MOUD is currently developing Standardized Service Level Benchmarks – SSLBs – for key municipal services), which could be used by ULBs for measuring urban services provided by both ULBs and corresponding parastatals.
- Communicating about the benchmarks to the citizens and stakeholders.
- Review of rules/regulations to include lessons from pilots, if any, and/or sharing of lessons and success stories from the pilot with other ULBs in the state.

Steps	Actor	Y0	Q1	Q2	Q3	Q4	Y2
Passing the resolution	State						
Instituting legislation drafting committee	State						
Constitution of Public Disclosure Committee	State						
Identification of pilot ULBs	State on consultation with ULBs						
Operationalization of pilots	ULB(s)						
Documentation of pilots and publication on quarterly basis	ULB(s)						
Preparation of draft legislation	State						
Enactment of draft legislation	State						
Notification of rules and regulations	State						
Implementation of public disclosure; publication of quarterly and yearly financial reports, service levels, etc.	ULBs						
Awareness drive for public monitoring	ULBs						
Constitution of service benchmarking advisory committee	State						
Preparation of service level benchmarks/use of SSLBs developed by MOUD, GOI	ULB/parastatal						
Publication of benchmarks for public consumption	ULB/parastatal						
Incorporation of lessons and success stories in the rules/regulation	State						

Notes:
Y0 – The year of signing the MoA.The quarterly time period mentioned is for the year of commitment made by the state in the MoA.
Y2 – Year after the year of commitment.

4. Measuring Achievement / Outcomes

- Resolution by the state government.
- Extent of measures taken by the state/ULB in the interim.
- Operationalization of disclosure in pilot ULBs:
  - Periodicity of disclosure (within 2 months at end of each quarter and 3 months at the year end)
  - Reduction in applications for RTI
  - Citizen satisfaction survey for measuring accountability
- Enactment of a Public Disclosure Law in the states:
  - The law should clearly list out the areas in which information has to be provided
  - The law should also clearly state the manner of disclosure
- Operationalization of disclosure in all ULBs:
  - Periodicity of disclosure (within 2 months at end of each quarter and 3 months at the year end)
  - % of service providers (including parastatals) under public disclosure
  - Reduction in the application for RTI
  - Citizen satisfaction survey for measuring accountability
  - Standard deviation of service measures from the benchmarks

Annex 1

(Following information is based on the guidelines issued by the Ministry of Urban Development, Government of India, in the form of Model Disclosure Law)

1. **What is the ambit of disclosure?**

   All financial and operational information pertaining to the municipal functioning will be subject to public disclosure. This includes the particulars of the municipality – details of committees, boards, councils, any other body instituted through resolution and the executive set up, with contact details of the officials.

   The Model Law lays particular stress on the disclosure of:
   - Financial statements – balance sheets, cash flow, etc. – that are statutorily audited.
   - Service levels of municipal services
   - Fiscal Plans – proposed expenditure, details of subsidy programmes, details of municipal funds and annual budget allocated ward-wise
   - Master Plan
   - Operational information – particulars of works, etc.

2. **What is the periodicity of disclosure?**

   Quarterly disclosures of audited financial statements are required to be made within 2 months at the end of each quarter.

   Annual disclosure of audited financial statements is required to be made within 3 months at the end of the financial year.

   Details of municipal funds and annual ward wise budget within 3 months at the end of each quarter.

   Rest of the information should be made available throughout the year with periodic updates to ensure that validity of the information.

3. **What is the manner of disclosure?**

   Through the following media:

   - Newspapers
   - Internet
   - Notice boards of municipal offices

4. **How will the ULB/parastatal measure its progress with respect to service delivery? How will the citizen comprehend the information disclosed?**

   In order to be able to measure the progress and to comprehend the quality of service provided by the ULBs/parastatals, it is essential to identify appropriate benchmarks for the services. ULBs/parastatals will be able to measure themselves by setting periodic targets against these benchmarks and comparing the actual measurement against them.

   Such benchmarking will also aid the citizen in comprehending the quality of service currently being provided.

12. Property Tax
ULB Level Reform

The Reform

One of the main objectives of the Constitution 74th Amendment is to make the Urban Local Bodies efficient units of self governance. For this the ULBs have to become autonomous and to depend more on their own revenues. Property tax is the single most important tax revenue source available to a ULB. Hence revenues from property tax have to show significant increase.

Reform of the property tax systems is one of the mandatory reforms under JNNURM. The guidelines emphasize the need for a) proper mapping of properties using a GIS system so that the ULB is able to have a full record of properties in the city and bring them under the tax net b); making the system capable of self-assessment (that is a system which is formula driven and where the property owner can calculate the tax due); and c) improving collections to achieve at least 85% of demand.

The objective of the reform should be to:

- Tap the full potential of property tax as a source of own revenue of the ULB.
- Bring all properties into the tax net.
- Introduce system improvements to increase efficiency in tax administration focusing on the entire value chain – coverage, billing, collection and enforcement.
- Make the system of assessment transparent and simple so as to be easily understood and interpreted by all property owners.
- Eliminate/reduce subjectivity and discretion in assessment particularly at the field level.
- Remove existing inequities in tax burden on similarly placed or similarly used properties.
- Enable property owners/occupiers to calculate tax liability on their own, file self assessment forms and pay tax on that basis, putting the onus upon the assesses to pay tax on time.
- Build in buoyancy and elasticity in the tax base to achieve revenue growth.
- Reward honest tax payers and penalize defaulters.
- Have a proper information system for monitoring to ensure full coverage in assessment and full collection of tax dues.
- Make the systems of assessment, collection and information citizen friendly.
- Introduce efficient mechanisms for speedy grievance redressal and dispute settlement.

1. Rationale for the reform

In most states the weaknesses and deficiencies in the current system of property taxation does not allow for full exploitation of the revenue potential of this tax. Property tax is one of the most under exploited tax instruments. To strengthen the financial autonomy of the local body a holistic reform of the property tax system is essential. The present deficiencies occur on account of the present assessment systems as also poor administrative and information systems currently in place.

Rental Value Basis: The system of property taxation followed in most Municipal Acts is a rent-based rateable valuation system where the annual value or the annual rental value (ARV) of the property shall be deemed to be “the gross annual rent at which the land or buildings might, at the time of assessment, be reasonably expected to be let from year to year …”

Capital Value Basis: In many Municipal Acts there is an alternative provision for assessment of properties (particularly those self occupied) on a capital value basis. The annual value is arrived at on the basis of estimated market value of land and cost of construction at the time of construction or acquisition.

ARV restricted by Judicial Pronouncements: Over the last few decades a series of judgments of the Supreme Court have given a severe setback to the revenue aspirations of municipal bodies, since they are required to assess annual value for the levy of property tax on the basis of "fair rent" as determined under the relevant Rent Control Act, irrespective of the actual rent received, or whether a fair rent has been determined by a Rent Control Court or not. Even in the cases where the municipal law provided for a non-obstante clause, the Court ruled that the municipal authorities should not consider the actual rent as the only yardstick. It has been held that reasonable determination of rent by the municipal authorities *needs application of mind*, keeping in mind all relevant factors and circumstances. This immediately leads to a scope for subjective assessment and discretion at the level of the assessing officer, as well as subjective interpretation by the appellate authority.

Other problems with the Rental based system: Besides the major issue above there are other problems with the ARV system:

- Rent deeds often suppress actual rent paid – with rent being collected in other forms like interest free deposits, partnership fees, charges for amenities and services.
- Difficulty in arriving at hypothetical "rent" in the case of self-occupied properties, particularly residential properties which have never been rented out.
- Problems of assessing properties like educational and medical institutions, clubs and entertainment places, hotels and guest houses.

Problems with a Capital Value based system: The system of assessment based on Capital Value has its own share of problems:

- In the absence of a free open market in land and property transactions, the purchase value of the property, particularly in metros, does not reflect the true "use" value of the property, but is more a speculative price.
- Hence there is a tendency to under report transaction prices, to escape stamp duty and registration.
- There is limited availability of a computerized data base of property transactions against which an objective assessment can be made.
- Assessing staff are not professionally trained valuers to make scientific assessments.
- Since the capital value is determined with reference to the date of acquisition or construction, the tax base gets frozen, and there is no buoyancy in the tax.
- This also leads to wide disparities and inequity in similarly placed properties assessed at different points of time.
- There is uncertainty in what category of assets in the property should be assessed (eg central air-conditioning systems, captive power generation systems).

Administrative deficiencies: Partly on account of the inbuilt deficiencies in the assessment systems noted above, and partly due to poor administrative systems in place, the present property tax systems have the following problems/drawbacks:

- Scope for subjective assessments in a corruption-prone environment.
- Scope for excessive use of discretionary powers leading to possible collusion between the assessor and assessee.
- Non-transparency in the assessment process.
- Self-assessment is not possible, and the onus of annual assessment is on the local body which is required to issue notice of demand every year.
- Higher social costs due to litigation, and consequent delayed recovery of taxes.
- Lack of a systematic computerized database – resulting in a large proportion of the properties being outside the tax net.
- Lack of efficient mechanisms for detecting and follow up on defaulters.

Benefits from reforms: If the reforms are carried out in a comprehensive manner the benefits expected are:

- Increased revenue for the urban local body, and buoyancy in revenues to keep pace with inflation and increased costs.
- Simple to understand, transparent citizen-friendly systems and processes.
- System capable of self assessment and ease of payment by the property owners.
- Lower (possibly almost nil) litigation and associated costs, decrease in revenues locked up for years in litigation.
- Cleaner administration, increasing the faith and trust of citizens in the ULB and councilors.
- Good database and information systems to enable better tax planning and policy making by the ULB.

2. Reform components

Some Policy, Technical and Operational Considerations

Need for Comprehensive Reforms: It must be emphasized that reforms in a property tax system will be successful only if improvements are carried out covering all aspects of property tax administration. The amount of revenue raised depends on the cumulative performance of all processes – identification, valuation, assessment, collection, discovery and enforcement.

The reforms in the property tax systems should therefore cover:

a. Rate and Base Structure
b. Valuation and Assessment Systems
c. Tax Administration
d. Citizen Interface Mechanisms.

It would be useful to take a comprehensive view at the state level in regard to the deficiencies in the present system of property tax and the reforms needed in each of the above areas. In doing this, learning from best practices from other cities would be useful. The state may consider setting up a suitable Committee/Expert Group to carry out this exercise and give its recommendations. This would also help in highlighting any amendments to existing legislation of the state. The state could decide on which of the reforms would be most cost effective and prioritize the implementation of reforms accordingly.

While a comprehensive reform process is desirable in the long run, there are a number of administrative and system improvements that can be introduced at the local body level, even without setting up a Committee, without waiting for legislative changes and not requiring policy decisions at the State level. Even these reforms can yield considerable increase in revenues. (see Annexure for details) In the context of JNNURM the following should receive priority:

- Putting in place a comprehensive property database (including a GIS system where needed) to ensure complete property mapping and bringing all properties under the tax net.
- Reducing exemptions and increasing coverage, including for slum settlements connected with municipal services.
- Reducing ad-hocism in assessment.
- Putting in place payment systems, including online systems, which will make payment of taxes hassle free.

- Proper system of tracking defaulters, and suitable system of incentives/disincentives to encourage compliance and penalize defaulters.
- Suitable grievance redressal and appeal system to ensure speedy disposal of cases and ensuring that appeal is not used as a forum for tax evasion (appeal to Courts should be allowed only after payment of assessed taxes).

Rate and Base Structure:

- **Basic Tax Rate:** In many municipalities to compensate for the unrealistically low and static assessed annual value, the rate of tax has been increased from year to year, reaching very high levels – even an absurd 120%. Any high rate of tax results in resistance on the part of the citizen, and increased tendency for evasion. Generally one month's rent as property tax would be reasonable. The Act should provide for lower and higher limits for the rate of tax – say 5% to 20%. Within the prescribed limits, the ULB should have the freedom to adjust the rate (without Government intervention/approval) such that the yield is at least sufficient to cover the cost of providing the basic urban services. It should be ensured that there is no intervention by the Government in this matter.

- **Flat rate vs. progressive sliding scale:** The rate could be a flat rate. Alternatively, one could provide for a progressive sliding scale – with properties having a higher annual value bearing a higher rate of tax. [In some states the Act provides for a regressive slab system with higher value properties being charged lower rates. This is not equitable.]

- **Residential/Institutional/Commercial:** One could also distinguish between the use category of the property and properties that are put to non-residential use, or those rented out can be subjected to higher rate of tax. Alternatively the Act could provide for levy of a surcharge on such properties.

- **Exemptions:** In many states the Act provides for several categories of exemptions, which often gives a loophole in the tax structure for avoiding tax. The list of exemptions should be reviewed, and kept to the minimum. And sufficient safeguards should be built in to ensure that the provisions are not misused. Some of these are mentioned below:

  - **Places of Worship:** Only that portion used for religious worship should be excluded. Portions put to residential, office and commercial use should be taxed.

  - **Agricultural Land:** Farm houses should not be exempt. Lawns and gardens in the guise of agriculture should not be exempted. Only lands where actually an agricultural crop is cultivated should be exempt.

  - **Charitable Institutions:** Only those institutions should be exempted which are tax exempt and are providing free service or at a nominal charge. (In many cases schools, colleges, other educational institutions, nursing homes and hospitals, etc. claim exemption on the ground of their being a registered society.)

  - Even when these properties are exempt from tax, a **service user charge** could be levied to cover the cost of certain basic services being provided – e.g, street cleaning, solid waste management, parking, etc.

- **Slum settlements:** A simpler form of tax or service charge could be levied per household per month, and the money so collected could be used to provide basic services in the locality in collaboration with community based organizations in the area.

Valuation and Assessment:

As has been spelt out in Section II, the present system of assessment is not transparent and not capable of self-assessment. It rewards the unscrupulous and penalizes the honest tax payer. It is in this context that the Government of India had recommended adoption of a system which is formula based and capable of self-assessment. Different cities have tried out alternative approaches to introduce a self-assessment system. These may be a capital value based system, a rental value based system or a unit area system based on multiple factors. Each state/ULB should decide which system is most suitable for it, given its local circumstances. (It must be mentioned that JNNURM does not mandate that there should be a change in the system of assessment since this may take a couple of years to finalise and implement. The first priority should be for achieving full coverage of assessments within the existing system and full recovery of taxes.)

Whatever be the basis decided upon the system of assessment should a) be objective based on clearly enunciated parameters; b) be formula based so that it is capable of self- assessment; c) eliminate or at least minimize discretion at the field level; and d) be citizen-friendly. The unit area system is enunciated in more detail below.

- **The unit area system:** The unit area system is a simple arithmetical system of calculation of property tax based on covered area of the building and the unit area value or unit area tax for the category (of locality or amenity, etc.) in which the premises is located through which it is possible for any citizen to self-assess his property tax and file his return form. (This could also be applied to vacant land).

- **Grouping of localities:** In the unit area value system the entire city has to be grouped into somewhat homogenous categories for specifying a unit area value. Such groupings could be done taking into consideration factors like average rental value, average capital value of land, quality of physical infrastructure, availability of social and market infrastructure, type of development, economic classes of occupants, etc. The factor(s) that should be considered should be decided by the ULB taking into consideration local requirements and availability of information.

  - In **Patna**, the city is classified into **three grades** based on **street size**.
  - In **Ahmedabad**, the wards have been grouped into **4 broad categories** mainly on **land value basis.**
  - In **Delhi** 2000 and odd colonies/localities have been classified into **7 categories** taking into account **ten different factors**.
  - In **Hyderabad**, the **average rental value** for each locality, for each type of use has been prescribed.
  - **Karnataka** has been working on a **capital value** based system.

- **Municipal Valuation Committee:** Whatever be the factors that are chosen for the classification, these must be clearly specified in the statute. Further, the process adopted should be objective, transparent and provide for a reasonable opportunity for the tax payers to file objections and be heard. To ensure this it is desirable that a Municipal Valuation Committee be appointed consisting

of experts and persons experienced in urban administration, taxation, and representatives from the local body. The manner of constitution of this Committee, its functions, and the processes that will be adopted to ensure fair consultation with the citizens should be clearly laid down in the statute. (Since this process would take time the State may consider, at the first stage, to incorporate some guidelines in the Rules to ensure greater objectivity in assessment and minimize discretion at the field level.

- **Other factors for grouping of properties:** Different multiplicative factors can be prescribed to adjust the location group-wise unit area value to individual premises level. These factors should also be clearly defined in the statutory frame work eliminating any scope for subjectivity. The factors that could be considered are:

  Structure: Pucca, semi-pucca, katcha
  Use: Residential, educational, medical, public purpose, industrial, office, commercial, recreational, hotels
  Age: On the basis of the year of construction
  Occupancy: Rented or self-occupied
  Street: On the basis of the category or width of the street on which the property is located

- **Unit Tax or Unit Annual Value:** In a unit area system, one could either fix the tax per unit area for each group, as in the case of Ahmedabad and Patna. In this case: Tax = Unit Rate of Tax x Area.

  Alternatively, one can prescribe the annual value per unit area as in case of the Municipal Corporation of Delhi. In this case: Tax = URV x Rate of Tax x Area.

  The former has the advantage of being simple to understand and easy to apply.

  In the latter there is greater flexibility for raising and lowering the tax burden by simply adjusting the tax rate without altering the annual value. Another advantage is the scope for bringing in equity considerations into the tax structure by having a graduated rate of tax or different rates of tax for different types of properties. Owners with more built-up area or higher annual value can be taxed at a higher rate, or some lower cut-off covered area or annual value can be prescribed for levy of tax to give relief to poorer people. The annual value could also become the base for levying other taxes or user charges.

- **Self-Assessment**: In this system individual owners or any other person liable to pay property tax can easily determine their tax liability by calculating the tax as follows:

Step 1	Note the base unit area value (per sqft or sq mtr) for the respective category of locality in which the property is.
Step 2	Annual Value (AV) = Base unit area value (UAV) x Multiplicative factors (f1, f2, f3) etc.) x Covered Area (A)
Step 3	In case the multiplicative factors for the different portions of the property are different then: Total AV = (AV of portion 1) + (AV of portion 2) + (AV of portion 3) + ….
Step 4	Tax = (AV x Rate of Tax) minus (rebate/concession applicable)

- **Advantages of Unit Area System:** The above system is objective, transparent, comprehensive and yet simple and equitable. It is capable of self-assessment. The parameters entering the

assessment being clear and measurable there is minimum scope for discretion, and hence chances of litigation are reduced.

Tax Administration:

Substantial improvements in the revenue from tax can be achieved by improving existing administrative and tax information systems in the municipality, many of which may not require legislative change or even large investments.

- **Discovery and Determination of Property Ownership:** One of the greatest deficiencies in most municipalities is the lack of an adequate database giving details of properties. The Indian experience shows that where efforts have been taken to improve the property tax base there has been marked growth in tax revenues–in some cases tax revenues have doubled. This should be given top priority by the ULB. Two basic approaches can be used for this (a) self declaration - where the tax payer is required to provide information; and (b) survey and inventory-where the taxing authority obtains information by field surveys. The information should include name and address of the owner, plot area, built-up area floor-wise, use to which property is put, the year of construction, the type of structure and details of assessment (if already assessed.) It may be necessary to outsource this activity and engage a professional agency. This field survey should be on a 100% basis and in subsequent years updated regularly through periodical surveys and inspections. To some extent, the system of self- declaration can be improved by penalties to induce compliance. To make the system more efficient it is necessary to supplement the self-declaration system by a complete property survey and mapping and a system of periodical field audits.

- **Property Identification Code:** While building up the database mentioned above, it would be useful to introduce a unique number which would identify the property. This may be called the Property Identification Code (PIC). This code could locate the property uniquely in terms of ward, the colony and the block and perhaps floor or flat. The code so developed should be used by all the departments and other government agencies and form part of the statutory regulatory or revenue records. This would help in exchange of information by various authorities, both Central and state, and would help in preventing leakage of revenue. Necessary provisions should made in the Act for this purpose.

- **GIS, Tax Mapping and Computerisation:** In the larger municipalities the database so created should be linked to a GIS system and digitized urban maps. The initial mapping exercise should be outsourced and carried out by a professional firm having adequate experience in this field. But in the long term it is recommended that the municipality set up a fully equipped urban mapping division utilizing modern GIS technologies and be manned by the trained staff. This would serve not only the Revenue Department but also other departments of municipality. This entire database should be computerized so that linkages can be established with other data in the corporation such as building sanctions, trade licenses, as well as *with* the self-assessment and revenue collection data.

- **Onus for Assessment:** Under a self-assessment system the onus for filing property returns on a regular basis and paying the tax within a prescribed time schedule on the basis of the self-assessment should be on the owner. Failure to file the self-assessment should attract a penalty. Every owner shall be required to give information in regard to the change of status of his property by way of completion of structure/addition to the building, change of occupancy or use status or any other such event which shall have an effect of changing the property tax liability.

- **Suppression of Information or Filing of Wrong Information:** A system of self assessment does not absolve the ULB of its responsibility to ensure that all owners come under the tax net. Hence the need for the ULB to have an independent full property database, against which self assessments can be monitored. Where an owner does not give information in regard to his properties as required under the law or where he has furnished wrong information in his self-assessment, he should be liable for a penalty, a penalty, say 30%, on the amount of tax suppressed. The commissioner should have powers of suo moto assessment or revision in cases where a return has not been filed or the return filed by the owner is found to be defective. In all such cases the assessment would be finalized after giving an opportunity to the owner for being heard.

- **Payment of Tax:** It should be the responsibility of the owner to compute the tax due and pay the same according to the schedule of payment notified. A system of payment in quarterly installments could be considered. As an incentive for early payment an owner paying the annual tax within the first quarter could be given a rebate, say up to 15% on the tax paid. To facilitate payment, arrangements should be made for accepting tax through designated banks, collection by the resident associations/group housing societies, and online through municipality websites. Any amount due as tax and not paid within the time frame prescribed should attract an interest of 1 % per month for the period of non-payment of tax.

- **Indexation:** With a view to provide buoyancy, and to take into account the rapid developments and increase in real estate values taking place, revaluation (re-assessment) and change of classification should be done every three to five years. However, often such periodic assessments, even when legislated, are postponed. And when assessments are revised after a large gap of time there is great resistance from the property owners on account of the steep increase in the tax payable. To get over this a provision should be made in the statute for indexation of the assessment on an annual basis tied to changes in the Consumer Price Index of urban non-manual workers or such any other suitable index Which captures changes in real estate (rental) values. This will provide the requisite buoyancy in revenue on a regular basis.

- **Agency for Administration of Tax:** It is considered that to improve the efficiency of tax the municipality could utilize the services of citizens welfare associations, banks or other agencies, including any private sector agency to:

    - maintain and administer the property, assessment and collection data base.
    - collect the tax and deposit the same with the corporation.
    - carry out any other tasks for better administration of property tax as may be passed by a resolution of the standing committee.

- **Monitoring and Enforcement:** While most of the Acts have adequate provision for enforcement and collection of tax, the system in actual practice of monitoring tax returns and payment is woefully inadequate. Suitable strengthening of the enforcement processes and revenue intelligence mechanisms would yield higher realization of tax dues. A suitable system of incentives/disincentives to reward honest and prompt tax payers and penalize defaulters should be put in place. Any appeal to a higher Court of Law should be permitted only after the tax as assessed has been paid by the assessee, so that appeal is not used as mechanism for tax evasion or delay.

Citizen Interface Mechanisms:

Greater acceptance of reforms and better compliance can be accomplished by paying attention to the interface between the local administration and the citizen. Some areas are suggested below:

- **Stakeholder Consultations:** At every stage of consideration of the reforms and in the development and design of the new system, wide ranging consultations with all stakeholder groups is necessary to ensure that the reformed system meets the requirements of all groups, and is acceptable to them. The groups should include resident associations, market associations, groups of special users (eg, schools, hospitals), political leaders, media and officials implementing the system.

- **Consensus Building:** Once a system is designed getting necessary approvals at the municipal and government level, it would require a well thought out strategy for consensus building. Often resistance to change comes from officials, councillors and commercial property owners who have vested interests in the status quo. Formal presentations and informal consultations with opinion leaders and ways to address their concerns are vital for successful implementation. In this, media can play an important role if they are coopted into the awareness building process from the beginning.

- **Citizen Education and Awareness:** During the period of design of the system citizens should be made aware of the reasons for the reforms, what is being planned and the advantages of the new system. Our experience shows that citizens are not averse to paying higher taxes provided they feel that the new system is equitable and fair, is easy to understand and to comply with. And they have the confidence that the increased revenues will be invested to provide better services.
  Once the new system is brought into force a series of brochures, pamphlets, newspaper articles simply worded should be brought and widely distributed to educate the citizens on their responsibilities and explain clearly the modalities of operation of the new system.

- **Transparency and Easy Access to Information:** The details of the returns as furnished by the owners and suo moto or revised assessments should be made accessible to any citizen, who wishes to see such information. It would be useful if this information is also accessible through the website of the municipality or copies made available at cost on request. Such details could also be made available to each resident association with reference to its residential locality. Any person who has reason to believe that the return filed by the owner does not portray the actual facts could then bring this to the notice of the commissioner. [This would be one useful channel of intelligence information on evasion] The property owner should also be in a position to get information on the status of demand and payment in respect of his property, preferably on line. Return forms, challans for payment, ready reckoner regarding rates, explanatory brochures should be available on the website and also at the ward offices.

- **Grievance Redressal and Appeal:** At present in many municipalities considerable numbers of appeals are pending in Court and it takes a long time for settlement. With a formula based self-assessment system as proposed it is expected that such grievances will be substantially reduced. To get over teething problems in the first year of implementation of reforms it may be advisable to appoint an Anomalies and Hardship Committee to hear grievances, objections and make recommendations for improvements/modifications in the system.

  Further the Act could provide for the designation by government of an officer to be the Grievance Redressal officer who could be approached by any citizen aggrieved by an assessment order of the

commissioner. With a view to ease and expedite the appeal process it is recommended that a Municipal Taxation Tribunal be constituted to hear appeals against levy or assessment of any tax under the amended system.

- **Citizen Friendly Systems:** The property tax system as well as any associated forms, educational materials, manuals, and the payment and information systems should be designed so that these are easily understood even by a lay person, is citizen friendly and can be easily used by the common citizen. This definitely helps in greater acceptability and better compliance.

3. Steps in implementing the reform

We briefly give below the steps that need to be taken in designing and implementing the reforms:

- **Data Collection and Mapping:** Lack of property data and digitized maps makes the work of any Reform Committee very difficult. So one of the first tasks to be undertaken by the ULB should be to engage a professional firm to gather data on the properties in the city. Some data would be available in the local body and in associated departments. But detailed property data will have to be collected by a house-to-house field survey. Some sample surveys would be needed to support the analysis by the Expert Group. In bigger municipalities a professional firm should also be appointed to prepare a digitized city map using GIS, and link the same to the property data. On a parallel basis a computerized property tax system should be put in place and the survey data and GIS maps would provide the base data.

- **Setting up Expert Group/Committee:** Appoint an Expert Group or Committee which can study the existing system, analyse problems, look at other best practices and design a system suitable to the state/municipality. The chairperson of the Committee should preferably be a senior person who has had considerable years of experience in urban policy, finance or taxation. The other members should possess sufficient experience in any of the areas of finance, taxation, urban planning/administration or municipal management. One of the members should have sufficient legal background and be familiar with taxation law and connected case law.

- **Consultative Process and Consensus Building:** The process of consultation should start right from the early months. This should involve the standing committee, corporators, MLAs and other political VIPs, Taxation department officials, RWAs, market associations, special interest groups, media, and the general public (through a public notice) and public hearings.

- **Grouping and Classification:** We have dealt with this earlier. This will require setting up of a MVC, consultations, experts, taxation assessment staff, engineering and planning staff, and finally issuing a public notice and hearing public objections and disposing of the same. This process is important to ensure that the system passes judicial scrutiny.

- **Designing of the System:** While designing the system keep in mind the need for making it objective (to minimize the scope for corruption and harassment) and to make it simple to understand and citizen-friendly.

- **Computer Simulation and Fixing Base Rates:** Once the property database is ready one can use this to conduct simulations for analyzing revenue outcomes and tax incidence on different groups, and for input into the decision making of fixing the base rates and multiplying factors.

- **Public Notice, Hearings and Amendments:** The final scheme, including the grouping of localities, base rates and other parameters, should be made public and objections called for and considered and the scheme finalized.

- **Municipality and Cabinet Approval:** The scheme as finalized would then need to be cleared by the Municipality and the State Cabinet for adoption.

- **Amendment Legislation and Rules:** In the event of amendments being required in the relevant sections of the Municipal Act, the amendment process will have to be gone through. This will require the following steps:

  i **Government constitutes a Legislation Drafting Committee**. This should be chaired by the person chairing the Expert Group Committee. It should have some of the members from the Expert Committee and a suitable senior officer from the legislative drafting division of the Department of Law of the state government, the legal officers of some of the big municipal corporations and municipalities, and one or two legal counselors/advocates having knowledge of taxation laws.

  ii **Hold a Preparatory Workshop.** This workshop should include representatives at the highest policy making level from the political and the bureaucratic side of the concerned departments of the state and mayors, and select councillors from the major urban local bodies. This workshop will deliberate on:
     . policy objectives for introduction of the reforms.
     . reform initiatives in other states – the pros and cons in the context of the state.
     . case law related to taxation of lands and buildings.
     . shortcomings and deficiencies in the existing property tax legislation and system.
     . preliminary recommendations of the Expert Committee on the design parameters of the new system.

  iii **Finalize Policy Agenda:** The Drafting Committee will meet to discuss and finalize the policy agenda which will cover the following:
     . the design parameters of the proposed area based system.
     . rational basis for and factors for classification of premises to be assessed.
     . the procedure to determine unit area values of lands and buildings.
     . institutional mechanism for transparency, objectivity and regularity in the above valuation process.
     . procedures and organizational set up for citizen interface, grievance redressal and appeal.
     . limits and reasonableness of the tax levied.
     . government-urban local body interface and protection against excessive delegation.
     . systems for Tax mapping including Unique Premises Numbering System.

  iv **Finalize Paper on Legislative Intentions:** The Drafting Committee will meet to discuss and finalize a detailed paper which will set out the policy objectives and legislative intentions of the amendment. This will clearly set out the purpose of each amendment and seek decisions

  v **Approval of Policy Agenda and Legislative Intentions:** The Municipal Affairs Department will seek the formal approval of the Policy Agenda and broad changes in the law proposed at the political levels of the government and the major urban local bodies concerned.

vi **Preparation of First Draft:** In close association with the drafting division of the government the Committee will deliberate on and prepare the first draft of the amending legislation for amendment of the Chapters relating to taxation and rates; payment and recovery of taxes; appeal. This will be sent to the Law Department for vetting.

vii **Preparation and Submission of Final Draft:** Having regard to the comments of the Law and other concerned Departments of the state government the final draft of the legislation will be prepared with notes on clauses, and a draft covering the policy note. This will be sent to the Department of Municipal Affairs for formal approval by the Legislative Assembly. The Committee could play a supportive role in ensuring smooth passage of the bill.

viii **Draft and notify Rules and Regulations:** The Drafting Committee may appoint a small group to finalize the rules and regulations. These could be approved by government and notified once the Act has obtained assent of the Governor and been notified.

ix **Undertake Pilot Project for Demonstration:** After notification of the Amendment Act, and framing of necessary Rules and Regulations, the Municipality may choose to undertake a pilot project for demonstration of the operation of the system in any ward or group of wards. This may help in ironing out any teething problems or field level problems in implementation and help in easier public acceptability for citywide implementation.

4. Measuring Achievement/Outcomes

To judge the efficacy of reforms and monitor progress the following parameters could be considered:

- **Coverage:** Number of properties in the assessment register, number of new assessments during the year, and number of properties assessed as % to the number of properties in the city. The target should be reach 100% coverage over a five-year period.

- **Tax Mapping:** Properties covered by the GIS mapping and field survey, targeted, achieved - during the year and cumulative in the reform period. Number of properties and covered area, ward-wise and use category wise.

- **Demand:** Current demand, arrears demand, % increase in current demand year-wise.

- **Collection:** Current and arrears collection separately, and % to demand year-wise. The target should be to reach a minimum of 85 % collection efficiency.

- **Tax Revenue:** Revenue from tax as a percentage of total revenues of the municipality, and trend over the years.

- **Enforcement:** Number of cases of evasion/suppression detected, amount of suppressed revenue/penalty recovered, number of cases pending in court, additions in the year, disposed off, revenue locked up in pending cases, revenue collected from case disposed off.

- **Grievances:** Number of grievances received from the public, number disposed off/pending, average response time for settlement of the grievance.

SUGGESTED ACTIONS BY ULB's and STATE GOVERNMENTS
For Improving Revenues from Property Tax

Actions that can be taken without legislative changes
❖ **By the Municipality/Corporation**
• Property Survey, Tax Mapping and GIS to ensure full coverage. This exercise could also cover reassessment of under-assessed properties. • Improvement in the Property Data Base, and MIS. While creating the data base the system of a assigning a Property Identification Code (PIC) could also be implemented, • Computerization of the Property Tax system (this should be an important component of the E-Governance reform) The first phase could be to computerize the process of issuing demand notices, billing, collection and issuing receipts, and preparing DCB statements. • Improving the Monitoring, Compliance and Enforcement systems. • Issuing guidelines within the existing framework for ensuring greater objectivity and uniformity in assessment by field officers (reducing scope for harassment of assesses.) On this basis property owners maybe called upon to file self assessments, within existing legislative framework. • Improving the Collection systems and making them user friendly -- providing for longer and flexible timings for collection, different options for payment, including payments through banks and online. • Calling for Property Information, required for area based assessment systems, from property owners, through a public notice. • Changing tax rates within existing structure, and imposing higher rates of tax on commercial and other non-residential use. • Reforming the grievance redressal mechanism for becoming more responsive and ensure speedier disposal of complaints/representations. • Holding periodic Tax Adalats to settle longstanding disputed cases and grievances, and special collection drives wardwise or zonewise. • Having greater transparency in rules and procedures, basis of assessment, collection status and other information needed by property owners. • Outsourcing of various services to improve efficiency and cost effectiveness in the assessment, collection, monitoring and information systems. • Initiating the ward (locality) grouping exercise and revenue simulation exercises needed for introducing a formula based self assessment system. • Initiating stakeholder consultations, citizen education awareness and building consensus for reforms. • Communicating to the State Government, deficiencies in the existing system and areas in which Government would need to give policy directions or bring about legislative changes.
❖ **By the State Government**

• Model terms of reference and standard bid documents for RFP's for property survey, tax mapping, GIS, computerization. And shortlist of firms that qualify for bidding for such consultancies and outsourcing.
• Framework under E-Governance intiative for the property tax component and proper guidelines to enable ULB to call for bids for computerization.
Actions that would require legislative change
❖ **By the Municipality/Corporation**
• Appointing the Municipal Valuation Committee and getting their report.
• Adopting any new formula based assessment system, as per the amended Act.
• Notifying the grouping of localities and unit area values based on recommendations of the MVC.
• Approving the final scheme, locality classification and unit area rates for adoption.
• Making self assessment compulsory, and calling for self assessments through public notice.
• Notifying other changes in the property tax systems introduced by the amended legislation.
• Appointing a Committee or Group to examine and dispose off representations of hardship and anomalies arising from the new systems.
• Undertaking a public awareness and education programme for familiarizing assesses with the new systems.
❖ **By the State Government**
• Changes in Rate Structure. Eliminating/reducing exemptions.
• Guidelines on structure and responsibilities of MVC.
• Change in assessment system – introduction of some form of formula-based self assessment.
• Penalties for non compliance, non filing or wrong filing of returns, non (or delayed) payment.
• Indexation of assessment and tax payable
• Appeal mechanism for speedier disposal of appeals.

13.Municipal Accounting

ULB Level Reform

SOURCE: NIUA

1. The Reform

In terms of the recommendations of the National Municipal Accounts Manual (NMAM) released by the Ministry of Urban Development MoUD, Government of India decided to introduce accrual-based double entry system and improved financial management systems in all ULBs in India (Annexure I). Taking this further and for achieving various objectives, JNNURM reform conditionalities call for "improved municipal accounting, with the objective of having a modern accounting system based on double entry and accrual principles, leading to better financial management, transparency and self reliance", as a mandatory reform for local bodies.

The outcomes to be achieved by states and ULBs that participate in the JNNURM and implement financial management reforms are:

- Increased access to resources for urban services.
- Improved financial management, accountability, transparency of management and improved governance.
- Accurate costing for all urban civic services.
- Timely and better MIS for decision-making,
- Accurate reporting of subsidies for better management and targeting.
- Better control and utilization of assets.
- Publishing of audited financial statements on a timely basis.
- Better management of resources and risks.
- Responsible civil society that is prepared to partner with local government.

2. Rationale for the reform

The importance of reliable information on municipal finances has come to the fore as cities in India develop infrastructure projects that reflect principles of commercial viability and private sector participation. Better financial management is essential.

Currently, due to a lack of good financial management and expenditure management ULBs are wasting scarce resources and are not able to hold municipal staff accountable. Most ULBs currently follow a cash basis of accounting, which provides inadequate information. Since, a statement of assets and liabilities is usually not prepared; a full picture of assets and liabilities is not readily available for appropriate financial management. There is inadequate cash management and timely quality information for planning, decision-making and financial control. As apposed to cash basis, accrual basis is a superior method of accounting of the economic resources of urban local bodies. Under accrual accounting, recording of transactions and events takes place whenever a transaction occurs. Even if no cash is received or disbursed, the relevance, objectivity, timeliness, completeness and comparability of the accounting records and statements are much enhanced. Accrual basis clearly distinguishes between items of a revenue nature and items of a capital nature. This helps in correct presentation of financial statements through an income and expenditure account, a balance sheet, and a statement of cash flows (Annexure II).

ULB budgets do not reflect citizen priorities as the development and consultation process does not include them. Budgeting is not done in a scientific manner; multi-year, flexible and performance-based budgets are not prepared. There is no system of reporting back to the citizens on actual performance compared to budget priorities. Financial audits in many ULBs are pending

for many years. Inadequate internal control systems and absence of an internal audit system hinder risk mitigation and management.

A financial management system for ULBs has to be transparent to be able to take into account citizen inputs and priorities and to be able to share information with the citizens. Users expect that ULB financial reports will help them to assess the use of resources and ensure their economic impact on the economy of the ULB; evaluate ULB spending options and priorities; and assess whether resources were used in accordance with legally mandated requirements. Finally, an appropriate financial management system will permit ULBs to assess their long-term ability to meet financial obligations and their overall financial condition.

3. Reform components

Under the JNNURM, MoUD will provide financial resources to states and ULBs that agree to undertake the following modern accounting reforms:

- Budgeting, accounting, internal controls and auditing.
- Reengineer business processes to align with accrual-based accounting system.
- Integrate financial management systems with financial accounting system.
- Staff training and building financial management capacity.

Roadmap for Implementation

Better financial reporting shall help ULBs be more accountable by assessing the effectiveness of programs and levels of services, and providing information about the financial condition of the ULB and its ability to raise resources to finance the delivery of improved services, and to meet its actual and contingent liabilities. To enable ULBs to implement improved financial management, state governments shall develop the following based on NMAM:

- State-level accounting manual.
- State-level manuals on expenditure management and performance-based budgets.
- State-level policies and guidelines on training and handholding.
- State-level accounting software integrating financial management systems with the financial accounting system.

To implement the new accounting system in ULBs, it shall be necessary to use the services of local chartered accountants to assist the municipal staff understand and implement the new accounting system. The consultants shall train on the manuals, provide on-the-job training as well as formal training programs[1]on specific elements of the new accounts manuals and on the new double entry accrual accounting transactions. It shall be necessary to use the new system in parallel with the old cash-based system until the municipal staff is proficient in the new system. This is necessary to stabilize the new system and prevent a relapse to the old system.

[1] Based on the NMAM, the MoUD has developed a National Municipal Accounts Training Manual (NMATM), which shall form the basis of preparing state-level municipal accounting training manuals.

4. Steps to implementing the reform

The state governments will have to take the following steps:

i. Constitute a state-level steering committee with the authority to promulgate accounting standards, formats for budgeting and costing, financial statements and audit reports.
ii. Pass a resolution expressing commitment to establish modern accounting system.
iii. Appoint a consultant for development of a state-level municipal financial accounting manual.
iv. Establish a state-level project management unit under the guidance of the steering committee to oversee implementation and conduct capacity building and training of municipal officials.
v. Review the legislative framework to identify the changes necessary to implement the improved financial management system. Implementation of the improved financial management system in all ULBs and urban civic service providers may require amendments to relevant legislation, byelaws, rules/regulations, etc.
vi. Provide guidelines on expenditure management and budgeting to better control expenditures, prepare outcome-based budgets, ensure accountability, and involve stakeholders in setting budget priorities.
vii. Develop a state-level accrual-based accounting manual detailing the accounting system, policies and procedures, the records and documents to be maintained, and the form, contents and periodicity of various accounting reports.
viii. Provide guidance on required manpower, training and implementation to switch over to the improved financial management system. Formulate appropriate policies for necessary handholding assistance and internal audit from chartered accounting firms. Based on MoUD's National Municipal Accounts Training Manual, state governments shall prepare a state-level training manual. Further, states shall evolve a suitable recruitment and transfer policy for municipal officials to ensure reasonable stability of tenure of finance personnel.
ix. Develop/customize accounting software to provide meaningful MIS for managerial decision-making through the new financial management system.

The ULBs governments will have to take the following steps:

i. Establish a committee to implement improved financial management reforms.
ii. Appoint chartered accountants for providing handholding support.
iii. Implement training programs.
iv. Prepare inventory of assets and liabilities.
v. Value all assets and liabilities, finalize opening balance sheet.
vi. Reengineer business processes to align with accrual-based accounting system.
vii. Adopt and implement an accrual-based accounting system.
viii. Appoint an external auditor.
ix. Publish financial statements along with audit reports.
x. Carry out parallel runs of both existing and new system of accounting till the latter gets stabilized.
xi. Implement transparent, multi-year budget system with the priorities set by stakeholders.
xii. Institute internal control procedures and appoint an internal auditor.

xiii. Undertake credit rating.[2]
xiv. Install the selected accounting software, and integrate financial management systems with the financial accounting system.

5. Setting the timeline

Implementation and sequencing of the financial management reforms will have to take into account the administrative capacity, political will and financial constraints of individual states, ULBs and all urban civic service providers.

Steps /Timeline	Y1	Y2	Y3	Y4
State				
Constitute steering committee				
Set up a dedicated project management unit (PMU) to oversee implementation				
Government Resolution expressing commitment to establish modern accounting system				
Appointment of consultant for development of state-level municipal financial accounting manual				
Review the legislative framework				
Develop a state-level accrual-based accounting manual				
Prepare a training manual, formulate policies for appointment of CAs for providing handholding and conducting of internal audit of ULBs				
Develop/customize accounting software integrating financial management systems with financial accounting system, and formulate policies to publish financial statements along with audit reports				
ULBs				
Establish committee to implement improved financial management reforms				
Appoint CAs for providing hand holding support				
Implement training programs				
Prepare inventory of assets and liabilities, value assets & liabilities and finalize opening balance sheet				
Reengineer business processes to align with accrual-based accounting system				
Adopt and implement an accrual-based accounting system				
Appoint an external auditor				
Publish financial statements along with audit reports				
Implement transparent, multi-year budget, commence preparation of outcome budgets				
Institute internal audit, and internal control procedures				

[2] The identification and valuation of the municipal assets and liabilities, based on the NMAM, to prepare the opening balance sheet shall be an important step for moving towards accrual-based accounting for ULBs (refer chapter 34 of NMAM).

Undertake credit rating				
Implement accounting software, integrated financial management systems with financial accounting system				

6. Measuring Achievement/Outcomes

Benchmarks of successful implementation are:

State Level

- The state has passed a Government Resolution expressing commitment to establish modern accounting system.
- The state has appointed a consultant for development of astate-level municipal financial accounting manual.
- The state has reviewed the legislative framework for the implementation of improved financial management reforms.
- The state has formulated policies for appointment of CAs for providing handholding and conducting of internal audit of all ULBs and urban civic services providers.
- The state has developed a state-level accounting manual and amended the legislation, as necessary, for adoption of a modern accounting system.
- The state has developed manuals on expenditure management, budgeting, policies on training and handholding and accounting software.
- The state has developed a training manual.
- The state has developed accounting software integrating financial management systems with financial accounting system, and policies to publish financial statements along with audit reports.

ULB Level

- Cities have appointed CAs for providing handholding and implementing training programs.
- Cities have prepared inventory of assets and liabilities and valued assets & liabilities.
- Cities have prepared opening balance sheets.
- Cities have reengineered business processes to align with accrual-based accounting system.
- Cities have adopted and implemented accrual-based accounting system.
- Cities have implemented transparent, multi-year budget, and costing formats.
- Cities have commenced preparation of outcome budgets.
- Cities have appointed an external auditor and adopted an audit cycle.
- Cities have published audited financial statements.
- Cities have instituted internal audit/control procedures.
- Cities have undertaken credit rating.
- Cities have installed accounting software, integrated financial management systems with financial accounting system.

Annexure I

Development of the National Municipal Accounts Manual and the National Municipal Accounts Training Manual

In pursuance of the recommendations of the Eleventh Finance Commission and *Guidelines for the Utilization of Local Bodies Grants* issued by Ministry of Finance, Department of Expenditure, Government of India, the Comptroller and Auditor General (C&AG) of India was to prescribe the accounting and budget formats for urban local bodies (ULBs). Accordingly, C&AG of India constituted a Task Force, which submitted its report on *Accounting and Budget Formats for Urban Local Bodies* to the MoUD. The Task Force noted the urgent need for improved municipal accounting to serve as an effective management tool to document ULB financial activities and financial position, promote more effective and timely decision-making, and facilitate greater accountability and transparency.

The key recommendations of the Task Force were that ULBs:
(i) Introduce an accrual system of accounting; (ii) Implement improved accounting policies; (iii) Use model budgeting and accounting formats, including financial statements and cost sheets for each utility (i.e., water and sanitation, solid waste management, street lights, hospitals, schools); and (iv) Set up required management information systems.

The report also discussed major issues in the transition from cash-based to accrual-based accounting and noted that since municipal law is a state subject, state governments will have to review their respective legislative frameworks to identify the changes to be made in the relevant Municipal Acts and Rules/Codes to implement the recommendations. Each state government will have to constitute a steering committee, develop an accounting manual, and provide training to its municipal staff. The Task Force recommended that ULBs should carry out parallel runs of both the existing and new system of accounting till the latter gets stabilized. Finally, the Task Force suggested that MoUD set up a monitoring unit/committee to ensure effective implementation of its recommendations and help state governments address issues arising during implementation. The report of the Task Force was accepted by the Government of India and forwarded to State Governments for implementation, keeping in view the local requirements.

Subsequently, the MoUD requested the C&AG, based on the Task Force recommendation, to prepare a the National Municipal Accounts Manual (NMAM), and a companion National Municipal Accounts Training Manual (NMATM). These were provided by the MoUD to the state governments. Based on these, the state governments can prepare state-level accounting manuals and state-level training manuals according to their requirements.

Annexure II

Difference between Cash-based Accounting and Accrual-based Accounting

Cash-Based Accounting

Presently, ULBs generally follow the cash basis of accounting reporting against budgetary outlays. Under cash accounting, transactions are recorded when the related cash receipts or cash payments take place. Similarly, expenditure on acquisition and maintenance of assets used in rendering services, as well as on employee remuneration, are recorded when the related payments take place. The end product of the cash basis of accounting is a statement of receipts and payments that classifies cash receipts and cash payments under different headings. It provides readers information about the sources of cash raised during the period, the uses to which cash funds were applied and the cash balance at the reporting date. The measurement focus is cash balances and changes therein. A statement of assets and liabilities may or may not be prepared.

Traditionally, ULB budgets have been cash-based, and this led to cash-based municipal accounting. Moreover, these systems conform to state and city legislative requirements. The information provided under cash accounting is easy to compile and understand, and historically, met the requirements of users. However, today the users of financial statements are demanding more information on assets and liabilities and the impact of current consumption of assets on the overall financial position.

Cash-based accounting fails to meet many financial reporting objectives. Evaluation of ULB performance requires the measurement of accomplishments and the resources expended on them during a set period. But the timing of cash receipts and payments may not coincide with earning revenues or incurring expenses. Managers can delay receipts or payments until the next reporting period. Another major weakness of cash-based accounting is that no distinction is made between receipts or payments on capital accounts and those on revenue accounts. With cash accounting, spending on the assets used over many years is recorded only when money is spent. No subsequent account is taken of depreciation or whether the asset is still in use. Cash accounting limits the ability of the citizens to hold the ULBs accountable for their use of resources. ULBs can be held accountable only for their use of cash, but not for their management of other assets and liabilities. Consequently, measurement of performance and financial position under the cash accounting is unlikely to yield correct results.

Completeness and accuracy of accounting data are important prerequisites of financial reporting. However, current accounting systems and practices neither record financial information completely nor guarantee the accuracy of this information. Thus, there is an urgent need to improve municipal accounting systems in the country to provide leaders and citizens of local bodies with more accurate and complete financial information. This will help improve governance, transparency, and accountability and facilitate improved service delivery, resource mobilization and utilization of scarce financial resources.

Accrual-Based Accounting

Under accrual accounting, recording of transactions and events takes place whenever a transaction occurs. Even if no cash is received or disbursed, the relevance, objectivity, timeliness, completeness and comparability of the accounting records and statements are much enhanced. Accrual basis clearly distinguishes between items of revenue nature and items of capital nature. This helps in correct presentation of financial statements through an income and expenditure account, a balance sheet, and a statement of cash flows.

It is increasingly accepted that the accrual basis of accounting is more appropriate and suitable for users of ULB financial statements than cash accounting. Accrual accounting recognizes assets, liabilities, net assets/net worth, revenues, and expenses. The focus of accrual accounting is on all assets, and not just cash.

Accrual accounting provides users with information that:

- Helps ULBs to demonstrate accountability for their management of all assets and liabilities recognized in the financial statements. This information is particularly important in relation to infrastructure assets, the replacement of which could strain ULB financial capacity.
- Identifies ongoing costs, such as depreciation and maintenance, of owning and operating assets, which are needed to measure the total cost of goods and services produced. ULBs need this information to determine which goods and services to provide and the most efficient way to provide them.
- Enables users to evaluate a ULB's ongoing ability to finance its activities and to meet its liabilities and commitments. Information on all liabilities forces ULBs to acknowledge and plan for the payment of long-term liabilities, such as pension liabilities. Information on the extent of financial obligations and exposure to contingent liabilities bears directly on future revenue requirements of ULBs and their ability to pay for commitments and obligations and finance their operations.
- Allows users to compare revenues with expenses, enabling them to assess whether current revenues are sufficient to cover the costs of services in the current period.
- Enables ULBs and other users to make rational decisions about the viability and sustainability of their programs, to decide whether to continue them, and to initiate proper budgeting and control of activities.

Accrual accounting does not disregard the usefulness of information available under cash-based accounting. A statement of cash flow is usually an integral part of the financial statements prepared under this basis. This provides better information on cash flow and, therefore, facilitates better cash management.

Conclusion

Most urban officials in India agree with the need to introduce double entry, accrual-based accounting systems. Providing the required capacity building of the municipal accounting and other staff will ensure its long-term sustenance. Now, with the development of NMAM and NMATM, it will be easy for states and cities in India to introduce improved accounting and financial reporting systems. In principle, the benefits to users of the financial statements will exceed the costs of recording, summarizing, reporting and auditing the information. The benefits and costs need to be considered over a reasonable time frame in order to balance the short-term costs of shifting from one basis to another.

14.Energy Management and Audit

ULB Level Reform

SOURCE: Bureau of Energy Efficiency

3.1 Definition & Objectives of Energy Management

The fundamental goal of energy management is to produce goods and provide services with the least cost and least environmental effect.

The term energy management means many things to many people. One definition of energy management is:

> *"The judicious and effective use of energy to maximize profits (minimize costs) and enhance competitive positions"*
> (Cape Hart, Turner and Kennedy, Guide to Energy Management Fairmont press inc. 1997)

Another comprehensive definition is

> "The strategy of adjusting and optimizing energy, using systems and procedures so as to reduce energy requirements per unit of output while holding constant or reducing total costs of producing the output from these systems"

The objective of Energy Management is to achieve and maintain optimum energy procurement and utilization, throughout the organization and:

- To minimize energy costs / waste without affecting production & quality
- To minimize environmental effects.

3.2 Energy Audit: Types and Methodology

Energy Audit is the key to a systematic approach for decision-making in the area of energy management. It attempts to balance the total energy inputs with its use, and serves to identify all the energy streams in a facility. It quantifies energy usage according to its discrete functions.
Industrial energy audit is an effective tool in defining and pursuing comprehensive energy management programme.

As per the Energy Conservation Act, 2001, Energy Audit is defined as "the verification, monitoring and analysis of use of energy including submission of technical report containing recommendations for improving energy efficiency with cost benefit analysis and an action plan to reduce energy consumption".

3.2.1 Need for Energy Audit

In any industry, the three top operating expenses are often found to be energy (both electrical and thermal), labour and materials. If one were to relate to the manageability of the cost or potential cost savings in each of the above components, energy would invariably emerge as a top ranker, and thus energy management function constitutes a strategic area for cost reduction.
Energy Audit will help to understand more about the ways energy and fuel are used in any industry, and help in identifying the areas where waste can occur and where scope for improvement exists.

The Energy Audit would give a positive orientation to the energy cost reduction, preventive maintenance and quality control programmes which are vital for production and utility activities. Such an audit programme will help to keep focus on variations which occur in the energy costs, availability and reliability of supply of energy, decide on appropriate energy mix, identify energy conservation technologies, retrofit for energy conservation equipment etc.

In general, Energy Audit is the translation of conservation ideas into realities, by lending technically feasible solutions with economic and other organizational considerations within a specified time frame.

The primary objective of Energy Audit is to determine ways to reduce energy consumption per unit of product output or to lower operating costs. Energy Audit provides a "bench-mark" (Reference point) for managing energy in the organization and also provides the basis for planning a more effective use of energy throughout the organization.

3.2.2 Type of Energy Audit

The type of Energy Audit to be performed depends on:

- Function and type of industry
- Depth to which final audit is needed, and
- Potential and magnitude of cost reduction desired

Thus Energy Audit can be classified into the following two types.

i) Preliminary Audit
ii) Detailed Audit

3.2.3 Preliminary Energy Audit Methodology

Preliminary energy audit is a relatively quick exercise to:

- Establish energy consumption in the organization
- Estimate the scope for saving
- Identify the most likely (and the easiest areas for attention
- Identify immediate (especially no-/low-cost) improvements/ savings
- Set a 'reference point'
- Identify areas for more detailed study/measurement
- Preliminary energy audit uses existing, or easily obtained data

3.2.4 Detailed Energy Audit Methodology

A comprehensive audit provides a detailed energy project implementation plan for a facility, since it evaluates all major energy using systems.

This type of audit offers the most accurate estimate of energy savings and cost. It considers the interactive effects of all projects, accounts for the energy use of all major equipment, and includes detailed energy cost saving calculations and project cost.

In a comprehensive audit, one of the key elements is the energy balance. This is based on an inventory of energy using systems, assumptions of current operating conditions and calculations of energy use. This estimated use is then compared to utility bill charges.

Detailed energy auditing is carried out in three phases: Phase I, II and III.

Phase I - Pre Audit Phase
Phase II - Audit Phase
Phase III - Post Audit Phase

A Guide for Conducting Energy Audit at a Glance

Industry-to-industry, the methodology of Energy Audits needs to be flexible.

A comprehensive ten-step methodology for conduct of Energy Audit at field level is presented below. Energy Manager and Energy Auditor may follow these steps to start with and add/change as per their needs and industry types.

Ten Steps Methodology for Detailed Energy Audit

Step No	PLAN OF ACTION	PURPOSE / RESULTS
	Phase I –Pre Audit Phase	
Step 1	• Plan and organise • Walk through Audit • Informal Interview with Energy Manager, Production / Plant Manager	• Resource planning, Establish/organize a Energy audit team • Organize Instruments & time frame • Macro Data collection (suitable to type of industry.) • Familiarization of process/plant activities • First hand observation & Assessment of current level operation and practices
Step 2	• Conduct of brief meeting / awareness programme with all divisional heads and persons concerned (2-3 hrs.)	• Building up cooperation • Issue questionnaire for each department • Orientation, awareness creation
	Phase II –Audit Phase	
Step 3	• Primary data gathering, Process Flow Diagram, & Energy Utility Diagram	• Historic data analysis, Baseline data collection • Prepare process flow charts • All service utilities system diagram (Example: Single line power distribution diagram, water, compressed air & steam distribution. • Design, operating data and schedule of operation • Annual Energy Bill and energy consumption pattern (Refer manual, log sheet, name plate, interview)
Step 4	• Conduct survey and monitoring	• Measurements : Motor survey, Insulation, and Lighting survey with portable instruments for collection of more and accurate data. Confirm and compare operating data with design data.
Step 5	• Conduct of detailed trials /experiments for selected energy guzzlers	• Trials/Experiments: - 24 hours power monitoring (MD, PF, kWh etc.). - Load variations trends in pumps, fan compressors etc.

Step No	PLAN OF ACTION	PURPOSE / RESULTS
		- Boiler/Efficiency trials for (4 – 8 hours) - Furnace Efficiency trials Equipments Performance experiments etc
Step6	• Analysis of energy use	• Energy and Material balance & energy loss/waste analysis
Step 7	• Identification and development of Energy Conservation (ENCON) opportunities	• Identification & Consolidation ENCON measures • Conceive, develop, and refine ideas • Review the previous ideas suggested by unit personal • Review the previous ideas suggested by energy audit if any • Use brainstorming and value analysis techniques • Contact vendors for new/efficient technology
Step 8	• Cost benefit analysis	• Assess technical feasibility, economic viability and prioritization of ENCON options for implementation • Select the most promising projects • Prioritise by low, medium, long term measures
Step9	• Reporting & Presentation to the Top Management	• Documentation, Report Presentation to the top Management.
	<u>Phase III –Post Audit phase</u>	
Step10	• Implementation and Follow-up	Assist and Implement ENCON recommendation measures and Monitor the performance • Action plan, Schedule for implementation • Follow-up and periodic review

Phase I -Pre Audit Phase Activities

A structured methodology to carry out an energy audit is necessary for efficient working. An initial study of the site should always be carried out, as the planning of the procedures necessary for an audit is most important.

Initial Site Visit and Preparation Required for Detailed Auditing

An initial site visit may take one day and gives the Energy Auditor/Engineer an opportunity to meet the personnel concerned, to familiarize him with the site and to assess the procedures necessary to carry out the energy audit.

During the initial site visit the Energy Auditor/Engineer should carry out the following actions: -

- Discuss with the site's senior management the aims of the energy audit.
- Discuss economic guidelines associated with the recommendations of the audit.
- Analyse the major energy consumption data with the relevant personnel.
- Obtain site drawings where available - building layout, steam distribution, compressed air distribution, electricity distribution etc.
- Tour the site accompanied by engineering/production

The main aims of this visit are: -

- To finalise Energy Audit team
- To identify the main energy consuming areas/plant items to be surveyed during the audit.
- To identify any existing instrumentation/ additional metering required.
- To decide whether any meters will have to be installed prior to the audit eg. kWh, steam, oil or gas meters.
- To identify the instrumentation required for carrying out the audit.
- To plan with time frame
- To collect macro data on plant energy resources, major energy consuming centers
- To create awareness through meetings/ programme

Phase II- Detailed Energy Audit Activities

Depending on the nature and complexity of the site, a comprehensive audit can take from several weeks to several months to complete. Detailed studies to establish, and investigate, energy and material balances for specific plant departments or items of process equipment are carried out. Whenever possible, checks of plant operations are carried out over extended periods of time, at nights and at weekends as well as during normal daytime working hours, to ensure that nothing is overlooked.

The audit report will include a description of energy inputs and product outputs by major department or by major processing function, and will evaluate the efficiency of each step of the manufacturing process. Means of improving these efficiencies will be listed, and at least a preliminary assessment of the cost of the improvements will be made to indicate the expected payback on any capital investment needed. The audit report should conclude with specific recommendations for detailed engineering studies and feasibility analyses, which must then be performed to justify the implementation of those conservation measures that require investments.

The information to be collected during the detailed audit includes: -

1. Energy consumption by type of energy, by department, by major items of process equipment, by end-use
2. Material balance data (raw materials, intermediate and final products, recycled materials, use of scrap or waste products, production of by-products for re-use in other industries, etc.)
3. Energy cost and tariff data
4. Process and material flow diagrams
5. Generation and distribution of site services (eg.compressed air, steam).
6. Sources of energy supply (e.g. electricity from the grid or self-generation)
7. Potential for fuel substitution, process modifications, and the use of co-generation systems (combined heat and power generation).
8. Energy Management procedures and energy awareness training programs within the establishment.

Existing baseline information and reports are useful to get consumption pattern, production cost and productivity levels in terms of product per raw material inputs. The audit team should collect the following baseline data:

- Technology, processes used and equipment details
- Capacity utilisation
- Amount & type of input materials used
- Water consumption
- Fuel Consumption
- Electrical energy consumption
- Steam consumption
- Other inputs such as compressed air, cooling water etc
- Quantity & type of wastes generated
- Percentage rejection / reprocessing
- Efficiencies / yield

DATA COLLECTION HINTS

It is important to plan additional data gathering carefully. Here are some basic tips to avoid wasting time and effort:

• measurement systems should be easy to use and provide the information to the accuracy that is needed, not the accuracy that is technically possible
• measurement equipment can be inexpensive (flow rates using a bucket and stopwatch)
• the quality of the data must be such that the correct conclusions are drawn (what grade of product is on, is the production normal etc)
• define how frequent data collection should be to account for process variations.
• measurement exercises over abnormal workload periods (such as startup and shutdowns)
• design values can be taken where measurements are difficult (cooling water through heat exchanger)

DO NOT ESTIMATE WHEN YOU CAN CALCULATE
DO NOT CALCULATE WHEN YOU CAN MEASURE

Draw process flow diagram and list process steps; identify waste streams and obvious energy wastage

An overview of unit operations, important process steps, areas of material and energy use and sources of waste generation should be gathered and should be represented in a flowchart as shown in the figure below. Existing drawings, records and shop floor walk through will help in making this flow chart. Simultaneously the team should identify the various inputs & output streams at each process step.

Example: A flowchart of Penicillin-G manufacturing is given in the figure 3.1 below. Note that waste stream (Mycelium) and obvious energy wastes such as condensate drained and steam leakages have been identified in this flow chart

The audit focus area depends on several issues like consumption of input resources, energy efficiency potential, impact of process step on entire process or intensity of waste generation / energy consumption. In the above process, the unit operations such as germinator, pre-fermentor, fermentor, and extraction are the major conservation potential areas identified.

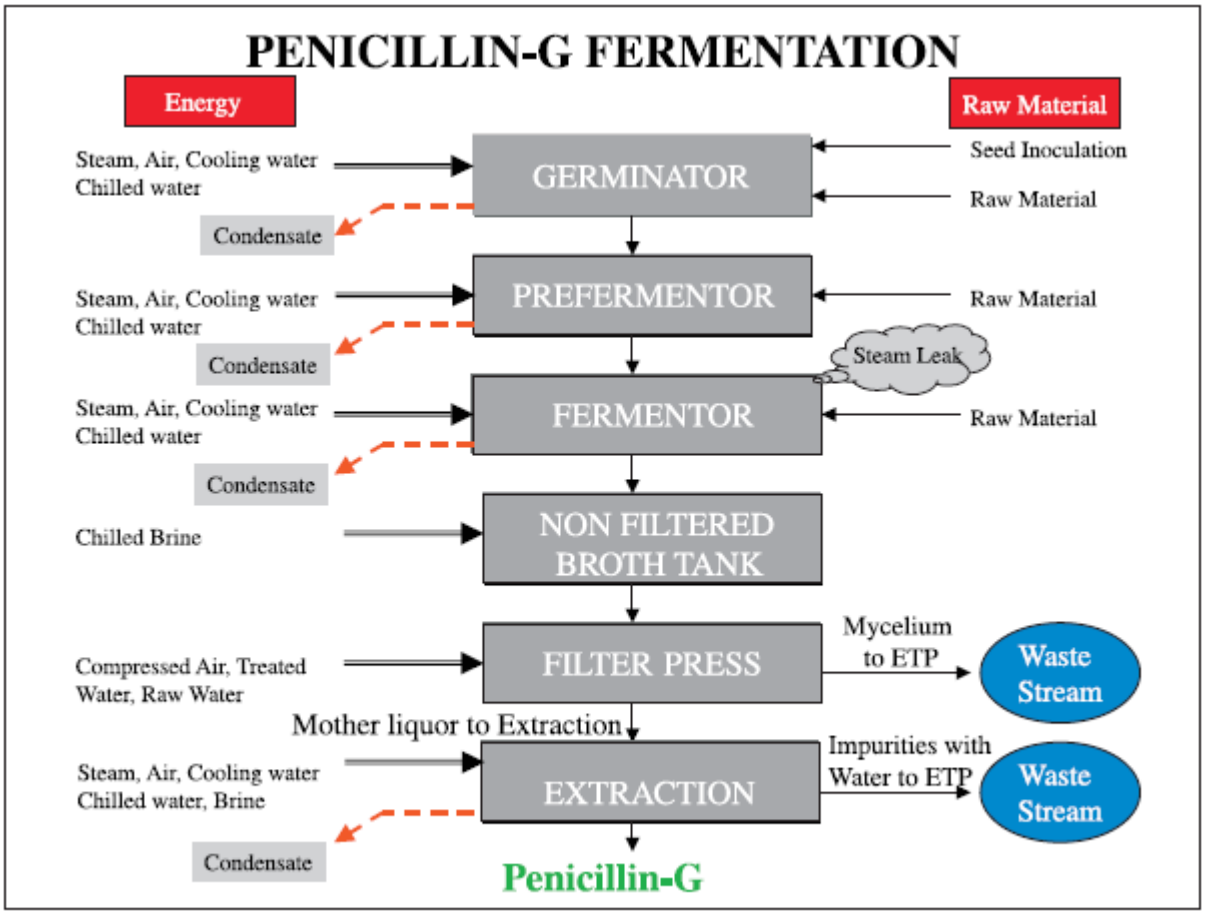


Figure 3.1

Identification of Energy Conservation Opportunities

Fuel substitution: Identifying the appropriate fuel for efficient energy conversion
Energy generation: Identifying Efficiency opportunities in energy conversion equipment/utility such as captive power generation, steam generation in boilers, thermic fluid heating, optimal loading of DG sets, minimum excess air combustion with boilers/thermic fluid heating, ptimising existing efficiencies, efficienct energy conversion equipment, biomass gasifiers, Cogeneration, high efficiency DG sets, etc.

Energy distribution: Identifying Efficiency opportunities network such as transformers, cables, switchgears and power factor improvement in electrical systems and chilled water, cooling water, hot water, compressed air, Etc.

Energy usage by processes: This is where the major opportunity for improvement and many of them are hidden. Process analysis is useful tool for process integration measures.

Technical and Economic feasibility
The technical feasibility should address the following issues
• Technology availability, space, skilled manpower, reliability, service etc
• The impact of energy efficiency measure on safety, quality, production or process.
• The maintenance requirements and spares availability
The Economic viability often becomes the key parameter for the management acceptance. The economic analysis can be conducted by using a variety of methods. Example: Pay back method, Internal Rate of Return method, Net Present Value method etc. For low investment short duration measures, which have attractive economic viability, simplest of the methods, payback is usually sufficient. A sample worksheet for assessing economic feasibility is provided below:

Sample Worksheet for Economic Feasibility
Name of Energy Efficiency Measure

i. Investment	2. Annual operating costs	3. Annual savings
a. Equipments b. Civil works c. Instrumentation d. Auxiliaries	• Cost of capital • Maintenance • Manpower • Energy • Depreciation	• Thermal Energy • Electrical Energy • Raw material • Waste disposal

Net Savings /Year (Rs./year) = (Annual savings-annual operating costs)	Payback period in months = (Investment/net savings/year) x 12

Classification of Energy Conservation Measures
Based on energy audit and analyses of the plant, a number of potential energy saving projects may be identified. These may be classified into three categories:

1. Low cost - high return;
2. Medium cost - medium return;
3. High cost - high return

Normally the low cost - high return projects receive priority. Other projects have to be analyzed, engineered and budgeted for implementation in a phased manner. Projects relating to energy cascading and process changes almost always involve high costs coupled with high returns, and may require careful scrutiny before funds can be committed. These projects are generally complex and may require long lead times before they can be implemented. Refer Table 3.1 for project priority guidelines.

TABLE 3.1 PROJECT PRIORITY GUIDELINE

Priority	Economical Feasibility	Technical Feasibility	Risk / Feasibility
A - Good	Well defined and attractive	Existing technology adequate	No Risk/ Highly feasible
B -May be	Well defined and only marginally acceptable	Existing technology may be updated, lack of confirmation	Minor operating risk/May be feasible
C -Held	Poorly defined and marginally unacceptable	Existing technology is inadequate	Doubtful
D -No	Clearly not attractive	Need major breakthrough	Not feasible

3.3 Energy Audit Reporting Format

After successfully carried out energy audit energy manager/energy auditor should report to the top management for effective communication and implementation. A typical energy audit reporting contents and format are given below. The following format is applicable for most of the industries. However the format can be suitably modified for specific requirement applicable for a particular type of industry.

DETAILED ENERGY AUDIT

TABLE OF CONTENTS

4.0 Detailed Process flow diagram and Energy& Material balance

4.1 Flow chart showing flow rate, temperature, pressures of all input-output streams

4.2 Water balance for entire industry

5.0 Energy efficiency in utility and process systems

5.1 Specific Energy consumption

5.2 Boiler efficiency assessment

5.3 Thermic Fluid Heater performance assessment

5.4 Furnace efficiency Analysis

5.5 Cooling water system performance assessment

5.6 DG set performance assessment

5.7 Refrigeration system performance

5.8 Compressed air system performance

5.9 Electric motor load analysis

5.10 Lighting system

6.0 Energy Conservation Options & Recommendations

6.1 List of options in terms of No cost/ Low Cost, Medium cost and high investment Cost, Annual Energy & Cost savings, and payback

6.2 Implementation plan for energy saving measures/Projects

ANNEXURE

A1. List of Energy Audit Worksheets

A2. List of instruments

A3. List of Vendors and Other Technical details

The following Worksheets (refer Table 3.2 & Table 3.3) can be used as guidance for energy audit assessment and reporting.

TABLE 3.2 SUMMARY OF ENERGY SAVING RECOMMENDATIONS

S.No.	Energy Saving Recommendations	Annual Energy (Fuel & Electricity) Savings (kWh/MT or kl/MT)	Annual Savings Rs.Lakhs	Capital Investment (Rs.Lakhs)	Simple Payback period
1					
2					
3					
4					
Total					

TABLE 3.3 TYPES AND PRIORITY OF ENERGY SAVING MEASURES

	Type of Energy Saving Options	Annual Electricity /Fuel savings	Annual Savings	Priority
		KWh/MT or kl/MT	(Rs Lakhs)	
A	No Investment (Immediate) - Operational Improvement - Housekeeping			
B	Low Investment (Short to Medium Term) - Controls - Equipment Modification - Process change			
C	High Investment (Long Term) - Energy efficient Devices - Product modification - Technology Change			

Reporting Format for Energy Conservation Recommendations		
A: Title of Recommendation	:	**Combine DG set cooling tower with main cooling tower**
B: Description of Existing System and its operation	:	Main cooling tower is operating with 30% of its capacity. The rated cooling water flow is 5000 m^3/hr.Two cooling water pumps are in operation continuously with 50% of its rated capacity. A separate cooling tower is also operating for DG set operation continuously.
C: Description of Proposed system and its operation	:	The DG Set cooling water flow is only 240 m^3/h. By adding this flow into the main cooling tower, will eliminate the need for a separate cooling tower operation for DG set, besides improving the %loading of main cooling tower. It is suggested to stop the DG set cooling tower operation.
D: Energy Saving Calculations		
Capacity of main cooling tower	=	5000 m^3/ hr
Temp across cooling tower (design)	=	8 °C
Present capacity	=	3000 m^3/hr
Temperature across cooling tower(operating)	=	4 °C
% loading of main cooling tower	=	(3000 x 4)/(5000 x 8) = 30%
Capacity of DG Set cooling tower	=	240 m^3/hr
Temp across the tower	=	5°C
Heat Load (240x1000 x 1x 5)	=	1200,000 K.Cal/hr
Power drawn by the DG set cooling tower		
No of pumps and its rating	=	2 nos x 7.5 kW
No of fans and its rating	=	2 Nos x 22 kW
Power consumption@ 80% load	=	(22 x2 +7.5 x2) x.80 = 47 kW
Additional power required for main cooling tower for additional water flow of 240m^3/h (66.67 l/s) with 6 kg/cm^2	=	(66.67 x 6) / (102 x 0.55) = 7 kW
Net Energy savings	=	47 – 7 = 40 kW
E: Cost Benefits		
Annual Energy Saving Potential	=	40kWx 8400hr = 3,36,000 Units/Year
Annual Cost Savings	=	3,36,000 xRs.4.00 = Rs.13.4 Lakh per year
Investment (Only cost of piping)	=	Rs 1.5Lakhs
Simple Pay back Period	=	**Less than 2 months**

3.4 Understanding Energy Costs

Understanding energy cost is vital factor for awareness creation and saving calculation. In many industries sufficient meters may not be available to measure all the energy used. In such cases, invoices for fuels and electricity will be useful. The annual company balance sheet is the other sources where fuel cost and power are given with production related information.

Energy invoices can be used for the following purposes:

• They provide a record of energy purchased in a given year, which gives a base-line for future reference

• Energy invoices may indicate the potential for savings when related to production requirements or to air conditioning requirements/space heating etc.

• When electricity is purchased on the basis of maximum demand tariff

• They can suggest where savings are most likely to be made.

• In later years invoices can be used to quantify the energy and cost savings made through energy conservation measures

Fuel Costs

A wide variety of fuels are available for thermal energy supply. Few are listed below:

• Fuel oil
• Low Sulphur Heavy Stock (LSHS)
• Light Diesel Oil (LDO)
• Liquefied Petroleum Gas (LPG)
• COAL
• LIGNITE
• WOOD ETC.

Understanding fuel cost is fairly simple and it is purchased in Tons or Kiloliters.

Availability, cost and quality are the main three factors that should be considered while purchasing. The following factors should be taken into account during procurement of fuels for energy efficiency and economics.

• Price at source, transport charge, type of transport
• Quality of fuel (contaminations, moisture etc)
• Energy content (calorific value)

Power Costs

Electricity price in India not only varies from State to State, but also city to city and consumer to consumer though it does the same work everywhere. Many factors are involved in deciding final cost of purchased electricity such as:

• Maximum demand charges, kVA
(i.e. How fast the electricity is used?)
• Energy Charges, kWh
(i.e., How much electricity is consumed?)
• TOD Charges, Peak/Non-peak period
(i.e. When electricity is utilized ?)
• Power factor Charge, P.F
(i.e., Real power use versus Apparent power use factor)
• Other incentives and penalties applied from time to time
• High tension tariff and low tension tariff rate changes

• Slab rate cost and its variation
• Type of tariff clause and rate for various categories such as commercial, residential, industrial, Government, agricultural, etc.
• Tariff rate for developed and underdeveloped area/States
• Tax holiday for new projects

3.5 Benchmarking and Energy Performance

Benchmarking of energy consumption internally (historical / trend analysis) and externally (across similar industries) are two powerful tools for performance assessment and logical evolution of avenues for improvement. Historical data well documented helps to bring out energy consumption and cost trends month-wise / day-wise. Trend analysis of energy consumption, cost, relevant production features, specific energy consumption, help to understand effects of capacity utilization on energy use efficiency and costs on a broader scale.

External benchmarking relates to inter-unit comparison across a group of similar units.
However, it would be important to ascertain similarities, as otherwise findings can be grossly misleading. Few comparative factors, which need to be looked into while benchmarking externally are:

• Scale of operation
• Vintage of technology
• Raw material specifications and quality
• Product specifications and quality

Benchmarking energy performance permits
• Quantification of fixed and variable energy consumption trends vis-à-vis production levels
• Comparison of the industry energy performance with respect to various production levels (capacity utilization)
• Identification of best practices (based on the external benchmarking data)
• Scope and margin available for energy consumption and cost reduction
• Basis for monitoring and target setting exercises.

The benchmark parameters can be:
• Gross production related
  e.g. kWh/MT clinker or cement produced (cement plant)
  e.g. kWh/kg yarn produced (Textile unit)
  e.g. kWh/MT, kCal/kg, paper produced (Paper plant)
  e.g. kCal/kWh Power produced (Heat rate of a power plant)
  e.g. Million kilocals/MT Urea or Ammonia (Fertilizer plant)
  e.g. kWh/MT of liquid metal output (in a foundry)
• Equipment / utility related
  e.g. kW/ton of refrigeration (on Air conditioning plant)
  e.g. % thermal efficiency of a boiler plant
  e.g. % cooling tower effectiveness in a cooling tower
  e.g. kWh/NM^3 of compressed air generated
  e.g. kWh /litre in a diesel power generation plant.

While such benchmarks are referred to, related crucial process parameters need mentioning for meaningful comparison among peers. For instance, in the above case:

• For a cement plant - type of cement, blaine number (fineness) i.e. Portland and process used (wet/dry) are to be reported alongside kWh/MT figure.

• For a textile unit - average count, type of yarn i.e. polyester/cotton, is to be reported along side kWh/square meter.

• For a paper plant - paper type, raw material (recycling extent), GSM quality is some important factors to be reported along with kWh/MT, kCal/Kg figures.

• For a power plant / cogeneration plant - plant % loading, condenser vacuum, inlet cooling water temperature, would be important factors to be mentioned alongside heat rate (kCal/kWh).

• For a fertilizer plant - capacity utilization(%) and on-stream factor are two inputs worth comparing while mentioning specific energy consumption

• For a foundry unit - melt output, furnace type, composition (mild steel, high carbon steel/cast iron etc.) raw material mix, number or power trips could be some useful operating parameters to be reported while mentioning specific energy consumption data.

• For an Air conditioning (A/c) plant - Chilled water temperature level and refrigeration load (TR) are crucial for comparing kW/TR.

• For a boiler plant - fuel quality, type, steam pressure, temperature, flow, are useful comparators alongside thermal efficiency and more importantly, whether thermal efficiency is on gross calorific value basis or net calorific value basis or whether the computation is by direct method or indirect heat loss method, may mean a lot in benchmarking exercise for meaningful comparison.

• Cooling tower effectiveness - ambient air wet/dry bulb temperature, relative humidity, air and circulating water flows are required to be reported to make meaningful sense.

• Compressed air specific power consumption - is to be compared at similar inlet air tem
perature and pressure of generation.

• Diesel power plant performance - is to be compared at similar loading %, steady run condition.

Plant Energy Performance

Plant energy performance (PEP) is the measure of whether a plant is now using more or less energy to manufacture its products than it did in the past: a measure of how well the energy management programme is doing. It compares the change in energy consumption from one year to the other considering production output. Plant energy performance monitoring compares plant energy use at a reference year with the subsequent years to determine the improvement that has been made.

However, a plant production output may vary from year to year and the output has a significant bearing on plant energy use. For a meaningful comparison, it is necessary to determine the energy that would have been required to produce this year production output, if the plant had operated in the same way as it did during the reference year. This calculated value can then be compared with the actual value to determine the improvement or deterioration that has taken place since the reference year.

Production factor

Production factor is used to determine the energy that would have been required to produce this year's production output if the plant had operated in the same way as it did in the reference year. It is the ratio of production in the current year to that in the reference year.

$$Production\ factor = \frac{Current\ year's\ production}{Reference\ year's\ production}$$

Reference Year Equivalent Energy Use

The reference year's energy use that would have been used to produce the current year's production output may be called the "reference year energy use equivalent" or "reference year equivalent" for short. The reference year equivalent is obtained by multiplying the reference year energy use by the production factor (obtained above)

Reference year equivalent = Reference year energy use x Production factor

The improvement or deterioration from the reference year is called "energy performance" and is a measure of the plant's energy management progress. It is the reduction or increase in the current year's energy use over the reference, and is calculated by subtracting the current year's energy use from the reference years equivalent. The result is divided by the reference year equivalent and multiplied by 100 to obtain a percentage.

$$Plant\ energy\ performance = \frac{Reference\ year\ equivalent - Current\ year's\ energy}{Reference\ year\ equivalent} \times 100$$

The energy performance is the percentage of energy saved at the current rate of use compared to the reference year rate of use. The greater the improvement, the higher the number will be.

Monthly Energy Performance

Experience however, has shown that once a plant has started measuring yearly energy performance, management wants more frequent performance information in order to monitor and control energy use on an on-going basis. PEP can just as easily be used for monthly reporting as yearly reporting.

3.6 Matching Energy Usage to Requirement

Mismatch between equipment capacity and user requirement often leads to inefficiencies due to part load operations, wastages etc. Worst case design, is a designer's characteristic, while optimization is the energy manager's mandate and many situations present themselves towards an exercise involving graceful matching of energy equipment capacity to end-use needs. Some examples being:

• Eliminate throttling of a pump by impeller trimming, resizing pump, installing variable speed drives

• Eliminate damper operations in fans by impeller trimming, installing variable speed drives, pulley diameter modification for belt drives, fan resizing for better efficiency.

• Moderation of chilled water temperature for process chilling needs

• Recovery of energy lost in control valve pressure drops by back pressure/turbine adoption

• Adoption of task lighting in place of less effective area lighting

3.7 Maximising System Efficiency

Once the energy usage and sources are matched properly, the next step is to operate the equipment efficiently through best practices in operation and maintenance as well as judicious technology adoption. Some illustrations in this context are:

• Eliminate steam leakages by trap improvements
• Maximise condensate recovery
• Adopt combustion controls for maximizing combustion efficiency
• Replace pumps, fans, air compressors, refrigeration compressors, boilers, furnaces, heaters and other energy consuming equipment, wherever significant energy efficiency margins exist.

Optimising the Input Energy Requirements

Consequent upon fine-tuning the energy use practices, attention is accorded to considerations for minimizing energy input requirements. The range of measures could include:

• Shuffling of compressors to match needs.
• Periodic review of insulation thickness
• Identify potential for heat exchanger networking and process integration.
• Optimisation of transformer operation with respect to load.

3.8 Fuel and Energy Substitution

Fuel substitution: Substituting existing fossil fuel with more efficient and less cost/less polluting fuel such as natural gas, biogas and locally available agro-residues.

Energy is an important input in the production. There are two ways to reduce energy dependency; energy conservation and substitution.

Fuel substitution has taken place in all the major sectors of the Indian economy. Kerosene and Liquefied Petroleum Gas (LPG) have substituted soft coke in residential use.

Few examples of fuel substitution

- Natural gas is increasingly the fuel of choice as fuel and feedstock in the fertilizer, petrochemicals, power and sponge iron industries.
- Replacement of coal by coconut shells, rice husk etc.
- Replacement of LDO by LSHS

Few examples of energy substitution

_ Replacement of electric heaters by steam heaters
_ Replacement of steam based hotwater by solar systems

3.9 Energy Audit Instruments

The requirement for an energy audit such as identification and quantification of energy necessitates measurements; these measurements require the use of instruments. These instruments must be portable, durable, easy to operate and relatively inexpensive. The parameters generally monitored during energy audit may include the following:

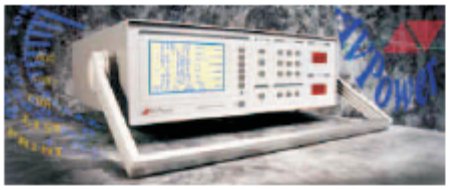
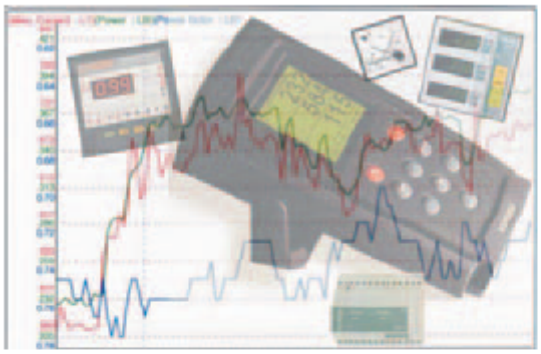
Basic Electrical Parameters in AC &DC systems - Voltage (V), Current (I), Power factor, Active power (kW), apparent power (demand) (kVA), Reactive power (kVAr), Energy consumption (kWh), Frequency (Hz), Harmonics, etc.

Parameters of importance other than electrical such as temperature & heat flow, radiation, air and gas flow, liquid flow, revolutions per minute (RPM), air velocity, noise and vibration, dust

concentration, Total Dissolved Solids (TDS), pH, moisture content, relative humidity, flue gas analysis - CO_2, O_2, CO, SO_x, NO_x, combustion efficiency etc.

Key instruments for energy audit are listed below.

The operating instructions for all instruments must be understood and staff should familiarize themselves with the instruments and their operation prior to actual audit use.

 	**Electrical Measuring Instruments:** These are instruments for measuring major electrical parameters such as kVA, kW, PF, Hertz, kVAr, Amps and Volts. In addition some of these instruments also measure harmonics. These instruments are applied on-line i.e on running motors without any need to stop the motor. Instant measurements can be taken with hand-held meters, while more advanced ones facilitates cumulative readings with print outs at specified intervals.
	**Combustion analyzer:** This instrument has in-built chemical cells which measure various gases such as O_2, CO, NO_X and SO_X.
	**Fuel Efficiency Monitor:** This measures oxygen and temperature of the flue gas. Calorific values of common fuels are fed into the microprocessor which calculates the combustion efficiency.
	**Fyrite:** A hand bellow pump draws the flue gas sample into the solution inside the fyrite. A chemical reaction changes the liquid volume revealing the amount of gas. A separate fyrite can be used for O_2 and CO_2 measurement.