Water Loss Management

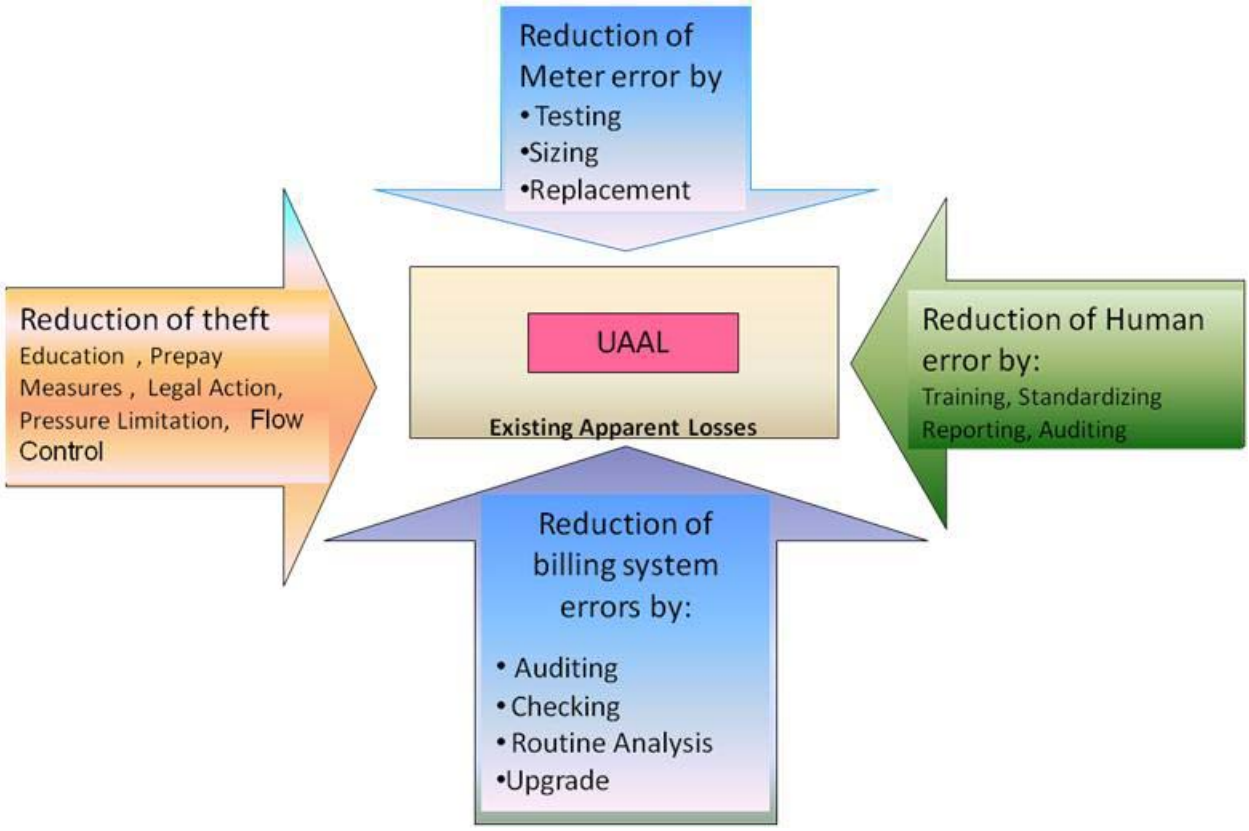
Water loss is management of quantity of water different between supply and consumption through the distribution system.

Types of Water Losses

- Apparent Losses
  - Water Theft (Complete illegal, By passes , Disconnected reconnect)
  - Free Water Supply (Stand posts , Bath taps , Toilet Taps , Fire demand , Bower Supply, Line Flashing)
  - Administration Errors (Meter errors, Billing mistakes, Estimated bills)

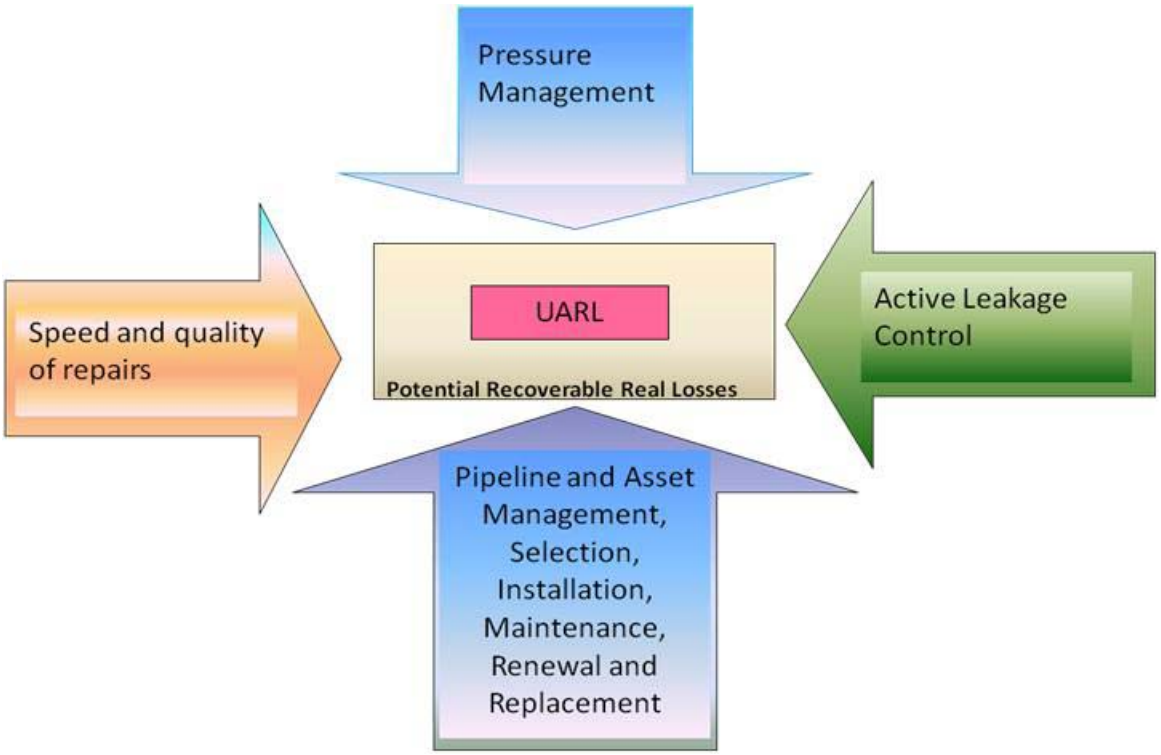
- Real Losses
  - Water Leaks (Treatment Losses, Transmission, Distribution & Service Leaks and Tank overflows & Leakages)

Four Basic Methods of Managing Apparent Losses



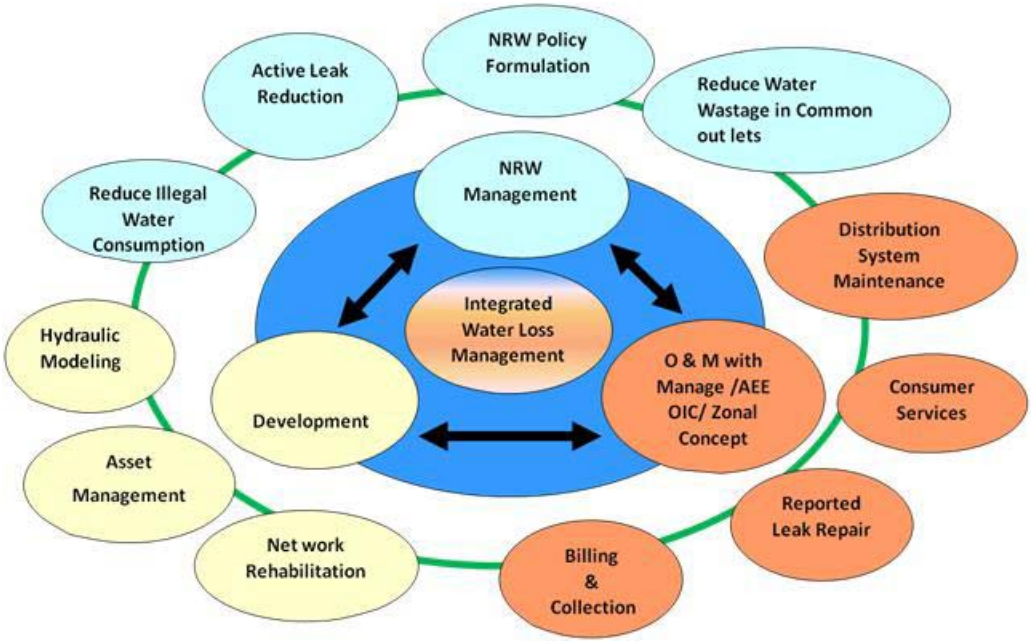
Every water scheme has its own allowable limits to reduce apparent losses according to the characteristic of the scheme. This minimum limit is called Unavoidable Annual Apparent Loss (UAAL). Further reduction of losses is not economically feasible.

Four Basic Methods of Managing Real Losses

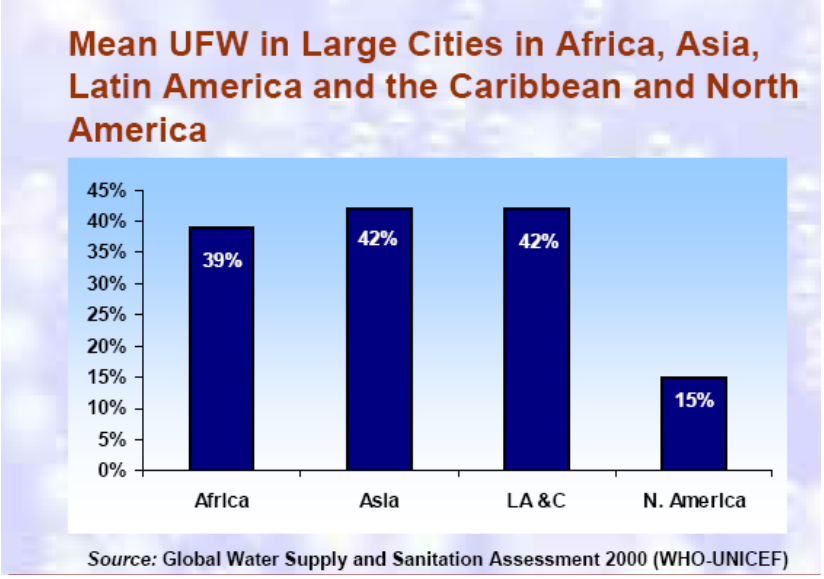


Every water scheme has its own allowable limits to reduce real losses according to the characteristic of the distribution system and the average water pressure. This minimum limit is called Unavoidable Annual Real Loss (UARL). Further reduction of losses is not economically feasible.

UFW Management Strategy in Western Central Region



Regional values of Unaccounted For Water (UFW)



Activities Implemented for Reduction of UFW in Western Central Region

- Introduced Zonal Management with Close Supervision
- Close Monitoring of Bulk Consumers
- Pool all the Staff During Weekend Concentrate to One Activity
- Introduce Meter Reader Rotating System
- Progress Monitoring with Performance Indicators with Bench Marking
- Bundle connection Pipe Replacement
- Checking of Disconnection & Low Consume premiers
- Deteriorated Cast Iron Pipe Replacement (Direct Labour)
- Deteriorated Cast Iron Pipe Replacement (Project)
- Implementing Pilot Studies
-

Activities Implemented for Reduction of Free Water Supply in Western Central Region

- Introduced Randiya Program and steps involved
  - Identified common outlets
  - Community Mobilization
  - Provide Individual Connections with concessionary basis with installments
  - Disconnect feasible common outlets

- Forming CBO to look after Remaining common outlets

Progress of Reduction of UFW in Western Central Region

- UFW in Western Central Last 10 Years
- UFW in Manager Divisions
- Progress of Randiya and Reduction of Free Water Supply in Colombo City Last 10 Years
- Progress of illegal detection and Loss of Revenue Recovery in Colombo City

Water Loss Management Indicators in Western Central Region for Year 2009

<table>
<tr><td rowspan="3">System Input Volume
170,919,640

100%
(+/- 3%)</td><td rowspan="2">Authorized Consumption
114,073,984
67%
(+/- 4%)</td><td>Billed Authorized Consumption
102,207,000
60% (+/- 4%)</td><td>Revenue Water
102,207,000
60% (+/- 4%)</td></tr>
<tr><td>Unbilled Authorized Consumption
11,866,984
7% (+/-5%)</td><td rowspan="3">Non – Revenue Water (NRW)
68,712,640
54% (+/- 4%)</td></tr>
<tr><td rowspan="2">Water Losses
56,845,656
33%
(+/- 4%)</td><td>Apparent Losses
18,801,160
11% (+/- 2.4%)</td></tr>
<tr><td>Real Losses
38,044,496
22% (+/- 4%)</td></tr>
</table>

Current Annual Real Loss in Western Central Region – 38,044,496 m^3

Unavoidable Real Losses

The UARL and ILI for Western Central Region water distribution system were calculated in order to assess the operational performance of the distribution system and to gauge how well the water loss reduction programmes put in place are working. The calculations are done based on the following formula

UARL =(* 18*Lm* + * 80.0 *Nc* + 25 *Lp*)* *P*

The parameters are:

UARL (liter/connection/yr)

Lm = Length of mains (km) = 810 (CC) + 1197 (TEC–S) +(TEC-N) 1323 = 3330

Lp = Length of service pipe (km) can be neglected due to connection length is less than 10m in Western Central Region

P = Average operating pressure when system is pressurized = 15 meters

Nc = No of house connections 330,514

UARL = (18 x 810 + 0.80 x 332,172) 15 x 365

1.776×10^{9} Liter / year = 1.776 Mm^{3}/year

Table is presented summarizes of system data and presents the UARL, CARL and ILI for the Western Central.

Input Description	Actual Data	Units
Length of Mains (Transmission + Distribution) (Lm)	3330	km
Length of Mains (Service) Lp	3300	km
Number of Service Connections (Nc)	330514	Number
Density of Service Connections (per km of mains) (Nc/Lm)	100	Per km
Average operating pressure when system pressurized (P)	15	meters
Population served by the supply system	1,983,084	Number
Current Annual Real loss	38.04	(Mm^3/yr)
UARL	1.78	(Mm^3/yr)
ILI	21.37	

Water Loss Management Indicators in Colombo City for Year 2009

Water Loss Management Indicators in Western Central Region for Year 2009

Water Loss Management Indicators in Western Central Region for Year 2009