

Water & Sanitation Agency Faisalabad

Performance Indicators

Presentation By:

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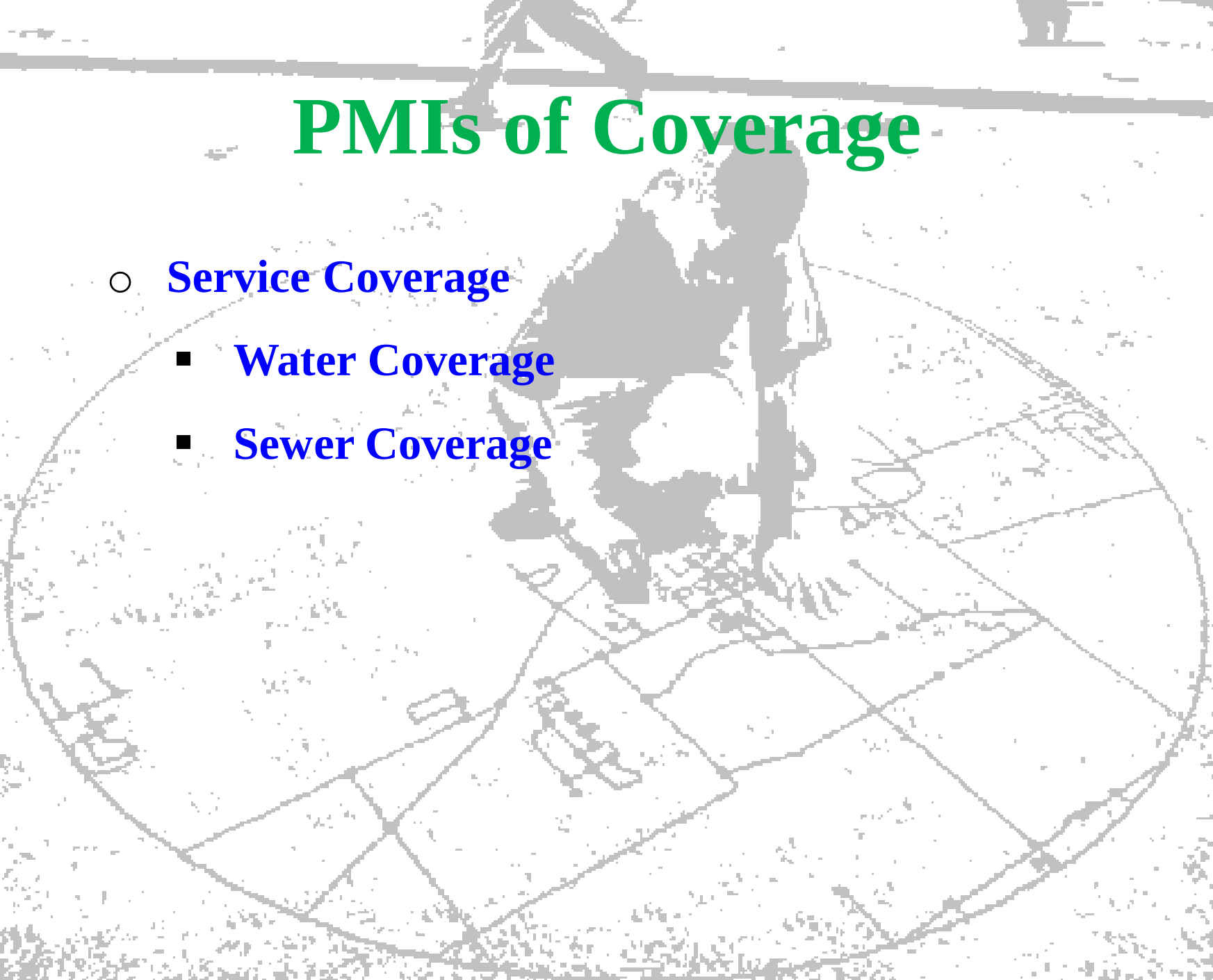
Summary

Performance Monitoring Indicators of:

1. Coverage
2. Water Production and Consumption
3. Non-Revenue Water
4. Metering Practices
5. Operational Performance
6. Cost and Staffing
7. Water Quality
8. Quality of Service
9. Billing and Collection
10. Financial Performance

PMIs of Coverage

- Service Coverage
 - Water Coverage
 - Sewer Coverage



1. Water Supply Coverage

$$\text{Water Supply Coverage} = \frac{\text{Population served with Water supply}}{\text{Total population Served in W\&S Operator area-Water Supply}} \quad \text{In millions}$$

Water Supply Coverage = 72% (Year 2016)
(July to September)2016

Water Supply Coverage = 60.00% (Year 2014-15)

2. Sewerage Coverage

$$\text{Sewerage Coverage} = \frac{\text{Population served with Sewerage}}{\text{Total population Served in W\&S Operator area-Sewerage}} \quad \text{In millions}$$

Sewerage Coverage = 76% (Year 2016)
(July to September)2016

Sewerage Coverage = 73% (Year 2014-15)

PMIs of Water Production & Consumption

- **Water Production**
- **Water Consumption**
- **Metered Water Consumption**



3a. Water Production

$$\text{Water production} = \frac{\text{Total water produced (m}^3\text{)} \times 1000}{\text{Population served (water supply connections + public points)} \times \text{No of days}}$$

$$\frac{155.147 \text{ (m.m}^3\text{/year)} \times 1000}{2.1 \text{ million} \times 365} = 202.4 \text{ lpcd (Year 2016)}$$

$$\frac{155.147 \text{ (m.m}^3\text{/year)} \times 1000}{1.92 \text{ million} \times 365} = 221.3 \text{ lpcd (Year 2014-15)}$$



3b. Water Consumption

$$\text{Water Consumption} = \frac{\text{Total water consumed (m}^3\text{)} \times 1000}{\text{Population served water supply (Direct + Public Points)} \times \text{No of days}}$$

$$\frac{111.69 \text{ (m.m}^3\text{/year)} \times 1000}{2.1 \text{ million} \times 365} = 145.71 \text{ lpcd (Year 2016)}$$

$$\frac{104.089 \text{ (m.m}^3\text{/year)} \times 1000}{1.92 \text{ million} \times 365} = 148.5 \text{ lpcd (Year 2014-15)}$$



3c. Metered Water Consumption

➤ **An ambitious drive has been initiated to install water meters**

➤ **15000 Domestic meters**

➤ **538 in Commercial and Industry**

➤ **51 Bulk meters**



PMIs of Non-Revenue Water

- **Un-Accounted for Water**
- **Non Revenue Water**



4. Un-Accounted For Water

$$\text{Un Accounted Water} = \frac{\text{Total water produced} - (\text{Total water sold} + \text{Free supplies})}{\text{Total Water Produced}} \times 100$$

$$\frac{(111.694 - (77.9 + 0.84)) \text{ mgd}}{111.694 \text{ mgd}} \times 100 = 29.50\% \quad (\text{Year 2016})$$

$$\frac{(93.5 - (62.7 + 0.94)) \text{ mgd}}{88.5 \text{ mgd}} \times 100 = 31.93\% \quad (\text{Year 2014-15})$$



5. Non-Revenue Water

$$\text{Non Revenue Water} = \frac{\text{Total water produced} - \text{Total water sold}}{\text{Total Water Produced}}$$

$$\frac{(111.694 - 77.9) \text{ mgd}}{111.694 \text{ mgd}} \times 100 = 30.25\% \quad (\text{Year 2015-16})$$

(November to December) 2015

$$\frac{(93.5 - 62.7) \text{ mgd}}{93.5 \text{ mgd}} \times 100 = 32.90\% \quad (\text{Year 2014-15})$$



PMIs of Operational Performance

- **Pipe Breaks / Bursts**
- **Sewerage Blockages**
- **Replacement of Manhole Covers and Covering of Open Manholes**
- **Pipe Leakage**
- **Cleaning / desilting of manholes**
- **Cleaning / desilting of Sewer**
- **Storm Water drains used as sludge carrier**
- **Sewer collapse / Crown Failures**

8. Pipe Break / Burst

$$\frac{\text{Total No. of Breaks / Bursts}}{\text{Total Length of water Distribution Network}}$$

$$\frac{184}{1527} = 0.123/\text{Km}/3 \text{ months (Year 2016)}$$

(July to September)2016

$$\frac{191}{1385} = 0.13/\text{Km}/\text{year (Year 2014-15)}$$

9. Sewer System Blockage

$$\frac{\text{Total no of blockages}}{\text{Total length of sewer system}}$$

$$\frac{1384}{1870} = 0.74 \text{ /Km/3 months (Year 2016)}$$

(July to September)2016

$$\frac{229}{1768} = 0.129 \text{ /Km/year (Year 2014-15)}$$

10. Replacement of Manhole Covers

$$\frac{\text{Total no of Manholes covers replaced}}{\text{Total no of Manholes}} \times 100$$

$$\frac{1424}{65000} \times 100 = 2.19 \% \quad (\text{Year 2016})$$

(July to September)2016

$$\frac{5521}{56000} \times 100 = 9.85 \% \quad (\text{Year 2014-15})$$

11. Pipe Leakages

Total no of Pipe Leakages

Total length of Water Distribution System

$$\frac{2107}{1527} = 1.36/\text{Km}/3\text{months} \quad (\text{Year 2016})$$

(July to September)2015

$$\frac{3168}{1308} = 2.42/\text{Km}/\text{year} \quad (\text{Year 2013-14})$$

12. Cleaning / Desilting of Manholes

$$\frac{\text{Total no of Manholes cleaned / desiltated}}{\text{Total no of Manholes}} \times 100$$

$$\frac{11200}{65000} \times 100 = 17.23 \% \quad (\text{Year 2016})$$

(July to September)2016

$$\frac{33040}{56000} \times 100 = 59 \% \quad (\text{Year 2014-15})$$

13. Cleaning / Desilting of Sewer

$$\frac{\text{Total length of sewer cleaned}}{\text{Total length of sewer}} \times 100$$

$$\frac{484}{1870} \times 100 = 25.88 \% \text{ (Year 2016)}$$

(July to September)2015

$$\frac{1007}{1768} \times 100 = 57 \% \text{ (Year 2014-15)}$$

14. Storm Water Drains Used as Sludge Carrier

$$\frac{\text{Total length of storm water drains used as sludge carrier}}{\text{Total length of storm water drainage network}} \times 100$$

$$\frac{46}{62} \times 100 = 74 \% \quad (\text{Year 2016})$$

$$\frac{48.98}{62} \times 100 = 79 \% \quad (\text{Year 2014-15})$$

15. Sewer Collapse / Crown Failure

$$\frac{\text{Total no of collapse or crown failure}}{\text{Total length of sewers}}$$

$$\frac{63}{1870} = 0.033 \text{ crown failure/Km/3months (Year 2016)}$$

(July to September)2016

$$\frac{123.2}{1768} = 0.069 \text{ crown failure/Km/Year (Year 2014-15)}$$



PMIs of Cost and Staffing

- Unit Operational Cost – Water Sold
- Unit Operational Cost – Water Produced
- Staff Per 1000 Water and Sewer Connections
- Water Staff Per 1000 Water Connection
- Sewerage Staff Per 1000 Water Connection
- Salary Cost as % of total operating cost
- Power Electricity Cost as a proportion of total operating cost
- Maintenance cost as % total operating cost
- Contracted out cost

16. Unit Operational Cost- Water Sold

$$\frac{\text{Total Operating Cost}}{\text{Total Water Sold*days}}$$

$$\frac{447.123}{0.321*92} = \text{Rs. 15.10/ m}^3 \text{ /3 months(Year 2016)}$$

(July to December)2016

$$\frac{1526.23}{0.286*365} = \text{Rs. 14.6/ m}^3 \quad (\text{Year 2014-15})$$

17. Unit Operational Cost- Water Produced

$$\frac{\text{Total Operating Cost}}{\text{Total Water Produced}}$$

$$\frac{447.123}{0.42280 \times 92} = \text{Rs. } 11.45/\text{m}^3 \quad (\text{Year 2016})$$

(July to September)2016

$$\frac{1526.23}{0.425 \times 365} = \text{Rs. } 9.84/\text{m}^3 \quad (\text{Year 2014-15})$$

18. Staff per 1000 Water & Sewer Connections

Total staff related to water & sewer services
Total Number of water & sewer connections/1000

$$\frac{1878}{383024/1000} = 4.90 \text{ person} \quad (\text{Year 2016})$$

(July to September)2016

$$\frac{1899}{265080/1000} = 7.16 \text{ person} \quad (\text{Year 2014-15})$$

19. Water Staff per 1000 Connections

$$\frac{\text{Total Staff of Water supply}}{\text{Total Water Connections/1000}}$$

$$\frac{495}{113.352} = 4.36 \text{ Nos. / 1000 Connection (Year 2016)}$$

$$\frac{521}{113.281} = 4.59 \text{ Nos. / 1000 Connections (Year 2014-15)}$$

20. Sewer Staff per 1000 Connections

Total staff related to waste water services

Total Number of waste water connections/1000

$$\frac{1125}{269672/1000} = 4.17 \text{ Approx. 4 No (Year 2016)}$$

(July to September)2016

$$\frac{920}{265080/1000} = 3.47 \text{ Approx. 4 No (Year 2014-15)}$$

Approximately 5 No Staff will be sufficient

21. Salary Cost As % Of Total Operating Cost

$$\frac{\text{Total Salaries Related cost}}{\text{Total Operating cost}} \times 100$$

$$\frac{170.335}{447.123} \times 100 = 48.19 \% \quad (\text{Year 2016})$$

(July to September)2016

$$\frac{634.249}{1526.230} \times 100 = 41.557 \% \quad (\text{Year 2014-15})$$

22. Power Electricity Cost as a Proportion of Total Operating Cost

$$\frac{\text{Total Power Electricity Cost}}{\text{Total Operating cost}} \times 100$$

$$\frac{170.335}{447.123} \times 100 = 38.09 \% \quad (\text{Year 2016})$$

(July to September)2016

$$\frac{602.342}{1526.230} \times 100 = 39.466 \% \quad (\text{Year 2014-15})$$

23. Maintenance cost as % Total Operating Cost

$$\frac{\text{Total Maintenance Cost}}{\text{Total Operating Cost}} \times 100$$

$$\frac{17.335}{447.123} \times 100 = 3.87\% \quad (\text{Year 2016})$$

(July to September)2016

$$\frac{102.007}{1526.230} \times 100 = 6.684\% \quad (\text{Year 2014-15})$$

24. Contracted Out Cost

$$\frac{\text{Service Contracted from Private Sector}}{\text{Total Operating Cost}} \times 100$$

$$\frac{2.114}{447.123} \times 100 = 0.47\% \quad (\text{Year 2016})$$

(July to September)2016

$$\frac{2.500}{1526.230} \times 100 = 0.164\% \quad (\text{Year 2014-15})$$

PMIs of Water Quality

- **Chemically Unfit Water Samples At Source**
- **Biologically Unfit Water Samples At Source**
- **Chemically Unfit Water Samples At User End**
- **Biologically Unfit Water Samples At User End**
- **Water Quality-Required Residual chlorine test**
- **Water Quality-Samples having Residual chlorine**

25. Chemically Unfit Water Samples At Source

$$\frac{\text{Total No. of Unfit Sources}}{\text{Total No. of Sources}} \times 100$$

$$\frac{0}{285} \times 100 = 0\% \quad (\text{Year 2016})$$

(July to September)2016

$$\frac{22}{613} \times 100 = 3.58\% \quad (\text{Year 2014-15})$$

26. Biologically Unfit Water Samples At Source

$$\frac{\text{Total No. of Unfit Sources}}{\text{Total No. of Sources}} \times 100$$

$$\frac{0}{285} \times 100 = 0\% \quad (\text{Year 2015-16})$$

(July to September)2016

$$\frac{0}{613} \times 100 = 0\% \quad (\text{Year 2014-15})$$

27. Chemically Unfit Water Samples At User End

$$\frac{\text{Total No. of Unfit Samples at Tap}}{\text{Total No. of Samples at Tap}} \times 100$$

$$\frac{8}{550} \times 100 = 0.015\% \text{ (Year 2016)}$$

(July to September)2016

$$\frac{76}{1813} \times 100 = 4.19\% \text{ (Year 2014-15)}$$

28. Biologically Unfit Water Samples At User End

$$\frac{\text{Total No. of Unfit Samples at Tap}}{\text{Total No. of Samples at Tap}} \times 100$$

$$\frac{8}{550} \times 100 = 0.015\% (\text{Year 2015-16})$$

(July to September) 2016

$$\frac{59}{1813} \times 100 = 3.25\% \quad (\text{Year 2014-15})$$

29. Water Quality-Required Residual Chlorine Test (source end)

$$\frac{\text{Total no of residual chlorine samples carried out}}{\text{Total no of residual chlorine samples carried out as per standards}} \times 100$$

$$\frac{285}{285} \times 100 = 100\% \quad (\text{Year 2016})$$

(July to September)2016

$$\frac{1848}{1848} \times 100 = 100\% \quad (\text{Year 2014-15})$$

30. Water Quality-Samples having Residual chlorine (user end)

$$\frac{\text{Total no of residual chlorine samples that passed the relevant standard}}{\text{Total no of residual chlorine samples carried out}} \times 100$$

$$\frac{521}{550} \times 100 = 94.72\% \quad (\text{Year 2016})$$

(July to September)2016

$$\frac{1790}{1848} \times 100 = 97.3\% \quad (\text{Year 2014-15})$$

PMIs of Quality of Service

- **Water Supply Complaints**
- **Sewerage Complaints**
- **Revenue / Billing Complaints**
- **Wastewater Treatment Primary**
- **Wastewater Treatment Secondary**

31a. Water Supply Complaints

$$\frac{\text{Total No. of Water Supply Complaints}}{\text{Total No. of Water Connections}} \times 100$$

$$\frac{640}{113352} \times 100 = 0.56\% \quad (\text{Year 2016})$$

(July to September)2016

$$\frac{937}{113259} \times 100 = 0.83\% \quad (\text{Year 2014-15})$$

31b. Sewerage Complaints

$$\frac{\text{Total No. of Sewerage Complaints}}{\text{Total No. of Sewer Connections}} \times 100$$

$$\frac{1427}{269672} \times 100 = 0.529\% \text{ (Year 2016)}$$

(July to September)2016

$$\frac{4301}{265080} \times 100 = 1.62\% \text{ (Year 2014-15)}$$

31c. Revenue / Billing Complaints

$$\frac{\text{Total No. of Revenue / Billing Complaints}}{\text{Total No. of Water + Sewer Connections}} \times 100$$

$$\frac{288}{383024} \times 100 = 0.075 \text{ (Year 2016)}$$

(July to September) 2016

0.059% for the Year 2014-15

32. Wastewater Treatment Primary

Wastewater treated at Primary Level

Wastewater Collected

X 100

$$\frac{325 \text{ mgd}}{338 \text{ mgd}} \times 100 = 89.7\% \quad (\text{Year 2016})$$

$$\frac{0 \text{ mgd}}{338 \text{ mgd}} \times 100 = 0\% \quad (\text{Year 2013-14})$$

33. Wastewater Treatment Secondary

$$\frac{\text{Wastewater treated at Secondary Level}}{\text{Wastewater Collected}} \times 100$$

$$\frac{25 \text{ mgd}}{362 \text{ mgd}} \times 100 = 6.90\% \quad (\text{Year 2015-16})$$

$$\frac{20 \text{ mgd}}{338 \text{ mgd}} \times 100 = 5.91\% \quad (\text{Year 2014-15})$$

PMIs of Billing and Collection

- Average Revenue of Water and Wastewater
- Collection Period
- Billing Efficiency
- Collection Efficiency(Physical)
- Collection Efficiency (Financial)

34. Average Revenue of Water and Wastewater

$$\frac{\text{Total Operating Revenue}}{\text{Total Water Sold}}$$

$$\frac{447.123}{41.10}$$

= Rs. 10.9/ Cubic Meter (Year 2016)
(July to September)2016

$$\frac{1528.231}{104.039}$$

= Rs. 14.689/ Cubic Meter (Year 2014-15)

35. Collection Period

$$\frac{\text{Arrears} * \text{Days in Reporting Period}}{\text{Total Operating Revenue}}$$

$$\frac{22333026 * 92}{147646000} = 13 \text{ days} \quad (\text{Year 2016})$$

(July to September)2016

$$\frac{199.95 * 365}{647.539} = 112 \text{ days} \quad (\text{Year 2014-15})$$

36. Billing Efficiency

$$\frac{\text{Total No. of Bill Issued} * 100}{\text{Total Water Connections}}$$

$$\frac{113308}{113352}$$

$$\times 100 = 99.96 \%$$

(December-2015)

$$\frac{112930}{113281}$$

$$\times 100 = 99.6 \%$$

(June-2015)

37. Collection Efficiency (Physical)

$$\frac{\text{Total No. of Bills Paid} \times 100}{\text{Total No. of Bills Issued}}$$

$$\frac{221259}{822042} \times 100 = 26.91 \% \quad \begin{array}{l} \text{(Year 2016)} \\ \text{(July to September) 2016} \end{array}$$

$$\frac{471402}{1707964} \times 100 = 27.60 \% \quad \text{(Year 2014-15)}$$

38. Collection Efficiency (Financial)

$$\frac{\text{Total Amount of Bills Received} * 100}{\text{Total Amount of Bills Issued}}$$

Figures are in million Rs

$$\frac{296.026}{401.12}$$

$$\times 100 = 73.81\%$$

(Year 2016)

(July to September)2016

$$\frac{602.799}{943.196}$$

$$\times 100 = 63.91\%$$

(Year 2014-15)

PMIs of Financial Performance

The background of the slide features a complex financial chart. It includes a candlestick chart at the top with green and red bars, a line graph with multiple green lines, and a bar chart at the bottom with green bars. The entire background is a dark teal color with a grid pattern.

- Operational Cost Coverage
- Working Ratio
- Debt Service Ratio

39. Operational Cost Coverage

Total Operating Revenue

Total Operating Cost

$$\frac{403.142}{447.123} = 1.10 \quad \begin{array}{l} \text{(Year 2016)} \\ \text{(July to September)2016} \end{array}$$

$$\frac{1528.230}{1526.230} = 1.001 \quad \text{(Year 2014-15)}$$

40. Working Ratio

Total Expenses

Total Revenues

$$\frac{405.256}{447.123} = 0.90 \quad \text{(Year 2016)}$$

(July to September)2016

$$\frac{1430.152}{1358.846} = 1.052 \quad \text{(Year 2013-14)}$$

THANKS!

