A regional analysis of sanitation performance in India

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Introduction:

Millennium Development Goal (MDG) 7 addresses environmental sustainability, with a target (target 10) to “halve the proportion of people without sustainable access to safe drinking water and basic sanitation by 2015”

<table>
<thead>
<tr>
<th>Water: Target MET</th>
<th>Sanitation: Not ACHIEVED</th>
</tr>
</thead>
<tbody>
<tr>
<td>World : 91%</td>
<td>World: 68%</td>
</tr>
<tr>
<td>India : 94%</td>
<td>India: 40% (URBAN- 63%, RURAL-28%)</td>
</tr>
</tbody>
</table>

After MDG, Goal 6 of Sustainable Development Goals (SDGs): “To secure water and sanitation for all for a sustainable world” (to be attained by 2030)” giving more importance on achieving access to adequate and equitable sanitation.
Economic loss due to inadequate sanitation

(Source: WHO, GLAAS, 2012)

**Country** | Expenditure on health | Expenditure on education | Expenditure on sanitation and drinking water
---|---|---|---
Bangladesh | 1.1 | 2.4 | 0.4
India | 1.3 | - | 0.2
Nepal | 1.7 | 4.7 | 0.8
Pakistan | - | - | 0.4 (rounded)

**Country** | US$ billion | % of GDP
---|---|---
Bangladesh | 4.2 | 6.3 (2007)
India | 53.8 | 6.4 (2006)
Pakistan | 5.7 | 3.9

Economic loss due to inadequate sanitation

Source: World Bank
Proportion of population using improved sanitation facility, WHO (2015)
Progress of Rural Sanitation Coverage:

Source: WHO and Unicef (2015)

**INDIA**

\[ y = 1.0915x - 2165.3 \]

\[ R^2 = 0.9898 \]

**PAKISTAN**

\[ y = 2.315x - 4605.4 \]

\[ R^2 = 0.9877 \]
Fund Allocation in Sanitation Normalized Real values

Data source: India Budget, Expenditure Budget, Vol.2, available online at: indiabudget.nic.in, World Bank
Institutional Effort to in the field of Sanitation:

1986
Central Rural Sanitation Program
To improve the quality of life of the rural people through supply driven approach

1999
Total Sanitation Campaign
A demand driven approach including large IEC expenditure

2003
Nirmal Gram Puruskar
Reward for 100% sanitation

2012
Nirmal Bharat Abhiyan
Encouraged by success of NGP, TSC revamped as NBA

2014
Swachh Bharat Mission
Accelerate sanitation coverage to achieve the vision of Clean India by 2019
The WASH Performance Index compares country performance on increasing access and equity to best-in-class performance considering different countries at different level of water and sanitation coverage.

It presents country performance and trends for the overall index and for each of its components – improving water access, water equity, sanitation access, and sanitation equity.

Country data compiled by the WHO/UNICEF Joint Monitoring Programme (JMP) and Frontier analysis was used to identify best-in-class performance at different levels of water and sanitation coverage.

The index has been calculated for 117 countries. Among the world’s most populated countries, Pakistan, China, and Nigeria were among the top performers (ranked 5, 11, and 18 respectively). Russia, the Philippines and India were among the bottom performers (ranked 72, 83, and 92 respectively).
Construction trend in India over the years and during one year before & after launch of SBM
Coverage of BPL HH Vs APL HH

- Andhra Pradesh
- Arunachal Pradesh
- Assam
- Bihar
- Chhattisgarh
- Gujarat
- Haryana
- Himachal Pradesh
- Jammu & Kashmir
- Jharkhand
- Karnataka
- Kerala
- Madhya Pradesh
- Maharashtra
- Manipur
- Meghalaya
- Mizoram
- Nagaland
- Odisha
- Punjab
- Rajasthan
- Sikkim
- Tamil Nadu
- Telangana
- Tripura
- Uttar Pradesh
- Uttarakhand
- West Bengal

Coverage in APL HH

Coverage in BPL HH
Performance Index

Construction of Performance index for 629 districts and 28 States of India

This index captures four crucial aspects:

1. **Coverage**
   - How far the districts/states are efficient in achieving current level of coverage & usage

2. **Usage**
   - captures Inter district variation

3. **(In)equality**
   - captures Intra district variation in APL and BPL performance as discussed in previous slides

4. **(In)equity**
Performance Index Construction:

Final Index

Performance Index (P.I)

Category

District P.I

State P.I

Dimension Index

Efficiency

Intra district Equity

Inter district Equality
Efficiency : Methodology

Data Envelopment Analysis (DEA) is applied to determine how far districts are efficient in sanitation access expansion.

\[ Q = f(\text{Awareness generating Exp., Other Expenditures}) \]

- (IHHL coverage Expansion, Making area open defecation free)
- (IEC Exp.)
- (Non- IEC Exp)

<table>
<thead>
<tr>
<th>Inputs</th>
<th>Outputs</th>
</tr>
</thead>
<tbody>
<tr>
<td>✓ Average IEC Expenditure Per Households from 2001-02 to 2015-16</td>
<td>✓ Percentage of Households with Toilet at 2015-16</td>
</tr>
<tr>
<td>✓ Average Non-IEC Expenditure Per Households from 2001-02 to 2015-16</td>
<td>✓ Percentage of GPs declared ODF at 2015-16</td>
</tr>
</tbody>
</table>
## Summary of DEA results

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Total number of districts</strong></td>
<td>630</td>
</tr>
<tr>
<td><strong>Number of Efficient districts</strong></td>
<td>34 (5.4%)</td>
</tr>
<tr>
<td><strong>Number of Inefficient districts</strong></td>
<td>596 (94.6%)</td>
</tr>
<tr>
<td><strong>Mean score of efficient districts</strong></td>
<td>1</td>
</tr>
<tr>
<td><strong>Mean score of all districts</strong></td>
<td>0.568</td>
</tr>
<tr>
<td><strong>Mean score of inefficient districts</strong></td>
<td>0.543</td>
</tr>
<tr>
<td><strong>Median score of all districts</strong></td>
<td>0.549</td>
</tr>
<tr>
<td><strong>Standard Deviation</strong></td>
<td>0.246</td>
</tr>
<tr>
<td><strong>Skewness</strong></td>
<td>0.199</td>
</tr>
<tr>
<td><strong>Kurtosis</strong></td>
<td>1.96</td>
</tr>
<tr>
<td><strong>Minimum Score</strong></td>
<td>0.118</td>
</tr>
</tbody>
</table>
Share of efficient districts across the states

Efficient district
Inefficient district

0%
10%
20%
30%
40%
50%
60%
70%
80%
90%
100%

Madhya Pradesh: Efficient district (49), Inefficient district (1)
Uttar Pradesh: Efficient district (73), Inefficient district (2)
Tamil Nadu: Efficient district (30), Inefficient district (1)
Jammu & Kashmir: Efficient district (21), Inefficient district (1)
Rajasthan: Efficient district (31), Inefficient district (2)
Kerala: Efficient district (13), Inefficient district (1)
Gujarat: Efficient district (24), Inefficient district (2)
West Bengal: Efficient district (17), Inefficient district (4)
Karnataka: Efficient district (26), Inefficient district (3)
Punjab: Efficient district (17), Inefficient district (4)
Haryana: Efficient district (9), Inefficient district (3)
Himachal Pradesh: Efficient district (4), Inefficient district (4)
Mizoram: Efficient district (0), Inefficient district (4)
Sikkim: Efficient district (0), Inefficient district (4)
Efficiency Dimension Index

State Efficiency Index = G.M of District Efficiency Score in respective states following Normalization

Top 3 states are: Sikkim, Kerala & HP

Bottom 3 states are: Bihar, Odisha & Andhra Pradesh
Economic Equity Dimension Index

State Equity Index = G.M of Intra District Equity score of the districts in respective states following Normalization

Top 3 states are: Tripura, HP, Sikkim
Bottom 3 states are: Jharkhand, Chhattisgarh, Assam
State Equality Index = Inter District Equality or Spatial Equality Score of in respective states following Normalization

Top 3 states are: Sikkim, Kerala, HP
Bottom 3 states are: AP, Rajasthan, Jammu and Kashmir
Final District Performance Index (D.P.I) and State Performance Index (S.P.I)

State Performance Index = G.M of State equality, equity & efficiency index

Top 3 states are: Sikkim, Kerala, HP
Bottom 3 states are: Bihar, Jharkhand, Andhra Pradesh
<table>
<thead>
<tr>
<th>State</th>
<th>Geographical Equality Rank</th>
<th>Economic Equity Rank</th>
<th>Efficiency Rank</th>
<th>Rank Final</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sikkim</td>
<td>1</td>
<td>3</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Kerala</td>
<td>2</td>
<td>4</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>Himachal Pradesh</td>
<td>3</td>
<td>2</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>Uttrakhand</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>4</td>
</tr>
<tr>
<td>Haryana</td>
<td>6</td>
<td>6</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>Mizoram</td>
<td>8</td>
<td>8</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>Tripura</td>
<td>5</td>
<td>1</td>
<td>11</td>
<td>7</td>
</tr>
<tr>
<td>Punjab</td>
<td>7</td>
<td>11</td>
<td>7</td>
<td>8</td>
</tr>
<tr>
<td>Gujarat</td>
<td>10</td>
<td>10</td>
<td>10</td>
<td>9</td>
</tr>
<tr>
<td>West Bengal</td>
<td>15</td>
<td>7</td>
<td>12</td>
<td>10</td>
</tr>
<tr>
<td>Tamil Nadu</td>
<td>9</td>
<td>13</td>
<td>13</td>
<td>11</td>
</tr>
<tr>
<td>Meghalaya</td>
<td>14</td>
<td>19</td>
<td>8</td>
<td>12</td>
</tr>
<tr>
<td>Nagaland</td>
<td>11</td>
<td>18</td>
<td>15</td>
<td>13</td>
</tr>
<tr>
<td>Manipur</td>
<td>12</td>
<td>22</td>
<td>9</td>
<td>14</td>
</tr>
<tr>
<td>Maharashtra</td>
<td>17</td>
<td>9</td>
<td>16</td>
<td>15</td>
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<tr>
<td>Arunachal Pradesh</td>
<td>16</td>
<td>24</td>
<td>14</td>
<td>16</td>
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<tr>
<td>Karnataka</td>
<td>23</td>
<td>17</td>
<td>17</td>
<td>17</td>
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<tr>
<td>Assam</td>
<td>13</td>
<td>27</td>
<td>18</td>
<td>18</td>
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<tr>
<td>Madhya Pradesh</td>
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<td>20</td>
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<td>Rajasthan</td>
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<td>20</td>
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<td>21</td>
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<tr>
<td>Chhattisgarh</td>
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<tr>
<td>Telengana</td>
<td>22</td>
<td>12</td>
<td>25</td>
<td>23</td>
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<tr>
<td>Jammu &amp; Kashmir</td>
<td>26</td>
<td>15</td>
<td>23</td>
<td>24</td>
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<tr>
<td>Odisha</td>
<td>25</td>
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<td>27</td>
<td>25</td>
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<tr>
<td>Andhra Pradesh</td>
<td>28</td>
<td>14</td>
<td>26</td>
<td>26</td>
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<tr>
<td>Jharkhand</td>
<td>24</td>
<td>28</td>
<td>24</td>
<td>27</td>
</tr>
<tr>
<td>Bihar</td>
<td>18</td>
<td>16</td>
<td>28</td>
<td>28</td>
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</tbody>
</table>
Policy issues
1. Demand generation

The generation of demand and usage of IEC remains a crucial factor in the Mission.

Across the states, average APL coverage as per 2015-16 data stands at 45.7%, while that for BPL is 61.9%.

Hinting towards lack of generation of demand among APL.

Serious evidence based research is called for analyzing this trend.
## Category of districts

<table>
<thead>
<tr>
<th>Category</th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total</td>
<td>259</td>
<td>91</td>
<td>63</td>
<td>216</td>
<td>629</td>
</tr>
<tr>
<td>%</td>
<td>41.18</td>
<td>14.47</td>
<td>10.02</td>
<td>34.34</td>
<td>100</td>
</tr>
</tbody>
</table>

- **A** Less BPL cov. Than avg, Less APL cov. Than avg.
- **B** More BPL cov. Than avg, Less APL cov. Than avg.
- **C** Less BPL cov. Than avg, More APL cov. Than avg.
- **D** More BPL cov. Than avg, More APL cov. Than avg.
2. IEC usage

Average IEC expenditure per household is Rs 18.02, with high standard deviation of Rs 15.60 (Highest being Rs 210.2 in Longleng in Nagaland and the lowest being 0 in Samli in UP).

Also, the correlation between average IEC expenditure and coverage among APL is significant, but low (0.29).

This is corroborated by very high average slack of usage of IEC in efficiency analysis (66%)!!

This needs to be addressed by monitoring and evaluation.
3. What about defunct toilets?

What will happen to the defunct toilets constructed before SBM?

Would they get subsidy again to make them functional?
THANK YOU