



**ಕರ್ನಾಟಕ ಸರ್ಕಾರದ ನಡವಳಿಗಳು**

**ವಿಷಯ:** ರಾಜ್ಯದಲ್ಲಿನ ನಗರ / ಪಟ್ಟಣ ಪ್ರದೇಶಗಳ ತ್ಯಾಜ್ಯ ನೀರಿನ ಮರು ಬಳಕೆಯ ಕಾರ್ಯನೀತಿಗೆ ಅನುಮೋದನೆ ನೀಡುವ ಬಗ್ಗೆ.

- ಓದಲಾಗಿದೆ:**
1. ಸರ್ಕಾರದ ಆದೇಶ ಸಂಖ್ಯೆ: ನಅಇ 435 ಪಿಆರ್‌ಜಿ 2014, ದಿನಾಂಕ:08-03-2016.
  2. ವ್ಯವಸ್ಥಾಪಕ ನಿರ್ದೇಶಕರು, ಕೆಯುಡಬ್ಲ್ಯೂಎಸ್&ಡಿಬಿ ರವರ ಪತ್ರ ಸಂಖ್ಯೆ:KWB/ TEC/ WWRU-Correspondence/ Vol-II/ 556/ 2017-18, ದಿನಾಂಕ:07-06-2017.

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**ಪ್ರಸ್ತಾವನೆ:**

ಕುಡಿಯುವ ನೀರು ಸರಬರಾಜು ಮಾಡುವುದು ನಗರ ಸ್ಥಳೀಯ ಸಂಸ್ಥೆಗಳ ಒಂದು ಪ್ರಮುಖ ಕರ್ತವ್ಯವಾಗಿರುತ್ತದೆ. ಪ್ರಸ್ತುತ ಅಂತರ್ಜಲ ಕುಸಿತ, ಮೇಲ್ಮೈ ನೀರಿನ ಕೊರತೆ ಮತ್ತು ಇತರೆ ಕಾರಣಗಳಿಂದ ನೀರಿನ ಲಭ್ಯತೆಯ ಪ್ರಮಾಣವು ದಿನೇದಿನೇ ಕ್ಷೀಣಿಸುತ್ತಿದ್ದು, ಇದರಿಂದ ನಾಗರೀಕರಿಗೆ ನಿಗದಿತ ಹಾಗೂ ಅವಶ್ಯ ಪ್ರಮಾಣದ ಕುಡಿಯುವ ನೀರು ಒದಗಿಸಲು ನಗರ ಸ್ಥಳೀಯ ಸಂಸ್ಥೆಗಳಿಗೆ ತೊಂದರೆಯಾಗುತ್ತಿದೆ. ಈ ಕಾರಣದಿಂದ ಗೃಹಬಳಕೆಯನ್ನು ಹೊರತು ಪಡಿಸಿ ಇತರೆ ಬಳಕೆಗಾಗಿ, ಕಾರ್ಖಾನೆಗಳ ಬಳಕೆಗಾಗಿ ಸಂಸ್ಕರಿಸಿದ ತ್ಯಾಜ್ಯ ನೀರನ್ನು ಮರು ಬಳಕೆ ಮಾಡುವುದರಿಂದ ಅತಿ ಅಮೂಲ್ಯವಾದ ಕುಡಿಯುವ ನೀರನ್ನು ನಾಗರಿಕರ ಬಳಕೆಗಾಗಿ ಉಳಿಸಬಹುದಾಗಿದೆ.

ಬೆಂಗಳೂರು ನಗರವು ರಾಜ್ಯದ ಎಲ್ಲಾ ನಗರಗಳಿಗಿಂತ ದೊಡ್ಡದಾಗಿದ್ದು ಸುಮಾರು ಶೇ.30ರಷ್ಟು ತ್ಯಾಜ್ಯ ನೀರನ್ನು ಬೆಂಗಳೂರು ನಗರ ಒಂದರಿಂದಲೇ ಉತ್ಪತ್ತಿಯಾಗುತ್ತಿರುವುದಾಗಿ ಅಂದಾಜಿಸಲಾಗಿದೆ. ಬಹುತೇಕ ನಗರಗಳಲ್ಲಿ ಮಲನ ನೀರು ಶುದ್ಧೀಕರಣ ಘಟಕಗಳು ಪೂರ್ಣ ಪ್ರಮಾಣದಲ್ಲಿ ಬಳಕೆಯಾಗುತ್ತಿಲ್ಲ ಮತ್ತು ಸುಮಾರು ಶೇ.72 ರಷ್ಟು ಬಳಕೆಗೆ ಮಾತ್ರ ಕಾರ್ಯ ನಿರ್ವಹಿಸುತ್ತಿರುವುದಾಗಿ ಕೇಂದ್ರ ಪರಿಸರ ಮಾಲಿನ್ಯ ನಿಯಂತ್ರಣ ಮಂಡಳಿ ರವರ ವರದಿ-2009 ರಲ್ಲಿ ತಿಳಿಸಲಾಗಿದೆ. ವರ್ಗ-1 ಮತ್ತು ವರ್ಗ-2 ಕ್ಕೆ ಸೇರಿದ ನಗರಗಳಿಂದ ಉತ್ಪತ್ತಿಯಾಗುವ ತ್ಯಾಜ್ಯ ನೀರಿನ ಶೇ.75ಕ್ಕಿಂತ ಹೆಚ್ಚು ಪ್ರಮಾಣವು ಯಾವುದೇ ಸಂಸ್ಕರಣೆ ಇಲ್ಲದೆ ಕೆರೆಗಳು ಅಥವಾ ಇತರೆ ನೀರಿನ ಮೂಲಗಳಿಗೆ ಹರಿಸುತ್ತಿರುವುದರಿಂದ ದೊಡ್ಡ ಮಟ್ಟದಲ್ಲಿ ಪರಿಸರ ಮಾಲಿನ್ಯ ಮತ್ತು ಗಣನೀಯವಾಗಿ ಸಾರ್ವಜನಿಕರ ಆರೋಗ್ಯಕ್ಕೆ ಮಾರಕವಾಗಿರುತ್ತದೆ. ಆದುದರಿಂದ ನಗರ ಸ್ಥಳೀಯ ಸಂಸ್ಥೆಗಳು ಮಲನ ನೀರು ಶುದ್ಧೀಕರಣ ಘಟಕಗಳನ್ನು ರಾಜ್ಯ ಪರಿಸರ ಮಾಲಿನ್ಯ ನಿಯಂತ್ರಣ ಮಂಡಳಿಯು ನಿಗದಿ ಪಡಿಸಿರುವ ಮಾರ್ಗದರ್ಶನ / ಸೂತ್ರಗಳಂತೆ ಸ್ಥಾಪಿಸುವುದು ಮತ್ತು ಅವುಗಳನ್ನು ನಿರ್ದಿಷ್ಟ ಪಡಿಸಲಾದ ಸಂಸ್ಕರಿಸಿದ ತ್ಯಾಜ್ಯ ನೀರಿನ ಗುಣ ಮಟ್ಟವನ್ನು ತಲುಪುವಂತೆ ನಿರ್ವಹಿಸುವುದು ಅತ್ಯಾವಶ್ಯಕವಾಗಿರುತ್ತದೆ.

ಹೆಚ್ಚುತ್ತಿರುವ ಜನಸಂಖ್ಯೆ, ನಗರೀಕರಣ ಮತ್ತು ಕೈಗಾರಿಕಾರಣದಿಂದ ರಾಜ್ಯದಲ್ಲಿ ನೀರಿನ ಬೇಡಿಕೆ ದಿನೇದಿನೇ ಹೆಚ್ಚಾಗುತ್ತಿದ್ದು ನೀರಿನ ಪೂರೈಕೆಯಲ್ಲಿ ಇಳಕೆಯಾಗಿ ಒತ್ತಡದ ಪರಿಸ್ಥಿತಿ ಸೃಷ್ಟಿಯಾಗಿರುತ್ತದೆ. ಏಕಕಾಲದಲ್ಲಿ ರಾಜ್ಯದಲ್ಲಿನ ನದಿ ಪಾತ್ರಗಳಲ್ಲಿನ ನೀರಿನ ಹರಿವುಗಿಂತಲೂ ಬೇಡಿಕೆ ಪ್ರಮಾಣವು ಹೆಚ್ಚಾಗುತ್ತಿರುವುದು ಕಂಡುಬರುತ್ತದೆ. ರಾಜ್ಯದ ನಗರಗಳ ಪೈಕಿ ಬೆಂಗಳೂರು ನಗರದಲ್ಲಿ ಹೆಚ್ಚುತ್ತಿರುವ ನೀರಿನ ಬೇಡಿಕೆ, ಕಾರ್ಖಾನೆಗಳಿಗೆ ಹಾಗೂ ಉಷ್ಣ ವಿದ್ಯುತ್ ಘಟಕಗಳ ನೀರಿನ ಬೇಡಿಕೆಯನ್ನು ಪೂರೈಸಲು ಕಾರ್ಯಸಾಧ್ಯವಾದ ನೀರಿನ ಪರ್ಯಾಯ ಮೂಲವನ್ನು ಹುಡುಕಲು ಕಾರ್ಯನೀತಿಯ ಅವಶ್ಯವಿರುತ್ತದೆ.

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 Managing Director's Office  
 KUPCO Board, Bangalore  
 (For Necessary Action)  
 CE(D&A)  
 PS/PA  
 21/11/18

21/11/18

ಈ ಹಿನ್ನೆಲೆಯಲ್ಲಿ, ಮೇಲೆ ಓದಲಾದ (1) ರ ಸರ್ಕಾರದ ಆದೇಶದಲ್ಲಿ ರಾಜ್ಯದಲ್ಲಿನ ನಗರ ಪ್ರದೇಶಗಳ ತ್ಯಾಜ್ಯ ನೀರಿನ ಮರು ಬಳಕೆಯ ಕಾರ್ಯನೀತಿಯನ್ನು ಸಿದ್ಧಪಡಿಸಿ ಸರ್ಕಾರಕ್ಕೆ ಶಿಫಾರಸ್ಸು ಮಾಡಲು ಕಾರ್ಯದರ್ಶಿಗಳು, ನಗರಾಭಿವೃದ್ಧಿ ಇಲಾಖೆ ರವರ ಅಧ್ಯಕ್ಷತೆಯಲ್ಲಿ ರಾಜ್ಯ ಮಟ್ಟದ ಸಮಿತಿಯನ್ನು ರಚಿಸಲಾಗಿದ್ದು, ಸದರಿ ಸಮಿತಿಯು ಸಲ್ಲಿಸಿರುವ ಶಿಫಾರಸ್ಸಿನಂತೆ ಕಾರ್ಯನೀತಿಯನ್ನು ಜಾರಿಗೆ ತರಲು ಸರ್ಕಾರವು ತೀರ್ಮಾನಿಸಿ, ಈ ಕೆಳಕಂಡಂತೆ ಆದೇಶಿಸಿದೆ.

**ಸರ್ಕಾರದ ಆದೇಶ ಸಂಖ್ಯೆ : ನಅಇ 435 ಎಆರ್‌ಜಿ 2014,  
ಬೆಂಗಳೂರು, ದಿನಾಂಕ:27-12-2017**

ಪ್ರಸ್ತಾವನೆಯಲ್ಲಿ ವಿವರಿಸಿರುವ ಹಿನ್ನೆಲೆಯಲ್ಲಿ ರಾಜ್ಯದಲ್ಲಿನ ನಗರ / ಪಟ್ಟಣ ಪ್ರದೇಶಗಳ ತ್ಯಾಜ್ಯ ನೀರಿನ ಮರು ಬಳಕೆಯ ಕಾರ್ಯನೀತಿಗೆ ಅನುಬಂಧದಲ್ಲಿ ಲಗತ್ತಿಸಿರುವಂತೆ ಅನುಮೋದನೆ ನೀಡಿ ಆದೇಶಿಸಿದೆ.

**1. ಕಾರ್ಯನೀತಿಯ ಅನುಷ್ಠಾನ:**

ತ್ಯಾಜ್ಯ ನೀರು ಮರುಬಳಕೆ ಕಾರ್ಯನೀತಿಯನ್ನು ಅನುಷ್ಠಾನಗೊಳಿಸಲು ಈ ಕೆಳಕಂಡಂತೆ ನಿರ್ವಹಣಾ ಸಮಿತಿಯನ್ನು ರಚಿಸಲಾಗಿದೆ.

1	ಕಾರ್ಯದರ್ಶಿಗಳು, ನಗರಾಭಿವೃದ್ಧಿ ಇಲಾಖೆ	ಅಧ್ಯಕ್ಷರು
2	ಆಯುಕ್ತರು, ಕೈಗಾರಿಕೆ	ಸದಸ್ಯರು
3	ವ್ಯವಸ್ಥಾಪಕ ನಿರ್ದೇಶಕರು, ಕರ್ನಾಟಕ ನಗರ ನೀರು ಸರಬರಾಜು ಮತ್ತು ಒಳ ಚರಂಡಿ ಮಂಡಳಿ	ಸದಸ್ಯರು
4	ಮುಖ್ಯ ಅಭಿಯಂತರರು, ಬೆಂಗಳೂರು ನಗರ ನೀರು ಸರಬರಾಜು ಮತ್ತು ಒಳಚರಂಡಿ ಮಂಡಳಿ	ಸದಸ್ಯರು
5	ವ್ಯವಸ್ಥಾಪಕ ನಿರ್ದೇಶಕರು, ಕರ್ನಾಟಕ ನಗರ ಮೂಲಸೌಕರ್ಯ ಅಭಿವೃದ್ಧಿ ಮತ್ತು ಹಣಕಾಸು ನಿಗಮ ನಿಯಮಿತ.	ಸದಸ್ಯರು
6	ಆಯುಕ್ತರು, ಕೃಷಿ ಇಲಾಖೆ	ಸದಸ್ಯರು
7	ನಿರ್ದೇಶಕರು, ಪೌರಾಡಳಿತ ನಿರ್ದೇಶನಾಲಯ	ಸಂಚಾಲಕರು
8	ಇತರೆ ಪಾಲುದಾರರು	ಅಗತ್ಯವಿದ್ದಲ್ಲಿ

**ನಿರ್ವಹಣಾ ಸಮಿತಿಯ ಪಾತ್ರ/ ಜವಾಬ್ದಾರಿಗಳು ಈ ಕೆಳಕಂಡಂತಿವೆ:**

1. ತ್ಯಾಜ್ಯ ನೀರಿನ ಸಂಪನ್ಮೂಲ ಕೇಂದ್ರವನ್ನು ನಗರಾಭಿವೃದ್ಧಿ ಇಲಾಖೆಯೊಳಗೆ ಸ್ಥಾಪಿಸಲು ಕಾರ್ಯತಂತ್ರ ಮತ್ತು ಮಾರ್ಗದರ್ಶನ ಒದಗಿಸುವುದು.
2. ತ್ಯಾಜ್ಯ ನೀರಿನ ಮರುಬಳಕೆ ಸಂಬಂಧ ನಗರ/ ಪಟ್ಟಣಗಳ ಆದ್ಯತೆ ಮತ್ತು ಆಯ್ಕೆ ಬಗ್ಗೆ ಸಲಹೆ ನೀಡುವುದು.
3. ಜಿಡಬ್ಲ್ಯೂಎಸ್‌ಎಸ್‌ಜಿ, ಕೆಯುಡಬ್ಲ್ಯೂಎಸ್‌ಡಿಜಿ, ಕೆಐಎಡಿಜಿ, ಕೆಯುಐಡಿಎಫ್‌ಸಿ ಸಂಸ್ಥೆಗಳಲ್ಲದೇ ರಾಜ್ಯದಲ್ಲಿ ತ್ಯಾಜ್ಯ ನೀರಿನ ಮರುಬಳಕೆ ಯೋಜನೆಗಳನ್ನು ಅನುಷ್ಠಾನಗೊಳಿಸಲು ಇತರೆ ಸಂಸ್ಥೆಗಳಿಗೆ ಸಲಹೆ ಮತ್ತು ಮಾರ್ಗದರ್ಶನ ನೀಡುವುದು.
4. ಅನುಷ್ಠಾನದ ಕಾರ್ಯ ವಿಧಾನಗಳು ಮತ್ತು ಹಣಕಾಸಿನ ಆಯ್ಕೆಗಳ ಬಗ್ಗೆ ಸಲಹೆ.
5. ಕೈಗಾರಿಕೆ ಮತ್ತು ವಾಣಿಜ್ಯ ಇಲಾಖೆ (ಕೆಐಎಡಿಜಿ, ಕೆಎಸ್‌ಐಐಡಿಎಸ್‌ಐ ಇತ್ಯಾದಿ) ನಗರಾಭಿವೃದ್ಧಿ ಇಲಾಖೆ (ಜಿಡಬ್ಲ್ಯೂಎಸ್‌ಎಸ್‌ಜಿ, ಕೆಯುಡಬ್ಲ್ಯೂಎಸ್‌ಡಿಜಿ, ಕೆಯುಐಡಿಎಫ್‌ಸಿ ಇತ್ಯಾದಿ), ಜಲಸಂಪನ್ಮೂಲ, ಕೃಷಿ, ಇಂಧನ, ಹಣಕಾಸು ಹಾಗೂ ಇತರೆ ಇಲಾಖೆಗಳ ಮಧ್ಯೆ ಸಹಕಾರವನ್ನು ಪ್ರೋತ್ಸಾಹಿಸುವುದು.

2. ನಗರ ತ್ಯಾಜ್ಯ ನೀರಿನ ಮರುಬಳಕೆ ಸಂಬಂಧ ಸರ್ಕಾರಕ್ಕೆ ಸಲಹೆ ನೀಡಲು **Urban Water Work stream Working Group** ಅನ್ನು ಈ ಕೆಳಕಂಡ ಸಂಯೋಜನೆಯೊಂದಿಗೆ ಸ್ಥಾಪಿಸಲಾಗಿದೆ.

ಸರ್ಕಾರ	ಉದ್ದಿಮೆ	ಸಾರ್ವಜನಿಕ ವಲಯ / ಶೈಕ್ಷಣಿಕ ವಲಯ
ಅಪರ ಮುಖ್ಯ ಕಾರ್ಯದರ್ಶಿಗಳು, ನಗರಾಭಿವೃದ್ಧಿ ಇಲಾಖೆ (ಅಧ್ಯಕ್ಷರು)	ಮುಖ್ಯಸ್ಥರು, Jindal power plant,	Arghyam ಸಂಸ್ಥೆಯ ಪ್ರತಿನಿಧಿ
ಅಪರ ಮುಖ್ಯ ಕಾರ್ಯದರ್ಶಿಗಳು, ವಾಣಿಜ್ಯ ಮತ್ತು ಉದ್ದಿಮೆ ಇಲಾಖೆ	Toyota Kirloskar Motors ಪ್ರತಿನಿಧಿ	Biome ಸಂಸ್ಥೆಯ ಪ್ರತಿನಿಧಿ
ಕರ್ನಾಟಕ ರಾಜ್ಯ ಪರಿಸರ ಮಾಲಿನ್ಯ ನಿಯಂತ್ರಣ ಮಂಡಳಿಯ ಪ್ರತಿನಿಧಿ	H & M Textiles ಪ್ರತಿನಿಧಿ	IISC ಪ್ರತಿನಿಧಿ
ವ್ಯವಸ್ಥಾಪಕ ನಿರ್ದೇಶಕರು, KUIDFC	FKCCI / CII ಪ್ರತಿನಿಧಿ	ಸಾರ್ವಜನಿಕ ಮತ್ತು ಶೈಕ್ಷಣಿಕ ವಲಯದ ಪ್ರತಿನಿಧಿಗಳು
ಅಧ್ಯಕ್ಷರು, ಬೆಂಗಳೂರು ಜಲ ಮಂಡಳಿ (ಸದಸ್ಯ ಕಾರ್ಯದರ್ಶಿಗಳು/ ಸಂಚಾಲಕರು)		

**ಮೇಲಿನ Urban Water Work stream Working Group ಕಾರ್ಯಗಳು:**

- ತ್ಯಾಜ್ಯ ನೀರಿನ ಮರು ಬಳಕೆಗೆ ಸಂಬಂಧಿಸಿದ ಯೋಜನೆಗಳನ್ನು ತ್ವರಿತಗತಿಯಲ್ಲಿ ಅನುಷ್ಠಾನಗೊಳಿಸಲು ಬಹು-ಪಾಲುದಾರರ ಮಾರ್ಗದರ್ಶನ ನೀಡುವುದು.
- ತ್ಯಾಜ್ಯ ನೀರಿನ ಮರುಬಳಕೆ ಯೋಜನೆಗಳನ್ನು ಸಿದ್ಧಪಡಿಸಲು ಮತ್ತು ಅನುಷ್ಠಾನಗೊಳಿಸಲು ಅಗತ್ಯವಿರುವ ಸಾಂಸ್ಥಿಕ ಕಾರ್ಯ ವಿಧಾನಗಳಿಗೆ ಸಹಕಾರ ಮತ್ತು ಬೆಂಬಲವನ್ನು ನೀಡುವುದು.
- ನಗರ ನೀರಿನ ವಿಷಯಕ್ಕೆ ಸಂಬಂಧಿಸಿದಂತೆ ಪರಿಕಲ್ಪನಾ ಟಿಪ್ಪಣಿಯನ್ನು ತಯಾರಿಸಲು ಸಲಹೆ ನೀಡುವುದು.

3. ತ್ಯಾಜ್ಯ ನೀರಿನ ಮರುಬಳಕೆಯ ಸಂಪನ್ಮೂಲ ಕೇಂದ್ರ:

ರಾಜ್ಯದ ನಗರ ಸ್ಥಳೀಯ ಸಂಸ್ಥೆಗಳ ತ್ಯಾಜ್ಯ ನೀರಿನ ಮರುಬಳಕೆ ಕಾರ್ಯನೀತಿಯನ್ನು ಅನುಷ್ಠಾನಗೊಳಿಸಲು ತ್ಯಾಜ್ಯ ನೀರಿನ ಮರುಬಳಕೆಯ ಸಂಪನ್ಮೂಲ ಕೇಂದ್ರ ಸ್ಥಾಪಿಸಲು ಅನುಮೋದನೆ ನೀಡಲಾಗಿದೆ.

ತ್ಯಾಜ್ಯ ನೀರಿನ ಮರುಬಳಕೆಯ ಸಂಪನ್ಮೂಲ ಕೇಂದ್ರವನ್ನು ರಾಜ್ಯ ಮಟ್ಟದಲ್ಲ ಮಾಹಿತಿ ಕೇಂದ್ರವಾಗಿ, ಸಲಹಾ ಕೇಂದ್ರವಾಗಿ ಹಾಗೂ ಯೋಜನೆಯ ಅನುಷ್ಠಾನಗೊಳಿಸಲು ಸ್ಥಾಪಿಸಲಾಗುವುದು. ಸದರಿ ಕೇಂದ್ರದ ರಚನೆ, ಕಾರ್ಯ, ಅಧಿಕಾರಿಗಳ ವರ್ಗದ ಬಗ್ಗೆ ಕಾರ್ಯದರ್ಶಿಗಳು, ನಗರಾಭಿವೃದ್ಧಿ ಇಲಾಖೆಯ ಅಧ್ಯಕ್ಷತೆಯಲ್ಲಿನ ನಿರ್ವಹಣಾ ಸಮಿತಿಯು ನಿರ್ಣಯಿಸತಕ್ಕದ್ದು.

ತ್ಯಾಜ್ಯ ನೀರಿನ ಮರುಬಳಕೆಯ ಸಂಪನ್ಮೂಲ ಕೇಂದ್ರವನ್ನು ಸ್ಥಾಪಿಸಲು ಆರಂಭಿಕ ವೆಚ್ಚವಾಗಿ ರೂ.53.00 ಲಕ್ಷಗಳನ್ನು ಈ ಕೆಳಕಂಡಂತೆ ಅಂದಾಜಿಸಲಾಗಿದ್ದು, ಆರಂಭದಲ್ಲಿ ತ್ಯಾಜ್ಯ ನೀರಿನ ಮರುಬಳಕೆಯ ಯೋಜನೆಗೆ ಮೂರು ನಗರಗಳನ್ನು ಆಯ್ಕೆ ಮಾಡತಕ್ಕದ್ದು. ಸದರಿ ವೆಚ್ಚವನ್ನು ನಗರಾಭಿವೃದ್ಧಿ ಇಲಾಖೆಗೆ ಮಂಜೂರಾಗುವ ಅನುದಾನದಲ್ಲಿ ಸರಿದೂಗಿಸುವುದು. ಹೆಚ್ಚಿನ ನಗರಗಳಲ್ಲಿ ತ್ಯಾಜ್ಯ ನೀರಿನ ಮರುಬಳಕೆಯನ್ನು ಅನುಷ್ಠಾನಕ್ಕೆ ತರಲು ಅಗತ್ಯವಿರುವ ಹೆಚ್ಚುವರಿ ವೆಚ್ಚವನ್ನು ನಗರ ಸ್ಥಳೀಯ ಸಂಸ್ಥೆಗಳಿಂದ ಮತ್ತು ನಗರಾಭಿವೃದ್ಧಿ ಇಲಾಖೆ, ಕನನೀಸ ಮತ್ತು ಒಜ ಮಂಡಳಿ, ಬೆಂಗಳೂರು ಜಲ ಮಂಡಳಿ, KIADB ರವರ ಸಹಕಾರದೊಂದಿಗೆ ಭರಿಸತಕ್ಕದ್ದು.

ವಿವರಣೆ (4 ತಿಂಗಳು)	ರೂ. ಲಕ್ಷಗಳಲ್ಲಿ
ಮಾನವ ಸಂಪನ್ಮೂಲ	44.6
ಸರ್ವೆ/ ಪರೀಕ್ಷೆ / ದಾಖಲಾತಿಗಳನ್ನು ಸಿದ್ಧಪಡಿಸುವಿಕೆ	2.00
ಕಾರ್ಯಾಗಾರ ಮತ್ತು ತರಬೇತಿ	2.40
ಕಚೇರಿ ಸ್ಥಾಪನೆ	2.00
ಇತರೆ	2.00
<b>ಒಟ್ಟು</b>	<b>53.00</b>

ಈ ಆದೇಶವನ್ನು ಸಚಿವ ಸಂಪುಟದ ಪ್ರಕರಣ ಸಂಖ್ಯೆ: ಸಿ/ 806/ 2017, ದಿನಾಂಕ:11-12-2017ರ ಅನುಮೋದನೆಯ ಮೇರೆಗೆ ಹೊರಡಿಸಲಾಗಿದೆ.

ಕರ್ನಾಟಕ ರಾಜ್ಯಪಾಲರ ಆಜ್ಞಾನುಸಾರ  
ಮತ್ತು ಅವರ ಹೆಸರಿನಲ್ಲಿ

**ಲಲಿತಾಬಾಯಿ ಕೆ**  
(ಲಲಿತಾಬಾಯಿ. ಕೆ)

ಸರ್ಕಾರದ ಅಧೀನ ಕಾರ್ಯದರ್ಶಿ,  
ನಗರಾಭಿವೃದ್ಧಿ ಇಲಾಖೆ.

ಇವರಿಗೆ:

ಸಂಕಲನಕಾರರು, ಕರ್ನಾಟಕ ರಾಜ್ಯಪತ್ರ, ಬೆಂಗಳೂರು ಇವರಿಗೆ ಮುಂದಿನ ರಾಜ್ಯ ಪತ್ರದಲ್ಲ  
ಪ್ರಕಟಿಸಲು.

- 1) ಮಹಾಲೇಖಪಾಲರು, ಕರ್ನಾಟಕ, ಬೆಂಗಳೂರು.
- 2) ಸರ್ಕಾರದ ಅಪರ ಮುಖ್ಯ ಕಾರ್ಯದರ್ಶಿಗಳು, ನಗರಾಭಿವೃದ್ಧಿ ಇಲಾಖೆ, ಬೆಂಗಳೂರು.
- 3) ಸರ್ಕಾರದ ಅಪರ ಮುಖ್ಯ ಕಾರ್ಯದರ್ಶಿಗಳು, ವಾಣಿಜ್ಯ ಮತ್ತು ಕೈಗಾರಿಕಾ ಇಲಾಖೆ.
- 4) ಸರ್ಕಾರದ ಅಪರ ಮುಖ್ಯ ಕಾರ್ಯದರ್ಶಿಗಳು, ಅರಣ್ಯ, ಜೀವಿ ಪರಿಸ್ಥಿತಿ ಮತ್ತು ಪರಿಸರ ಇಲಾಖೆ.
- 5) ಸರ್ಕಾರದ ಪ್ರಧಾನ ಕಾರ್ಯದರ್ಶಿಗಳು, ಯೋಜನಾ ಇಲಾಖೆ, ಬೆಂಗಳೂರು.
- 6) ಸರ್ಕಾರದ ಪ್ರಧಾನ ಕಾರ್ಯದರ್ಶಿಗಳು, ಆರ್ಥಿಕ ಇಲಾಖೆ, ಬೆಂಗಳೂರು.
- 7) ಮಾನ್ಯ ಮುಖ್ಯ ಮಂತ್ರಿಯವರ ಪ್ರಧಾನ ಕಾರ್ಯದರ್ಶಿಗಳು, ವಿಧಾನಸೌಧ, ಬೆಂಗಳೂರು.
- 8) ಸರ್ಕಾರದ ಕಾರ್ಯದರ್ಶಿಗಳು, ನಗರಾಭಿವೃದ್ಧಿ ಇಲಾಖೆ, ಬೆಂಗಳೂರು.
- 9) ಅಧ್ಯಕ್ಷರು, ಬೆಂಗಳೂರು ಜಲ ಮಂಡಳಿ.
- 10) ವ್ಯವಸ್ಥಾಪಕ ನಿರ್ದೇಶಕರು, ಕೆಯುಐಡಿಎಫ್‌ಸಿ, ಬೆಂಗಳೂರು.
- 11) ಆಯುಕ್ತರು, ಕೈಗಾರಿಕೆ.
- 12) ಆಯುಕ್ತರು, ಕೃಷಿ ಇಲಾಖೆ.
- 13) ವ್ಯವಸ್ಥಾಪಕ ನಿರ್ದೇಶಕರು, ಕರ್ನಾಟಕ ನಗರ ನೀರು ಸರಬರಾಜು ಮತ್ತು ಒಳಚರಂಡಿ ಮಂಡಳಿ, ಬೆಂಗಳೂರು.
- 14) ನಿರ್ದೇಶಕರು, ಪೌರಾಡಳಿತ ನಿರ್ದೇಶನಾಲಯ, ವಿ.ವಿ.ಗೋಪುರ, ಬೆಂಗಳೂರು.
- 15) ಮುಖ್ಯ ಅಭಿಯಂತರರು, ಬೆಂಗಳೂರು ನಗರ ನೀರು ಸರಬರಾಜು ಮತ್ತು ಒಳಚರಂಡಿ ಮಂಡಳಿ.
- 16) ಎಲ್ಲಾ ಜಿಲ್ಲಾಧಿಕಾರಿಗಳು, ಜಿಲ್ಲಾಧಿಕಾರಿಗಳ ಕಾರ್ಯಾಲಯ.
- 17) ಉಪ ಕಾರ್ಯದರ್ಶಿಗಳು (ಸಚಿವ ಸಂಪುಟ ಶಾಖೆ), ವಿಧಾನಸೌಧ, ಬೆಂಗಳೂರು.
- 18) ಮಾನ್ಯ ನಗರಾಭಿವೃದ್ಧಿ ಸಚಿವರ ಆಪ್ತ ಕಾರ್ಯದರ್ಶಿಗಳು, ಬೆಂಗಳೂರು.
- 19) ಮಾನ್ಯ ಪೌರಾಡಳಿತ ಸಚಿವರ ಆಪ್ತ ಕಾರ್ಯದರ್ಶಿಗಳು, ಬೆಂಗಳೂರು.
- 20) ಎಲ್ಲಾ ಯೋಜನಾ ನಿರ್ದೇಶಕರು, ಜಿಲ್ಲಾ ನಗರಾಭಿವೃದ್ಧಿ ಕೋಶ, ಜಿಲ್ಲಾಧಿಕಾರಿಗಳ ಕಾರ್ಯಾಲಯ.
- 21) ಎಲ್ಲಾ ಆಯುಕ್ತರು/ ಪೌರಾಯುಕ್ತರು/ ಮುಖ್ಯಾಧಿಕಾರಿಗಳು, ಮಹಾ ನಗರ ಪಾಲಿಕೆ/ ನಗರಸಭೆ/ ಪುರಸಭೆ/ ಪಟ್ಟಣ ಪಂಚಾಯಿತಿ- ಪೌರಾಡಳಿತ ನಿರ್ದೇಶನಾಲಯ ಮೂಲಕ.
- 22) ಕರ್ನಾಟಕ ರಾಜ್ಯ ಪರಿಸರ ಮಾಲಿನ್ಯ ನಿಯಂತ್ರಣ ಮಂಡಳಿಯ ಪ್ರತಿನಿಧಿ.
- 23) ಮುಖ್ಯಸ್ಥರು, Jindal Power Plant,
- 24) Arghyam ಸಂಸ್ಥೆಯ ಪ್ರತಿನಿಧಿ
- 25) Toyota Kirloskar Motors ಪ್ರತಿನಿಧಿ
- 26) Biome ಸಂಸ್ಥೆಯ ಪ್ರತಿನಿಧಿ
- 27) H & M Textiles ಪ್ರತಿನಿಧಿ
- 28) IISC ಪ್ರತಿನಿಧಿ
- 29) FKCCI / CII ಪ್ರತಿನಿಧಿ
- 30) ಸಾರ್ವಜನಿಕ ಮತ್ತು ಶೈಕ್ಷಣಿಕ ವಲಯದ ಪ್ರತಿನಿಧಿಗಳು
- 31) ಶಾಖಾ ರಕ್ಷಾ ಕಡತ/ಹೆಚ್ಚುವರಿ ಪ್ರತಿ.

ಬೆಂಗಳೂರು ಜಲ.....  
ಮಂಡಳಿ ಮೂಲಕ



**Urban Development Department**

**Policy for Urban Waste Water Reuse**

**Enabling Environment for Urban Wastewater Reuse**

**Government of Karnataka**

**December 2017**

# Urban Waste Water Reuse Policy

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# Government of Karnataka

## Enabling Environment for Urban Wastewater Reuse

### Key Aspects

- Government of Karnataka seeks to position the state as a national leader in the sphere of integrated urban water resource management, and circular economy with respect to water and wastewater. Urban wastewater treatment and reuse, guided by this policy, is a central aspect thereunder.
- The overall goal of this policy is to establish an enabling environment for the reuse of municipal wastewater to maximize efficient resource use, protect the environment, address water scarcity, and enhance economic output. It aligns with international and national guidance on the same.
- This policy covers all Class I and Class II urban centres in Karnataka. It targets for at least 10 major cities/towns to adopt wastewater reuse principles with concrete implementation plans by 2020, starting with AMRUT cities; and to augment the initiative to all major cities/towns by 2030.
- The policy adopts water quality standards for various categories of re-use which are in alignment with national, state and other relevant guidance on the same.
- For each urban centre in the state, the allocation of secondary treated wastewater among categories of users viz., industry, agriculture, urban etc. will be based on the principles of (a): equity and fairness (b): sustainability of operations of the wastewater treatment plant.
- To promote a shift in industrial water use from freshwater to treated wastewater, it is proposed that industrial estates/ zones within [30 km] of a sewage treatment plant (STP) mandatorily examine, as a first option, available secondary treated wastewater (STW) from the STP, with regard to reliability of supply, quality and pricing. Only if off-take of such STW is shown to be non-viable, will alternate sources of water for use by industry be examined.
- Where demand for off-take is significant, or approximates availability of secondary treated wastewater generated, urban centres will seek to establish operational cost recovery of networks and sewage treatment plants, by balancing allocation and tariff for wastewater among various user categories.
- With the aim of achieving the policy goals, Government of Karnataka is committed to establishing a municipal wastewater reuse "Resource Center" at the state level, to act as an information and implementation facilitation cell.

### I. Background and Context

Urban waste water (or sewage) is understood as water carrying waste, comprising both grey water (water used for washing) and black water (water used in toilets that is combined with human waste). While this policy focuses on the reuse of treated waste water and the associated implications on sustainable sanitation and water resource availability, it is recognised that an integrated approach to urban water management – one incorporating all streams of water in urban areas with a view to optimising use and management – would necessarily consider other elements of the water loop, i.e., the management of water supply; as well as of surface run-off.

As per Census 2011, 38.7 percent, i.e., 23.6 million population or 5.16 million households in Karnataka live in urban areas. Projections indicate that the urban population will grow to more than 36 million by 2030. Of these, nearly 19 million currently live in Class I and Class II cities, with

populations above 50,000<sup>1</sup> (Census 2011). Adopting conservative levels of water supply<sup>2</sup>, the current generation of waste water in Class I and Class II cities of the state is estimated at approx. 1215 MLD. The waste water treatment capacity developed in the state so far is not adequate to treat the total volume of waste water generated in these two classes of urban centres. Moreover, existing urban wastewater treatment plants in the country are also not utilised at full capacity, and, on average, operate at 72% utilisation (CPCB 2009a). Consequently, it is estimated that more than 75% of the waste water generated in Class I and Class II urban centres (nation-wide) is discharged on land or in various water bodies without any treatment<sup>3</sup>, resulting in large scale environmental pollution and posing significant public health hazard.

Capture, treatment and reuse of municipal waste water presents an opportunity for environmental rehabilitation, as well as for meeting the water requirements of different categories of users:

**1. Hydrological and Economic Rationale for Wastewater Reuse:**

The urban water demand-supply gap in Karnataka is estimated to increase from 24% in 2011 to 58% in 2030<sup>4</sup>. This stems from climate change factors as well as rising urban water demand on account of an increase in the urban population. The total annual demand for water for the industrial sector is estimated to increase more than three times, from 26 TMC in 2011 to 85 TMC by 2030, resulting in a 69% water demand-supply gap by 2030. Closing this demand-supply gap through primary supply augmentation measures presents major financial and physical issues, while the reuse of secondary treated wastewater (STW) offers a cost-effective and feasible solution.

**2. Benefits of Secondary Treated Water (STW) Reuse:**

The reuse of STW offers the following benefits:

- **Decreased risks to human health and the environment** by reducing the release of untreated wastewater to the environment
- **Reliability of supply** for agricultural and industrial use to enhance economic output and employment opportunities, particularly as a coping strategy in view of climate change variability and associated water supply risks
- **Reduced energy consumption** associated with production, treatment and distribution of freshwater
- **Improvement in the financial sustainability** of Urban Local Bodies ("ULBs") through improved recovery of the costs of wastewater treatment and supply, particularly to industry
- **Highernutrient content in wastewater**, providing benefits for agricultural production

## II. Vision

Accelerated adoption of circular economy across the major towns and cities of Karnataka with respect to wastewater treatment and reuse, with following targets:

- By 2020, [10 major cities<sup>5</sup>] have adopted wastewater reuse principles and developed firm plans, to be increased to [100% of all major cities/towns] by 2030
- By 2020, 20% of all STW is targeted for reuse across the state, in accordance with regulatory standards; [to be increased to [50%] by 2030], subject to responsible ecological return flow provisions approved under Integrated Urban Water Management Plans<sup>6</sup>

<sup>1</sup>At which scale network sewerage systems and Sewage Treatment Plants (STPs) may be considered as feasible options IWMI & WSP, 2016)

<sup>2</sup>80 litres per capita per day (lpcd)

<sup>3</sup>International Water Management Institute (IWMI) and Water and Sanitation Program (WSP) (2016), Recycle and Reuse of Treated Wastewater in Urban India: A Proposed Advisory and Guidance Document.

<sup>4</sup>2030 WRG (2014), Creating a Sustainable Water Future for Karnataka – Urban and Industrial Sectors

<sup>5</sup>Class I and II cities, corresponding presently to 67 cities and towns in Karnataka (Refer Annex 2)



### III. Key Policy Issues

In order to achieve the above vision, the following key policy constraints must be addressed:

- **Lack of an integrated approach to urban water resource management:** Water and wastewater initiatives are currently planned in a piecemeal manner, with little consideration of efficient resource use in the full water loop; or circular economy principles
- **Poor awareness:** Safe capture, treatment and disposal of wastewater has been accorded low priority, and there is poor awareness, even among key stakeholders, of linkages with public health. As a result, there is insufficient focus on ensuring adequate coverage of network sewerage, and connections to the same; or on decentralised options, where network sewerage may not be viable; and on the health implications of the use of untreated wastewater in agriculture
- **Viability of urban wastewater treatment facilities:** Revenues from sanitation services in urban centres and/or fiscal transfers for the same are inadequate to ensure operation and maintenance of wastewater treatment plants to required standards. Consequentially, secondary treated wastewater often does not meet regulatory standards, and is unfit for reuse
- **Lack of clear guidelines and framework:** While wastewater reuse finds mention in several policies and programs, there is an absence of a clear framework to support implementation of projects in a manner that aligns stakeholder interests and priorities, and is operationally sustainable
- **Institutional coordination:** Water plays a significant role in several sectors, including urban, agriculture, industries and power. There is a need for a platform for interaction and coordination among sectoral departments and other concerned stakeholders to facilitate greater synergies and collaboration towards efficient resource use.

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<sup>6</sup>This provision accounts for the hydrological principle of return flows, whereby users of treated wastewater are themselves new generators of wastewater; and whereby net withdrawal of the urban hydrological cycle is limited to evapo-transpiration, embedded water in products, and/or lost return flows.

## IV. Alignment with International/ National Policies and Frameworks

The concept of waste water re-use, and the need to include the same in water supply management programs is recognised by most policy and guidance documents in India. Specifically, this policy aligns with the following national and international agenda:

1. **UN Sustainable Development Goals:** The Sustainable Development Goals (“SDGs”) are focused, among other areas, on environmental protection and prosperity creation. In particular, the policy aligns with the following SDGs: SDG 3: Good Health and Well-Being; SDG 6: Clean Water and Sanitation; SDG 8: Decent Work and Economic Growth; SDG 11: Sustainable Cities and Communities.
2. **National Water Policy 2012:** The National Water Policy 2012 promotes and incentivizes the reuse of wastewater, including through Section 6.3: ‘Recycling and reuse of water, including return flows, should be the general norm’; Section 7.3: ‘Recycling and reuse of water, after treatment to specified standards, should also be incentivized through a properly planned tariff system’; and Section 11.7: ‘Subsidies and incentives should be implemented to encourage ... and recycling / reuse, which are otherwise capital intensive.
3. **National Service Level Benchmarks; National Urban Sanitation Policy (NUSP):** The National Service Level Benchmarks, instituted by the Ministry of Urban Development, Government of India, establish a 20% target for reuse of urban wastewater generated.
4. **Power Tariff Policy (revised, 2016):** The revised power tariff policy mandates thermal power plants within 50 kms of a city STP to off-take all the treated wastewater from the STP. Charges incurred in conveyance of wastewater from the STP to the power plant are eligible for pass through in the power tariff.
5. **AMRUT:** This policy will align with the Government of India’s AMRUT scheme, for implementation of wastewater reuse infrastructure solutions in selected towns and cities (refer Annex 2).
6. **Karnataka State Water Resources Policy:** The policy envisages formulation of city-level integrated water management plans incorporating wastewater re-use and recycle in alignment with the Karnataka State Water Resources Policy 2012, including priority allocations across different sectors.
7. **Government Order for Promoting Wastewater Reuse in Bangalore:** Government Order No: FEE 188 ENV 2003, Bangalore dated 14-08-2003, mandates the use of tertiary treated water for non-potable purposes, including gardening; washing, servicing and cleaning of vehicles; and civil construction activities; and roads and bridges in Bangalore city.
8. **KSPCB Order for Promoting Wastewater Reuse in Urban Local Bodies:** KSPCB Order No. PCB/074/STP/2012/4975 dated 5<sup>th</sup> December 2015, stipulates that secondary treated sewage mandatorily be sold for use for non-potable purposes such as industrial use, railways, bus cleaning, flushing of toilets with dual piping, horticulture and irrigation; and no potable water be allowed for such activities.

## V. Coverage

This policy covers all Class I and Class II urban centers in Karnataka (as listed in Annex 2), and focuses largely on recycling afterwastewater conveyance through sewer networks and treatment at sewage treatment plants. Separate guidance may be developed for smaller cities and towns that may have alternate wastewater conveyance and treatment systems in place, for eg., systems for faecal sludge management.

## VI. Policy Goals

The overall goal of this policy is to establish an enabling environment for the reuse of municipal wastewater to maximize efficient resource use, protect the environment, address water scarcity, and enhance economic output.

Reuse is envisaged under the following broad categories, with associated quality standards (refer Annex 1): (a): agriculture (b): industry (c): urban non-potable, including residential, commercial and institutional (d): environment and (e): energy and nutrient recovery

The Government of Karnataka seeks to be a pioneer regionally in sustainable water resources management in the urban and peri-urban context. Towards this, the specific measures proposed to achieve the policy goals are:

### **Integrated Urban Water Resource Management**

Adopting an integrated approach to water resources in cities, including wastewater, through mainstreaming thinking, planning and implementing measures related to urban water resources in all relevant sectors and departmental domains as a cross cutting issue, and particularly in all urban management endeavours. This would include strengthening state, city and local institutions to take up the approach in planning, implementation and O&M including through partnerships with private sector and community. It is proposed that at least 10 major cities/towns have adopted integrated water resource management plans, developed as multi-sectoral initiatives and incorporating wastewater reuse principles and implementation plans therein, by 2020; and that the initiative be augmented to include all major cities/towns by 2030.

The integrated approach shall account for the hydrological principle of return flows, whereby users of STW are themselves new generators of wastewater, and whereby net withdrawal of the urban hydrological cycle is limited to evapo-transpiration, embedded water in products, and/or lost return flows.

### **Overall Urban Wastewater Generated**

Reuse of not less than 20% STW is targeted, as a combined average across sectors, of total urban wastewater generated for identified Karnataka urban centers by 2020, aligning with the national Service Level Benchmark and with the AMRUT program. For the purposes of this document, agricultural, industrial and urban non-potable uses will be considered to contribute to the reuse target. However, discharge of treated wastewater into water bodies will not be part of the target. Subject to responsible ecological return flow provisions approved under Integrated Urban Water Management Plans, the reuse target shall be increased progressively.

### **Water Consumption by Industry**

In addition, in order to promote a shift in industrial water use from freshwater to treated wastewater, this policy proposes that industrial estates/ zones within [30 km] of a sewage treatment plant (STP) mandatorily examine, as a first option, available STW from the STP, provided that STW of the required quality is made reliably available at a cost to consumer that is comparable to the applicable tariff for provision of fresh water for industrial use in the region. Only if off-take of such STW is shown to be non-viable, will alternate sources of water for use by industry be examined. The Department of Industries and Commerce may set a voluntary target for use of STW to comprise (indicatively) 20% of the total state-wide industrial water use, including energy sector, by 2020. This goal shall be aligned with the volume of STW available for industry as per the integrated urban water management plans of the first (AMRUT) cities targeted under this Policy by 2020.

## Treatment of Urban Wastewater

Cities will strive to progress towards greater capture and treatment of wastewater generated through centralised and decentralised options, with treatment increasingly linked to reuse. With the aim of reducing loads at centralised wastewater treatment facilities, the following decentralised treatment and re-use practices are encouraged, and may be appropriately incentivised:

- For large generators (e.g., residential complexes, hotels...etc.), on-site treatment for localised re-use
- En-route off-take (including at plant gate, prior to treatment) of untreated waste water, at the applicable tariff, for further local treatment and re-use (e.g.: for urban environmental purposes, industry, other uses)

In this context, this policy specifically seeks to acknowledge and encourage the practice of localised treatment of wastewater through constructed wetlands for the express purposes of rejuvenation of urban and peri-urban water bodies, as is currently being practiced in Bangalore city (e.g.: Jakkur lake, Allalassandra lake, Puttenhalli lake, and several others)

## Allocation of Secondary Treated Wastewater

For each urban centre, the allocation of secondary treated wastewater among categories of users viz., industry, agriculture, urban...etc. will be based on the principles of (a): Equity and Fairness, aimed at ensuring access to different user groups, as per need and context

(b): Sustainability, targeting to minimise subsidies required to operate and maintain networks and the wastewater treatment plant to meet regulatory standards for STW quality

## Pricing of Wastewater and Operational Cost Recovery of Wastewater Treatment Plants

In accordance with the Generator Pays Principle, cities have been levying charges for wastewater services on generators as a percentage of water consumption charges<sup>7</sup>. This is envisaged to remain a primary source of revenue for the operation of wastewater systems, including networks, alternate collection systems (if any) and sewage treatment plants; and will be sought to be strengthened through metering, volumetric charges for water consumption, and other means.

However, revenue from the sale of STW can, to a significant extent<sup>8</sup>, contribute to operational costs of wastewater systems. Where adequate demand exists for off-take of the STW generated, urban centres will seek to maximize operational cost recovery of networks and secondary treatment plants, by balancing allocation and tariff for wastewater among various user categories duly considering the following:

- The tariff proposed (in Rs/KL) is applicable at the plant gate, or at in-city locations en-route of the sewerage network<sup>9</sup>. The off-taker is responsible for meeting additional cost of conveyance to a specified location
- The tariff proposed for any user category is comparable to the applicable tariff for provision of freshwater (municipal, industrial or other water supply; excluding agriculture) to the same category
- The principle of cross-subsidy is applied, as required

Where off-take for industrial reuse requires tertiary treatment of a specific volume of STW to be undertaken by the city, operational costs for the same – including disposal of process rejects – shall be recovered from industry through additional charges. Hence tertiary treatment plants are to be established by urban centres only after establishing (conditions for)

<sup>7</sup>For eg., in the case of Bangalore, a fee of 25% of the water charge is raised towards sanitation services. Additionally, properties with borewells are also charged a separate fee for sanitation

<sup>8</sup>In some cases, revenue from sale of STW is adequate to cover the operational costs of STPs

<sup>9</sup>In case of off-take of untreated wastewater, for further treatment by the user

reliable demand /off-take for the entire volume of water so treated to pre-agreed quality standards.

Where off-take of either untreated sewage or STW for agricultural use has been prevalent, consideration shall be made to ensure that the demand is met in accordance with the principles for allocation and pricing outlined above; and without unduly compromising operational sustainability of the network and wastewater treatment plant; while ensuring that the reuse wastewater complies with the applicable regulatory standards for quality.

## VII. Implementation Support for Wastewater Reuse Opportunities

With the aim of achieving the policy goals and systematically identifying wastewater reuse opportunities in cities, Government of Karnataka will support:

### 1. Development of Integrated Urban Water Resources Management Plans

Each ULB will be supported in developing an Integrated Urban Water Resources Management Plan through a consultative process by:

- i. Identifying demand for untreated<sup>10</sup> and secondary treated wastewater by agricultural, industrial and other users, including:
  - Largest potential users of STW, in order to maximize possible revenue streams from the sale of STW
- ii. Ensuring supply of a sufficient volume of secondary treated wastewater for distribution
- iii. Identifying local water resources availability and requirement for environmental flows, along the hydrological principle of return flows outlined above

The ULBs will explore Public Private Partnerships (PPPs) as a possible option for implementation of wastewater reuse projects, focussing on bringing in private sector expertise for sustainable operations and maintenance of wastewater assets, with balanced risk allocation, and performance-based remuneration.

### 2. Establishment of a Wastewater Reuse Resource Center

A global best practice Wastewater Reuse "Resource Center" will be established at state level to act as an information and transaction facilitation cell, aimed at:

- i. **Awareness and Capacity Building:** Building awareness, disseminating information, and augmenting capacity of: (a) ULBs; and (b) potential offtakers of treated wastewater, in the following areas:
  - a. Business/ environmental case for wastewater reuse
  - b. Models for project development and execution, including arrangements for sustainable operations and maintenance (incl. public private partnerships), and performance-based contracting
  - c. Cost-effective options for sewage collection, treatment and reuse, including decentralized solutions
- ii. **Project Assistance:** Assisting ULBs and potential wastewater reuse customers with the following:
  - a. Preparing first-level Integrated Urban Water Resources Management plans
  - b. Identifying viable wastewater reuse projects, with a particular focus on AMRUT cities, aligning with AMRUT investment programs and capacity building goals, where appropriate, in the preliminary phase
  - c. Supporting project structuring and financial/ economic analysis, including pre-feasibility assessments

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<sup>10</sup> Subject to further treatment by the user, to meet applicable regulatory standards, prior to re-use

- d. Facilitating outreach and engagement with off-takers, including coordination and collaboration with Department of Industries and Commerce (DIC) and Karnataka Industrial Areas Development Board (KIADB) for industrial off-take; and Department of Energy for off-take from thermal power plants
- e. Facilitating transaction support through the recruitment of transaction advisors
- f. Supporting cities in tariff setting for supply of secondary treated wastewater in line with principles outlined in Section VI above
- g. Monitoring the implementation of wastewater reuse projects

The Resource Center will support the development of projects, with the aim of ensuring that relevant quality parameters for each reuse category are met, rather than prescribing wastewater technologies. This would encourage the development of innovative, cost-effective, and context-specific solutions for wastewater treatment and reuse.

The Resource Center will establish connections with global partners to reinforce and accelerate the transfer of best practices and shared learning from implementation of wastewater reuse initiatives globally. As part of this, it will keep updated on developments in thinking and practice, including with regard to online tools by leading organisations for water (stress) management.

### 3. Performance Monitoring

Karnataka State Pollution Control Board (KSPCB) will be responsible for monitoring secondary treated wastewater quality from treatment plants, including decentralised units, to ensure compliance with quality standards required for different reuse categories.

### 4. Financing of Wastewater Reuse Projects

Wastewater reuse projects will be aligned to the AMRUT / alternate Government of India program, where appropriate, including drawing upon available AMRUT / other Government of India funding, coordinated by the Directorate of Municipal Administration (DMA).

For individual wastewater reuse projects, financing of implementation will include a combination of:

- Revenues from the sale of secondary treated wastewater, particularly in the case of industrial (including power sector) off-take
- Funding from Government of Karnataka (including DMA under the AMRUT program/ state budget/Urban Development Department budget / ULB budget),
- Capital investments by industry (including power sector) for part of the estimated costs, where feasible

Funding of pre-feasibility and feasibility assessments will be made available from Urban Development Department budgets, including from ULBs and KUWSDB.

## VIII. Roles and Responsibilities

### A: Government of Karnataka: Primary Departments

1. Urban Development Department, through Directorate of Municipal Administration; Karnataka Urban Water Supply and Drainage Board ("KUWSDB"); Karnataka Urban Infrastructure Development and Finance Corporation ("KUIDFC"); and Bangalore Water Supply and Sewerage Board ("BWSSB")

In addition to the implementation support outlined in Section VII above, the Urban Development Department will undertake

- Establishment of the overall enabling environment, including supportive policies, capacity building, financing, IEC and awareness raising, information dissemination, market development...etc. for wastewater reuse projects and investments
- Establishment of a body to oversee and monitor the performance of wastewater reuse projects, including the performance of concessionaires in PPP projects; and constitute a dispute resolution mechanism for the same
- Budget and resource allocation to operationalise Wastewater Reuse Resource Center, including procurement of expertise for pre-feasibility assessments and project development support; coordination and oversight of inputs
- Identification of wastewater reuse opportunities
- Active partnerships with all relevant departments to mainstream an integrated urban water resources management approach in planning and implementation; and implement cross sector STW reuse initiatives

2. **Department of Industries and Commerce, through Karnataka Industrial Areas Development Board**

- Establishment of a voluntary target for treated wastewater to comprise 20% of the total state-wide industrial water use by 2020
- Coordination and outreach to industries to facilitate secondary treated wastewater reuse, particularly in industrial zones and clusters

3. **Department of Energy**

- In compliance with the Government of India's recently revised Power Tariff Policy (2016), coordinate partnerships of thermal power plants with urban centres within 50 km radius for off-take of all STW available; and facilitate operational sustainability of wastewater treatment plants

4. **Department of Forest, Ecology and Environment, through Karnataka Pollution Control Board**

- Establishment of and monitoring of compliance to standards and regulations on wastewater quality norms for various reuse categories

**Secondary Departments**

1. **Water Resources Department**

- Overall water resources allocation and prioritization
- Alignment and consistency with irrigation policies and practices, including Minor Irrigation, for reuse of wastewater by agriculture

2. **Department of Agriculture**

- Monitoring of irrigation practices and use of (untreated) wastewater for food production
- Sensitising farmers to adverse health impacts of use of untreated wastewater

**B: Urban Local Bodies**

- Preparation of Integrated Urban Water Resources Management Plans, including consultations with stakeholder groups for STW demand assessment;

- Ensuring supply of a sufficient volume of secondary treated wastewater for off-take, including through adequate coverage of sewerage network sustained and Information, Education and Communication (IEC) programs to promote connections to the network .
- Outreach to Wastewater Reuse Resource Center for support in project identification, structuring and pre-feasibility assessments .
- Provision of funding for project feasibility assessments

  
(Lalitha Bai. K)

Under Secretary to Government,  
Urban Development Department.



## Annex 1

### Wastewater Reuse Categories:

Municipal wastewater may be used for the following broad purposes, with associated quality standards:

- **Agriculture**
  - **Rationale:** Use of wastewater for nutrient content, in order to increase food production and ensure food security, along with reduced fertilizer use/ costs, to supply growing urban and peri-urban populations
  - **Relevant Standard:** As specified in “Manual on Sewerage and Sewage Treatment Systems”, Central Public Health Engineering and Environment Organisation (CPHEEO), Ministry of Urban Development, Govt. of India, 2013.

#### *Suggested Minimum Water Quality Criteria for Agricultural Reuse*

Parameter	Unit	Value
Intestinal nematodes	No./liter	< 1
Faecal coliforms	MPN/100 ml	Nil (for crop eaten raw) & <230/100 ml (for crops eaten cooked or non-edible crops)
pH		6 – 9

*Source: Chapter 7, Part A of the CPHEEO 2013 Manual on Sewerage and Sewage Treatment*

- **Industry:**
  - **Rationale:** Use of wastewater in production processes and/ or for secondary applications within industrial facilities–
  - **Relevant Standard:** as per industrial reuse requirements

#### *Typical Water Quality Requirements for Industrial Reuse*

Constituent (mg/L)	Industrial Application				
	Boiler Feed	Pulp and Paper	Textiles	Petroleum and Coal	Cooling Water <sup>11</sup>
Calcium	0.01 – 0.4	20	-	75	100
Iron	0.05 – 1.0	0.3 – 1.0	0.1 – 0.3	1	-
Manganese	0.01 – 0.3	0.05 – 0.5	0.01 – 0.05	-	-
Alkalinity as CaCO <sub>3</sub>	40 – 350	100	-	125	-
Chloride	-	200 – 1000	-	300	100
TDS	200 – 700	-	100	1000	-
Hardness as CaCO <sub>3</sub>	0.07 – 350	100	25	350	-
Ammonium - N	0.1	-	-	-	1-3
Phosphate - P	-	-	-	-	0.6
Silica	0.7 – 30	50	-	-	20
Color (Hazen)	-	10 – 30	5	-	-

*Source: Guidance Note for Municipal Wastewater Reuse and Reclamation in India, JICA*

- **Urban non-potable uses, such as residential, commercial, or institutional use**
  - **Rationale:** Associated reduction in freshwater use
  - **Relevant Standard:** Karnataka State Pollution Control Board standards, depending on type of reuse

<sup>11</sup>2013 CPHEEO Manual (Part A Chapter 7) discusses cooling tower water and boiler water in some detail

- **Environment**

- **Rationale:** Discharge of treated wastewater to support wetlands, and supplement water bodies, streams and rivers to increase environmental flows
- **Relevant Standard:** Karnataka State Pollution Control Board standards for discharge into rivers and water bodies; or as specified in CPHEEO 2013

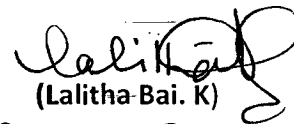
*Suggested Minimum Water Quality Criteria for Environmental/ Recreational Reuse*

Parameter	Unit	Value
BOD5		≤ 10
TSS	mg/L	<5
Faecal coliforms	MPN/100 ml	Nil
pH		6.5 – 8.3
Total Kjeldahl Nitrogen (as N)	mg/L	< 5 for impoundments, < 10 for Horticulture/Golf Course
Dissolved Phosphorus (as P)	mg/L	1
Colour (Hazen)		Non Detect

Source: Chapter 7, Part A of the CPHEEO 2013 Manual on Sewerage and Sewage Treatment

- **Energy and nutrient recovery**

- **Rationale:** Development of circular economy solutions, including business case for energy and nutrient recovery
- **Relevant Standard:** According to global benchmarks of potential energy and nutrient recovery

  
(Lalitha Bai. K)

Under Secretary to Government,  
Urban Development Department.

## Annex 2

**List of Class 1 and Class 2 Cities, and AMRUT Cities in Karnataka**

S. No.	Name	Status	Population	AMRUT City
1	Arsikere	TownOG	53,216	
2	Bāgalkot	City	1,11,933	Yes
3	Bail Hongal	Town	49,182	
4	Basavakalyān	City	69,717	
5	Belgaum	Aggl	6,10,350	Yes
6	Bellary	City	4,10,445	Yes
7	Bengaluru	Aggl	85,20,435	Yes
8	Bhadravati	City	1,51,102	Yes
9	Bhatkal	Aggl	49,730	
10	Bidar	CityOG	2,16,020	Yes
11	Biapur	City	3,27,427	Yes
12	Challakere	Town	55,194	
13	Chamarajanagar	City	69,875	
14	Channapatna	City	71,942	
15	Chikkaballapura	City	63,652	
16	Chigmaglur	City	1,18,401	Yes
17	Chintāmani	City	76,068	
18	Chitradurga	CityOG	1,45,853	Yes
19	Dandeli	City	52,069	
20	Dāvanagere	City	4,34,971	Yes
21	Dod Ballāpur	CityOG	93,105	
22	Gadag-Betigeri	City	1,72,612	Yes
23	Gangāwati	CityOG	1,14,642	Yes
24	Gokāk	City	79,121	
25	Gulbarga	CityOG	5,43,147	Yes
26	Harihar	Aggl	90,502	
27	Hassan	Aggl	1,73,008	Yes
28	Hāveri	City	67,102	
29	Hiriyūr	Town	56,416	
30	Hoskote	Town	56,980	
31	Hospet	City	2,06,167	Yes
32	Hubli Dharwad	City	9,43,788	Yes
33	Hunsūr	Town	50,865	
34	Ilkal	City	60,242	
35	Jamkhandi	City	68,938	
36	Kanakapura	Town	54,014	
37	Karwar	CityOG	77,139	
38	Kolar	City	1,38,462	Yes
39	Kollegal	City	57,149	
40	Koppal	City	70,698	
41	Mandya	City	1,37,358	Yes

42	Mangalore	Aggl	6,23,841	Yes
43	Mudhol	Town	52,199	
44	Mulbāgal	Town	57,276	
45	Mysore	Aggl	9,90,900	Yes
46	Nanjangūd	Town	50,598	
47	Nipāni	City	62,865	
48	Puttūr	Town	53,061	
49	Rabkavi Banhatti	City	77,004	
50	Rāichūr	City	2,34,073	Yes
51	Rāmanagara	City	95,167	
52	Ranībennur	City	1,06,406	Yes
53	Robertson Pet	CityOG	1,62,230	Yes
54	Sāgar	City	54,550	
55	Shāhābād	Aggl	61,262	
56	Shāhpur	Town	53,366	
57	Shimoga	City	3,22,650	Yes
58	Shorāpur	Town	51,398	
59	Sidlaghatta	Town	51,159	
60	Sindhūr	City	75,837	
61	Sira	City	57,554	
62	Sirsi	City	62,882	
63	Siruguppa	Town	52,492	
64	Tiptūr	City	59,543	
65	Tumkūr	City	3,02,143	
66	Udupi (Udipi)	Aggl	1,65,401	Yes
67	Yādgīr	City	74,294	

  
(Lalitha Bai. K)

Under Secretary to Government,  
Urban Development Department.