



Guidelines for Urban Water Conservation

Jal Shakti Abhiyan



सत्यमेव जयते

Ministry of Housing and Urban Affairs
Government of India

Contents

1. Context	3
1.1 Why water conservation is important?	3
1.2 Thrust areas	3
1.3 Coverage	3
2. Interventions	4
2.1 Rain Water Harvesting (RWH)	4
2.2 Reuse of Treated Waste Water	6
2.3 Rejuvenation of Urban Water Bodies	7
2.4 Plantation	9
3. Awareness Campaign	10
4. Funding	10
5. Monitoring	11
6. Documentation	11
7. Summary	11
Annexures	12
Annex 1- A: List of Cities for JSA in Phase I	12
Annex 1 – B: List of Cities for JSA in Phase II	28
Annex-2: Illustrations of Rain Water Harvesting (RWH) Structures	35
Annex-3: Best Practices in Rain Water Harvesting (RWH)	37
Annex-4: Notification of Ministry of Power	39
Annex-5: A Best Practice in Reuse of Treated Waste Water	41
Annex-6: Best Practices in Rejuvenation of Water Bodies	42
Annex-7: Best Practices in Plantation	43

1. Context

1.1 Why water conservation is important?

1.1.1 Sustainable Development Goal 6 (SDG 6) envisages availability and sustainable management of water for all by 2030. India is facing the challenge to serve 17% of the world population with 4% of the world's freshwater resources. Presently designated as a water stressed nation, India stores less than one-tenth of annual rainfall. Furthermore, disproportionate use of water for agricultural use, excessive ground water pumping and deficient monsoon in the last couple of years make the demand-supply balance more critical. As per NITI Aayog, India is facing water crisis with around 50% population experiencing high-to-extreme water shortage.

1.1.2 In order to address water scarcity, it is important to undertake efforts for conservation, restoration, recharge and reuse of water. In this pursuit, Ministry of Jal Shakti (MoJS), Government of India is launching Jal Shakti Abhiyan (JSA) from 1st July, 2019. Ministry of Housing and Urban Affairs (MoHUA) is participating actively in the Jal Shakti Abhiyan (JSA) along with States/UTs/ Urban Local Bodies (ULBs) to make water conservation measures a *Jan Andolan*.

1.2 Thrust areas

- i. Rain Water Harvesting (RWH)
- ii. Reuse of Treated Waste Water
- iii. Rejuvenation of Water Bodies
- iv. Plantation

1.3 Coverage

1.3.1 Ministry of Jal Shakti (MoJS) has identified 255 Districts and 1,597 Blocks across the country as water stressed. From the information made available by MoJS, total 756 ULBs have been identified as water stressed. List of ULBs is at Annex - 1. JSA will be organized in all cities included in Annex 1 – A and Annex 1 - B as below:

Phases	Period	ULBs
Phase I	1 st July – 15 th September, 2019	ULBs in Annex 1 - A
Phase II	1 st October – 30 th November, 2019	ULBs in Annex 1 - B

2. Interventions

2.1 Rain Water Harvesting (RWH)

2.1.1 Rain Water Harvesting (RWH) is collection and storage of rainwater from roof tops, roadside, open areas, etc. which can be stored for further usage or recharged into ground water to augment water resources.

2.1.2 Illustrations of RWH structures taken from Model Building Bye-Laws 2016 (MBBL 2016) are at Annex - 2.

2.1.3 A Rain Water Harvesting system comprises of:

- i. A system or catchment from where water is captured for storage;
- ii. A system of pipes/ducts to carry the harvested water to the storage facility;
- iii. Filter unit for removal of dirt that comes with rain water; and
- iv. Storage tank or ground water recharging structures.

2.1.4 ULBs may undertake the following measures

- i. Enforcement of Building Bye-Laws

RWH needs to be implemented as per the provisions of MBBL, 2016 shared with all States/UTs for adoption. Most of the States/UTs have incorporated RWH in their respective Building Bye-Laws. Cities need to ensure that the RWH provisions are incorporated in their or State Building Bye-Laws (BBLs), as may be applicable.

Thereafter, an effective enforcement mechanism should be put in place for providing RWH structures in all buildings as stipulated under BBL of the city or State/UT.

ii. Establishment of Rain Water Harvesting Cell

Urban Local Bodies (ULBs) should constitute a Rain Water Harvesting Cell which will be responsible for effective monitoring of Rain Water Harvesting in the city. The cell should monitor the extent of ground water extraction and ground water aquifer recharge. This Information should be displayed at prominent locations for public awareness.

iii. Specific measures during JSA:

- a. ULBs should ensure that all government buildings (Central/State/ULB) must have RWH structures. If such structures are there, but not functional, then they should be made functional during this period. If they are not there, as a special drive, RWH structures should be constructed in these buildings for which major work should start during this period.
- b. ULBs should check that all public buildings like educational institutions, commercial establishments, hospitals, etc have got RWH structures. If they are found non-functional during the drive, then they should be made functional. In case they are not there, action needs to be taken to develop such structures during the period.
- c. ULBs should check Group Housing Societies whether they have RWH structures available or not. If they are there, they should be made functional during the drive period. In case they are not there, Resident Welfare Associations (RWAs) should be persuaded to take up its development during the drive period.
- d. ULBs should ensure that in future all building permissions granted must have RWH structures incorporated, as per BBLs, and same should be checked before issuing Occupancy-cum-Completion Certificate (OCC).
- e. Urban public spaces such as road side footpaths and walkways in parks are being concretized. These measures have adverse effect on natural water percolation. Concretization increases surface run-off and restricts natural percolation of water contributing to urban flooding. ULBs should undertake de-concretizing of pavements

around trees. ULBs should lay perforated paver blocks which allow water to percolate into the ground along tree roots.

2.1.5 List of best practices in RWH is enclosed as Annex-3.

2.2 Reuse of Treated Waste Water

2.2.1 Considering the growing need of water demand in urban areas and depleting water resources, there is a need to explore alternatives to fresh water. To optimize the use of water, it is important to undertake treatment of waste water and reuse it. Reuse of treated waste water provides an alternative to fresh water where water is required for non-potable use. The water reclaimed from waste water can be used for toilet flushing, agriculture/horticulture, fire hydrants, industries, construction activities, power plants, etc.

2.2.2 National Urban Sanitation Policy 2008 mandates reuse of at least 20% of treated waste water.

2.2.3 In order to promote reuse of treated waste water, State Government and ULBs should undertake the following measures:

- i. Provision of dual piping under Building Bye-Laws should be checked in all government (Central/State/UT/ULB) buildings, commercial complexes, public buildings like educational institutions, hospitals, and Group Housing Societies, whether the same is available, so that the treated waste water can be used for horticulture, toilet flushing and fire hydrants. If it already exists, then its functionality should be checked, and made fully operational during JSA. If it is not there, then action should be taken to ensure that these buildings have dual piping systems.
- ii. In all new government buildings/Group Housing Societies, public buildings, whenever building plan is approved, it should be ensured that there should be dual piping as has been provided in City/State/UT BBLs. At the time of inspection for issuance of Occupancy-cum-Completion Certificate, compliance of provision of Building Bye-Laws for dual piping to reuse the treated waste water should be checked thoroughly.
- iii. In case, city has got sewage treatment plants (STPs), ULB should ensure that treated waste water is used for the following purposes:
 - a. Recycling for use in agriculture / horticulture;

- b. Fire hydrants;
- c. Large scale construction activities;
- d. Made available to industry if it consumes water in bulk;
- e. Supplied to power plants located within 50 Km of the city. As per directions of Ministry of Power, Tariff Policy Circular dated 28 January, 2016, it is mandatory that power plants within 50 kms from STPs have to develop a system for conveyance and use treated waste water. Copy of the Circular is enclosed at Annex-4.

2.2.4 Best Practice in Reuse of Treated Waste Water is listed at Annex-5.

2.3 Rejuvenation of Urban Water Bodies

2.3.1 Urban water bodies such as lakes, ponds, step-wells, and baolis have traditionally served the function of meeting water requirements of drinking, washing, agriculture, fishing and religious/cultural purposes. Surface water bodies and traditional water harvesting structures in several cities have either dried up, or disappeared due to encroachment, dumping of garbage, and entry of untreated sewage. These water bodies, if revived, can store water and recharge ground water besides improving amenity value of the area.

2.3.2 Every city must initiate action to revive at least one water body during Jal Shakti Abhiyan. ULBs should identify all the water bodies in the city and select one for rejuvenation through public consultations.

2.3.3 ULBs should undertake following measures to rejuvenate the water bodies:

- i. Water body should be cleaned through bio-remediation measures, de-silting, aeration, removal of floating and other invasive aquatic plant-species or any other technology suiting local conditions.
- ii. Shore-line of the water bodies should be properly fenced to protect them from encroachment. Inlet and outlet of the water body should be strengthened.

- iii. Inflow of domestic/ industrial sewage into the water body should be arrested and only treated effluent adhering to standards prescribed by CPCB may be allowed into the water body.
- iv. Catchment area treatment via afforestation, storm water drainage management, silt traps, etc. may be undertaken.
- v. Water front development around the water body may be taken up, keeping in view the eco-system based approach for the aquatic body, conforming to prevalent environmental legislation and maintaining social and cultural sanctity of the place.
- vi. Creation of public spaces may be taken up to ensure public eye and vigilance to protect from encroachment or throwing garbage.
- vii. Street vendor zones may be developed close to the water body, in convergence with National Urban Livelihood Mission (DAY-NULM).
- viii. Public toilets may be provided in convergence with SBM-Urban.
- ix. Participation of private sector, community based organizations, philanthropic foundations may be encouraged in rejuvenation and maintenance of water bodies.

2.3.4 Monitoring

- i. ULBs should monitor quality of water in the selected body on weekly basis and undertake appropriate action to improve wherever necessary.
- ii. Each water body may be geo-tagged with photographs.

2.3.5 Some of the best practices in Rejuvenation of Water Bodies are listed at Annex-6.

2.4 Plantation

2.4.1 Plantation plays a significant role in absorption of storm and rainwater for maintenance of ground water table, prevention of soil erosion and run-off and encourage growth of natural habitat for flora and fauna.

2.4.2 ULBs should undertake plantation near water bodies, public spaces, parks and on roadside to improve green cover and water cycle.

2.4.3 Measures to be taken by ULBs:

- i. Such places where plantation could be done during the rainy season like roadside, around water bodies or vacant public spaces should be identified at the earliest.
- ii. Water hardy indigenous variety of trees should be identified for plantation and preferably tall plants (4-6 feet) may be used.
- iii. In collaboration with District Forest Department/Horticultural Department, special drive needs to be taken up during JSA to plant such trees in identified areas.
- iv. Adequate measures need to be taken up to protect and nurture such plants to ensure their survival.
- v. Special drive may be taken up to motivate Resident Welfare Associations (RWAs), Civil Society Organizations (CSOs), NCC, NSS, NYK, etc to plant trees at large scale in the resident colonies, schools, public buildings etc, in the city during JSA.

2.4.4 Some of the best practices in urban plantation are listed at Annex-7.

3. Awareness Campaign

- 3.1 There is need for public awareness regarding water conservation. Jal Shakti Abhiyan has been designed to achieve greater public participation in the efforts being undertaken by Centre/States/UTs/ULBs in this regard. Local communities need to be mobilized to play a vital role in efforts being undertaken under JSA. ULBs should undertake measures to encourage collective ownership in management of water available locally.
- 3.2 ULBs should engage RWAs, schools, businesses, Civil Society Organizations (CSOs), Nehru Yuva Kendras (NYKs), NSS volunteers, NCC cadets, SHGs formed under DAY-NULM, elected representatives, Swachhagrahis to organize door to door outreach, community events, workshops, flyers, banners, wall paintings, street plays, social media, etc. for dissemination and building awareness for all four enlisted Water Conservation measures in urban areas. Leading personalities in films, sports, social work or public life may be invited to the campaigns.

4. Funding

- 4.1 AMRUT guidelines allow funding for rejuvenation of water bodies in AMRUT cities. ULBs should undertake rejuvenation of at least one water body in their jurisdiction, availing the funds under AMRUT. For this purpose, savings from already approved SAAP projects may be utilized with the approval of State level High Powered Steering Committee (SHPSC). In cities not covered under AMRUT, ULBs should utilize State Funds, grants available under 14th Finance Commission or State Finance Commission or explore financing through funds available as Corporate Social Responsibility or utilize Land Value Capture Finance framework for monetizing some land. Funds available under DAY-NULM can be tapped for developing Street Vending Zones (SVZs) near the water body to promote public eye and vigilance for protection and maintenance of water bodies.
- 4.2 AMRUT guidelines have been amended on 29.06.2019 to provide for utilization of State A&OE funds for mass awareness campaign regarding water conservation measures. State's own resources, Central and State Finance Commission funds may also be utilized

for mass campaign besides mobilizing Corporate Social Responsibility funds and contributions from Resident Welfare Associations or Civil Society Organizations (CSOs).

5. Monitoring

- 5.1 In order to ensure effective monitoring, it is important to establish a clear baseline and benchmark for State/UT/ULB level performance on implementation of Rain Water Harvesting, Rejuvenation of Water Bodies, Reuse of Treated Waste Water and Plantation. The progress needs to be monitored on a real-time basis to ascertain the progress of ULBs and gaps therein in each of the thrust areas under JSA.
- 5.2 Following measures of monitoring will be undertaken:
- State/UT/ULB level reporting
 - Video Conferencing with State/UT governments at the Centre level and ULBs at the State/UT level
 - Uploading of progress and photographs on the websites and dashboards of Ministries of Jal Shakti and Housing and Urban Affairs.

6. Documentation

- 6.1 ULBs are encouraged to document their experiences and innovative practices which have led to successful implementation of water conservation measures and upload the same on the websites of Ministries of Jal Shakti and Housing and Urban Affairs. Such documentation may be used in future workshops, consultations, cross-learning and replicating best practices within and outside the States/UTs with/without local adaptive modifications.

7. Summary

- 7.1 In brief, States/UTs/ULBs are requested to carry out focused activities during two phases between 1st July, 2019 to 15th September, 2019 and 1st October 2019 to 30th November 2019 to promote and develop the culture of water conservation in urban areas which have been identified as water stressed. The crux of this drive is building large scale awareness campaign so that conservation of water becomes a *Jan Andolan*. For this purpose, suggested activities and other innovative activities on these lines may be undertaken by the States/UTs/ULBs during the JSA period.

Annexures

Annex 1- A: List of Cities for JSA in Phase I

List of Water Stressed Urban Local Bodies (ULBs)

State /UT	District	ULB	Affected Districts /ULBs
Andaman & Nicobar Island	South Andaman	Port Blair	1/1
Arunachal Pradesh	Upper Subansari	Daporijo (NT)	1/1
Assam	North Cachar Hills	Haflong	1/1
Bihar	Nalanda	Rajgir (NP)	12/16
		Bihar Sharif	
	Patna	Patna (M. Corp)	
		Phulwari Sharif (NP)	
	Bhojpur	Arrah	
		Koilwal	
		Behea	
	Jehanabad	Jehanabad	
	Begusarai	Begusarai	
	Gaya	Gaya	
	Gopalganj	Gopalganj	
	Katihar	Katihar	
	Muzaffarpur	Muzaffarpur	
	Nawada	Nawada	
	Saran	Chappra	
	Vaishali	Hajipur	
Chandigarh	Chandigarh	Chandigarh (M. Corp)	1/1
Chattisgarh	Balod	Gurur	2/3
		Balod	
	Raipur	Raipur (M. Corp)	

D&N Haveli	Dadra and Nagar Haveli	Dadra and Nagar Haveli	1/1
Daman& Diu	Diu	Diu	1/1
Delhi	Central Delhi		10/4
	Delhi Shahdara		
	East Delhi	East DMC (M.Corp)	
	New Delhi	NDMC (M. CI)	
	North - West Delhi	North DMC(M. Corp)	
	North-EastDelhi		
	South Delhi	South DMC (M. Corp)	
	South East Delhi		
	SOUTH WEST		
	West Delhi		
Goa	South Goa	Margao	1/5
		Mormugao (M CI)	
		Quepem (M CI)	
		Sanguem (M CI)	
		Canacona (M CI)	
Gujarat	Katchh	Bhachau (M)	5/22
		Anjar (M)	
		Bhuj (M) (HQ)	
		Mandvi (M)	
	BanasKantha	Tharad (M)	
		Dhanera (M)	
		Palanpur (M) (HQ)	
		Deesa (M)	
	Gandhinagar	Mansa (M)	
		Gandhinagar (NA) (HQ)	
		Dehgam (M)	
		Kalol (M)	
	Patan	Sidhpur (M)	
		Patan (M) (HQ)	
		Chanasma (M)	
	Mahasena	Kheralu (M)	
		Unjha (M)	
		Visnagar (M)	
		Vadnagar (M)	

		Vijapur (M)	
		Mahesana (M) (HQ)	
		Kadi (M)	
Haryana	Ambala	Ambala (M.Corp)	19/52
		Naraingarh (MC)	
		Barara	
	Yamunanagar	Yamunanagar (M Corp)	
		Radaur (MC)	
	Kurukshetra	Kurukshetra (M. CI)	
		Shahbad (MC)	
		Pehowa (MC)	
		Thanesar (M CI)	
		Ladwa (MC)	
	Kaithal	Kaithal (M CI)	
		Kalayath (MC)	
		Pundri (MC)	
		Rajound	
	Karnal	Nilokheri (MC)	
		Karnal (M CI)	
		Nissing (MC)	
		Assandh (MC)	
		Gharaunda (MC)	
	Panipat	Panipat (M CI)	
		Samalkha (MC)	
	Sonipat	Ganaur (MC)	
		Sonipat (M CI)	
	Jind	Uchana (MC)	
		Jind (M CI)	
		Safidon (MC)	
	Fatehabad	Ratia (MC)	
		Tohana (M CI)	
		Fatehabad (M CI)	
		Bhuna	
	Sirsa	Sirsa (M CI)	
		Rania (MC)	
		Ellenabad (MC)	
	Hisar	Hisar (M. Corp)	
		Barwala (MC)	

		Narnaund (MC)	
	Bhiwani	Bhiwani (M CI)	
		Loharu (MC)	
	Mahendragarh	Kanina (MC)	
		Mahendragarh (MC)	
	Rewari	Rewari (M CI)	
	Gurgaon	Pataudi (MC)	
		Gurgaon (M Corp.)	
		Sohna (MC)	
	Mewat	Nuh (MC)	
		Taoru (MC)	
		Punahana (MC)	
	Faridabad	Faridabad (M Corp.)	
	Palwal	Palwal (M CI)	
		Hathin (MC)	
		Hodal (MC)	
	Charkhi Dadri	Charkhi Dadri (MC)	
Himachal Pradesh	Una	Una (M CI)	4/5
	Solan	Solan (M CI)	
		Nalagarh (M CI)	
	Sirmaur	Nahan (M CI)	
	Kangra	Kangra (M CI)	
Jammu & Kashmir	Kargil	Kargil (MC)	1/1
Jharkhand	Dhanbad	Dhanbad (M Corp.)	2/2
	Bokaro	Bokaro Steel City	
Kerala	Kasadgod	Kasaragod (M)	2/3
	Pallakkad	Pallakkad	
		Chittur-Thathamangalam (M)	
Madhya Pradesh	Neemuch	Jawad (NP)	11/29
		Neemuch (M) (HQ)	
	Mandsaur	Bhanpura (NP)	

		Malhargarh (NP)	
		Mandsaur (M) (HQ)	
		Sitamau (NP)	
	Ratlam	Piploda (NP)	
		Jaora (M)	
		Alot (NP)	
		Ratlam (M Corp.) (HQ)	
	Ujjain	Ujjain (M Corp.) (HQ)	
		Badnagar (M)	
	Agar Malwa	Agar (HQ)	
		Susner (NP)	
		Nalkheda (NP)	
	Shajapur	Shajapur (M) (HQ)	
		Pankhedi(Kala pipal)	
	Dewas	Sonkatch (NP)	
		Dewas (M Corp.) (HQ)	
	Dhar	Badnawar (NP)	
		Dhar (M) (HQ)	
	Indore	Depalpur (NP)	
		Sawer (NP)	
		Indore (M Corp.) (HQ)	
	Barwani	Barwani (HQ) Pansemal (NP)	
	Rajgarh	Rajgarh (HQ) Sarangpur (M)	
		Narsinghgarh (M)	
Maharashtra	Jalgaon	Jalgaon (M CI)	8/27
		Yawal (M CI)	
		Raver (M CI)	
	Buldana	Buldhana (M CI)	
		Jalgaon (Jamod) (M CI)	
		Sangrampur (NP)	
	Amravati	Amravati (M CI)	
		Achalpur (M CI)	

		Chandurbazar (M CI)	
		Morshi (M CI)	
		Warud (M CI)	
	Nashik	Nashik (M. Corp)	
		Deolali (CB)	
		Sinnar (M CI)	
		Niphad NP	
	Pune	Pune (M. Corp)	
		Shirur (M CI)	
	Ahmadnagar	Ahmednagar (M. corp)	
		Sangamner (M CI)	
		Kopargaon (M CI)	
		Rahuri (M CI)	
		RahtaPimplas (M CI)	
		Shrirampur (M CI)	
	Solapur	Solapur	
		Malshiras	
	Sangli	Kavathemahal	
		Sangli (HQ)	
Manipur	Senapati	Senapati	1/1
Meghalaya	East Garo Hills	Williamnagar	1/1
Mizoram	Saiha	Saiha (NT)	1/1
Nagaland	Longleng	Longleng (TC)	1/1
Odisha	Kendrapara	Pattamundai (M)	1/2
		Kendrapara (M)	
Punjab	Gurdaspur	Gurdaspur (M CI)	20/82
		Dhariwal (M CI)	
		Fatehgarh Churian (M CI)	
		Batala (M CI)	
		Qadian (M CI)	

		Sri Hargobindpur (M CI)	
		Dera Baba Nanak (M CI)	
	Kapurthala	Kapurthala (M CI)	
		Dhilwan (NP)	
		Sultanpur (M CI)	
		Phagwara (M CI)	
		Nadala	
	Jalandhar	Lohian Khass (NP)	
		Shahkot (NP)	
		Nakodar (M CI)	
		Phillaur (M CI)	
		Nurmahal (M CI)	
		Jalandhar Cantt. (CB)	
		Jalandhar (M Corp.)	
		Adampur (M CI)	
		Bhogpur (NP)	
	Hoshiarpur	Urmur Tanda (M CI)	
		Dasua (M CI)	
		Gardhiwala (M CI)	
		Hoshiarpur (M CI)	
	SBS Nagar	Banga (M CI)	
		Nawanshahr (M CI)	
	Sirhind	Fatehgarh Sahib (M CI)	
		Bassi Pathana (M CI)	
		Khamanon (NP)	
	Ludhiana	Machhiwara (M CI)	
		Samrala (M CI)	
		Khanna (M CI)	
		Doraha (M CI)	

		Ludhiana (M Corp.)	
		Raikot (M CI)	
		Jagraon (M CI)	
	Moga	Bagha Purana (M CI)	
		Moga (M CI)	
		Dharamkot (M CI)	
	Ferozepur	Ferozepur (M CI)	
		Firozpur Cantt (CB)	
		Guru Har Sahai (M CI)	
	Fazilka	Fazilka (M CI)	
		Jalalabad (M CI)	
	Faridkot	Faridkot (M CI)	
		Kot Kapura (M CI)	
	Bathinda	Bathinda (M Corp.)	
		Maur (M CI)	
	Mansa	Mansa (M CI)	
		Sardulgarh (NP)	
		Bareta (M CI)	
		Budhlada (M CI)	
		Bhikhi (NP)	
	Patiala	Samana (M CI)	
		Patran (M CI)	
		Ghagga (NP)	
		Nabha (M CI)	
		Rajpura (M CI)	
		Patiala (M Corp.)	
		Sanaur (M CI)	
		Ghanaur (NP)	
	Ajnala	Ajnala (NP)	
		Majitha (M CI)	
		Jandiala (M CI)	
		Rayya (NP)	
	Taran Taran	Tarn Taran (M CI)	
		Patti (M CI)	
		Bhikhiwind	

	Rupnagar	Rupnagar (M CI)	
		Chamkaur Sahib (NP)	
		Morinda (M CI)	
	Mohali	SAS Nagar (M Corp)	
		Kharar (M CI)	
		Dera Bassi (M CI)	
	Sangrur	Ahmedgarh (M CI)	
		Malerkotla (M CI)	
		Dhuri (M CI)	
		Bhawanigarh (M CI)	
		Sangrur (M CI)	
		Lehragaga (M CI)	
	Barnala	Barnala (M CI)	
Rajasthan	Ajmer	Ajmer (HQ)	29/111
		Sarwar (M)	
		Kekri (M)	
	Bikaner	Bikaner (M Corp.) (HQ)	
		Nokha (M)	
	Churu	Churu (HQ)	
		Rajgarh (M)	
		Bidasar (M)	
		Sujargarh (M)	
	Jhunjhunun	Jhunjhunun (M CI) (HQ)	
		Surajgarh (M)	
		Chirawa (M)	
		Khetri (M)	
		Nawalgarh (M)	
		Udaipurwati (M)	
	Alwar	Alwar (HQ)	
		Behror (M)	
		Tijara (M)	
		Rajgarh (M)	
		Kishangarhbas MB	
	Bharatpur	Bharatpur (HQ)	
		Kaman (M)	
		Nagar (M)	

		Deeg (M)	
		Nadbai (M)	
		Kumher (M)	
		Weir (M)	
		Bayana (M)	
		Rupbas	
	Dhaulpur	Dhaulpur (M) (HQ)	
		Rajakhera (M)	
	Karauli	Todabhim (M)	
		Hindaun (M)	
		Karauli (M) (HQ)	
	SawaiMadhopur	Gangapur City (M)	
		SawaiMadhopur (M)	
	Dausa	Bandikui (M)	
		Dausa (M) (HQ)	
		Lalsot (M)	
		Mahwa	
	Jaipur	Jaipur (HQ)	
		Kotputli (M)	
		Viratnagar (M)	
		Shahpura (M)	
		Sambhar (M)	
		Chaksu (M)	
	Sikar	Sikar (HQ)	
		Lachhmangarh (M)	
		Khandela (M)	
		Sri Madhopur (M)	
		Neem-Ka- Thana (M)	
	Nagaur	Nagaur (HQ)	
		Ladnu (M)	
		Didwana (M)	
		Mundwa (M)	
		Merta City (M)	
		Parbatsar (M)	
		Makrana (M)	
		Kuchaman City (M)	
		Nawa (M)	
		Degana	
	Jodhpur	Jodhpur (HQ)	
		Phalodi (M)	

		Pipar City (M)	
		Bilara (M)	
	Jaisalmer	Jaisalmer (M) (HQ)	
	Barmer	Barmer (HQ)	
		Balotra (M)	
	Jalor	Jalor (M) (HQ)	
		Bhinmal (M)	
		Sanchore (M)	
	Sirohi	Sheoganj (M)	
		Sirohi (M) (HQ)	
		Abu Road (M)	
	Pali	Jaitaran (M)	
		Sojat (M)	
		Pali (M CI) (HQ)	
		Rani (M)	
		Sumerpur (M)	
		Bali (M)	
	Tonk	Tonk (HQ)	
		Malpura (M)	
		Niwai (M)	
		Uniara (M)	
	Bundi	Bundi (HQ)	
		Nainwa (M)	
	Bhilwada	Asind (M)	
		Shahpura (M)	
		Bhilwara (M CI) (HQ)	
		Jahazpur (M)	
		Mandalgarh (M)	
	Rajsamand	Deogarh (M)	
		Amet (M)	
		Rajsamand (M) (HQ)	
	Chittaurgarh	Begun (M)	
		Rawatbhata (M)	
		Chittaurgarh (M) (HQ)	
		Kapasan (M)	
		Nimbahera (M)	
		Bari Sadri (M)	
	Kota	Kota (HQ)	
		Sangod (M)	
	Baran	Baran (M) (HQ)	
		Chhabra (M)	

	Jhalawar	Jhalawar (HQ)	
		Jhalrapatan (M)	
		Pirawa (M)	
	Udaipur	Udaipur (HQ)	
		Bhinder (M)	
	Pratapgarh	Chhoti Sadri (M)	
		Pratapgarh (M)	
Sikkim	South Sikkim	Namchi (M CI)	1/2
		Jorethang (NP)	
Telangana	Adilabad	Adilabad	24/29
	Bhadradri	Kothagudem	
	Bhopapalli	Bhupalpalle	
	Hyderabad	GHMC (M Corp.)	
		Secunderabad Cantt.	
	Jagtial	Jagtial	
	Jangaon	Jangaon (M)	
	Kamareddy	Kamareddy	
	Karimnagar	Karimnagar	
		Ramagundam (M)	
		Metpalle (M)	
	Mahaboobnagar	Mahabubnagar	
	Mahabubabad	Mahabubabad	
	Medak	Medak	
	Medchal Malkajgiri	Medchal(NP)	
	Nagarkurnool	Nagarkurnool	
	Nalgonda	Nalgonda	
	Nizamabad	Nizamabad (M Corp.)	
		Armur (M)	
	Rajanna Siricilla	Sircilla (M)	
	Rangareddy	Shamshabad	
	Sangareddy	Sangareddy	
	Siddipet	Siddipet	
	Suryapet	Suryapet	
	Wanaparthy	Wanaparthy	
	Warangal Urban	Warangal (M.Corp.)	

	Warangal	Warangal	
	Yadadri Bhongiri	Bhongir (M)	
Tripura	Khowai	Khowai (NP)	1/2
		Teliamura (NP)	
Uttarakhand	Nainital	Bhimtal (NP)	1/4
		Nainital (M.CI)	
		Haldwani-cum-Kathgodam (NPP)	
		Ramnagar (NPP)	
Uttar Pradesh	Agra	Etmadpur (NPP)	35/84
		Agra (M Corp.) (HQ)	
		Achhnera (NPP)	
		FatehpurSikri (NPP)	
		Shamsabad (NPP)	
		Fatehabad (NP)	
	Aligarh	Aligarh (M Corp.) (HQ)	
		Iglas (NP)	
	Allahabad	Allahabad (M Corp.) (HQ)	
	Baghpat	Baghpat (NPP) (HQ)	
		Khekada (NP)	
	Bijnor	Bijnor (HQ)	
		Noorpur (NPP)	
	Budaun	Budaun (HQ)	
		Islamnagar (NP)	
	Bulandshahr	Sikandrabad (NPP)	
		Bulandshahr (NPP) (HQ)	
		Gulaothi (NPP)	
		Bhawan Bahadur Nagar (NP)	
		Siana (NPP)	
		Shikarpur (NPP)	

		Khurja (NPP)	
	Chitrakoot Dham (Karwi)	ChitrakootDham (Karwi) (NPP) (HQ)	
	Etah	Etah (HQ)	
		Jalesar (NPP)	
	Firozabad	Tundla (NPP)	
		Firozabad (M.Corp.) (HQ)	
		Shikohabad (NPP)	
	Ghaziabad	Loni (NPP)	
		Ghaziabad (M Corp.) (HQ)	
	Hapur	Hapur (NPP) (HQ)	
		Garhmukhteshwar (NPP)	
	Jaunpur	Jaunpur (HQ)	
		Kerakat (NP)	
	Amroha	Dhanaura (NPP)	
		Amroha (HQ)	
		Gajraula (NPP)	
		Joya (NP)	
		Hasanpur (NPP)	
	Kannauj	Kannauj (HQ)	
		Talgram (NP)	
	Kanpur Urban	Kanpur (M Corp.) (HQ)	
		Ghatampur (NPP)	
	Kasganj	Kasganj (NPP) (HQ)	
	Kaushambi	Chail (NP)	
		Manjhanpur (HQ)	
	Hathras	Sasni (NP)	
		Hathras (NPP) (HQ)	
		Mursan (NP)	
		Sahpau (NP)	
	Mathura	Raya (NP)	
		Mathura (HQ)	
		Baldeo (NP)	
	Meerut	Parikshitgarh (NP)	

		Meerut (M Corp.) (HQ)	
		Kharkhoda (NP)	
	Mirzapur-cum-Vindhyachal	Mirzapur-cum-Vindhyachal (NPP) (HQ)	
	Moradabad	Moradabad (M Corp.) (HQ)	
		Bilari (NPP)	
	Muzaffarnagar	Muzaffarnagar (HQ)	
		Charthawal (NP)	
		Budhana (NP)	
	Pratapgarh	Pratapgarh City (NP) (HQ)	
		Patti (NP)	
	Saharanpur	Saharanpur (HQ)	
		Sarsawa (NPP)	
		Nakur (NPP)	
		Gangoh (NPP)	
		Deoband (NPP)	
		Nanauta (NP)	
		Rampur Maniharan (NP)	
	Sambhal	Sambhal (NPP) (HQ)	
	Bhadohi	Bhadohi (NPP) (HQ)	
		Gyanpur (NP)	
	Shamli	Un (NP)	
		Kairana (NPP)	
		Kandhla (NPP)	
		Shamli (NPP) (HQ)	
	Varanasi	Varanasi (M Corp.) (HQ)	
	Fatehpur	Fatehpur City	
	G B Nagar	Noida	
	Mahoba	Mahoba	
	Mainpuri	Mainpuri	
	Rampur	Rampur	
West Bengal	Hooghly	Hooghly-Chinsura	1/1

Summary

Name of States/UTs	No of Affected Districts	ULBs
Andaman & Nicobar Islands	1	1
Arunachal Pradesh	1	1
Assam	1	1
Bihar	12	16
Chandigarh	1	1
Chhattisgarh	2	3
D&N Haveli	1	1
Daman& Diu	1	1
Delhi	10	4
Goa	1	5
Gujarat	5	22
Haryana	19	52
Himachal Pradesh	4	5
Jammu and Kashmir	1	1
Jharkhand	2	2
Kerala	2	3
Madhya Pradesh	11	29
Maharashtra	8	27
Manipur	1	1
Meghalaya	1	1
Mizoram	1	1
Nagaland	1	1
Odisha	1	2
Punjab	20	82
Rajasthan	29	111
Sikkim	1	2
Telangana	24	29
Tripura	1	2
Uttaranchal	1	4
Uttar Pradesh	35	84
West Bengal	1	1
TOTAL	200	496

Annex 1 – B: List of Cities for JSA in Phase II

List of Water Stressed Urban Local Bodies (ULBs)

Affected by Returning Monsoon

State	District	ULB		
Andhra Pradesh	West Godavari	Eluru	Affected Distts-9 ULBs-18	
		Jangareddygudem		
	Prakasam	Ongole		
		Markapur (M)		
		Giddaluru(NP)		
	YSR	Kadapa		
		Rajampet (NP)		
	Anantpur	Anantpur		
		Tadpatri (M)		
		Hindupur (M)		
		Puttaparthi		
		Madakasira		
	Chittoor	Chittoor		
		Tirupati (M Corp.)		
	Guntur	Guntur		
		Krishna	Machilipatnam	
		Srikakulam	Srikakulam	
		Kurnool	Kurnool	
	Karnataka	Belgaum	Belgaum (HQ)	Affected Distts-18 ULBs-57
Athni (TMC)				
Saundatti-Yellamma (TMC)				
Ramdurg (TMC)				
Bijapur		Vijayapura (HQ)		
		Indi (TMC)		
Bagalkot		Mudhol (TMC)		
		Badami (TMC)		
		Bagalkot (CMC) (HQ)		
Koppal		Koppal (HQ)		
		Yelbarga (TP)		
Gadag-Betigeri		Ron (TMC)		
		Gadag-Betigeri (CMC) (HQ)		
Haveri		Haveri (HQ)		
		Ranibennur (CMC)		
Bellary		Ballari (HQ)		
		Hagaribommanahalli (TMC)		
Chitradurga		Challakere (TMC)		

		Chitradurga (CMC) (HQ)	
		Holalkere (TP)	
		Hosdurga (TMC)	
		Hiriyur (TMC)	
	Devanagere	Harapanahalli (TMC)	
		Jagalur (TP)	
		Davanagere (M Corp.) (HQ)	
		Channagiri (TP)	
	Chikmagalur	Chikmagalur (HQ)	
		Kadur (TMC)	
	Tumkur	Tumakuru (HQ)	
		Chiknayakanhalli (TMC)	
		Sira (CMC)	
		Tiptur (CMC)	
		Madhugiri (TMC)	
		Koratagere (TP)	
	Bangalore Urban	BBMP (M Corp.)	
		Anekal (TMC)	
	Hassan	Hassan (HQ)	
		Arsikere (TMC)	
		Channarayapatna (TMC)	
	Chamarajanagar	Chamarajanagar	
		Gundlupet (TMC)	
		Srinivaspur (TMC)	
	Kolar	Kolar (CMC)	
		Malur (TMC)	
		Bangarapet (TMC)	
		Mulbagal (TMC)	
	Chikkaballapura	Chikkaballapura (CMC)	
		Bagepalli (TMC)	
		Chintamani (CMC)	
	Bangalore Rural	Bengaluru	
		Nelamangala (TMC)	
		DodBallapur (CMC)	
		Devanahalli (TMC)	
		Hosakote (CMC)	
	Ramanagara	Magadi (TMC)	
		Ramanagara (CMC)	
		Kanakapura (TMC)	

Puducherry	Puducherry	Puducherry	Affected Distts-1
			ULB-1

Tamil Nadu	Chennai	Chennai (M Corp.) (HQ)	Affected Distts-27
	Coimbatore	Mettupalayam (M)	ULBs-184

		Karumathampatti (TP)	
		Sulur (TP)	
		Annur (TP)	
		Coimbatore (M Corp.) (HQ)	
		Thondamuthur (TP)	
		Perur (TP)	
		Alanthurai (TP)	
		Madukkarai (TP)	
		Othakalmandapam (TP)	
		Thirumalayampalayam (TP)	
		Kinathukadavu (TP)	
		Periyanegamam (TP)	
		Pollachi (M)	
		Anaimalai (TP)	
		Kottur (TP)	
	Cuddalore	Cuddalore (HQ)	
		Nellikuppam (M)	
		Virudhachalam (M)	
		Pennadam (TP)	
	Dharmapuri	Dharmapuri (HQ)	
		Palakkodu (TP)	
		Marandahalli (TP)	
		Kambainallur (TP)	
		Kadathur (TP)	
		Pappireddipatti (TP)	
		Papparapatti (TP)	
		Pennagaram (TP)	
	Dindigul	Dindigul (HQ)	
		Neikkarapatti (TP)	
		Ayakudi (TP)	
		Oddanchatram (TP)	
		Palayam (TP)	
		Vedasandur (TP)	
		Eriodu (TP)	
		Ayyalur (TP)	
		Vadamadurai (TP)	
		Dindigul (M)	
		Chinnalapatti (TP)	
		Ayyampalayam (TP)	
		Nilakkottai (TP)	
	Erode	Sathyamangalam (M)	

		Bhavanisagar (TP)	
		Punjaipuliampatti (M)	
		Ammappettai (TP)	
		Anthiyur (TP)	
		Athani (TP)	
		Kasipalayam (G) (TP)	
		Elathur (TP)	
		Nambiyur (TP)	
		Perundurai (TP)	
		Chennimalai (TP)	
		Erode (M.Corp) (HQ)	
		Modakurichi (TP)	
		Kilampadi (TP)	
		Arachalur (TP)	
		Kodumudi (TP)	
	Karur	Pallapatti (TP)	
		TNPL Pugalur (TP)	
		Karur (M) (HQ)	
	Krishnagiri	Hosur (M)	
		Bargur (TP)	
		Krishnagiri (M) (HQ)	
		Uthangarai (TP)	
	Madurai	A.Vellalapatti (TP)	
		Palamedu (TP)	
		Usilampatti (M)	
		Thirumangalam (M)	
		Madurai (M Corp.) (HQ)	
	Nagapattinam	Nagapattinam (HQ)	
		Sirkali (M)	
		Vaitheeswarankoil (TP)	
		Mayiladuthurai (M)	
		Kuthalam (TP)	
	Namakkal	Mallasamudram (TP)	
		Kumarapalayam (M)	
		Tiruchengode (M)	
		Vennanthur (TP)	
		Namagiripettai (TP)	
		Rasipuram (M)	
		Kalappanaickenpatti (TP)	
		Senthamangalam (TP)	
		Namakkal (M) (HQ)	

		Erumaipatti (TP)	
		Mohanur (TP)	
		Paramathi (TP)	
		Pandamangalam (TP)	
	Perambalur	Perambalur (M) (HQ)	
		Kurumbalur (TP)	
	Pudukkottai	Pudukkottai (HQ)	
		Keeramangalam (TP)	
	Salem	Mecheri (TP)	
		Mettur (M)	
		Nangavalli (TP)	
		Kadayampatti (TP)	
		Omalur (TP)	
		Karuppur (TP)	
		Poolampatti (TP)	
		Edappadi (M)	
		Konganapuram (TP)	
		Sankari (TP)	
		Salem (M Corp.) (HQ)	
		Vazhapadi (TP)	
		Pethanaickenpalayam (TP)	
		Attur (M)	
		Keeripatti (TP)	
		Veeraganur (TP)	
		Gangavalli (TP)	
	Thanjavur	Thanjavur (HQ)	
		Thiruppanandal (TP)	
		Thiruvidaimarudur (TP)	
		Kumbakonam (M)	
		Papanasam (TP)	
		Ayyampettai (TP)	
		Ammampettai (TP)	
		Thiruvaiyaru (TP)	
		Vallam (TP)	
		Madukkur (TP)	
		Pattukkottai (M)	
		Adiramapattinam (TP)	
	Theni Allinagaram	Theni (HQ)	
		Thevaram (TP)	
	Thoothukkudi	Thoothukkudi (HQ)	
		Udangudi (TP)	

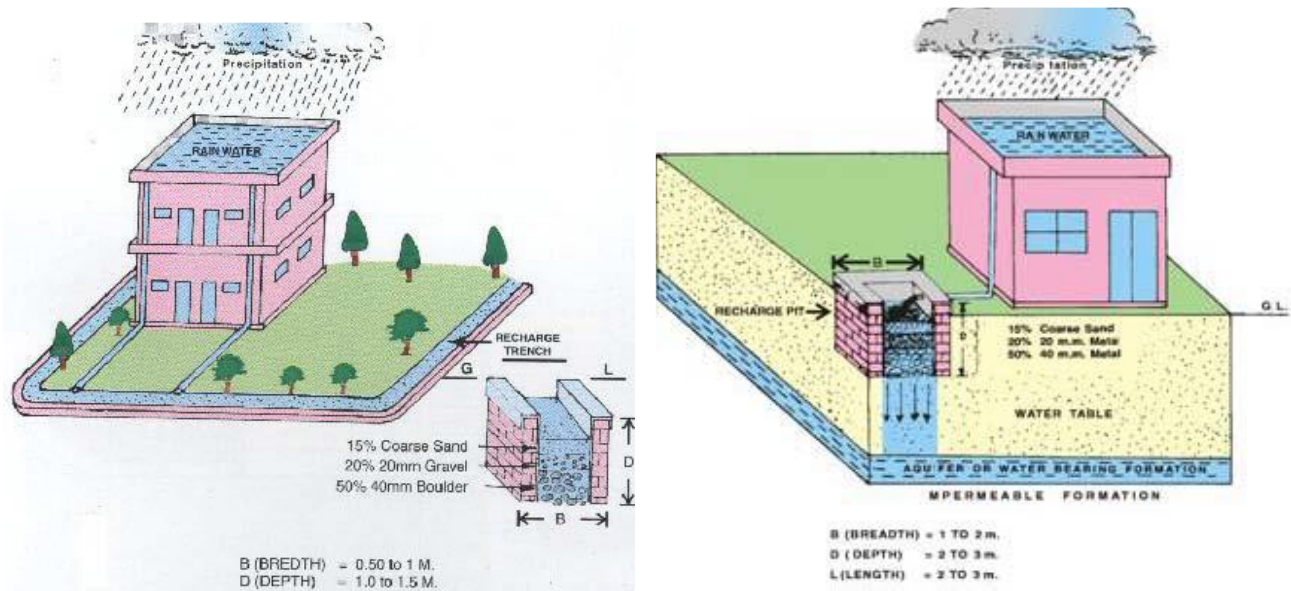
	Tiruchirappalli	Kattuputhur (TP)	
		Tiruchirappalli (HQ)	
		Thottiyam (TP)	
		Thathaiyangarpet (TP)	
		Uppiliapuram (TP)	
		Thuraiyur (M)	
		Manapparai (M)	
	Tirunelveli	Puliankudi (M)	
		Surandai (TP)	
		Tirunelveli (HQ)	
		Kadayanallur (M)	
		Aygudi (TP)	
		Kilapavoor (TP)	
	Tiruppur	Vellakoil (M)	
		Dharapuram (M)	
		Uthukuli (TP)	
		Tiruppur (M.Corp) (HQ)	
		Samalapuram (TP)	
	Thiruvallur	Thiruvallur (M) (HQ)	
		Avadi (M)	
		Thirunindravur (TP)	
		Thirumazhisai (TP)	
		Poonamallee (M)	
	Tiruvannamalai	Arani (M)	
		Vandavasi (M)	
		Desur (TP)	
		Polur (TP)	
		Pudupalayam (TP)	
		Chengam (TP)	
		Tiruvannamalai (M) (HQ)	
		Kilpennathur (TP)	
		Vettavalam (TP)	
	Thiruvarur	Valangaiman (TP)	
		Kodavasal (TP)	
		Thiruvarur (HQ)	
		Koradacheri (TP)	
		Peralam (TP)	
	Vellore	Gudiyatham (M)	
		Pernampattu (M)	
		Walajapet (M)	
		Arcot (M)	

		Timiri (TP)	
		Kalavai (TP)	
		Vellore (M. Corp) (HQ)	
		Pallikonda (TP)	
		Pennathur (TP)	
		Vaniyambadi (M)	
		Alangayam (TP)	
		Ambur (M)	
		Natrampalli (TP)	
	Viluppuram	Gingee (TP)	
		Tindivanam (M)	
		Marakkanam (TP)	
		Viluppuram (M) (HQ)	
		Thiagadurgam (TP)	
		Ulundurpettai (TP)	
	Virudhunagar	Rajapalayam (M)	
		Virudhunagar (HQ)	
	Kanchipuram	Kanchipuram (HQ)	

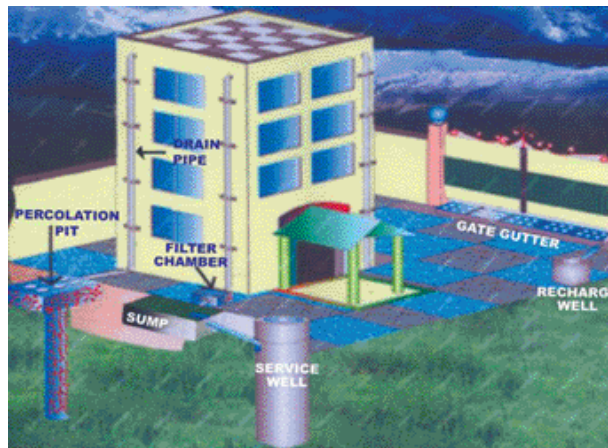
Summary

State/UT	Affected Districts	Affected ULBs
Andhra Pradesh	9	18
Karnataka	18	57
Puducherry	1	1
Tamil Nadu	27	184
TOTAL	55	260

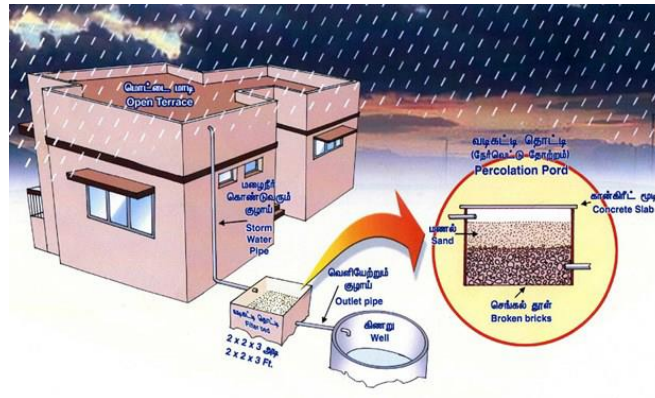
Annex-2: Illustrations of Rain Water Harvesting (RWH) Structures



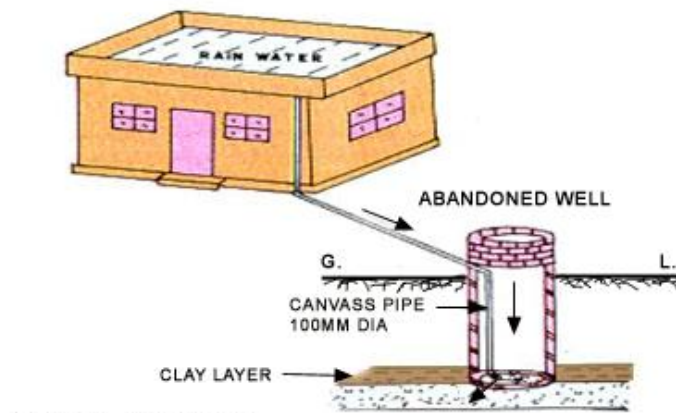
Rainwater harvesting and ground water recharge for individual plotted house (by percolation pits and well-cum-channel)



Rainwater harvesting and ground water recharge for Multi-storied residential building (by storage sump and percolation pits)



Rainwater collection and Ground water recharge (through abandoned wells and Hand pumps)



COST Rs. 5000-8000/-

Recharge Through Abandoned Dug Well

Annex-3: Best Practices in Rain Water Harvesting (RWH)

1. Garden Estate, Gurgaon

The Garden Estate colony in Gurgaon faced frequent water logging with low levels of ground water in April 2013. The Resident Welfare Association decided to adopt rain water harvesting throughout the colony through rooftop rain water harvesting and surface runoff harvesting. As a measure, rooftop rain water is diverted into a recharge well which measures 2.5m x 1.25m x 3.5m with two recharge bores each 150 mm in diameter and 20 m deep, which are filled with layers of pebbles for filtration. Similarly, in surface runoff harvesting, the water is harvested through 116 inter-connected collection chambers into percolation pits by drilling a recharge bore of 100 mm diameter and 15 m depth. A total volume of 23,549 m³ has been harvested, which represents 46% of the total rain water harvesting potential. The project was successful with the water logging being resolved, and a net rise in the ground water level of 1.7m.

2. Tihar Jail, Delhi

Tihar jail uses two rain water harvesting systems—rooftop rain water collection and controlling runoff from unpaved areas in order to address the issue of low ground water levels and water logging. The main mechanisms by which the rain water harvesting occurs is through rooftop rain water from the barracks and surface runoff from unpaved areas getting collected in a collection chamber which is covered by a perforated RCC slab. This water is then diverted to a recharge well measuring 1m x 1m x 2m with a recharge bore of 150 mm diameter and 10 m depth. The recharge well is filled with layers of pebbles and coarse sand, which act as a filtration media to improve the quality of the water which is harvested. A total volume of 1,280 m³ has been harvested, which represents 50% of the total rain water harvesting potential of the total area in Ward 1 and Ward 13 (4,125 m²). Implementation of the project was completed in November 2002 and in a very short period considerable jump in water level was recorded.

3. Mother Dairy F&V Units, Delhi

Mother Dairy uses rooftop rain water harvesting from the administrative block, workers' amenities, and central buildings to take the water to storm water drains. The storm water drains are intercepted at strategic locations and rain water is diverted into recharge wells which are

2.5m x 2m x 2m in size with recharge bores of 300 mm and 15 m depth. Existing bore wells were used to make the scheme more economical, and finally layers of filtering material were used to ensure efficient filtration. Implementation of the project was completed in April 2004. A total volume of 32,250 cubic meter has been harvested, which represents 59% of the total potential.

4. Rain Water Harvesting Measures in Chennai

Due to shortage of fresh water sources in and around Chennai, people were extracting ground water at high levels which was worsened by further ingress of saline water into fresh ground water sources. The State Government enacted legislation to control and regulate extraction under “The Chennai Metropolitan Area Ground Water (Regulation) Act 1987”. The Chennai Metropolitan Water Supply and Sewerage Board (CMWSSB) also launched a rain water harvesting campaign and offered free technical assistance to all citizens through the Rain Water Harvesting Cell. CMWSSB has also made the installation of RWH structures as a pre-requisite for providing water and sewer connections for all new buildings. Since the campaign was launched by the Government as a people’s movement, a total number of 8.19 lakh RWH structures in 7,10,000 buildings have been constructed by individuals and in Government buildings. The RWH Cell in CMWSSB regularly monitors the ground water table and a considerable rise has been recorded in the past 10 years. During the year 2004, the water level fluctuated between 2.0 m to 13.53 m and during year 2013, the water level fluctuated between 1.2 m to 6.5 m.

Annex-4: Notification of Ministry of Power

रजिस्ट्री सं० डी० एल०-33004/99

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संकल्प

नई दिल्ली, 28 जनवरी, 2016

टैरिफ नीति

सं. 23/2/2005-आर एंड आर (खंड-IX).-1.0 प्रस्तावना

- विद्युत अधिनियम, 2003 की धारा 3 का अनुपालन करते हुए, केंद्र सरकार ने दिनांक 6 जनवरी, 2006 को टैरिफ नीति अधिसूचित की। टैरिफ नीति में और संशोधन 31 मार्च, 2008, 20 जनवरी, 2011 और 08 जुलाई, 2011 को अधिसूचित किए गए थे। विद्युत अधिनियम, 2003 की धारा 3(3) के अंतर्गत प्रदत्त शक्तियों का प्रयोग करते हुए केंद्र सरकार एतद्वारा भारत के राजपत्र में इस संकल्प के प्रकाशन की तारीख से प्रभावी किए जाने हेतु संशोधित टैरिफ नीति अधिसूचित करती है।
06 जनवरी, 2006 को अधिसूचित टैरिफ नीति के प्रावधानों के अंतर्गत तथा इसमें किए गए संशोधनों के अंतर्गत किसी भी किए गए कार्य अथवा की गईं करवाईं अथवा तथाकथित किए गए अथवा किए जाने वाले कार्य के होते हुए भी, जहां तक कि इस नीति से असंगत नहीं हैं, उन्हें इस संशोधित नीति के प्रावधानों के अंतर्गत किया गया अथवा किया जाने वाला माना जाएगा।
- राष्ट्रीय विद्युत नीति ने नयी उत्पादन क्षमता की अभिवृद्धि एवं प्रतिवर्ष विद्युत की प्रतिव्यक्ति उपलब्धता

domestic coal supplied by CIL, vis-à-vis the assured quantity or quantity indicated in Letter of Assurance/FSA the cost of imported/market based e-auction coal procured for making up the shortfall, shall be considered for being made a pass through by Appropriate Commission on a case to case basis, as per advisory issued by Ministry of Power vide OM No. FU-12/2011-IPC (Vol-III) dated 31.7.2013.

6.2 Tariff structuring and associated issues

- (1) A two-part tariff structure should be adopted for all long-term and medium-term contracts to facilitate Merit Order dispatch. According to National Electricity Policy, the Availability Based Tariff (ABT) is also to be introduced at State level. This framework would be extended to generating stations (including grid connected captive plants of capacities as determined by the SERC). The Appropriate Commission shall introduce differential rates of fixed charges for peak and off peak hours for better management of load within a period of two years.

Power stations are required to be available and ready to dispatch at all times. Notwithstanding any provision contained in the Power Purchase Agreement (PPA), in order to ensure better utilization of un-requisitioned generating capacity of generating stations, based on regulated tariff under Section 62 of the Electricity Act 2003, the procurer shall communicate, at least twenty four hours before 00.00 hours of the day when the power and quantum thereof is not requisitioned by it enabling the generating stations to sell the same in the market in consonance with laid down policy of Central Government in this regard. The developer and the procurers signing the PPA would share the gains realized from sale, if any, of such un-requisitioned power in market in the ratio of 50:50, if not already provided in the PPA. Such gain will be calculated as the difference between selling price of such power and fuel charge. It should, however, be ensured that such merchant sale does not result in adverse impact on the original beneficiary(ies) including in the form of higher average energy charge vis-à-vis the energy charge payable without the merchant sale. For the projects under section 63 of the Act, the methodology for such sale may be decided by the Appropriate Commission on mutually agreed terms between procurer and generator or unless already specified in the PPA.

- (2) Power Purchase Agreement should ensure adequate and bankable payment security arrangements to the Generating companies. In case of persisting default on payment of agreed tariff as per PPA in spite of the available payment security mechanisms like letter of credit, escrow of cash flows etc. the generating companies may sell such power to other buyers.
- (3) In case of coal based generating stations, the cost of project will also include reasonable cost of setting up coal washeries, coal beneficiation system and dry ash handling & disposal system.
- (4) After the award of bids, if there is any change in domestic duties, levies, cess and taxes imposed by Central Government, State Governments/Union Territories or by any Government instrumentality leading to corresponding changes in the cost, the same may be treated as "Change in Law" and may unless provided otherwise in the PPA, be allowed as pass through subject to approval of Appropriate Commission.
- (5) The thermal power plant(s) including the existing plants located within 50 km radius of sewage treatment plant of Municipality/local bodies/similar organization shall in the order of their closeness to the sewage treatment plant, mandatorily use treated sewage water produced by these bodies and the associated cost on this account be allowed as a pass through in the tariff. Such thermal plants may also ensure back-up source of water to meet their requirement in the event of shortage of supply by the sewage treatment plant. The associated cost on this account shall be factored into the fixed cost so as not to disturb the merit order of such thermal plant. The shutdown of the sewage treatment plant will be taken in consultation with the developer of the power plant.

6.3 Harnessing captive generation

Captive generation is an important means to making competitive power available. Appropriate Commission should create an enabling environment that encourages captive power plants to be connected to the grid.

Such captive plants could supply surplus power through grid subject to the same regulation as applicable to generating

Annex-5: A Best Practice in Reuse of Treated Waste Water

1. Recycle and reuse of water at Nagpur

Maharashtra State Power Generation Co. Ltd (MahaGenco), an electric energy production company owned by Govt. of Maharashtra was planning capacity expansion, which would result in a hike in demand for water of around 110 MLD. Considering the existing stress on the fresh water sources, Nagpur Municipal Corporation (NMC) undertook the initiative and entered into a Memorandum of Understanding (MoU) for reuse of treated waste water in power plant. Both the stakeholders recognized the suitability of installing sewage treatment plant and use its treated effluent for MahaGenco's potential industrial needs. The project was established as a symbiotic venture, in the common interest of both NMC and MahaGenco. The estimated cost of the project stands at Rs.133.11 crores with estimated O&M expenditure of Rs.8.12 crore. User charges were levied on recycled water from MahaGenco @ 2.23/KL, in order to ensure sustainability. Rs. 2.73 crore per annum from the project area is derived as revenue from the sale of treated waste water to Thermal Power Plant.

Annex-6: Best Practices in Rejuvenation of Water Bodies

1. Rejuvenation of Hauz Khas Lake, Delhi

The Indian National Trust for Art and Cultural Heritage (INTACH) and Delhi Development Authority (DDA) had undertaken a project to revive Hauz Khas Lake, a 700 year-old water body, lying dry for decades, with treated sewage water. In 2003, about 2.5 million litres/day of waste water from the Kishan Garh Sewage Treatment Plant (STP) in Vasant Kunj was diverted at an expense of Rs. 50 lakh by means of a 3.5 km long pipeline to the water body. Additionally, a number of fish species were introduced to keep the water clean by consuming algae and feeding on mosquito larvae. Overall, the project has been successful in rejuvenating the lake on economic, environmental and social fronts.

2. Development of Kankaria Lake, Ahmedabad

Kankaria Lake is the biggest lake of Ahmedabad, Gujarat with an approximate circumference of 2.3 km. In 2006-2007, the Government of Gujarat undertook rejuvenation of the lake. The lake conservation project involved cleaning, and de-silting. A large component involved the development of lake front activities and infrastructure such as jogging tracks, zoo, parks, libraries etc. Currently, the Ahmedabad Municipal Corporation (AMC) charges an entry fee to cover the maintenance of the premises. Originally, ground water was used for refilling the lake which was causing depletion in the total available ground water for residents of Mani Nagar. To facilitate rejuvenation, a sub-surface infiltration trench was proposed to collect and store runoff water. The response to the rejuvenation project has been overwhelming.

Annex-7: Best Practices in Plantation

1. Green Space Planning in Lutyens' Delhi

Considering the roads with high density of traffic in Lutyens' Delhi, tall trees have been planted on roadside as an urban greening initiative. Multiple species of *Neem* and *Imli*, constitute about half of the trees planted in the zone. In order to mitigate the challenges faced due to increasing population and lack of space, general management practices like pruning, replacement, manure application, transplantation, seed and leaf litter collection, canopy trimming, watering and other techniques have been adopted in order to ensure maintenance of the roadside plantation and augment the green cover.

2. Green Space Development in Pune

Pune Municipal Corporation (PMC) financed a project which was implemented by the Forest Department in the Panchgaon Parvati area with a spread of 613 acres. The purpose of the project was to restore and enrich the greenery of Panchgaon Parvati Hills by means of conservation measures and providing protection from illegal encroachment of the Hills. The project started in the year 2008, and the PMC ensured that wall protection, plantation, soil and water conservation works were carried out.