BEFORE THE HON'BLE NATIONAL GREEN TRIBUNAL,

PRINCIPAL BENCH, NEW DELHI

ORIGINAL APPLICATION NO. 458/2017

IN THE MATTER OF:-

HARINDER DHINGRA **APPLICANT**

VERSUS

INTERNATIONAL RECREATION & AMUSEMENT LTD. & ORS. **RESPONDENTS**

INDEX

A. SUDHAKAR
SCIENTIST-E
CENTRAL POLLUTION CONTROL BOARD,
PARIVESH BHAWAN, EAST ARJUN NAGAR,
DELHI-110032.

DATE: 25.06.2019
PLACE: DELHI

REPORT SUBMITTED IN COMPLIANCE TO HON'BLE NGT ORDER DATED 25/3/2019 IN ORIGINAL APPLICATION NO. 458/2017 IN THE MATTER OF HARINDER DHINGRA VS INTERNATIONAL RECREATION & AMUSEMENT LTD & ORS

CENTRAL POLLUTION CONTROL BOARD
"Parivesh Bhawan", East Arjun Nagar,
Delhi-110032

June 25, 2019

CONTENTS

1. Background

The Hon'ble National Green Tribunal (NGT), Principal Bench, New Delhi in the matter of Original Application No. 458/2017 vide order dated 25/3/2019 filed by Harinder Dhingra Vs International Recreation & Amusement Ltd & Ors directed Ministry of water Resources, River Development and Ganga Rejuvenation (MoWR,RD&GR) and Central Pollution Control Board (CPCB) in para 8 which is reproduced as follow:

"We also take note of an article published in the Economic Times magazine Cover story, March 24, 2019 titled "A Midsummer Nightmare" highlighting the issues of water mismanagement. A copy of the article be forwarded to the Secretary, Ministry of Water Resources and CPCB so that appropriate follow up action on the highlighted issues is taken and the report furnished within three months to this tribunal."

A copy of Hon'ble NGT order is enclosed at ***Annexure-I***.

2. Follow up action taken by CPCB

In pursuance to Hon'ble NGT order dated 25/3/2019, CPCB vide letters dated 10/4/2019 requested Deputy Commissioner, Gurugram, Gurugram Metropolitan Development Authority (GMDA), Municipal Corporation of Gurugram (MCG), Haryana State Pollution Control Board (HSPCB), Ground Water Cell, Gurugram, Haryana State Industrial and Infrastructure Development Corporation (HSIIDC), Haryana State Vikas Pradhikaran (HSVP), Department of Irrigation and Water Resources (DIWR), Central water Commission (CWC) to take necessary action for implementation of long term strategies (within nine months) and short term strategies (within three months). Further, CPCB vide letter dated 20/6/2019 reminded concerned departments to submit action taken report and updated information on the matter is awaited. Response received only from Ground Water Cell, Gurugram of Haryana State vide letter dated 24.06.2019 informing that during inspection to the site of International Recreation and Amusement Park, Sector 29, Gurugram, it was found that no tube well has been found within the above premises. Response from other organisations is awaited.

Further, in compliance to Hon'ble NGT order dated 25/3/2019, two meetings were conducted on 2/5/2019 and 17/6/2019 with the officials of Central Ground Water Board (CGWB), Central Ground Water Authority (CGWA) and official of CWC deputed by Ministry of Water Resources, River Development and Ganga Rejuvenation (MoWR,RD&GR) to discuss and review the article "A Midsummer Nightmare" published in 'The Economic Times' on 24/3/2019. Summary of the article is enclosed at ***Annexure-II***.

In the above meetings, NITI Aayog report entitled 'Composite Water Management Index-2018' (http://pibphoto.nic.in/documents/rlink/2018/jun/p201861401.pdf) which highlighted 21 cities including Delhi, Bengaluru and Chennai running out of ground water by 2020 and issues highlighted in the afore-said article especially on water demand, supply and gaps observed in major cities of India were also discussed. Minutes of the meeting is enclosed at ***Annexure-III***.

CGWB informed that the report on "Water Demand, Availability and Shortage upto 2041" is in final stage of preparation and shall be submitted once it is finalized. CGWA official also informed that a report prepared by CGWA on "Aquifer Mapping and Ground Water Management Plan of NCT Delhi, 2016", available at http://cgwb.gov.in/AQM/NAQUIM_REPORT/Delhi/old/Naquim%20Report%20Delhi%20.pdf. Further, CGWB officials informed that a report entitled "Water Demand, Availability and Shortage up to 2041" in line with report of NITI Aayog is under preparation. CGWB had also shared "Ground Water Year Book of NCT, Delhi-2016-17 and the findings of the report is annexed at ***Annexure-IV***.

2.1 Initiatives taken by CPCB in various court matters for water management

A. Environmental compensation for illegal extraction of ground water

In compliance to Hon'ble National Green Tribunal order dated 3/1/2019 in O.A. No. 327/2018 filed by Shailesh Singh v/s Central Ground Water Board

& Ors, CPCB constituted a committee under the Chairmanship of Shri A. Sudhakar, DH, WQM-I Division with Shri P. K. Gupta, DH, IPC-VI Division, Shri Vishal Gandhi, Sc D, UPC-I Division and Smt. Suniti Parashar, Scientist B, WQM-I Division as members. The committee deliberated in detail on the issue of Environmental Compensation to be recovered from individuals/industries such as domestic, packaging units, mining & infrastructure projects and industrial units in case of illegal extraction of ground water. The committee recommended a formula based on water consumption, no of days of illegal ground water abstraction and rates for imposing Environmental Compensation (EC) for violation of illegal abstraction of ground water for all categories of assessment units identified by CGWA. The EC rates, varies from Rs. 4 to 200 per m^3 per day, depending on the type of sector indulged in illegal abstraction of groundwater. The Committee also recommended minimum environmental compensation for household shall be charged as Rs.100/day for OCS categories (Over-exploited, Critical and Semi-critical Category). Similarly, for safe category, the rate shall be charged as Rs 50/ day. However, minimum environmental compensation for household shall be charged as Rs 10,000, and minimum EC Rs. 50,000 to Rs 1,00,000/- in case of institutional activity, commercial complexes, townships, packaged drinking water, mining, infrastructure, dewatering projects and industrial units. Report is under revision as per direction of Hon'ble NGT vide order dated 7/5/2019 and shall be submitted for consideration.

B. Action plan on utilization of treated sewage

The Hon'ble National Green Tribunal order dated 27.11.2018 in the matter of OA NO. 148/2016 filed by Mahesh Chandra Saxena V/s South Delhi Municipal Corporation & Ors wherein "Before parting with this order, we consider it also necessary to observe that all the States and Union Territories ought to prepare and furnish their action plans for ulitization of treated water in their respective States/UTs within three months. Such action plans may be furnished to the CPCB. The CPCB may review such action plans and issue appropriate directions in the matter and furnish a report." In compliance to direction issued, Chairman, CPCB has communicated directions of Hon'ble NGT to Chief Secretaries of States and Union Territories to submit the action plan. In response, action plan has been received from 15 States /UTs and from remaining 21 States/UTs

are yet to be received. CPCB reviewed the action plans and observations made are; (i) Action plan received from State of Andhra Pradesh, Madhya Pradesh and NCT of Delhi has mentioned schemes for utilization of treated sewage in different sectors like horticulture, Metro washing, Power Plants, Construction activity, rejuvenation of water bodies (Pond/lakes), industrial sectors. Action plan also include firmed timelines for implementation of various schemes. (ii) Public Health Engineering Department, Manipur mentioned that they do not have any specific policy of utilization of treated wastewater from STPs. (iii) Union Territory of Lakshadweep has mentioned that no STPs was installed in their territory and no action plan was provided. (iv) Short comings observed in action plan submitted by remaining 10 State/UTs are:- i)Utilization of treated sewage mainly focussed on activities like Horticulture and Irrigation. ii) Other potential users of treated sewage like Industrial Clusters, Metro Rail, Indian Railways, Infrastructure Projects, Agriculture and Bus Depots are not explored; iii) Sewage Generation and Treatment Capacity for future are not projected and same was not considered for utilization. iv) Timelines for implementation of proposed schemes are not mentioned.

C. Appropriate use of Reverse Osmosis (RO) plant and disposal of RO reject

The Hon'ble NGT vide order dated 20/12/2018 in the matter of O.A. No. 134/2015 constituted a committee comprising of representatives of MoEF&CC, CPCB, BIS, IIT, Delhi and NEERI, Delhi and directed Expert Committee to provide use of appropriate technology making re-filtration or secondary use of the water rejected by the RO system viable. It may also have to be explored whether deficiencies in the filtered treated water can be made up and whether the purified water needs to be remineralized so as to compensate for the minerals lost during the process and also how the re-filtered water can be utilized. CPCB prepared a report and submitted to Hon'ble NGT for consideration and approval. It is mentioned in the report that RO plants are being installed indiscriminately without considering quality or source of raw water. Installation of RO plants is advisable for the sources having TDS levels above 500 mg/l which is the acceptable limit as per the IS 10500-2012 Drinking Water Standards. Recommendations proposed in the report are; (i) concerned local bodies like PHED/Jal Nigam/Municipal Corporation/Jal Board/Municipalities, as the case may be, shall inform consumers about water source and quality including TDS

concentration of water being supplied through billing instrument. (ii) water purifier market shall be classified based on TDS level of water being supplied/available in the area so that right technology/product may be deployed based on input water TDS. RO may be used only when TDS is more than 500 mg/l and RO may not be recommended below these levels. However ultra-filtration clubbed with UV can serve the purpose of drinking water. (iii) Apart from TDS, other parameters of special importance which may vary from location to location, be also considered to confirm to the norms of drinking water as prescribed in BIS Standards IS 10500:2012. (iv) star rating of RO system based on recovery of water as practiced in other countries can also made mandatory. (v) appropriate use/disposal of RO reject at domestic and commercial level and industrial level.

D. Constitution of Central Monitoring Committee

Hon'ble National Green Tribunal (Principal Bench), New Delhi has passed an order on 08.04.2019 in O. A. No. 673 of 2018 constituting a Central Monitoring Committee (CMC) comprising Senior representative of NITI Aayog; Secretary, Ministry of Water Resources; Secretary, Ministry of Urban Development; Secretary, Ministry of Environment, Forest and Climate Change; Director General, National Mission for Clean Ganga and Chairman, CPCB. Main Activities to be performed by CMC as per Hon'ble NGT are; (i) to undertake a national initiative by way of preparation and enforcement of a national plan to make river stretches pollution free (ii) to co-ordinate with the RRCs of the States and oversee the execution of the action plans, taking into account the timelines, budgetary mechanism and other factors (iii) CMC may consider identifying experts, best practices and models for use of treated water, including plan to supply untreated sewage for a price or otherwise so that the concerned needy party can treat and utilize such water as is reportedly being done at Surat in Gujarat, Nagpur in Maharashtra and Bhilwada in Rajasthan or any other place. First meeting of the committee was convened on 11th June, 2019 as per Hon'ble NGT order dated 08.04.2019 in OA No. 673 of 2018. Background note on action Plan for Restoration of Identified Polluted River Stretches' and 'National Initiatives to Make River Stretches Pollution Free' was discussed and course of action to be taken were also decided by the CMC. Minutes of the first meeting of CMC is available in CPCB website at https://cpcb.nic.in/NGTMC/CMC-1MOM.pdf.

E. Indicative Guidelines for Restoration of Water Bodies

In compliance to Hon'ble NGT Order dated 10.05.2019 in M.A. No. 26/2019 in OA.No. 325 of 2015, CPCB has prepared an indicative guideline for restoration of water bodies and uploaded in CPCB website at https://cpcb.nic.in/NGTMC/Ind-Guidelines-RestWaterBodies-10062019.pdf.

3. Strategies for Water Management

Officials of CPCB, CGWB, CGWA and CWC representative of MoWR, RD and GR discussed on various issues of water mismanagement highlighted in the article and suggested following short term and long term strategies as detailed below for implementation by all the concerned organisations: -

a. Short Term Strategies

i. Rain water harvesting and water recycling may be made mandatory in all urban areas.

ii. Provision of dual water supply system: Use of innovative technologies like dual pipe, plumbing for supplying fresh water for drinking, cooking and bathing etc and supply of recycled water for non-drinking purposes such as flushing, landscape, irrigation, car washing, etc.

iii. Sprinkler/drip irrigation method may be widely propagated in farming.

iv. Mass awareness programme among the targeted population, farmers and stakeholders may be organized for conservation of water resources.

b. Long Term Strategies

i. State specific plan for availability of piped water supply from surface water sources may be formulated to reduce the dependence on ground water.

ii. Increasing storage capacities: Additional water storage structures may be constructed to augment the domestic water supplies as per requirements. Repairs, renovation, augmentation of existing water storage structures may be carried out.

iii. During monsoon period storage of rain water may also be expedited through innovative ways. Dewatering and refilling of aquifers underlying active flood plains of major rivers shall be undertaken.

iv. Efficiency of irrigation may be improved as the saved water could be utilised for domestic and other beneficial purposes.

v. Farming of water intensive crops in over-exploited blocks of States may be discouraged. Incentives may also be provided to encourage farming of less water required crops.

vi. Waste water Treatment: Strengthening of wastewater treatment infrastructure and onsite treatment of waste water should be enhanced with maximum reuse of treated water for non-drinking purposes.

vii. Need to develop ground water management plans for each city/urban centres for long term ground water management.

viii. Desalination of saline water: Through innovative ways and usage in controlled manner.

ix. Rejuvenation and redevelopment of natural, traditional and innovative water conservation methods. Time bound action plan for revival of local fresh water resources may be prepared by each State/district.

x. Improvement in water supply distribution system and fixing of leakage in pipelines by the concerned authorities.

xi. Construction of artificial recharge structure like percolation tank, nala bunds, check dams can be recommended.

xii. Online monitoring and distribution system.

xiii. Revision of water tariff to avoid wastage of water.

xiv. Reduction/restriction in per capita water consumption may be implemented in case of acute shortage/crisis.

4. Ground water regulatory measures

i. Penal Provision/Law Enforcement: for illegal extraction of ground water: The provision of environmental compensation may be imposed as per the formula developed by CPCB and being submitted to Hon'ble NGT.

ii. Restriction on construction of new tube well: Permission of installation of new tube wells and sealing of illegal tube wells.

iii. Map on GIS Platform and online processing of abstraction in dynamic manner.

iv. Restrict the abstractions and quantities in critical and over-exploited blocks.

v. As per the latest categorization of assessment units by CGWA, it is proposed that each block identified as over exploited, a plan may be

prepared by CGWB/Concerned Government Department/State/UT to implement rain water harvesting and aquifer recharge by considering one over exploited block as one unit for demonstrative replicability and for improvement in the ground water situation.

Above mentioned short and long term strategies for water management may be taken up by the Ministry of Jal Shakti, Government of India to further look for implementation in a time bound manner.

Annexure-I

Item No.03 Court No. 1

BEFORE THE NATIONAL GREEN TRIBUNAL
PRINCIPAL BENCH, NEW DELHI

Original Application No.458/2017

Harinder Dhingra Applicant(s)

Versus

International Recreation & Amusement Ltd.& Ors. Respondent(s)

Date of hearing: 25.03.2019

CORAM: **HON'BLE MR. JUSTICE ADARSH KUMAR GOEL, CHAIRPERSON**
HON'BLE MR. JUSTICE K. RAMAKRISHNAN, JUDICIAL MEMBER
HON'BLE DR. NAGIN NANDA, EXPERT MEMBER

For Applicant(s):

For Respondent (s): Mr. Anil Grover, AAG Haryana with Mr. Rahul Khurana, Advocate
Ms. Deep Shikha Bharti for MoEF&CC

ORDER

1. The issue for consideration is illegal drawal of ground water at Gurgaon by Amusement park known as Appu Ghar and others. Further issue for consideration is illegal use of drinking water for non drinking purposes in collusion with the authorities.

2. This application was filed before the Tribunal on 21.7.2017 stating that though the area in question is water scarce area, the Haryana Urban Development Authority has illegally allowed use of drinking water for commercial purpose. The respondent company has also illegally installed tubewells to extract ground water for commercial purposes.

3. The matter was considered at length on the last date on 26.10.2018. The Tribunal referred to the newspaper report in the Hindustan Times highlighting the problems in violation of law under the heading "Gurgaon: 50 Lakhs litres of groundwater extracted daily by tanker mafia, say experts"[1] and another article published on 6.6.2017 in the Times of India under the title "4 Crores litres groundwater drawn illegally every day in Gurugram".[2] The Tribunal found that Gurgaon was a 'notified area' under the relevant notification where use of ground water is restricted due to scarcity of drinking water. Water from canal has been diverted by HUDA for permitting its use for commercial purposes without any study whether such diversion will affect the eco-system of the canal. Reference was made to orders of the Tribunal in *O.A No. 59/2012 in Vikrant Kumar Tongad vs. Union of India & Ors,* dated 26.7.2018 *O.A No. 411/2018 in M/s A-One Mineral Water Industry vs. Central Ground Water Authority & Ors,* dated 29.8.2018, *O.A No. 200/2014 in M.C Mehta Vs. UOI,* dated 13.7.2017, *O.A No. 176/2015 in Shailesh Singh vs. Hotel Holiday Regency, Moradabad & Ors,* dated 28.8.2018 and in *O.A No. 484/2015 in Shailesh Singh vs. Hotel The Oberoi Amarvilas & Ors* dated 28.8.2018 on subject of restrictions on use of ground water without requisite consent of CGWA and for commercial purpose.

4. Accordingly, the Tribunal disposed of the petition as follows:

> *" 8. In view of the above, we dispose of this petition by directing constitution of a Committee of representatives of Ministry of Environment, Forest*

[1] https://www.hindustantimes.com/gurugram/gurugram-50-lakh-litres-of-groundwater-extracted-daily-by-tanker-mafia-say-experts/story-NN54J9Fu3jMXY7OYd9nH6N.html
[2] https://timesofindia.indiatimes.com/city/gurgaon/4cr-litres-groundwater-drawn-illegally-everyday-in-gurgaon-water-table-plummets/articleshow/59008468.cms

and Climate Change, Central Pollution Control Board, Central Ground Water Authority and District Magistrate, Gurgaon to review the existing policy of permitting supply of water for commercial purposes, when there is scarcity of drinking water and whether the water is being diverted from the river supply for commercial use, without affecting e-flows. Decision may be taken within two months from today. The Central Pollution Control Board will be the nodal agency for coordinating such exercise. It will be open to the parties to put forward their view point before the Committee through the Central Pollution Control Board. Report of the Committee may be sent to this Tribunal by email on or before February 28, 2019. Copy of this order be sent to the Central Pollution Control Board by e-mail.

9. The application is disposed of.

10. Put up the report for consideration in second week of March, 2019."

5. The Expert Committee constituted in above terms has filed report dated 27.2.2019 acknowledging that the use of ground water for commercial activity is prohibited. In terms of Central Ground Water Authority (CGWA) guidelines dated 16.11.2015, no tubewell is permitted except for drinking water. CGWA has not given any permission in the present case. The extraction was three times more than the recharge. 22 teams of officers have been constituted to keep check on illegal extraction of ground water. 1025 illegal tubewells have been sealed. Zero waste water policy has been introduced. Ponds have been rejuvenated. Awareness programs are being organized in educational institutions.

6. The Committee recommended that sewage treated water may be provided and canal water supply may be disconnected, recharge of water be increased, diversion of drinking water for commercial purposes be discouraged, water park operators may use treated water. Short term and long term strategies be simultaneously adopted for proper monitoring of e-flow and revival of water sources.

7. The recommendations are as follows:

"6.0 Recommendations

- *Sewage treated water maybe provided from the existing line in Sector-29 to the M/s International Recreation & Amusement Ltd. Sector-29 Gurugram and the canal water supply connection from HUDA/HSVP line may be disconnected.*
- *More efforts may be made to recharge all storm water of HUDA/HSVP sectors and other colonies through rain water harvesting structures. The foothills area of Aravali Ridge is acting as recharge zone for aquifers underlying in Gurugram district.*
- *Diversion of drinking water supply for commercial purposes should be discouraged. The water park operators may explore possibility to use treated waste water after having all water quality parameters within the prescribed standards limit.*

To address the water shortage problem with a sustainable approach in Gurugram region we need to adopt the long-term and short-term water conservation strategies simultaneously:

a. Long-Term Strategies:

- *Time bound action plan for revival of local fresh water resources.*
- *Strengthening of water supply and waste water treatment infrastructure.*
- *Setting up of independent monitoring mechanism to monitor the implementation of conservation strategies including complete and effective restriction on withdrawal of ground water for commercial purposes with periodic review of its functioning at Deputy Commissioner level.*
- *Enactment of Ground water management Bill as per the Model Bill circulated by Government of India and*

constitution of State Ground water authority (SGWA) in Haryana State.

- *Maintenance of E-Flow: A minimum flow should be kept in river to meet ecological needs ensuring that the flow and high flow releases are proportional to the natural flow regime, including base flow contribution in the low flow season through regulated ground water use.*
- *All village ponds shall be protected and shall be converted into percolation ponds so that the water can be recharged to ground water.*
- *Saline water resources of water logged areas surrounding Badshahpur drain meeting Najafgarh drain may be taken up for controlled ground water development.*

b. Short-Term Strategies:

- *Water recycling and rainwater harvesting should be measured and recorded to monitor the water balance and use of modern technology like dual pipe plumbing for supplying fresh water for drinking, cooking and bathing etc and other for supply of recycled water for flushing, landscape irrigation, car washing, thermal cooling and conditioning, etc.*
- *100% onsite treatment of waste water and promotion of its maximum reuse for non drinking purposes.*
- *Maintenance of record about the quantity of fresh water usage.*
- *Mass Awareness Programmes among the targeted population and stakeholders should be organized for protection and preservation of exhausting ground water resources.*
- *Re-cycle & Re-use of the treated waste water from STP for non-drinking purpose to distress abstraction of ground water in Gurugram Distt. Study may be carried out to use treated STP water for water intensive commercial activities."*

8. We also take note of an article published in the Economic Times Magazine Cover Story, March 24-30-2019 titled "A Midsummer Nightmare" highlighting the issues of water mismanagement. A copy of the article be forwarded to the Secretary, Ministry of Water Resources and CPCB so that appropriate follow up action on the highlighted issue is taken and the report furnished within three months to this Tribunal.

9. The above recommendations of the Committee need to be implemented at the earliest. In absence of any suggested timelines, the short term strategies may be implemented within three months and long term strategies within nine months. The Chief Secretary, Haryana may monitor the matter and send periodical reports along with the reports in terms of the directions of the Tribunal vide order dated 06.03.2019 in O.A No. 606/2018.

List the matter for further consideration on 8.7.2019.

Adarsh Kumar Goel, CP

K. Ramakrishnan, JM

Dr. Nagin Nanda, EM

March 25, 2019
Original Application No.458/2017
AK

Annexure-II

Summary of the News article "A Midsummer Nightmare"

The summary of the article published in The Economic Times is given below:

1. Lack of piped water supply and rapidly depleting ground water levels in Bellandur, Bengaluru and depends on private water tankers by paying variable amounts.
2. In Delhi, shortfall of about 300 million gallons of water is observed according to DJB and during the summer fracas over water lead to the death of three people in New Delhi.
3. In Mumbai, civic authorities have reduced daily water supply by 10% from November due to paucity in rainfall.
4. In Chennai, the supply is nearly 300 million litres a day less than what it should be, according to Joint Director, Chennai Metro Water.
5. Last year, NITI Aayog, in its report, issued the warning that 21 cities including Delhi, Bengaluru and Chennai will run out of ground water by 2020, which would affect about 100 million people.
6. Centre for Science and Environment (CSE) published a report predicting that 10 cities around the World, including Bengaluru were likely to face Day Zero when taps there would run dry, like the situation Cape Town in South Africa happened.
7. Dipping ground water across the country has been a cause over the years, as extraction of the resource largely continues unchecked to meet the demands of a growing population.
8. Director, National Geophysical Research Institute said that areas in and around Delhi have been losing 30-32 cubic km of groundwater every year.
9. A 2019 report by Water Aid, points out that groundwater depletion across India Increased by yearly a quarter between 2000 and 2010 and the water available per person annually in India has also come down by a steep 70% between 1951 and 2011.
10. Sh. Suresh Rohilla, Senior Director, CSE, Delhi stated that in last two decades, all the major urban centres in India have become dark zones, where extraction of water exceeds the natural recharging capacity.
11. Action taken by Civic Authorities/NGOs and current water demand and supply scenario has also been incorporated in the article, listed as under:

a. In a study undertaken in Bengaluru by Ashoka Trust for Research in Ecology and Environment (ATREE) Bengaluru, it was found there is inequitable distribution of

water both region wise, where periphery is poorly served and class wise, where there is huge variation in per capita consumption of water.

b. Bengaluru is awaiting Stage V of the Cauvery water supply scheme to be complete, which will add another 700 million litres a day (MLD). The Bengaluru Water Supply and Sewerage Board (BWSSB) plans to clamp down on buildings that are not implementing rainwater harvesting.

c. In Chennai. Metro Water Authorities plan to tap agriculture wells in Thiruvallur which they estimate will yield another 120MLD and another 300-400 MLD from desalination plant.

d. In Mumbai, three dam projects, including the Gagai Dam which is expected to supply over 40 million lit of water a day when complete, are being planned.

e. In Bellandur, residents are signing up for the "2500 Challenge" with the aim of digging 2500 recharge wells over the next three months to improve ground water.

f. Biome Environment Trust, Bengaluru is heading a large campaign to recharge Bengaluru's wells called "A Million Recharge Wells".

g. At the peak of the Cape Town crisis last year, *domestic users were not allowed to use more than 50 litres of water a day.* Starting to use water prudently and efficiently would go some way in helping Indian cities avoid a similar fate.

Availability of water supply, in major cities in India by various sources including NITI Aayog Report is tabulated in Table-1.

Table-1 Availability of water, supply, in major cities in India

Sources	Scenario
Sh. Suresh Rohilla, Senior Director, CSE, Delhi	✓ India's per capita water availability has been reducing drastically. ✓ Per capita per day water requirement is 135 litres but actual water supply is only 69 litres ✓ Per capita ground water availability in 1951 was 14180 lit/day and in 2050 it will be 3120 lit/day
NITI Aayog	✓ 54% of wells in India are seeing a fall in water level ✓ 21 major cities forecast to run out of ground water 2020 ✓ Only 33% of urban waste water has been treated in India

Sh. Narsimha Murthy (Liquid Gap in 2019)	✓ In New Delhi, water requirement is 4500 MLD but supply is 3400 MLD only ✓ In Mumbai, water requirement is 4500 MLD but supply is 3800 MLD only ✓ In Bengaluru, water requirement is 1450 MLD and supply is 3400 MLD only ✓ In Chennai, water requirement is 830 MLD but supply is 550 MLD only

Annexure-III

CENTRAL POLLUTION CONTROL BOARD

(Ministry of Environment, Forest & Climate Change, Govt. of India)

Parivesh Bhawan, East Arjun Nagar,

Delhi – 110032

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Minutes of the meeting held on 2nd May, 2019 at 11.00 AM to ensure compliance to Hon'ble National Green Tribunal (NGT) Order dated 25/3/2019 in Original Application No. 458/2017 in the matter of illegal extraction of ground water

In compliance to Hon'ble National Green Tribunal (NGT) Order dated 25/3/2019 in Original Application No. 458/2017, a meeting was held on 2/5/2019 under the Chairmanship of Sh. A. Sudhakar, DH, WQM-I Division, CPCB. Representative of CWC, CGWB and CGWA (nominated by MoWR,RD&GR) attended the meeting. The list of officials is attached at Annexure I.

Sh. A. Sudhakar, Divisional Head, WQM-I CPCB welcomed all the officials and briefed about the Hon'ble NGT order dated 25/3/2019 wherein an article published on 24.03.2019 in The Economic Times Magazine has been quoted in para 8 entitled as *"A Midsummer Nightmare" highlighting the issue of water mismanagement. An appropriate follow up action on the highlighted issue is to be taken and report to be furnished to Tribunal within three months.* He said that there are many issues highlighted in the article are almost similar to recommendations given in the previous report submitted to Hon'be NGT alongwith short term and long term strategies for Haryana specially on the ground water usage. This is probably for entire country we have to come out with some similar short term and long term strategies to streamline management of water.

Smt Suniti Parashar, Scientist B, WQM-I Division briefed that article is focused on water demand, supply and shortage in major cities of India such as Delhi, Bengaluru, Chennai and Mumbai as quoted in news article. Lack of piped water and rapidly depleting ground water levels found in Bellandur, Bengaluru shortfall of demand and supply of water in Delhi, Mumbai and Chennai are also quoted.

It was also discussed that, Niti Aayog, in its report issued warning that 21 cities including Delhi, Bengaluru and Chennai will run out of ground water by 2020. Centre for Science and Environment (CSE) published a report predicting that 10 cities, including Bengaluru were likely to face Day Zero when taps would run dry. National Geophysical Research Institute (NGRI) said that areas in and around Delhi have been losing 30-32 cubic km of groundwater every year. Report by Water Aid, 2019 points out that water available per person annually in India has also come down by a steep 70% between 1951 and 2011. Similarly, Sh. Suresh Rohilla, Senior Director, CSE, Delhi stated that in

last two decades, all the major urban centres in India have become dark zones, where extraction of water exceeds the natural recharging capacity.

Discussion held in which the news article mentions some of the steps taken by civic authorities and NGOs in Bengaluru, Chennai and Mumbai for water conservation and recharge of Ground Water.

Sh. S. K. Mohiuddin, Sr. Hg, CGWB informed that CGWB is already preparing a report about water scarcity in 21 cities (on the basis of Niti Aayog report) on "Water Demand, Availability and Shortage upto 2041" and sustainability of water supply based on ground water is also included in the report. DH, WQM-I Division desired to share a copy of the same to CPCB and a communication in this this regard may be sent to Chairman, CGWB. CGWB official further informed that CGWB has also prepared a report on Ground Water Status in NCT Delhi recently. In this regard, a communication may be sent to Sh. Juneja, Office Incharge, Delhi Unit, CGWB to share the report.

Sh. Rajesh Chandra, Sr Hg, CGWA, discussed about a report on Aquifer Mapping which could be used for preparation of recommendation part in the report. He also suggested to emphasize on recycle and reuse of treated waste water in construction, gardening and relevant activities to reduce groundwater consumption.

The meeting ended with thanks to the Chair.

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Annexure IV

Ground Water Year Book
National Capital Territory, Delhi
2016-17

GOVERNMENT OF INDIA
CENTRAL GROUND WATER BOARD
STATE UNIT OFFICE, DELHI
MINISTRY OF WATER RESOURCES, RIVER DEVELOPMENT & GANGA REJUVENATION

JUNE - 2018

EXECUTIVE SUMMARY

GROUND WATER YEAR BOOK 2016-17: NCT DELHI

National Capital Territory (NCT) of Delhi occupies an area of 1483 sq. km. and lies between 28° 24' 15'' and 28° 53' 00'' N latitudes and 76° 50' 24" and 77° 20' 30" E longitudes. The population of NCT Delhi, as per the census 2011 is 167.87 lakhs with a density of 11320 persons/sqkm area.

The normal annual rainfall of NCT Delhi is 611.8 mm. The rainfall increases from west to east. About 80% of the annual rainfall is received during the monsoon months July, August and September. The rest of the annual rainfall is received in the form of winter rain. Long-term rainfall data 1984 to 2016 shows that the rainfall in Delhi is highly variable and which in turn affects the natural recharge to ground water from year to year. The probability of rainfall exceeding normal rainfall of 611 mm is up to 62 % whereas there are 90 % chance that rainfall would limit to 450 mm.

The ground water availability in the territory is controlled by the hydrogeological conditions characterized by occurrence of different geological formations namely Delhi Quartzite, Older & Younger Alluvium. Central Ground Water Board (CGWB) is monitoring groundwater levels and quality through its monitoring stations spread over both Alluvial as well as quartzitic area of NCT of Delhi. Total 124 hydrograph monitoring stations data have been analyzed for this report, out of which 22 are dug wells and 102 are Piezometers.

District wise distribution of hydrograph network stations is highly uneven and varies from one monitoring station per 1.4 sq. km in New Delhi district to one monitoring station per 30 sq. km in North East district. Considering this unevenness in distribution of monitoring stations, Central Ground Water Board is striving to increase the number of stations for better monitoring of the ground water regime in the diverse hydrogeological terrain.

The depth to water level recorded in NCT Delhi during May 2016 ranges from 1.85 in Northwest district to 58.89 m bgl (meters below ground level) in South district. Water level is deep around Delhi Ridge areas and varies from 20 to 40 m bgl. The depth to water level in central part of NCT Delhi ranges from 2 to 10 m bgl. In north it ranges from 5 to 15 m bgl and in north east areas it ranges from 4 to 15 m bgl. In the entire Yamuna flood plain it is around 2 to 5 m bgl.

The comparison of water level between May 2015 and May 2016 of Delhi shows rise in water level in 31 wells in range of 0.01 m to 3.8 m. Remaining 82 wells shows fall in the range of 0.01 to 10.0 m. The overall data indicates that in South and South-West districts the water levels are showing maximum fall.

When the data of May 2016 was compared with 10 year mean for the month of May water level, it was observed that 75 % of wells show a fall in few pockets of Southwest, West, New Delhi and South districts of NCT Delhi. Maximum fall is of 5.6 m. Rise in water level recorded in 25% of wells. Maximum is of 4.0 m.

The depth to water level recorded in NCT Delhi during August 2016 ranges from 0.44 to 58.33 m bgl., of which 30 % wells of South, Southeast, New Delhi, Southwest districts show water levels in the range of 20 to 60 m bgl. Nearly 52 % wells shows water level in range of 5 to 20 m bgl where as 18 % wells show shallow water level up to 5 m bgl.

The fluctuation of water level between May 2016 (Pre-monsoon) and August 2016 for Delhi indicates that 14 % wells show fall of less than 2.9 m. Remaining 86 % wells show rise. Nearly 72% wells show rise up to 2 m while rest 14 % show rise in range to 2 to 7 m.

The hydrograph analyses of August 2015 and August 2016 water level reveals that 32% of wells show rise in the range of 0.03 to 2.0 m while East, New Delhi, North East, South and South West districts show fall in ground water level up to 4 m. In all 62% wells show a fall in water level.

The fluctuation of water level between May 2016 (Pre-monsoon) and November 2016 (Post Monsoon) of Delhi shows 0.05 to 4.86 m rise in more than 70 % of the wells. Some wells of East, New Delhi, North West, South and South-West district shows fall in the range of 0 to 3 m.

When the water level data of November 2016 was compared with the 10 year mean of November (2006-2015) it was observed that 63% of the wells shows a fall of water level, the maximum being 6.5 m. Rise is recorded in 37 % wells, the maximum being 8.4 m.

The depth to water level recorded in NCT Delhi during January 2017 ranges from 1.2 to 58.9 m bgl. Among the monitoring stations 27 % wells of South, Southeast, New Delhi, Southwest districts show water level in the range of 20 to 60 m bgl. Nearly 56 % wells shows water level in the range of 5 to 20 m bgl where as 27% wells show shallow water level up to 5 m bgl.

The fluctuation of water level between May 2016 and January 2017 in Delhi reveals that 70 % wells of North East, North West, South and South West Districts show rise. Most of the wells show rise up to 2 m. Maximum rise is 6.9 m. The rest 30 % wells show fall in range of 0.02 to 3.4 m.

When the water level data of January 2017 was compared with 10 year mean of January, (2006-2017) it was observed that has been a rise in January 2017 water level data which is mostly confined to two parts of NCT Delhi; i.e. in western part of Southwest and West districts and in small pockets of Southeast, South and New Delhi district in southern part of NCT Delhi. The rise is reflected in 34 % wells. Maximum is 8.6 m. The rest of NCT show fall in water level. Total 66% of monitoring wells show a fall in water levels. The maximum fall is 8.4m.

Most of eastern part of NCT Delhi, in areas around Yamuna flood plain and Delhi Quartzite Ridge zones has EC within permissible range of 0 to 2250 µS/cm at 25°C where as rest of NCT Delhi, except some pockets of Najafgarh and West District, has EC value of more than 3000 uS / cm at 25 °C. It is also observed that water from deeper aquifers have greater EC value than the water from shallow aquifer. The EC value increases with depth.

Chloride concentration in groundwater of NCT Delhi is related with EC content. It is observed that in areas having EC values within permissible limits (2250 to 3000 µS/cm), the chloride content also lies within permissible limit of 250 mg/l. In areas having high EC more than 3000 µS/cm, chloride value is also high upto a maximum of3000 mg/l.

Chemical analysis of ground water samples collected during May 2016 shows that nitrate content in groundwater of Delhi is within permissible limit of 45 mg/l at almost all places. Similarly, except 25 locations in Central & Western half of NCT Delhi, all 63 locations show fluoride concentration within permissible limit of 1.5 mg /l.