



# **SUSTAINABLE WATER MANAGEMENT CONSTRUCTION PHASE AFFORDABLE SOLUTIONS**

By  
**Sandeep Narang**

# From The Media :

**hindustantimes**

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## Noida builders flout norms, 'use groundwater for construction'

Report sent to National Green Tribunal says all nine sites inspected in Noida were extracting water using borewells for construction.

**NOIDA** Updated: Apr 13, 2017 13:00 IST

 Vinod Rajput  
Hindustan Times



A local commissioner appointed by the National Green Tribunal (NGT) in his report has blamed developers of big-ticket projects in Noida and Greater Noida of wasting groundwater and rainwater instead of taking steps to conserve it.



The report, submitted to the NGT on August 7, said real estate companies while building residential and commercial towers extract groundwater for construction and dump rainwater

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# From The Media :

The image is a screenshot of a news article on the ET Realty.com website. The article is titled "Groundwater extraction: NGT acts tough, 14 builders get notice in Delhi NCR" and is dated 13 September 2015. The article text states that the National Green Tribunal (NGT) has issued notice to 14 builders in Delhi-NCR for extracting water in violation of regulations. The article is highlighted with a red border. The website header includes the ET Realty.com logo and a navigation menu. A sidebar on the right contains a "SMART CITY LIST" section. A notification at the bottom right of the page reads "New folder added" and "The builder shoots himself".

**ET Realty.com**  
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SMART CITY LIST  
*The full list of 98 cities to be made Smart*  
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#National Green Tribunal #Mahagun India Pvt Ltd #Delhi NCR

## Groundwater extraction: NGT acts tough, 14 builders get notice in Delhi NCR

*A bench headed by NGT Chairperson Justice Swatanter Kumar passed the order after perusing inspection reports filed by the local commissioners*

PTI | 13 September 2015 10:28 AM IST

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**Builders' body CREDAI protests member's demise, token strike today**

CREDAI has consistently sought rationalization of approval processes and single-window system and the demand has been

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# From The Media :



## Green court issues warrant against 2 Noida builders for groundwater misuse

Vinod Rajput, Hindustan Times | Updated: Oct 15, 2015 01:32 IST



Extraction of groundwater for any purpose is banned in Noida. (HT File Photo)

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## Depleting groundwater level: 'One-family one-house rule' recommended in Noida, G Noida

In a bid to check the depleting groundwater level, the Central Ground Water Authority (CGWA) has said a 'one-family one-house rule' should be made mandatory in the twin cities of Noida and Greater Noida.

**NOIDA**

Updated: Apr 17, 2015 10:37 IST



Vinod Rajput  
Hindustan Times



In a bid to check the depleting groundwater level, the Central Ground Water Authority (CGWA) has said a 'one-family one-house rule' should be made mandatory in the twin cities of Noida and Greater Noida.

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# From The Media :

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In a report to the National Green Tribunal on Thursday, the authority recommended that houses should be purchased for residential purposes and not merely for investment.



The water body said the measure would discourage indiscriminate concretisation of the region (Noida and Greater Noida) and increase ground water recharge.



The NGT had asked the CGWA to find out the reasons behind groundwater depletion in the two cities on a petition filed by a Greater Noida resident, who demanded a ban on the misuse of the precious resource.



According to an earlier report of the CGWA in 2012, the water table had been depleting at a rate of 3.87 metre per year against the earlier 1 metre in two largest blocks of Gautam Budh Nagar district - Dankaur and Bisrakh — from 2008 to 2012.

“The water table will slip into the critical zone in the next 2-3 years if groundwater exploitation is not checked,” said Gauhar Mahmood of Jamia Milia University’s engineering department. Mahmood had worked on a rainwater conservation master plan for Noida.

# From The NASA :

## NASA Satellites Unlock Secret to Northern India's Vanishing Water

08.12.09

Beneath northern India's irrigated fields of wheat, rice, and barley ... beneath its densely populated cities of Jaipur and New Delhi, the groundwater has been disappearing. Halfway around the world, hydrologists, including Matt Rodell of NASA, have been hunting for it.

Where is northern India's underground water supply going? According to Rodell and colleagues, it is being pumped and consumed by human activities -- principally to irrigate cropland -- faster than the aquifers can be replenished by natural processes. They based their conclusions -- published in the August 20 issue of *Nature* -- on observations from NASA's Gravity Recovery and Climate Experiment (GRACE).

"If measures are not taken to ensure sustainable groundwater usage, consequences for the 114 million residents of the region may include a collapse of agricultural output and severe shortages of potable water," said Rodell, who is based at NASA's Goddard Space Flight Center in Greenbelt, Md.



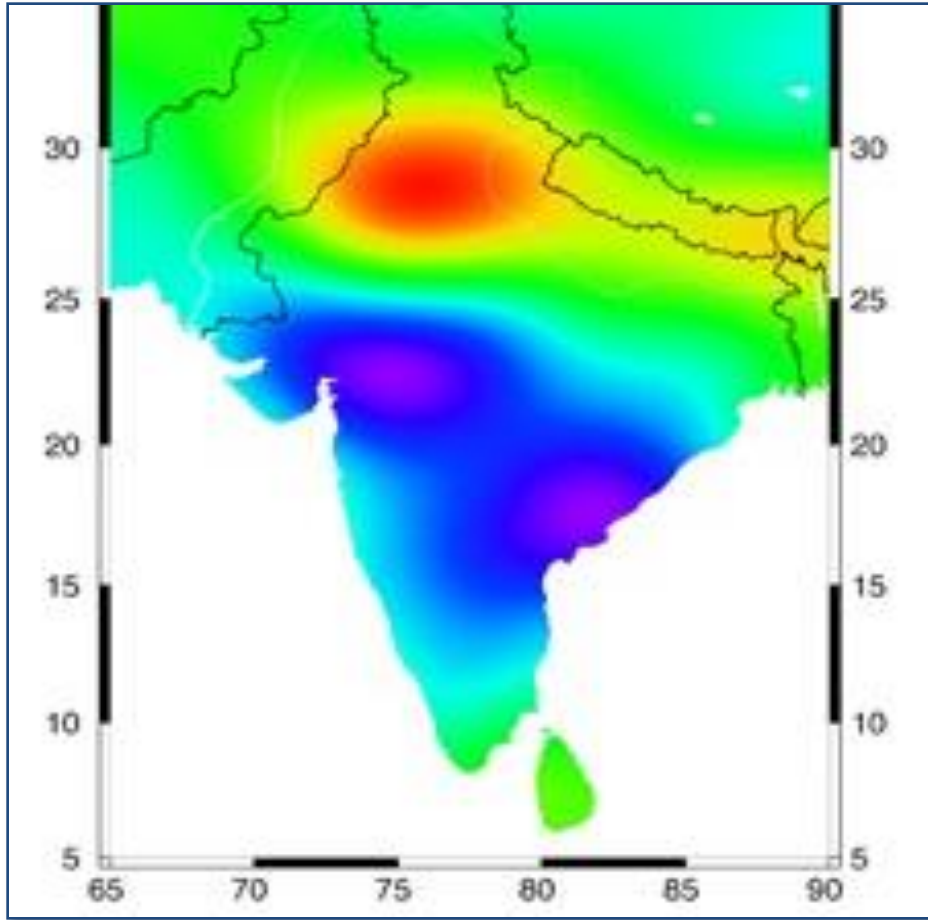
NASA Hydrologist Matt Rodell discusses vanishing groundwater in India. Credit: NASA

[Watch Video](#)



Source: *NASA Earth Science News Team*

# From The NASA :



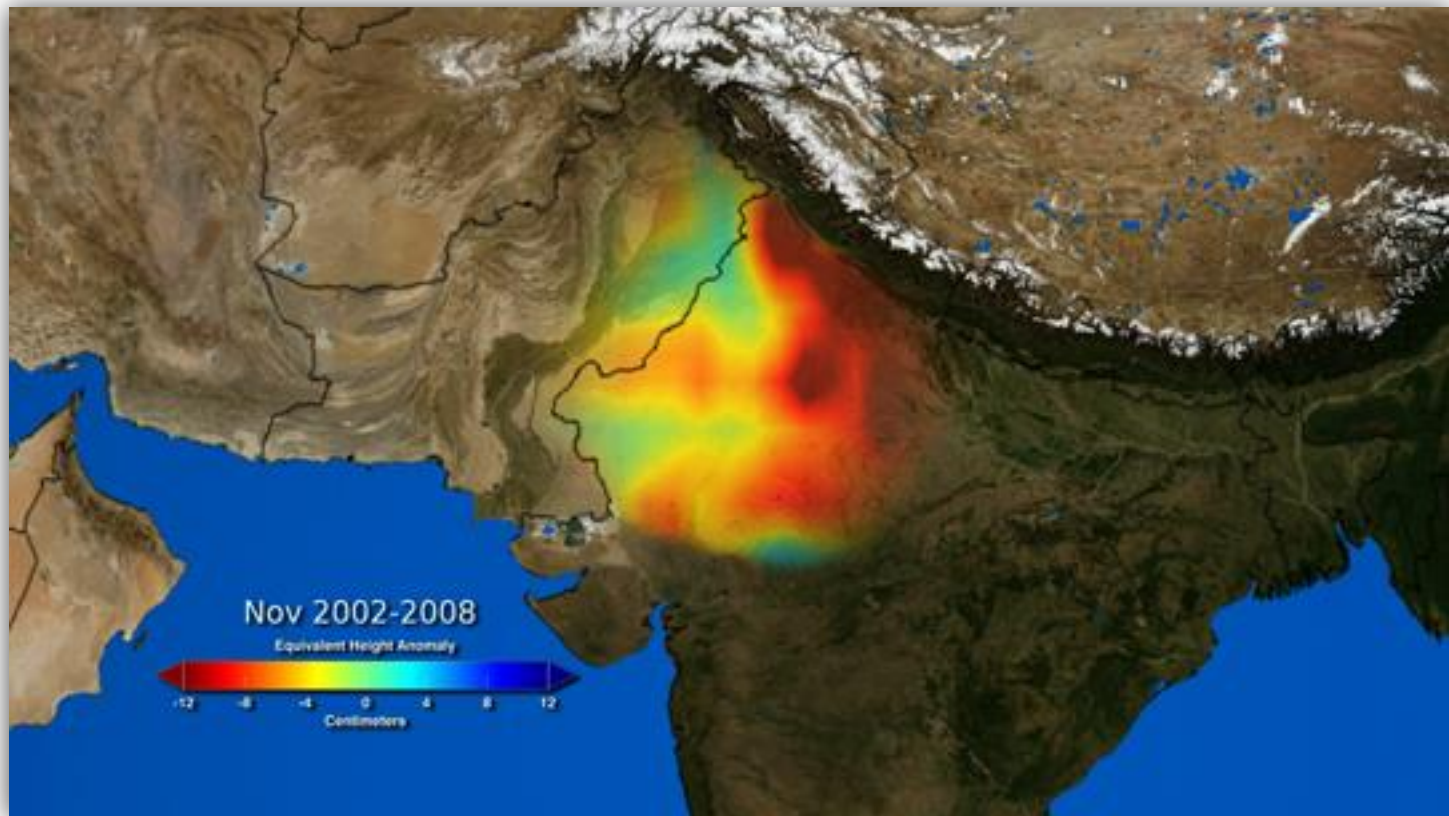
The map shows groundwater changes in India during 2002-08, with losses in red and gains in blue, based on GRACE satellite observations. The estimated rate of depletion of groundwater in northwestern India is 4.0 centimeters of water per year, equivalent to a water table decline of 33 centimeters per year. Increases in groundwater in southern India are due to recent above-average rainfall, whereas rain in northwestern India was close to normal during the study period.

Credit: Velicogna@UCIrvine



# From The NASA :

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# WHERE IS THE WATER FOR CONSTRUCTION ???

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- **NGT has banned underground water extraction**
- **Government of India - “Housing for All by 2022” Mission – National Mission for Urban Housing**
- **Authorities approve construction of PROJECTS**
- **100 Smart Cities**

# HOW MUCH WATER DO WE NEED FOR CONSTRUCTION ??



Real Estate Construction Site

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# DO WE NEED TO DO THIS STUDY ???

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Reporting on water usage from construction sites is a rarity.

This pilot study attempts to address this information lacuna so that this baseline study results can trigger a strong water conservation drive at construction sites.

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# PILOT PROJECT

## DIRECT EMBODIED WATER FOOTPRINT

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To calculate optimum  
water requirement  
for in situ  
construction in real  
estate industry

To set the  
benchmarks

To show savings in  
water use



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## Criterion 12 Efficient water use during construction

### *Objective*

To minimize use of potable water during construction activity.

### 12.1 Commitment

12.1.1 Use materials such as pre-mixed concrete for preventing water loss during mixing.

12.1.2 Use recycled treated water.

12.1.3 Control the wasting of curing water .

### 12.2 Compliance

The following documents should be submitted.

12.2.1 Certificate of architect, confirming the initiatives taken on site to minimize the use of potable water during construction.

12.2.2 Narrative on the initiatives on water use minimization, indicating the various sources of water.

### 12.3 Appraisal (1 point)

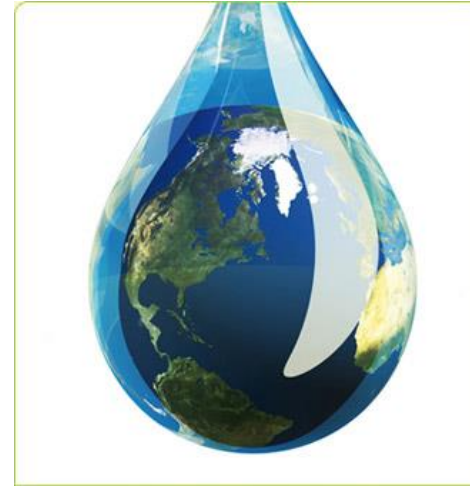
12.3.1 Efforts to minimize potable water use for construction as per clause 12.2.1, 12.2.2 (1 point)

**Note:** This point is completely subject to evaluator's discretion

# WATER FOOTPRINT OF PROJECT

TOTAL EMBODIED WATER : The total embodied water is the sum of both indirect and direct embodied water that remains as the capital water invested in the building i.e. its total embodied water foot-print.

- **INDIRECT EMBODIED WATER:** Building materials used for construction have their own water foot-prints created during their respective production processes.



**DIRECT EMBODIED WATER FOOTPRINT :** Direct embodied water is the one that is used in-situ towards multifarious on-site activities involving infrastructure creation (stockyard, labor hutments etc.), man-power and the construction process.

# DIRECT WATER FOOTPRINT

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As per a research paper\* by **Dr. Suchandra Bardhan** -  
*Dept. of Architecture, Jadavpur University, Kolkata,  
W.B., India*

Direct embodied water density i.e. construction water used directly at site was **~132 litre/sqft.** of construction in Eighteen Storey Apartments at Kolkata

\*Please see the link:  
[http://www.ijetae.com/files/Volume5Issue6/IJETAE\\_0615\\_30.pdf](http://www.ijetae.com/files/Volume5Issue6/IJETAE_0615_30.pdf)



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- **DO NOT WASTE WATER DURING CONSTRUCTION PHASE**
- **CARE FOR AIR QUALITY DURING CONSTRUCTION PHASE**
- **OPTIMIZE ALL WASTAGES THAT CAN HAPPEN AT PROJECT SITE**

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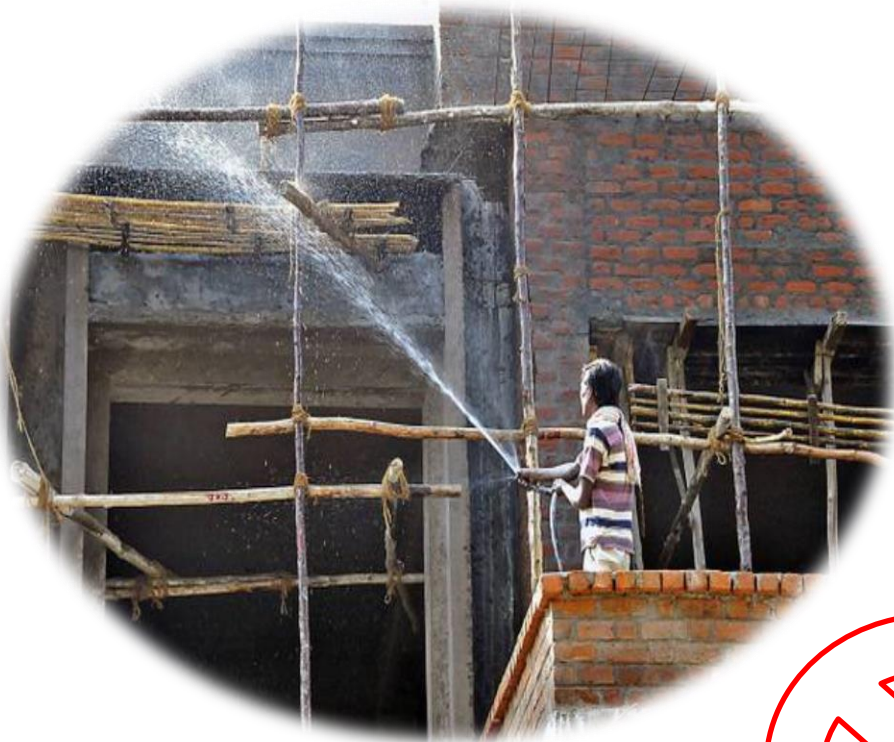
## “ SUSTAINABLE CONSTRUCTION PRACTICES ”

TRAINING OF PROJECT TEAMS FOR PRACTISING SUSTAINABILITY  
DURING CONSTRUCTION PHASE

**NO WASTAGES OF WATER**

**NO AIR POLLUTION**

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**SIGNATURE GLOBAL**  
HEALTHY RELIABILITY RESPONSIBILITY



W  
A  
T  
E  
R

**DON'T WASTE**  
**WE RESPECT**  
**WILL NOT LAST**  
**FOREVER**

**ZERO WASTAGE PROJECT**

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# #ZEROWASTAGEPROJECT

**SIGNATURE GLOBAL**  
REALTY. RELIABILITY. RESPONSIBILITY.

**WE CARE FOR  
AIR QUALITY  
DURING CONSTRUCTION**

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## ROADMAP

- Calculate the water requirement for a project.
- Track water consumption.
- ISSUE COMPANY POLICY ON WATER USAGE
- Make all water tanks at site with sizes measurable like of 30,000 or 40,000 litres with markers.

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- Use of trigger guns and sprays for curing of plastered surface/Brickwork to avoid runoff.
- Create washing platform for machinery wash and recycle water from wheel wash.
- Educate site staff for tool wash on washing platforms.
- Check for leakages.
- Appoint A CHAMPION for site.

# WATER HIERARCHY

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ELIMINATE WATER WASTAGE

IMPROVE EFFICIENCY

REUSE RECYCLE WATER

**“In the race of excellence there is  
no finish line “**

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