

Groundwater Policy and Regulatory Mechanism in Uttar Pradesh

A : Policy for Ground Water Management, Rainwater Harvesting and Ground Water Recharge in the State

Background :

The major portion of Uttar Pradesh is covered by Ganga-Basin. The state is known for having the richest repository of ground water resource as it comprises the largest aquifer systems in the world. The significance of the ground water resource can be judged by the fact that 75% of the irrigated agriculture is mainly dependent on ground water resources. The ground water availability in UP is estimated at 56.93 MAF. Allowing for other uses ground water useable for irrigation is about 48.42 MAF, of which 36.82 MAF is already being utilized. (Table 1).

Table 1: Ground Water Resources of U.P. (MAF)

1.	Total Ground Water Available	68.12
2.	Utilisable Ground Water	61.81
3.	Share of U.P.	56.93
4.	Reserved for Drinking	8.52
5.	Water currently utilised for irrigation	36.82
	Balance available for Utilisation	11.60

Source : Twelfth Five Year Plan (2012-17) document, Vol. I Part II (GOUP)

Further, 80-90% of the drinking water and about 85% of all the industrial needs are fulfilled by ground water. In agriculture, industrial and urban areas after the decade of 70's, unprecedented development/withdrawal of ground-water has been witnessed. While agricultural productivity has increased because of ground-water based irrigation, the contribution of this resource is also the maximum in fulfilling the water demand for drinking water and industrial sectors. But due to its unplanned and unlimited exploitation, adverse effects are also being noticed which mainly include problems like water-level decline, reduced availability of ground-water, failure of tube-wells, ground-water pollution, etc. As a

result, and as a matter of concern, marked shortage is observed in ground-water resource availability in many parts of the state both in urban and rural areas. In short, four major problems have been identified.

- 1- Wide spread decline of ground-water level as a result of uncontrolled exploitation in many of the rural and urban areas.
- 2- Rising problem of potable drinking water and safe irrigation water supplies in many rural/urban areas due to large scale chemical and bacteriological pollution.
- 3- Problem of ground-water recharge, particularly, in Bundelkhand-Vindhyan regions due to less ground-water availability and high run-off of rain water.
- 4- Emergence of water logging conditions in the areas of shallow ground-water level (0-3 m), particularly, in the canal-command areas.

Growing dependency on ground water resource can be assessed by the fact that the rate of ground water development/exploitation assessed as 54.31% in the year 2000, has increased to 72.16% in the year 2009. The ground water declining is recorded in 630 blocks out of 820 blocks. As per the 2009 estimates, 76 blocks are categorized as over-exploited, 32% as critical and 107 as semi-critical in the state. Thus, it is clear that the stress on ground water resource is continuously increasing and if not properly managed, the state will face grave consequences in not so distant future.

The policy :

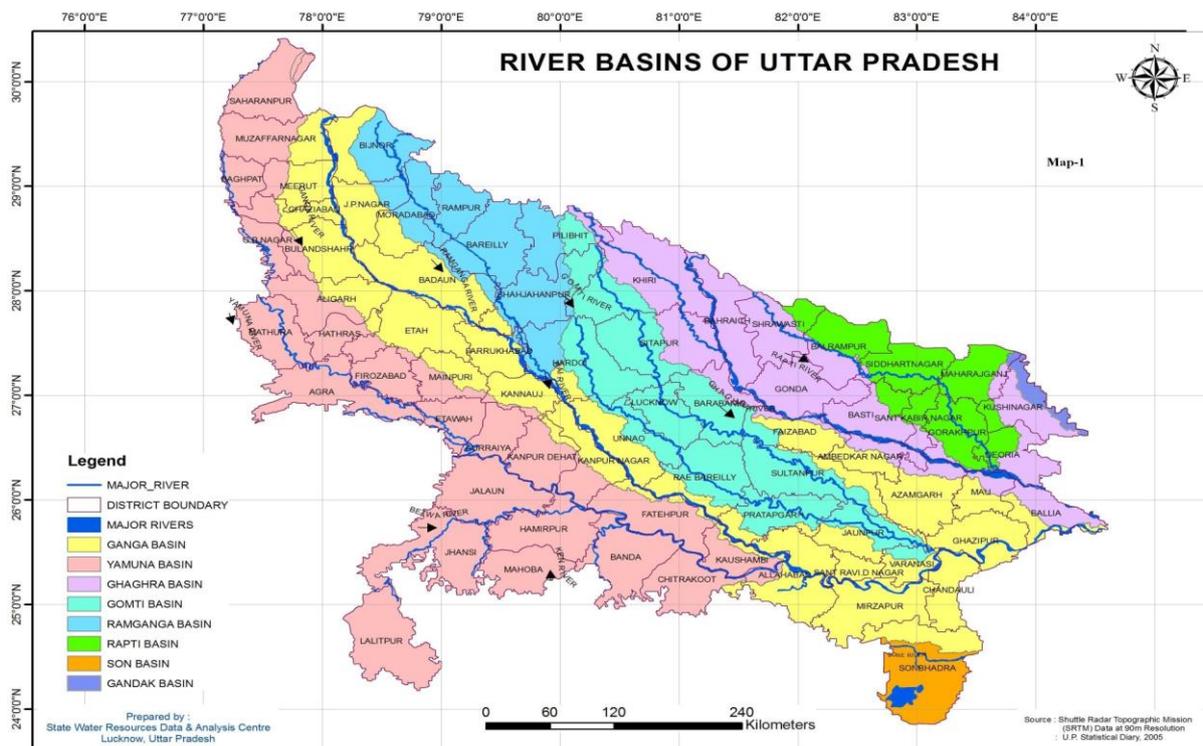
In view of the importance of integrated management of ground-water resource and continuously increasing dependency on ground-water in different schemes, the State Government has come out with a comprehensive ground-water management policy in the state, called as 'Policy for Sustainable Ground Water Management in Uttar Pradesh' that was issued by a Government Order No 280/60-1-2013-7 WP-2004, TCIII dated 18 February, 2013 and published in Uttar Pradesh Extraordinary Gazette, 2013. The policy aims to implement the rain water and recharge programs in integrated manner and to effectively minimize the existing level of ground-water withdrawals through efficient water use and techniques.

The policy document clearly defines the 'vision', 'goals' and the 'objectives' and finally, discusses, in detail, the strategies and action points along with necessary guidelines. The goals and objectives of the policy revolve around the four major problems mentioned above and emphasize upon the efficient and sustainable management for the exploitation and use of ground-water in the state as well as for its recharge and augmentation. It is directed in the

government order that all the concerning departments would coordinate and work together with the Ground Water Department which has been declared as the "Nodal Agency" by the Government Order, dated 08, September, 2004.

The Salient features of the policy :

The policy paper describes its strategy and main action points in nine different subheadings, starting with the aquifer mapping to monitoring and review. In the strategy formulation, the priority issues identified include (i) need for long-term management and planning, especially, for the stressed areas, (ii) taking up appropriate steps for conservation, protection and development of ground-water resources, (iii) the need to promote efficient irrigation techniques, encourage low-water consuming crops and crop varieties, promote soil-moisture conservation and demand-side management and other water management methods, (iv) determining and fixing the minimum distance between the ground-water structures and (v) develop suitable legal interventions for ground-water exploitation, use, recharge and quality control. The different strategies and action points as suggested in the policy document are briefly given here under :-



- The first strategy and the actions relate to '**Aquifer Mapping and Aquifer-based Ground-water Management**'. The emphasis here in is not simply on preparing aquifer maps, but the aim is to make this program a significant effort towards the effective solution of challenges related to water demand of the next 50 years along

with achieving the goal of efficient and participatory management. It is expected that in future, as a result of this program, management of ground-water will be done as a single aquifer unit.

- The next strategy and the action plans relate to '**Optimum Use of Ground-water and Planned Management of its Exploitation**'. Quite often, in ground-water based supplies huge quantity of ground-water goes waste due to faults existing in the water distributing system which include leakages. In rural areas, water waste occurs due to field losses while taking the water from tube-wells to fields, excess irrigation than the water really required to crop, etc. Concrete interventions are required for the judicious, optimum and efficient use of water including planned development / abstraction.
- Obviously, the management initiatives have to be taken separately for urban and rural areas.
 - '**Management Interventions for Urban Areas**' emphasizes upon checking about 40% losses due to leakage in water supplies. *Jal Nigam* would take effective steps, so that ground-water is saved along with reduction in ground-water withdrawals. It proposes to work out the need-based drinking water requirement and the arrangements like roastering for controlling exploitation of ground-water. While the existing tube-wells in major cities need be closed in phased manner, the new tube-wells be constructed in second aquifer group, marked as alternate aquifer. For the cities situated on the bank of river Ganga, the policy suggests the construction of tube-wells in the first aquifer group located up to 150 meters. It also emphasizes on reducing dependency on ground-water by promoting surface water based schemes, besides ground-water auditing.

The above actions would be taken up at the level of *Jal Nigam*, Urban Development Department and Housing & Urban Planning Department.

- **Management Interventions for Rural Areas** : In rural areas, the foremost requirement of the ground-water is for irrigating crops. Efforts are needed to reduce ground-water withdrawals to an effective level, especially, in stressed areas. The policy suggests a number of interventions like 'pipe irrigation' to check leakages, promoting sprinkler system, conjunctive use of canal water and ground-water, promote low-water consuming crops and encourage use of canal water for

irrigation in over-exploited areas. In this regard, a proper collaboration between the Department of Agriculture and Irrigation Department is necessary.

- The third main strategy and action plans relate to '**Rain Water Harvesting and Ground-water Conservation/Recharge**' wherein the main emphasis is on implementation of the schemes in an integrated manner, based on Geo-scientific norms, so that ground water situation could improve.

National Mission for Micro-irrigation

Scheme of micro-irrigation systems like drip and sprinkler for providing irrigation to horticultural crops under the above mission is operationalized in all districts of UP. For implementation of this scheme, over-exploited/critical blocks be given priority.

- Comprehensive technical guidelines for ground-water conservation / recharge have been worked out by the Ground Water Department. Ground Water Recharge Manual will be prepared which would include simple models and techniques for recharge.
- The Minor Irrigation and Irrigation (mechanical) Department should consider to start pilot schemes for assessing the feasibility of those techniques of recharge which could recharge on a large scale.
- The policy suggests to take advantage of the experiences of the participatory water-shed management programmes implemented by Gujarat, Andhra Pradesh and other states and also emphasizes upon the need for including rain water harvesting and ground-water recharge in the syllabus of class IV to XII, for which appropriate action be taken at the level of Education Department.
- The chapter on '**Rain-water Harvesting and Ground water Conservation/Recharge**' has five subheads–Ground Water Conservation in Urban Areas, Ground Water Conservation in Rural Areas, Ground Water Conservation in Industrial Areas, Ground Water Conservation and Water-Shed Program, and Impact Assessment and Maintenance of Recharge Work. Establishment of 'Technical Cell' and appointment of experts to provide technical advice and development of interactive website be considered by the department authorities and UP Housing and development board.

- The **ground water conservation in urban areas** emphasizes on roof-top rainwater harvesting systems on buildings along with combined recharge systems to be implemented by the Housing and Urban Planning Department.
- Further, the possibility of conserving surplus run-off through, "the pavement storm water harvesting" need to be assessed and promoted by the Urban Development and Housing and Urban Planning Department.
- It also gives the details of the recharge techniques for urban areas and the guidelines for implementation of roof-top rain water harvesting.
- In respect of **ground-water conservation in rural areas**, the emphasis is more on rehabilitation of village ponds and reservoirs for water storage and conservation. 'Recharge Activity Core Team' constituted in the stressed-districts will be made more effective and to speed up the rain-water harvesting program, "the Ground Water Recharge Task Force" constituted at state level, will provide the required technical cooperation.

Master Plan

- Central Ground Water Board has prepared Master plan for the artificial ground water recharge for UP, costing Rs. 9429.28 crore, which envisaged Rs. 1800 crore for Roof Top Rain Water Harvesting.
 - In this plan, 110783.14 sqkm area of the state is reported as suitable for recharge. It is proposed that about 5185 MCM water would be available for recharge.
- In **industrial areas**, Pollution Control Board would ensure careful implementation of the rain water harvesting and promote use of the ground water recharge techniques which would be applied by using Geo-Scientific norms. The polluted effluent of industries be treated for its maximum reuse and recycle. Due to risk of ground-water pollution, 'recharge well method' should not be encouraged.
 - The policy emphasizes upon the **adoption of micro-water-shed and micro-basin approach** for comprehensive planning of rain-water harvesting and ground-water recharge. The aim is to saturate each micro-water-shed by suitable recharge structures. Under the Government of India supported

'Integrated Water-shed Management Program (IWMP)', the rain-water harvesting and recharge are being implemented by the Agriculture and Land Development and Water Resources Development Department.

- Here, the condition is that these works be carried out only in those areas which are un-irrigated or irrigation facilities are less than 30%. This program cannot be implemented in those areas where irrigation facilities are adequate. However, in the over-exploited and critical blocks, where irrigation facilities are adequate, the Government of India should relax the above condition for initiating the work under IWMP.

Land Development and Water Resources Departments have prepared a perspective plan for 8509 lac hectare area for 70 districts of the state under IWMP, where, as per the provisions of the scheme, different conservation works are proposed in about 4 lac hectare area, falling in 108 over-exploited/critical and 107 semi-critical blocks.

- Under the '**impact assessment and maintenance of recharge works**' the policy provides for provision of impact assessment of the recharge schemes and the responsibilities for this lies with the concerned departments.
- The policy also suggests '**Setting of Ground Water Regulation Processes**' in the state. As of today, no legal system exists in the state for 'Ground-water Management and Regulation'. However, there do exist certain guidelines in this regard, such as,
 - no government scheme of tube-well construction should be implemented in the over-exploited / critical blocks.
 - The installation of roof-top rainwater harvesting system has been made compulsory with certain provisions in the building by-laws.
 - The policy envisages the formulation of practical and acceptable regulation process separately for both urban and rural areas.
 - It also proposes to prepare a separate Ground-water Act for the urban areas on the basis of 'Chennai Metro-Politian Area Ground Water (Regulation) Act–1987'.
 - Some other provisions regarding constructions of ground-water development for commercial, industrial, residential, road construction purposes also exist.

- It also suggests that the Pollution Control Board/ Environment Department should consider development of an initiative for monitoring and control system for ground-water pollution under Environment Protection Act.
- The policy emphasizes upon '**continuous monitoring of ground-water quality and environment protection**'. An integrated action plan for mapping of ground-water quality be prepared by the Ground Water Department, in coordination with U.P. Jal Nigam, Drinking Water and Sanitation Mission, Ground Water Department, Pollution Control Board/ Environment Department.
- The policy proposes the constitution of a '**Water Quality Review Committee**' on the pattern of the 'Water Quality Assessment Authority' constituted by Government of India. For monitoring of ground-water level and quality in industrial units, the provision for piezo-meter installation would be effectively ensured by the Pollution Control Board.
- The policy lays the guidelines for '**ground-water study and research**', according to the guidelines of 'Ministry of Water Resource', Government of India. It proposes to prepare district-wise GIS based ground-water maps and carry out investigations and research studies such as hydro-geological analysis for calculation of ground-water flow, its availability, storage, specific yield, etc. Establishment of high-level ground-water research and training institute as a centre of excellence in the state will be considered for promoting the advanced researches and studies in ground-water sector.
- The policy emphasizes upon the need for an organized approach for collection and analysis of reliable data on ground-water resources available with different departments and to ensure effective management of ground-water data, a GIS based efficient '**Ground-water Data Bank and Information System**' will be developed. Data / information, except the classified data, will be available in the public domain through website.
- The policy suggests preparation of '**Water Management Plan**' for every district, based on the local hydro-geological conditions, separately, for the urban as well rural areas.
- At the government and non-government level, the capacity building and training programs would be conducted for which the desired cooperation be taken from Water and Land Development Institutes (WALDI), U.P., Administration and Management

Academy and the State Rural Development Institutes. For development of information – education – communication (IEC) related to ground-water, action need to be taken at the level of Ground Water Department.

- The policy envisages establishment of a well-defined institutional structure for the ground water sector in the state.
- The issue of '**formulation, inter-departmental cooperation and implementation of schemes**' have also been considered at length in the policy. Presently, there exists no separate arrangements in the concerned departments for formulation of ground-water related schemes. Therefore, to provide guidelines / proper technical support and inter-departmental coordination, in the formulation of such schemes, a "Separate Cell" with efficient expertise be established in the Ground Water Department. All concerned departments shall maintain mutual coordination for achieving the objectives of the policy.
- Lastly, a '**Comprehensive Ground Water Policy Monitoring and Review Committee**' shall be constituted under the chairmanship of Agriculture Production Commissioner. If necessary, the committee can also take up third party study as per need. Checking up implementation, analysis and efficacy of different schemes related to ground-water, shall be done as per the directives of the committee.

Observations and suggestions :

The policy, as has been announced by the Government of UP and called as 'Policy for Ground Water Management, Rain water Harvesting and Ground Water Recharge in the State', provides broad guide lines for ground water management, rain water harvesting and ground water recharge in the state. The purpose of the policy is to ensure regulated exploitation and optimum use of ground water resource on a sustainable basis. **The policy also emphasizes upon the urgent need for the enactment of appropriate rules and regulations for ground water development in the nearest future.** However, while implementing this policy, some important suggestions are required to be kept in mind :

1. The rising demand of ground water for irrigation and for domestic, municipal, recreational, industrial and commercial purposes, has led to over-extraction of ground water in many areas in the State, giving rise to both water scarcity and stress. Reportedly, of 821 development blocks in U.P. more than 150 face over-extraction

problems and fast receding down of ground water levels. Ground water management needs a positive make over. Its extraction needs to be finely regulated. Ground water tables must be restored to ensure sustainability of water supply for critical areas like irrigation, domestic purpose and sanitary uses.

2. While in many areas ground water table levels have gone down sharply, some in other areas are suffering from sub-surface water logging. Such conditions give rise to infertility of lands and loss of agricultural production. About 63 lakh hectares of land in U.P. is estimated to face this problem. Evidently much greater attention needs to be paid to conjunctive uses of surface and ground water to ensure balanced and prudent use of both of these kinds of resources. This is a serious water use management gap in U.P. that must be addressed and filled up on a priority basis.
3. Conservation of water and improvement in water use efficiencies are declared policy objectives of the State. But, the ground reality is that there are large losses of water caused by overuse, wastage, evaporation, seepages and other conveyance leakages. For example, water supplies are high at canal heads and get much lowered at tails. It is important to line canals and distribution channels in a phased time-bound manner. Illegal tapping of canal water is another problem that needs to be sorted out and solved.
4. Loss of water is also caused many a times through over-irrigation by ill-informed farmers and by unauthorized and illegal cutting of canals by irresponsible elements eager to snatch more than their due share of water. It is important to educate farmers and other water users about the scarce availability of this important resource. Two approaches are called for; firstly, water distribution must be regulated through effective patrolling and enforcement, and secondly, Water User Groups must be activated to combat this menace.
5. Appropriate pricing of water can be a policy instrument for rationalized water use and management. The pricing should be volumetrically based to prevent wastage of water and over-irrigation and to meet sustained demand management needs.
6. Demand of water is incessantly increasing. The estimated requirement of water by 2025 in U.P. has been projected to be of the order of about 171 billion cubic meters (BCM) (Every Drop Counts, SHERPA/IIPA, U.P., 2005-O6). This demand can be met, if water-management is improved, water use is economized by application of

appropriate efficiency measures and wastage is minimized. Use of sprinklers and drip irrigation, wherever possible, particularly in growing horticultural and floriculture crops, should be promoted to conserve water. Recycling of water is another strategic need that must be promoted and incentivized.

7. Equitable distribution of water is called for, to ensure inclusive growth of farmers and problem of land productivity. That requires Participatory Irrigation Management (PIM) by Water User Associations (WUA). The WUAs have been set up, but these have not as yet become functional in an effective mode.
8. Presently, a large part of rain water flows into rivers and seas. Concerted efforts have to be made to harvest rain water by channelizing it into underground storages for re-charging ground water. A declared State Policy in that regard is in place and necessary guidelines too have been provided but the fact is that implementation is extremely poor. The State Government, through all its concerned departments and agencies, needs to take proactive steps to implement the policy with both speed and effect.
9. About two-third of surface water and a little over one-third of the ground water is usable for irrigation. Surface water sources (canals, tanks, lakes, ponds, etc.) provide water for farming to only about 20% of the irrigated land. The rest is tube wells that provide water to 72% of the irrigated land, of this nearly 69% is provided by private tube-wells (state tube-wells contributing just 3%). The tragedy is that the potential of state tube-wells has remained largely unutilized for various reasons, like poor maintenance, uncertain supply of electricity and frequent break downs. Only about 48% of the potential of state tube-well is reportedly being utilized. There has been no improvement in that regard since long. This is a serious deficiency that needs to be addressed and corrected.
10. In the case of private tube-wells, utilization of capacity is now better at about 63% (against 61.5% during the Tenth Plan), but further improvement is called for here, too. Canals face a different problem. Here both seepage and evaporation losses are considerable. Most canals are not lined.
11. There are about 40 lakh private tube-wells/pump sets in UP. About 80% of these are diesel-operated and are costly to run. These need to be electrified and that would

require higher and widely distributed installation of supply of electrical energy. Power generation capacity in UP. is low and that badly needs to be re-enforced.

12. Canals in the state are unlined which allows water to seep through the soil and flood adjoining lands. That impacts land fertility negatively. Lining of canals should be an area of attention.
13. Land and water Policy and Management are inseparable issues. But, their integrated and sustainable uses have yet to be planned, projected and realized in U.P. The need is of the setting up of a high level statutory empowered Land and Water Management Board, headed by the Chief Minister of the State, which should determine the policy and planning goals and lay down time and cost-lined steps that must be taken to achieve the objectives set and provide organizational, financial and technical resources for that purpose.

B : The Uttar Pradesh Ground Water Conservation, Protection and Development (Management, Control and Regulation) Bill, 2010

Introduction:

Legislative interventions concerning groundwater are significant for two main reasons. Firstly, from a legal perspective, they constitute a major organized attempt at redrawing the rules concerning control and use of groundwater, which is still otherwise largely based on common law principles that make it part of the resources, a landowner can use largely without outside control; secondly, they constitute a response to the fact that over time the groundwater has, in various areas, become the most important source of water and provides, in particular, 80 per cent of the domestic water supply in rural areas and supports around 70 per cent of agricultural production. This strengthens the case for ensuring the sustainable use of groundwater (Nations World Water Development Report 2003).

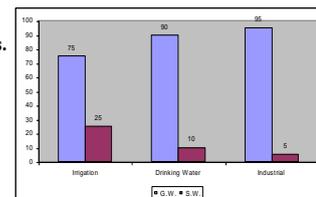
The Government of Uttar Pradesh through its order No. 280/62-1-2013-7 WP-2014, TCIII, dated 18 February, 2013 has declared its policy for '**Sustainable Ground Water Management in Uttar Pradesh**'. The policy provides the necessary guide lines for Ground Water Management, Rain Water Harvesting and Ground Water Recharge to promote efficient and sustainable use of ground water and stop wastages. The policy also emphasizes upon the need for a proper regulatory mechanism in the state for ground water management. 'The Uttar Pradesh Ground-water Conservation, Protection and Development Bill-2010', therefore, is a welcome step in this direction.

GROUND WATER IN U.P.

Ground Water is the most neglected, poorly managed & unregulated resource.

However, its contribution can not be overlooked. The significance of this resource can be evaluated-

- 75% irrigation supplies.
- 80-90% of drinking water supplies.
- almost all the industrial needs.



But, despite its growing significance, regulatory & management requirements for protecting this resource have so far not been given due recognition.

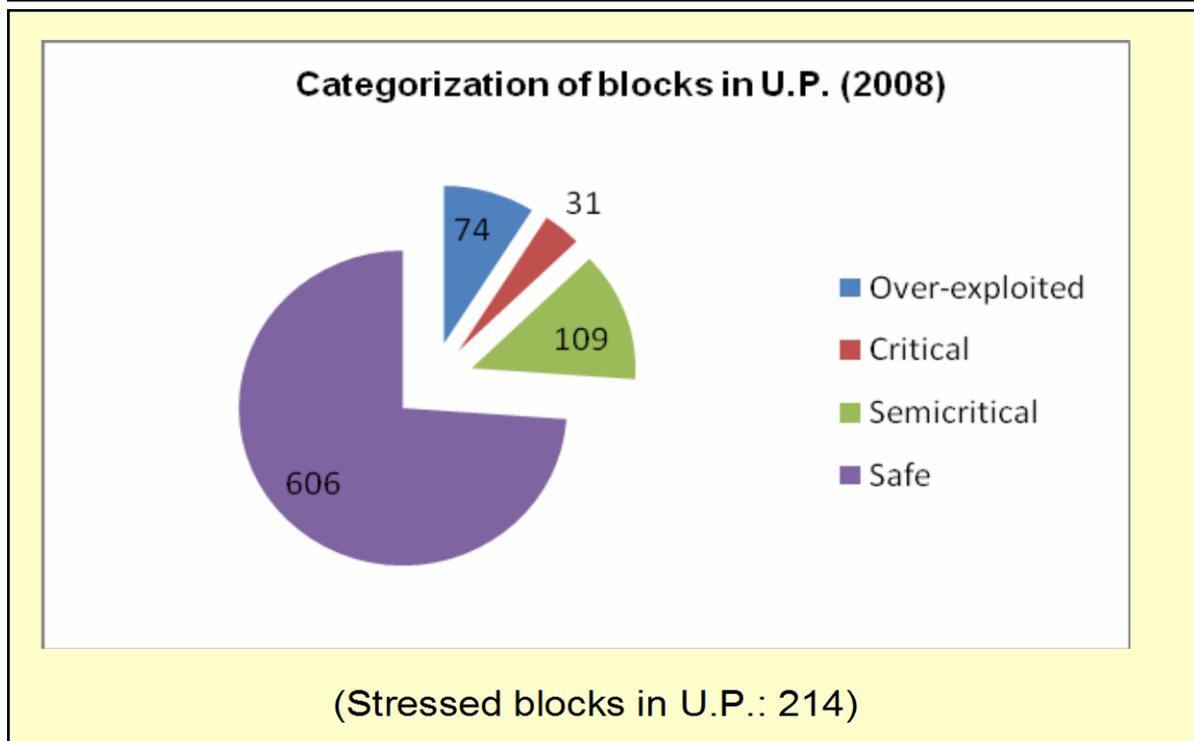
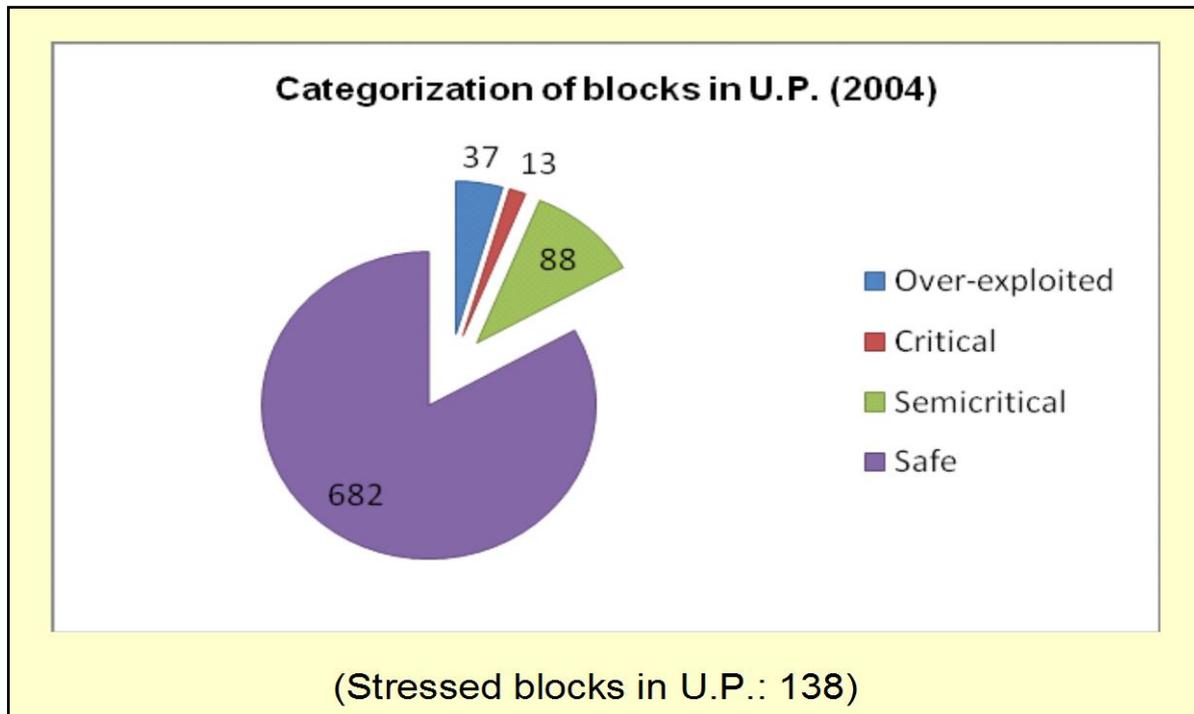
Total Ground Water Potential in U.P.

- Rainfall & Recharge from various sources replenishes Ground Water every year, but its large scale exploitation/development is increasing day by day.

Regionwise status of Dynamic Ground Water resource in U.P.

Name of region	Net Annual Ground Water Recharge (m. ham)	Annual Draft for all users (m. ham)	Net Ground Water availability for future use (m. ham)	Stage of Ground Water Development (%)
Eastern	2.54	1.68	0.86	66
Western	2.58	2.05	0.53	79
Central	1.45	0.96	0.49	66
Bundelkhand	0.44	0.19	0.25	43
Total	7.01	4.88	2.13	69

According to the Central Ground Water Board (CGWB), the state's demand for groundwater has nearly doubled in the recent years. While the U.P. gross domestic product (GDP), is expected to grow by 64% by the year 2020, over 60% of the industrial water demand is currently met by groundwater. The Uttar Pradesh State Water Policy envisions that by 2025, groundwater use will increase by 137% (from 27 Billion Cubic Meters (BCM) to 65 BCM) and the number of over-exploited blocks will be over 20% (177 blocks out of 820 blocks).



The proposed Act states that 'industries, barring some selected ones, shall be required to bear the development cost of the resource and its maintenance along with the cost of water to reflect the scarcity value of this resource'. It goes on to add, "for industrial use extensive water conservation and the pollution control shall be exercised to keep the requirement low and prevent pollution of both, the ground and the surface water. Treatment of industrial discharge and reuse of water shall be enforced".

The draft Bill is a step in the right direction. The draft Bill says that the use of groundwater by commercial and industrial bulk users will be regulated; users will be charged; water cannot be abstracted in dark areas; and, users must recharge the aquifer through rainwater harvesting. In recent decades, regulatory intervention has increased for two principal reasons: to authorize the state's control over water resources and to protect the growing importance of groundwater, which provides 80% of the rural domestic water supply and 70% of the agricultural demand.

The Bill-2010

The first circulation of the Model Bill for the Regulation and Control of Ground Water by The Ministry of Water Resources, Govt. of India, was released in 1970. The Bill was re-circulated in 1992, 1996, and most recently in 2005. Uttar Pradesh would be the twelfth state to enact groundwater legislation, following Andhra Pradesh, Goa, Tamil Nadu, Kerala, West Bengal, Himachal Pradesh, Bihar, Chandigarh, Dadra and Nagar Haveli, and Union Territories of Lakshadweep and Pondicherry.

In the coming months, the UP government is slated to enact official rules on the basis of existing groundwater levels, wells in use, competitive users, depth and design of well, purpose of water use, quality and quantity of water to be withdrawn, likelihoods in adverse effect, and rainwater harvesting potential. Decisions regarding permits will follow a similar principle, mandating withdrawal rates in accordance to groundwater potential and neighboring users.

The Bill-2010 aims to provide for the management, control and regulation of the conservation, protection and development of groundwater in the state and for matters connected therewith or incidental thereto. While the development of groundwater is the need of the state, its management, control and regulation, especially, in over-exploited and critical areas, is also the need of the hour for protection and conservation of this precious resource. After careful examination of all aspects, the State Government has decided that it is expedient and necessary in the public interest to manage, control and regulate the extraction and use of groundwater in any form and to conserve and recharge groundwater in the state, and hence this bill.

A brief description of the bill and its provisions

The Bill known as '**The Uttar Pradesh Groundwater Conservation, Protection and Development (Management, Control and Regulation) Bill-2010**', consists of four broad chapters – preliminary, establishment of groundwater authority, recharge of groundwater and the miscellaneous.

The first chapter of the Act is entitled as the **Preliminary- concerns with short title, extent and commencement**. The Act called as 'The Uttar Pradesh Groundwater Conservation, Protection and Development (Management, Control and Regulation) Act, 2010', extends to the whole of the state and shall come into force on such date as the State Government may, by notification in the gazette, appoint, and different dates for different areas may be appointed. The chapter provides definitions of the terms often used in this regard such as 'artificial recharge', 'authority', 'drinking water', 'groundwater', 'industry', 'user of groundwater', 'water user association', 'bulk users', etc.

The second chapter is on the '**Establishment of Groundwater Authority**'. The state Government shall, by notification in the gazette, establish an authority to be known as 'Uttar Pradesh Groundwater Authority' under the chairmanship of the Agriculture Production Commissioner, Government of Uttar Pradesh. The bill also provides for the appointment of the staff of the groundwater authority and entrust the authority the necessary powers to notify areas for control and regulation of groundwater development. The authority shall also take steps through registered Service Providers* to ensure that exploitation of groundwater resources does not exceed natural replenishment to the aquifers. The bill also provides for formation of 'water user association' and defines their functions, formation of resident welfare user association and their functions, registration of service providers and fixing their responsibilities, registration of bulk users, drilling agencies with guidelines for construction of tube-wells, registrations of users in over-exploited/critical areas and industrial users.

*'Service Provider' refers to an organization having agricultural engineer, civil/mechanical engineer, Master Degree holders in Geology/Geophysics or individual having qualification of B.Tech/ B.E. or M.Sc. with at least 20 years of experience in his/her field.

Some of the important provisions envisaged in the bill are given here under:-

1. Provisions for existing and new bulk users in non-notified, semi-critical, critical and over-exploited areas (S-16, 17, 18)

Any user engaged in use of groundwater in bulk or huge quantity as notified by the authority [sec 2(15)] will be termed as bulk user.

- Every exiting bulk user is required to register within 120 days in non-notified and semi-critical areas and within 60 days in critical and over exploited areas. New bulk users need to register before the construction of well in all areas.
- Complete ban is envisaged on construction of new well in critical & over-exploited areas. However, construction of new well for water supply scheme for human consumption/drinking will be allowed on a case to case basis in consultation and under guidance of registered service provider.
- Authority/Government may charge fee for ground water use annually.
- Adoption of area specific RWH technique is mandatory for the existing bulk users.
- Mandatory provision exists for inspection twice a year to ensure and check efficacy of RWH/R structure, limit of ground water withdrawal, size of pump set, suction & pipe, quality of water being recharged etc.

2. Provision to extract and use groundwater for commercial users and industries (S-19)

- Every existing user if required to register with in 120 days in non-notified & semi-critical areas and within 60 days in critical & over-exploited areas. New users need to register before the construction of well in all areas.
- Commercial users and industries need to sink a well in semi-critical, level-1 and non-notified area shall apply to any of the registered Service Provider.
- Complete ban exists on construction of new well in critical & over-exploited areas.
- Authority/Government may charge fee for groundwater use annually.
- Mandatory provisions exist to establish Rainwater Harvesting technique, with in a period, specified by Authority under the supervision and guidance of the Service Providers.
- There is a mandatory provision for inspection twice a year to ensure and check efficacy of RWH/R structure, limit of groundwater withdrawal, size of pump set, suction & delivery pipe, quality of water being recharged etc.

3. Provisions for common farmers in rural area

3.1 Non-notified area

- No regulation for the time being for any user of groundwater for installing pump set of power not exceeding 7.5 H.P.
- All user of ground water will self regulate themselves by installing pump set of power exceeding 7.5 H.P.
- All users of ground water will adopt the rain water harvesting/recharging activities.
- Mandatory provisions for all sellers to inform the Authority about selling of pump sets of power exceeding 7.5 H.P.
- Promotion of mass awareness and sensitization programme through WUA.

3.2 Semi-critical Area, Level-1

- All users need to self regulate themselves through WUA by installing pump set of power not exceeding 7.5 H.P.
- Installation of pump set exceeding 7.5 H.P. through Service Provider.
- The limit/rate of ground water with drawl from one well/tube well with pump set exceeding 7.5 H.P. shall be fixed by the Authority.
- It will be mandatory for seller of pump set to inform the Authority if he sells any pump set of power exceeding 7.5 H.P.
- To promote mass awareness program on Rain Water Harvesting & Recharge through WUA's.

4. Provisions for common persons in urban areas.

4.1 Non-notified area (S-16)

- No regulation for the time being for any user of ground water for installing pump set of power not exceeding 0.5 H.P.
- All users of ground water will self regulate themselves through Resident Welfare Association to install submersible pump set of power exceeding 0.5 H.P.
- All users of ground water will adopt the rain water harvesting/recharging activities.
- Mandatory provisions for all sellers to inform the Authority about selling of pump set of power exceeding 0.5 H.P.
- Promotion of mass awareness and sensitization programme through RWA.

4.2 Semi-critical area, Level (S-17)

- All users to ground water will self regulate themselves through RWA by installing pump set of power not exceeding 0.5 H.P.
- Installation of pump set of power exceeding 0.5 H.P. through Service Provider.
- Sinking of new well/bore well/ tube well allowed with the condition that user will declare the installation with mandatory provisions to adopt Rainwater Harvesting/Recharging techniques.
- It will be mandatory for seller of pump set to inform the authority if he sells any pump set of power exceeding 0.5 H.P.
- Promote mass awareness program on Rain Water Harvesting & Recharge through RWA's

5. Provisions for common persons in over-exploited and critical areas (both urban and rural)

- Every existing user to inform the Authority with in 60 days of Act coming into being.
- Complete ban on construction of new wells/tube wells (both private & Govt.).
- Ban to continue till such areas are de-notified by the Authority.
- Existing users of ground water (Private & Government) to mandatorily adopt the area specific RWH techniques.
- Mandatory provision for inspection twice a year to ensure and check efficacy of RWH/R structure, limit of ground water with drawl, size of pump set, suction & delivery pipe, quality of water being recharged etc.
- No person shall cause any such activity, which is against the provisions of this Act or which is prejudicial or in contravention of the Act.

6. Rain water harvesting for groundwater recharge

- In order to improve groundwater situation in critical areas, it is essential to adopt rain water harvesting for groundwater recharge. In urban areas, rain water available from roof tops of buildings and other open areas can be utilized gainfully for groundwater recharge. For this, harvesting structures feasible in urban areas include recharge pits, trench, existing wells, etc. In rural areas, groundwater recharge be taken up considering watershed as a unit. The feasible structures include construction of gully plugs, contour bunding, check dam, percolation tank, recharge shaft, etc.
- The Authority may identify recharge worthy areas in the state and issue necessary guidelines for adoption of rain water harvesting for groundwater recharge. In rural

areas, watershed management to facilitate groundwater recharge may be encouraged through community participation.

- The Authority may issue directions to the Housing Department providing combined rain water harvesting system for existing urban colonies along with provision for maintenance.
- Existing ponds, lakes and other water bodies shall be maintained and governed by concerned District Magistrate or any other body appointed by the District Magistrate.
- Water bodies existing in rural areas at the time of enforcement of the Uttar Pradesh Zamindari Abolition and Land Reform Act and in other areas on 1st January, 1950, shall be maintained properly and any encroachment etc. made thereupon shall be removed as per provisions of the respectable laws applicable in that particular area for that purpose which has been made out after the time mentioned in this act.
- Land records at the time of enforcement of U.P. Zamindari Abolition and Land Reform Act – 1950 in rural areas and on 1st January, 1950 in other areas, will be conclusive proof for defining the water bodies.
- The Authority shall take steps for promotion of mass awareness and training programs on rain-water harvesting and artificial recharge through Government Agencies / NGOs / educational institutions / industries / individuals, etc.

7. Penal provision regarding pollution (S-34)

- Any person/user, institution, industry including small users who contaminates ground water in any manner or directly disposes waste water including sewage into aquifers shall be treated as an Act of Criminal Offence.
- For such offence, the person responsible shall be liable for strict punishment with imprisonment for term, which shall not be less than one month but which may extend to one year as prescribed by the Authority.

7.1 Other penal provision for groundwater users:

- Any user of ground water except small users in notified area, if fails to comply with any of the provisions of the Act or any rule made or obstructs the Authority or any other person authorized by it, shall be punishable-
 - With fine upto Rs. 5000 for first offence and,
 - for second and subsequent offence with imprisonment for a term, which may extend to six months or with fine upto Rs. 10,000 or with both

- To implement the provisions of the Code of Criminal Procedure, 1973 (Act No. 2 of 1974) for any search or seizure.

8. Miscellaneous provisions:

- Service providers (S-10) & Drilling agencies (S-13) need to be registered by paying registration fee in every district.
- Authority shall fix water rates (S-20) for selling ground water from private tube wells.

Some comments and suggestions on the proposed Act:

- The main institutional innovation proposed in the Groundwater Act is the setting up of a new Authority or Cell made of government civil servants and members nominated by the government because of their expertise. The balance between civil servants and other members varies. In the proposed UP legislation, membership is overwhelmingly drawn from government circles with a couple of other members, such as the provision for an NGO member.
- The authority setup has been tasked with different functions in the different states, such as notifying areas of special concern and granting permits to use groundwater in notified areas. In this respect, the UP Bill is conservative and limits itself to providing for notification of areas threatened with over-exploitation of groundwater and granting of certificate of registration for use of groundwater.
- The UP Bill does not break new ground and limits itself to giving special consideration to drinking water by, for instance, providing an exception to a complete ban on the construction of new wells in over-exploited/critical areas. This does not specifically put drinking water supply in a hierarchically superior position for groundwater, in general, something that is not only desirable, but necessary in the context of the recognition of the fundamental right to water.

What is required is a legislation that recognizes that water is a unitary resource, that drinking water is the first priority as well as a human right and that Panchayati Raj Institutions must have control over and use of groundwater.

- There is no incentive in the common law rules or in the Act that are being adopted for individual landowners to use the water responsibly and equitably. There is also no mechanism to ensure that groundwater is shared with non-landowners. Further, without a broader perspective, no single water user has any reason to recognize environmental needs ensuring that all ecosystem functions are met in the long-term.

- Overall, the model bill extends the control that the state has over the use of groundwater by imposing the registration of groundwater infrastructure and providing a basis for introducing permits for groundwater extraction in those regions where groundwater is over-exploited. The model bill is not adapted to the current challenges that need to be addressed. It fails to include specific prioritization of uses, does not specifically address the question of domestic use, does not differentiate between small and big users; commercial and non-landowners/occupiers are, by and large, excluded from the existing and proposed system which focuses on the rights of use of landowners.

Conflicts between ground water uses and users are likely to grow. The main concerns are irrigation vs domestic use, irrigation vs hydro-power and water use vs ecologic flow. Water rights of individuals and group of individuals need better delineation through a legalized process of allocations and review of allocations.

- The model bill provides for the grandfathering of existing uses by only requiring the registration of such uses. This implies that in situations where there is already existing water scarcity, an Act modeled after these provisions will not provide an effective basis for controlling existing overuse of groundwater and will, at most, provide a basis for ensuring that future use is more sustainable.
- There is no specific provision for public participation in this scheme. In any notified area, every user only proposes to use a hand pump or a well from which water is drawn manually. Wells need to be registered even in non-notified areas. Decisions of the authority in granting or denying permits are based on a number of factors which include technical factors such as the availability of groundwater, the quantity and quality of water to be drawn and the spacing between groundwater structures.
- The rapid population growth and resulting domestic demand for water require rapid and effective decision-making as regards groundwater management and control of the various sources of pollution. Understanding of the variability and range of hydro-geological settings and UP's demands on aquifer systems is crucial to effective management practices. Sustainable allocation of groundwater resources will therefore, require catchments and aquifer management plans that clearly integrate groundwater and surface water systems. This will require an accurate catchments and aquifer water balance to develop management plans which recognize the long time-frames of

aquifer and catchments interaction. This type of knowledge framework is missing from the current reform strategies.

- Such Bill needs proper debate among the stakeholders and policy makers, before being finally notified, so that socio-economic transition to a 'less water-dependent economy and society' could be developed over time,
- Potability and safety of groundwater quality is not mentioned, specially chemical and microbiological quality of groundwater sources, and improvement in existing well protection. The Authority needs to outline "Critical Aquifer Protection Areas" and declare such areas such as floodplains, open low lying areas or ponds/water bodies as "Potential Groundwater Sanctuary". Their land uses should not be altered or modified to suit developers.
- The Bill does not talk about reduced rights of uses in riparian areas of insufficient water availability, nor does it draw the conflicts associated with 'sale' of excess water allocations by the bulk users.
- The costing system of legal rights for groundwater abstraction is poorly constructed. No distinction is made on grounds of efficiency of the irrigation use, nor the level of water-stress in the area concerned. There is a need of "differential charging" in critical areas or groundwater use restriction zones, as defined by the Authority.
- It is also important to make a more detailed assessment of the current process of groundwater salinization/quality reduction, which could, reduce the future value of groundwater for drinking/irrigation, if not carefully managed or influenced the preferred approach to aquifer artificial recharge.
- Water sector institutional arrangements and other potential regulatory issues such as actual cost of over-extraction and cost of groundwater pollution etc. should be clearly defined in drafting the proposed Bill.
- In areas, where groundwater is low, the Bill should allow to establish groundwater management areas and plan how much water can be sustainably withdrawn from aquifers. The Bill should emphasize upon local control, flexibility, conservation, and science-based management of water.

The Ground Water Legislation Needs a New Frame-work:

The ongoing reforms of groundwater regulation, as proposed in the UP Bill, fail to bring in a regulatory framework that is either adapt to the needs of the 21st century or compliant with existing constitutional principles for two main reasons:-

- Firstly, the existing groundwater reforms fail to implement basic constitutional principles related to water that apply without doubt to groundwater. This is the case of the fundamental human right to water and the decentralization amendments. The groundwater legislation has only exceptionally focused on drinking water and never from a fundamental right perspective.
- Secondly, the existing reforms fail to address the core issue of the legal status of groundwater. Groundwater legislation is to-date conceived largely as a natural resource legislation that fails to integrate the key social dimension of groundwater and the existing environmental law principles, such as the precautionary principle. Therefore:-
 - The new set of reforms needs to be based on the basic principles of the national legal framework as it exists today, rather than what was prevalent in 1970. Two of the important novel aspects are the explicit recognition of the fundamental human right to water and the decentralization amendments. In other words, an entirely new set of reforms is needed to ensure the implementation of these basic principles. Such reforms must, for instance, ensure that de-linking land and water rights is undertaken in the framework of the human right to water that requires restricting or eliminating individual entitlements to water.
 - Further, the reforms must benefit from advances in the scientific understanding of the water sector. This should lead to the development of laws that do not make artificial divisions between surface and groundwater, for instance. This is problematic because the disconnect does not exist in practice and leads today to absurd results, because the basic principles governing surface water and groundwater are different.
 - Finally, the reforms must be based on recent legal developments with in water law and related areas. This includes the need to extend the principle of public trust, which has been repeatedly confirmed by the Supreme Court for more than a decade, to groundwater and the need to integrate the precautionary principle, a basic principle of environmental law that is directly relevant in the case of groundwater.

Conclusion:

The UP Groundwater Act is a conservative step in the right direction. Mandates for rainwater harvesting/recharge and drilling bans in the notified areas certainly follow recommendations laid out in the 1970 model bill. However, the exemption of legal entitlements to water resources leaves much to be desired. Non-landowners and small pump-well users must continue to surrender their trust to the state. In the balance teeters the integrity and availability of groundwater for all users. Meanwhile, industry continues to grow along side groundwater stress, and a memorandum by the UP Chamber of Indian Industries Association (IIA) threatens to curb withdrawal and recharge provisions for bulk users. Pending the official rules of the Act, extensive data and water mapping must weigh in against industries priorities. Specifically, rules should include area-specific guidelines for rainwater harvesting/recharge and withdrawal rates. Legislation is only a small piece of mitigation efforts, and coordination among the GWA Service Providers, and users are essential to ensuring an equitable groundwater situation in UP.

However, the bill is a good start towards moving away from the inequitable and environmentally unsustainable legal regime concerning groundwater, prevailing since colonial times. At the same time, it needs to be given much more thought to provide an effective response to the challenges that need to be addressed today and for the next few decades. The Bill needs to make much bolder attempts at breaking away with the past and ensuring the integration of the basis principles of water law as the fundamental right to water and the principle of public trust.



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