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A study of Groundwater in Haryana

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Abstract: This paper finds out the impacts of groundwater pumping irrigation on level of ground water. It has been observed that continuous pumping caused decreasing of groundwater level after Green Revolution. Groundwater has speedily emerged to occupy a paramount role in India's agriculture after green revolution. In Haryana groundwater pumping has become the main means of irrigation and it now accounts for over about 54 percent of the irrigated area in state. Intensive agriculture dominated by paddy- wheat mono-culture has led to overexploitation of groundwater in Haryana. It is leading for a crisis and needs most urgent attention and understanding in India mainly in original Green Revolution states comprising, Punjab, Rajasthan and Haryana vulnerable to severe water scarcity. As per the latest assessment by the Central Ground Water Board (CGWB), Delhi, Punjab, Rajasthan and Haryana consume much more groundwater than their rechargeable limit every year, making them vulnerable to severe water shortage. In Punjab and Haryana, the offender is the indiscriminate use of groundwater in agriculture (India water portal organization).The paper is based on both primary and secondary data.

Keywords: pumping irrigation, green revolution, vulnerable, monoculture.

Introduction: During the past four decades, there has been a phenomenal increase in the growth of groundwater abstraction structures due to implementation of technically viable schemes for development of the groundwater resource, backed by liberal funding from institutional finance agencies, improvement in availability of electric power and diesel, good quality seeds, fertilizers, government subsidies, etc. Growing demand of water in agriculture, industrial and domestic sectors has brought problems of over-exploitation of the groundwater resource, continuously declining groundwater levels, seawater ingress in coastal areas, and groundwater pollution in different parts of the country. The falling groundwater levels in various parts of the country have threatened the sustainability of the groundwater resource, as water levels have gone deep beyond the economic lifts of pumping. The Central Groundwater Board has established more than 15,000 network- monitoring stations in the country to monitor groundwater level and its quality. Water levels in major parts of the country generally do not show any significant rise/fall. In Haryana requirement protective irrigation increased yearly and dependency on groundwater pumping irrigation also increased. But continue extraction of groundwater through tube well, the lap of earth has been drying. State has 8lac 44thousand tube well which are extracting water from the lap of earth. Ground water decline rate in case of Haryana had been estimated about 35 cm per annum (Chatterjee and Purohit, 2009). From 1999 to 2017 the depth of the underground water in state has reached double time (Amar Ujala, 16April, 2017).

Groundwater quality and pollution: The groundwater quality dimension is addressed by describing pollution sources, namely (a) groundwater salinity (inland and coastal), (b) geogenic contaminants (arsenic, fluoride, and iron), and (b) anthropogenic contaminants from mining, industrial, tanneries, land-fills and garbage dumps, agriculture, and poor sanitation and wastewater disposal. The report highlights the need for groundwater quality management if groundwater use is to be sustainable.

Groundwater governance framework: The main findings related to groundwater governance are:

- Even though the 1998 National Water Policy (NWP) and the 2002 amended version do not have statutory status, and thus cannot be legally enforced, they are the outcome of intensive political

discussions and so state governments could find them useful in developing their own water policies. Agriculture, energy, water supply, and many other sectoral policies influence groundwater use and pollution, but they are difficult to reform.

- The legal system for groundwater management in India falls within a complex, multilayered framework of constitutional and statutory provisions at the central and state levels. It is clear that groundwater management falls under the jurisdiction of the states and to this effect the central government has circulated since 1970 a model groundwater bill. Regretfully, only a few states have formally adopted it. Nevertheless, the two main legal drawbacks (the resource being assumed to follow the right to land and the absence of groundwater legislation at the central level) have been sorted out by:
- The Supreme Court and High Court rulings have affirmed the government's right and obligation to protect groundwater under the right to life guaranteed by the Constitution
- The Planning Commission's Groundwater Expert Group have argued that the legislative framework is reasonably robust for effective groundwater management, so the priority lies in enforcement of existing measures, supported by innovative approaches such as an expansion of community based-management.

Lessons Learned: The main lessons learned from the pilot aquifers are:

- Up-scaling and replication of very positive community-based groundwater management experiences will necessitate a flexible phased approach together with development of a ―lighthouse function‖ in the state government. This is to ensure that pilot initiatives do not fail because of lack of support and control, especially after government or donor agency support finishes and to make sure that experiences from successful interventions can be up-scaled and remain available for replication.
- Policies must be developed to improve urban groundwater finances and groundwater quality if the widespread institutional vacuum in Indian urban groundwater is to be addressed.
- In the Indo-Gangetic Plain, changes in management practices such as postponing transplanting paddy rice to achieve ―real groundwater savings‖ can help conserve groundwater.

Climate Change: In both rural and urban environments, the lessons learned in pilot aquifers in the Indo-Gangetic Plain show that it is worthwhile to move from spontaneous or incidental to more planned conjunctive use. This is useful for coping with climate change and for reducing waterlogging as well as inland and coastal salinization and other groundwater quality threats. At the same time, it is important to promote better characterization of underlying aquifers, institutional strengthening and coordination, and improved awareness among farmers and municipal engineers. No matter how merit-worthy groundwater recharge enhancement measures may be—and their potential as a tool for adaptation to climate change—the question of the extent to which such measures benefit the sustainability of specific rural water supply sources has to be addressed.

Groundwater and socio-economic development: Groundwater has played a significant role in the maintenance of India's economy, environment, and standard of living. India is the largest groundwater user in the world. Through the construction of millions of private wells, there has been a phenomenal growth in the exploitation of groundwater in the last five decades. The factors driving this expansion include poor public irrigation and drinking water delivery, new pump technologies, the flexibility and timeliness of groundwater supply, and government electricity subsidies. As a result, 29 percent of the groundwater assessment blocks in the country are classified in semi-critical, critical, or overexploited

categories with the situation deteriorating rapidly. The government has no direct control over the groundwater use of millions of private well owners, both in rural and urban areas. In part, this is due to the absence of a systematic registering of wells with attached user rights and metering. In an indirect way, groundwater use is also sometimes limited through power shedding with limited hours of electricity supply, especially in rural areas. The potential social and economic consequences of continued weak or nonexistent groundwater management are serious. Aquifer depletion is concentrated in many of the most populated and economically productive areas—and the consequences will be most severe for the poor. Furthermore, climate change will put additional stress on groundwater resources, while at the same time having an unpredictable impact on groundwater recharge and availability.

Recommendations: Recommendations for addressing groundwater over-abstraction include (a) using a mixture of management approaches, and (b) a balanced set of on-the-ground actions. But these actions must be implemented within existing provisions and institutional capacity, given the fact that the technical, legal, and institutional provisions are in a more or less acceptable status but the implementation capacity is weak. An overriding conclusion for all pilot projects is thus that the weakest link of all the elements in the groundwater governance chain is institutional capacity—and that although some degree of community self-regulation is required, government capacity to enable and nurture it must be strengthened. In many cases, groundwater pollution is caused or aggravated by intensive groundwater abstractions. This is the case for seawater intrusion in coastal aquifers, but also for various types of geogenic pollution such as high fluoride and arsenic levels. In these cases, groundwater quality has to be considered when establishing safe groundwater abstraction levels and management practices. The required legal and institutional provisions for most cases are acceptable, but the level of implementation capacity is lacking. Nevertheless, much can be learned from both unsuccessful and successful cases, including (a) the need to raise awareness among professionals and decision makers and develop effective communication with stakeholders; (b) the use of sophisticated mathematical models coupled with adequate experimental data to help remediate contaminated aquifers; (c) the value of adequately costing groundwater resources and environmental benefits; and (d) the use of innovative solutions, such as using distillery effluents to grow commercial plantations. The main recommendation for improving groundwater management in India is strengthening the State Groundwater Development and Management Agencies (SGWDMAs). A broad outline is presented of how they could be reorganized. However, successful implementation also depends on (a) political commitment at the highest level; (b) acknowledging the need for a transition to a substantially less water-demanding economy in some critical blocks to reduce the risk of permanent deterioration; and (c) acknowledging the fact that SGWDMAs are imbedded within a macro political and economic system and therefore an open dialogue with the central level must be established to reduce bureaucratic restrictions and grant the required support to state agencies to become groundwater resource guardians.

Reference:

- Agrawal, G. D., Lunkad, S. K. and T. Malkhed, 1999, Diffuse agricultural Nitrate pollution of groundwaters in India, Water Science Technology, Vol. 39, No. 3, pp. 67-75.
- Chowdhury T. R., G. K. Basu, B. K. Mandal, B. K. Biswas, U.K.Chowdhury, C. R. Chanda, D. Lodh, S. L. Roy, K. C. Saha, S. Roy, S. Kabir, Q. Quamruzzaman and D. Chakraborti., 1999, Arsenic poisoning in the Ganges delta Nature, 401, 545-546.

- Indu, Rajnarayan, 2003, Fluoride-free drinking water supply in North Gujarat: The rise of Reverse Osmosis plants as a cottage industry, Unpublished report of IWMI-Tata Water policy programme, Vallabh Vidyanagar, India.
- Jalan, J., Somanathan, E. and Choudhuri, S. (2004). Adoption of safe drinking water practices : does awareness of health effects matter. (Policy brief ; no. 4-04). Kathmandu, Nepal, SANDEE
- Janakarajan, S., 1999, Conflicts over an invisible resource in Tamil Nadu: Is there a way out, In Rethinking the Mosaic: Investigations into Local Water Management, edited by Marcus Moench, Elisabeth Caspari and Ajaya Dixit.
- Kumar, D. and T. Shah, 2003, Groundwater pollution and contamination in India, In Hindu Survey of the Environment.
- Londhe A., Talati J., Singh L. K., Vilayasseril M., Dhaunta S., Rawlley B., Ganapathy K.K and R. P. Mathew, 2004, Urban-hinterland Water interactions: A scoping study of six Class I Indian Cities, Presented in Annual Partner's Meet, IWMI-Tata Water policy programme, Vallabh Vidyanagar, India
- Maria, A., 2003, The costs of Water pollution in India, In Conference on Market Development of Water and Waste technologies through Environmental Economics, New Delhi
- . Rao, N. S., Rao G. K. and D. J. Devadas, 1998, Variations of Fluoride in groundwaters of crystalline terrain, Journal of Environmental Hydrology, Vol. 6, Paper 3 Shah, T., and Indu, Rajnarayan, 2004, Fluorosis in Gujarat: A disaster ahead, Unpublished report of IWMI-Tata Water policy programme, Vallabh Vidyanagar, India. TOI, 2005, Times of India news report, Vadodara edition, May 2005.