**How Indus Basin Aquifers Offer Hope**

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February 1, 2024

The government is currently contemplating the exploration of Indus Basin aquifers as a strategic initiative to attract foreign investment and enhance exports, with a primary focus on corporate farming. In addition to boosting foreign exchange reserves and ensuring food security, the Indus Basin aquifers hold the promise of meeting the increasing drinking water needs of a rapidly growing population. Many urban areas are grappling with deteriorated water quality, leading to preventable diseases. Thus, the utilisation of these underground water resources not only serves agricultural interests but also addresses critical issues related to public health in expanding cities.

The Indus Basin, crucial for agriculture, however, faces complex challenges that jeopardize the sustainability and optimal utilization of its aquifers, estimated to be roughly equivalent to the three-year mean flow of the Indus River. From issues like waterlogging and pesticide contamination to the intrusion of brackish water, immediate remedial measures are imperative to unlock the full potential of these aquifers. This unlocking not only enhances agricultural productivity but also plays a vital role in alleviating the burden of water-borne diseases.

Focusing not only on regulatory frameworks but also on establishing a robust mechanism to monitor the quality, quantity, and recharging rate of groundwater is critical for sustainable use. It ensures not only food security but also meets the drinking water needs of a burgeoning population, offering a glimmer of hope amidst the challenges faced by the region.

Sustainable agricultural practices are key to managing aquifers effectively.

Primary among the challenges is waterlogging, stemming from excessive water use for flood irrigation in arid regions compounded by inadequate drainage systems. This leads to rising water tables, saturating crop roots, and impeding their growth, posing a direct threat to the agricultural productivity that defines the Indus Basin.

Linked to waterlogging is aquifer contamination due to indiscriminate pesticide use without proper regulations. Pesticides leach into the soil, eventually reaching aquifers, and introducing harmful chemicals into water used for agriculture. This contamination jeopardizes the environment and human health, questioning the sustainability of agricultural practices in the region.

Further complicating matters is the discharge of uncycled urban and industrial waste into rivers and canals, exacerbating aquifer contamination. Inadequate waste management systems contribute to the direct discharge of untreated waste into water sources, compromising groundwater quality and suitability for agriculture.

The excessive pumping of groundwater above recharging rates, particularly in areas like Bahawalpur, has turned it brackish, adding another layer of complexity to the challenges faced by aquifers in the Indus Basin. This burdens the population with deadly diseases and considerably lowers crop yields, posing a threat to both food security and economic stability.

In the Indus Basin, where unsustainable agricultural practices and untreated water have led to the contamination of underground water, the population is grappling with severe health consequences. The overburdening of health infrastructure is a direct result of waterborne diseases stemming from sewage and pesticide contamination.

The inadequate management of agricultural runoff and untreated wastewater discharge has allowed harmful pathogens from sewage to infiltrate underground aquifers. Consequently, the population is experiencing a surge in gastrointestinal infections, with cases of diarrhoea, nausea, vomiting, and abdominal cramps on the rise. Waterborne illnesses are placing an immense strain on local health facilities, particularly in areas with limited access to clean water and proper sanitation.

The prevalent use of pesticides in agriculture further exacerbates the health challenges faced by the population. Chronic exposure to these chemicals through contaminated groundwater is linked to neurological disorders, reproductive problems, and an increased risk of certain cancers. This has led to a surge in patients with long-term health issues, adding significant pressure to an already overburdened health infrastructure.

Skin conditions, respiratory issues, and other ailments related to water contamination are becoming increasingly common, affecting the overall well-being of the population. The vulnerable demographic groups, such as children and pregnant women, are particularly at risk, facing heightened susceptibility to the adverse effects of waterborne contaminants.

The interconnected nature of environmental and public health concerns underscores the urgency of comprehensive efforts to secure clean and safe water for the population, mitigating the burden on the health sector and fostering a healthier future for the region.

To combat these challenges and unlock the full potential of Indus Basin aquifers, a comprehensive and integrated approach is imperative. Improving water management practices is paramount, involving the adoption of efficient irrigation techniques such as drip irrigation and sprinklers. These methods ensure judicious water use, minimizing losses through evaporation and runoff, while proper drainage systems can mitigate waterlogging.

Regulating and monitoring pesticide use is equally critical to prevent aquifer contamination. Stringent regulations and promoting organic farming practices can significantly reduce reliance on harmful chemicals, safeguarding aquifer quality.

To counter contamination from urban and industrial waste, substantial investments in comprehensive wastewater treatment facilities are essential. These facilities should efficiently treat and manage waste before it reaches water sources, ensuring the sustainability of aquifers for agricultural use.

In the broader context, sustainable agricultural practices are key to managing aquifers effectively. Exploring alternative irrigation methods, developing drought-resistant crop varieties, and implementing precision agriculture techniques can contribute to maximizing productivity while minimizing water usage and potential harm to aquifers.

Monitoring wells and regular assessments of groundwater levels are crucial to track changes and formulate effective strategies for groundwater management. As the government contemplates plans for corporate farming, a comprehensive monitoring system becomes even more crucial to prevent over-extraction and preserve aquifer integrity.

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