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Use of Managed Aquifer Recharge to Assist in the Capture and Reuse of Water

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Changes in available fresh water supplies due to increasing populations, climate change and global warming are issues concerning many nations. Over exploitation of existing water resources has led to depletion of groundwater supplies and environmental degradation in many countries. Managed aquifer Recharge (MAR) is a process that is being employed in many places around the world as part of an increased effort to improve water resources for local communities. The deliberate recharge of water to aquifers with later recovery is used to enhance the capture, storage and reuse of water that would be normally lost to the environment. MAR has the advantage over direct reuse as it can act as a buffer by increasing the residence time in the environment prior to use of the recharge water. This has the benefit of providing a more stable supply, improved protection against impacts from treatment failures, and cheaper storage options during low demand periods. In addition, MAR has been demonstrated to have the potential to improve the quality of recharged water, thus providing the opportunity for MAR to be used as part of the treatment and barrier system of water reclamation schemes. Information is still lacking, however, on many of the processes impacting the fate and behaviour of contaminants such as microbial pathogens, trace organics and nutrients on anything larger than a local scale. Government regulators, conservation groups and local communities remain concerned about the applicability of transferability of research findings on MAR from one region and nation to another. This presentation will detail the current research findings of processes influencing water quality changes during MAR and outline existing knowledge gaps that remain to be studied.