

A SYSTEMATIC REVIEW OF THE IMPACTS OF AGRICULTURAL ACTIVITIES ON GROUNDWATER QUALITY AND QUANTITY

O.D.I.P. Dissanayake^{*#}, and G.Y Jayasinghe

Department of Agricultural Engineering and Environmental Technology, Faculty of Agriculture, University of Ruhuna, Mapalana, Kamburupitya, Sri Lanka

**Correspondence E-mail: od.ip.indunil@gmail.com, Phone: +94703614593*

#Presenting Author

Abstract: A variety of ecological, social, and economic problems arise as a result of agricultural operations such irrigation, the application of fertilizers and pesticides, and the livestock farming. The tank cascade system (TCS) in Sri Lanka also can affect groundwater dynamics. The implementation of unsustainable agricultural activities in TCS has the potential to significantly affect ground water quality and quantity. In response to this pressing issue, a comprehensive literature review was conducted with the dual goals of (a) bringing together existing knowledge about the agricultural activities impact on groundwater quality and quantity and (b) providing an invaluable resource for policymakers, researchers, and stakeholders dedicated to promoting sustainable agriculture and safeguarding groundwater resources. This review focused on English-language publications published in major academic journals and investigated more than 50 scientific studies that were published between 2000 and 2022. In order to investigate the various impacts of agricultural operations on both the quality and quantity of groundwater, these investigations were subjected to rigorous examination and extensive assessment. The review uncovered information on the different elements that affect groundwater quality, including trace element mobility from soil to aquifers, pesticide infiltration, and fertilizer discharge. Investigating the mechanisms underlying these processes provided information on the fate and mobility of contaminants as well as their potential long-term effects on ecosystems and human health. This review examined the simultaneous effects of groundwater management strategies, land use changes, and irrigation practices on groundwater quantity. Furthermore, a complete understanding of the hydrological effects of expanded agriculture was provided by its investigation of the dynamics of groundwater recharge, depletion, and natural aquifer system alteration. The review also highlighted regional variations in how agricultural operations affect groundwater, highlighting the significance of geographical and geological variability. This review highlights the urgent ecological challenges in agriculture, offering crucial insights for sustainable practices and groundwater preservation.

Keywords: Groundwater pollution; Sustainable resource utilization; Systematic review, Unsustainable agricultural activities