

RESEARCH ARTICLE

Water quality in Northern Province of Sri Lanka: A bibliometric analysis of publications 1960–2021

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Abstract

Groundwater contamination derived from human activities including farming is a serious problem threatening water security in the Northern Province (NP) of Sri Lanka. Gathering all existing research knowledge on the province's water resource base to create a digital repository is a key action in the 3-year action research project on water security. Papers gathered in the repository showed that water quality, particularly salinity in groundwater and its contamination, was a prominent theme in research over the past two decades. Thus, the scope of this bibliometric study is restricted to published work on water quality pertaining to the North during 1969–2021. Publications listed in four electronic databases, namely, Scopus, PubMed, Web of Science, and Google Scholar yielded 118 scholarly publications. This paper provides an overview of the publication types and distribution, titles of journals and conferences, authorship, institutions, countries, themes, and keywords used. Final 20 years of study period saw a substantial growth in publication rate of water quality papers in the NP with journal articles and conference papers being the dominant types at 63% and 35%, respectively. Authors from 52 different institutions contributed to production of these publications, 93% of whom represented public sector institutions in Sri Lanka. University of Jaffna was in the lead position

in numeric terms ($n = 82$), followed by the University of Peradeniya ($n = 28$). A significant 81% of the papers accounted for studies on water contamination, some indication of the degree of concern for this aspect among the research community. Around 65% of papers have been published in a wide range of international journals, some of which are less well established. This tendency has implications for the scientific output in terms of its quality, peer review process, and in turn also for usefulness of the work in the local context and in policy making.

KEYWORDS

bibliometric analysis, bibliometry, data visualization, Sri Lanka, water contamination, water quality

1 | INTRODUCTION

Groundwater contamination derived from domestic sewage, industrial effluents, and agricultural residues infiltrating into the soil in rural areas presents itself as one category of serious problems threatening water security in the Northern Province (NP) of Sri Lanka (Jeyaruba & Thushyanthi, 2009; Joshua et al., 2013; Li et al., 2020; Wijesekera, 2016). Prior to the 1970s, the predominantly rural livelihoods characterized by irrigated farming systems prevailing in the NP were not as extractive of land and water resources as what followed in the 1970s and 1980s in the name of Green Revolution agriculture with the high demands on resources it placed through the intensification that accompanied it. Whatever sustainable water management that was in place then was allowed to degrade during the violent conflicts which lasted for next three decades. At this time, water infrastructure collapsed and governance of water according to long held management practices was gradually abandoned (Janithra et al., 2018; Sivakumar, 2015; Thal pawila, 2016). Large-scale migration, both within the province and beyond, resulted in much disruption among the population, leading to depletion of water in some areas and degradation of the water resource itself due to neglect. This situation has only been worsened by the speed and unregulated nature of postwar development in the NP.

The NP (Figure 1) is nominally in the dry zone region though it can still receive average annual rainfalls of 1,750 mm and it covers a total area of 8,848.58 kms² (Northern Provincial Council, 2014). NP includes two geographical regions, Jaffna peninsula and the adjoining islands which are heavily dependent on groundwater sources, and the remainder of the province south of the peninsula relying on surface water in the form of small reservoirs traditionally called *tanks* fed by seasonal rivers which meet the agricultural, industrial, and domestic needs (Ranasinghe, 2014).