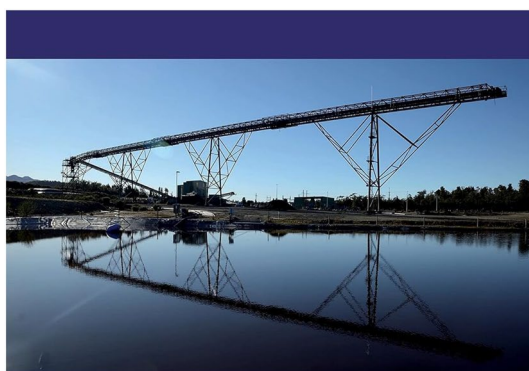


Sahu: Physico-Chemical Analysis of the Mine River Water (Book Review)

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Rajesh Kumar Sahu

Physico-chemical Analysis of Mine River Water



Physico-Chemical Analysis of Mine River Water by Rajesh Kumar Sahu is a 57-page publication issued by Lambert Academic Publishing in 2016 (ISBN 978-3-659-94278-5, approx. €35) and still available from many online bookshops. It reproduces the author's 2001 dissertation from Guru Ghasidas Vishwavidyalaya, Bilaspur (CG), India. The

book is divided into five chapters and contains 15 figures and 20 tables, accompanied by 53 references ranging from 1949 to 1998. The compact length already raises questions about the depth of analysis, since a doctoral dissertation is typically expected to present a substantial body of work.

The study investigates physico-chemical parameters of the Lilagar River at three sampling locations – 'Up-stream', 'Middle Stream' and 'Down Stream' – over a 12-month period (July 1999–June 2000). While this scope could be meaningful, this publication leaves the reader without a coherent picture of the river's condition or broader environmental implications.

This publication caught my attention because it is available in six languages: English, German, Italian, French, Portuguese and Spanish, and I thought it might be a good reference book. I bought the English version (Fig. 1), in which the language is weak and at times substandard. The book is riddled with spelling, grammatic, and typographic errors, many of which interfere with readability. For instance, the summary includes the following passage:

Coal mine water is acidic in nature and dissolves the toxic elements like Cd, Pb and Al. Water from river, pond and other sources have shown to be changing in quality parameters, total dissolved solids, suspended solid, PH and conductivity have shown increasing trend. Mine discharged water showed increasing concentration of trace and toxic elements in water discharged from mine. Pb and Cd concentration in soil and water of the Dipika coal are discharge have shown increasing trend. Lilagar river is most affected at the junction of river and mine water, due to pollutional effect of heavy mining. Toxic elements Cu, Pb and Cd have shown high concentration in soil in Dipika coal area. Cd is primary excreted through kidney and Pb is known to have multiple hematotoxic effects. Coal dust from Dipika coal field is integrated to water resources; it affects the ecosystem of the river and its base.

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This passage illustrates the two central problems: poor grammar and a lack of correspondence between summary and content. Conductivity, for example, is not reported anywhere in the book. pH is neither tabulated nor graphed. The claim that mine discharge water was analysed cannot be verified in the results. Soil and coal dust are hardly addressed at all, yet appear prominently in the abstract.

The publication's five chapters are: Introduction; Seasonal variation of Lilagar River water; Chemical Oxygen Demand; Heavy Metals; and Results and Discussion. The structure is illogical, with parameters such as Nitrate-Nitrogen, Sulphate and Total Hardness oddly appearing as sub-chapters within Chemical Oxygen Demand. Tables and figures frequently duplicate information; for example, Tables 1 and 2 are identical, and the figures on pages 16 and 18 are the same. Some figures appear without explanation, and crucially, there is no figure showing sampling locations. Sampling points C_1 , C_2 , and C_3 remain undefined spatially, leaving the reader unable to interpret geographical trends.

Terminology is also confusing. The title itself raises the question of what "Mine River Water" is supposed to mean. One passage suggests it is "coal mine effluent [that] mixes with Lilagar river." Elsewhere, peculiar references appear to elements such as $C\ddot{o}$, Po , No_2 and So or to " $C\ddot{o}$ concentrations in blood samples." These are either examples of the many typographical errors or conceptual misunderstandings, but in either case they compromise scientific clarity.

Units are inconsistently reported, sometimes as "gm." instead of the SI unit g, or with a trailing period such as "mg.", "ml.", "mg/l." At times, $\mu\text{g/l}$ and ug/l appear side by side. Standards are incorrectly presented: " CaCo_4 " is given instead of Ca^{2+} , with a drinking water limit of 75 mg/l, while SO_4^{2-} is listed with an implausible 0.01 mg/l limit (instead of the correct 200 mg/l). Considering that the book was published in 2016, the absence of the revised Indian Drinking Water Standard IS 10500:2012 (updated 2015) is problematic.

Descriptions of methods are fragmentary, wrong, and often unintelligible. Nitrate Nitrogen is for example measured at a wavelength of 410 nm. Reagents include terms such as "Feso", " $7H, o$ ", " TH_2O ", " HCl " and " $N H So$ " – besides the so often wrongly written " HCL " or " H_2O ". Analytical methods combine wet-chemical techniques with atomic absorption spectroscopy (described as "atomic ulsorption spectroscopy"), but without clear explanation of which elements were measured by which method. This suggests reliance on outdated laboratory procedures more typical of the 1960–1980s.

Chapter 5 begins with the statement: "Water from river, pond and other sources have shown to be changing in quality parameters." This is puzzling, since all stations were on the Lilagar River itself (p. 14) and not in ponds or other water

bodies. The "discussion" largely repeats earlier descriptive results and incorporates older literature data without sufficient context. The chapter ends abruptly in mid-sentence: "Cd concentration in freshwater shellfish (to study the effect of fly ash pollution) was found to be between", leaving the reader without closure.

Elsewhere, sentences appear that mix unrelated ideas without coherence. For example (p. 52),

Tobacco plants of NTPC area have been found to absorb 0.8 to 7.0 μg of Cd from soil. Blood $C\ddot{o}$ concentrations in human being have been were found to increase with smoking. Possible relationship between smoking, Cd tissue levels and cardiovascular diseases have been reported. The mechanism by which Cd induces hypertension, is not known definitely. Albino rats exposed to 15 ppm Cd in drinking water for 30 days showed mild hypertension. Ca treated rats not responded to Atrial natriuretic peptide (a well defined vasodialator and diuretic hormone produced by heart). [47] Since Cd is primarily excreted through kidneys, it exerts more toxic effects on renal function [48].

Such passages highlight the poor integration of citations, the lack of clear argumentation, and the persistence of errors in spelling and terminology.

The reference list includes duplicates (e.g. references 7 and 8, 11 and 12), incomplete entries, and sources that could not be located. One example reads: "Bocsai I. (1963). Test of [Moo, *. Atlanta, 10, 543]" which is incomprehensible as a bibliographic entry. Reference 50, supposedly about Zn poisoning of fish, is cited in relation to Pb and also contains incorrect page numbers. Many of the references might exist, but I was unable to locate or verify them. This inconsistency suggests a lack of editorial control in the compilation of references.

The book contains errors on virtually every page. An estimate of five errors per page suggests over 300 mistakes in total. Beyond typographical issues, fundamental scientific problems persist: vague definitions, unclear methods, inconsistent data, and an incoherent structure. The absence of a clear research question or meaningful discussion prevents this work from making a genuine contribution to knowledge.

"Physico-Chemical Analysis of Mine River Water" does not meet the standards of a doctoral thesis or a published scientific book. The numerous flaws, which range from weak language and inaccurate data to structural incoherence and unreliable references, make it unsuitable as a reference work. Its value lies only as a cautionary example of what happens when research and editorial oversight fail. Students and colleagues might use it, not as a model to follow, but as a demonstration of "how-not-to-do-it." In summary, due to its numerous flaws and inconsistencies, I cannot recommend this book to anyone.

Declarations

Conflict of interest The author declares no competing interests.

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