

Chapter 26

Surface Water Chemical Composition Monitoring in Several Villages: Case Study of Kakheti Region, Georgia

Ketevan Kupatadze

Ilia State University, Georgia

ABSTRACT

The chapter reviews the chemical composition monitoring results of water running from taps installed in yards and from the so-called drilled wells in villages of Gurjaani Region, Kakheti. The study was focused on the purity of water as it is used by the population in everyday life for drinking, as well as for cooking and other household purposes. In the process of examination, a small amount of iodine was observed in drilled waters, which probably could serve as an explanation for the fact that there are fewer cases of goiter problems in this region.

INTRODUCTION

Water resources are of significant importance in providing favorable living conditions for people, a healthy state of the economy, and in the preservation of the environment. Providing water to the population, industry, energy, and agriculture is one of the priority tasks for the successful performance of countries. The purpose of the study was to examine the quality of water running from taps and drilled wells installed in village yards. In a previous study (Kupatadze, 2018), we conducted an investigation in a few villages and now, the investigation was extended for the following villages: Akhasheni, Vejini, Zemo Kachreti, Mukuzani. There are mainly two types of water in Kakheti. The first originates from one of the ravines and runs from taps installed in yards. This type of water undergoes only mechanical treatment, i.e., unlike similar-sized villages in neighboring countries, there is no unified wastewater system and therefore, neither natural nor another type of treatment systems are applied. This type of

DOI: 10.4018/978-1-7998-7356-3.ch026

water is not used for drinking purposes, but for washing, bathing, cooking, and for preparation of various hot beverages. Drilled waters originate from mountains, outcropping to the surface of the ground. It is natural, that these waters are not examined, yet people drink the water for its good taste. Drilled water pipes sometimes run directly into the street and occasionally into residents' yards.

AREA UNDER STUDY

Gurjaani Municipality - Administrative-Territorial Unit in Eastern Georgia, Kakheti Region. Gurjaani municipality is bordered by 5 administrative municipalities. It is bordered by Sagarejo Municipality to the west, Signaghi Municipality to the southeast, Telavi Municipality to the northwest, Kvareli Municipality to the north, and by Lagodekhi Municipality to the east. The territory of Gurjaani municipality belongs to the district of moderately humid subtropical climate. To the east, the plain has a moderately humid climate with mild winters and hot summers. There is a moderately humid climate on the Gombori range, characterized by long summers. The Iori Plateau is known for its dry subtropical steppe climate, with moderately cold winters and hot summers.

Water quality investigation nowadays is a major challenge. Many disease come from water pollution, especially in the big cities (Hazrat, 2016). Unwholesome water, polluted by natural sources, has caused great hardship for those people, who drink it as the only alternative or use it for irrigation. There are general types of drinking water pollutants (Table 1).

Table 1. The general types of water pollutants

Class of pollutant	Significance
Trace elements	Health, aquatic biota
Heavy metals	Health, aquatic biota
Organically-bound metals	Metal transport
Radionuclide	Toxicity
Inorganic pollutant	Toxicity, aquatic biota
Asbestos	Human health
Algal nutrients	Eutrophication
Acidity, alkalinity, salinity	Water quality, aquatic life
Trace organic pollutant	Toxicity
Polychlorinated biphenyls	Possible biological effects
Pesticides	Toxicity, aquatic biota, wildlife
Petroleum wastes	Effects on wildlife, esthetics
Sewage, human, animal wastes	Water quality, oxygen levels
Biochemical oxygen demand	Water quality, oxygen levels
Pathogens	Health effects
Detergents	Eutrophication, wildlife, esthetics
Chemical carcinogens	Incidence of cancer
Sediments	Water quality, aquatic biota, wildlife
Taste, odor and color	Esthetics

10 more pages are available in the full version of this document, which may be purchased using the "Add to Cart" button on the publisher's webpage:
www.igi-global.com/chapter/surface-water-chemical-composition-monitoring-in-several-villages/299900

Related Content

Water Scarcity and Conflicts: Can Water Futures Exchange in South Asia Provide the Answer?

Nilanjan Ghosh and Anandajit Goswami (2018). *Hydrology and Water Resource Management: Breakthroughs in Research and Practice* (pp. 245-268).

www.irma-international.org/chapter/water-scarcity-and-conflicts/187636

Environmental Hazards Assessment at Pre-Saharan Local Scale: Case Study From the Draa Valley, Morocco

Ahmed Karmaoui, Adil Moumane and Jamal Akchbab (2020). *Decision Support Methods for Assessing Flood Risk and Vulnerability* (pp. 250-267).

www.irma-international.org/chapter/environmental-hazards-assessment-at-pre-saharan-local-scale/233467

Flood Hazard Casting and Predictions of Climate Change Impressions

Vartika Singh (2020). *Decision Support Methods for Assessing Flood Risk and Vulnerability* (pp. 212-229).

www.irma-international.org/chapter/flood-hazard-casting-and-predictions-of-climate-change-impressions/233465

Commonly Used Methods to Calculate Water Quality Indices

Clement Kiptum (2022). *Handbook of Research on Water Sciences and Society* (pp. 271-292).

www.irma-international.org/chapter/commonly-used-methods-to-calculate-water-quality-indices/299884

Membrane Characterizations

(2020). *Membrane Technology for Water and Wastewater Treatment in Rural Regions* (pp. 93-108).

www.irma-international.org/chapter/membrane-characterizations/249532