

SDG 14 Report Life Below Water

Assiut University (2024–2025)

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Prepared by : Prof. : Prof. Fatma Mohamed Abdel Maksoud

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Our Aim in 2024–2025

Assiut University affirms its strong commitment to achieving SDG 14: Life Below Water. Despite its inland location, the university plays a central national role in freshwater ecosystem protection, riverine biodiversity, aquaculture sustainability, water quality research, and environmental stewardship.

1. Education and Academic Programs Supporting SDG 14

Assiut University offers a range of academic programs that directly contribute to freshwater ecosystem sustainability.

- **Department of Soils and Water – Faculty of Agriculture** plays a critical role in advancing education and research in soil-water interactions and sustainable resource management. Its academic programs are designed to equip students with in-depth knowledge of soil properties, water dynamics, and modern irrigation techniques essential for agricultural productivity. The department conducts applied research aimed at improving water-use efficiency, combating soil

جامعة اسيوط – المبنى الاداري – الطابق الأول – جناح (ب) – تليفون الداخلي: 5345 – الرقم البريدي: 71515

البريد الإلكتروني: auiro@aun.edu.eg

Assiut University Administrative Building- Suite (b) , 1st Floor- Postal code : 71515- Tel : 5345- E-mail : auiro@aun.edu.eg

degradation, and promoting environmentally friendly farming practices. Through collaborations with governmental agencies, local communities, and research institutions, it contributes to developing innovative solutions for water conservation and sustainable agriculture. Additionally, the department organizes training workshops and extension activities to transfer scientific knowledge into practical applications, ensuring that farmers and professionals are prepared to meet the challenges of water scarcity and climate change.

- **Department of Geology – Faculty of Science** is dedicated to advancing education and research in earth sciences with a strong emphasis on water-related studies. The department offers comprehensive programs that explore hydrogeology, groundwater resources, and the geological factors influencing freshwater ecosystems. Its research activities focus on assessing water quality, understanding aquifer systems, and developing strategies for sustainable groundwater management in arid and semi-arid regions. Equipped with modern laboratories and fieldwork facilities, the department provides students and researchers with practical skills and scientific expertise to address pressing challenges such as water scarcity, pollution, and climate-induced changes in water availability. Through partnerships with governmental agencies and environmental organizations, the department contributes to policy development and resource planning aimed at ensuring long-term water security.

- **Department of Zoology & Entomology – Faculty of Science:** Its programs focus on understanding aquatic biodiversity, ecological interactions, and the impact of environmental changes on freshwater habitats. Through both theoretical and practical training, the department equips students and researchers with the skills needed to address challenges in water conservation, ecosystem management, and sustainable resource use.

- **Department of Aquatic Animals Medicine & Management – Faculty of Veterinary Medicine** Its programs cover fish physiology, disease diagnosis and treatment, and best practices for aquaculture management. The department conducts applied research on water quality, pathogen control, and the impact of environmental changes on aquatic animal health, aiming to improve productivity and ensure ecological balance. Equipped with specialized laboratories and experimental facilities, it provides hands-on training for students and professionals in fish farming, aquatic veterinary care, and ecosystem monitoring. Through collaboration with fisheries, aquaculture enterprises, and environmental agencies, the department contributes to food

جامعة اسيوط – المبنى الاداري – الطابق الأول – جناح (ب) – تليفون الداخلي: 5345 – الرقم البريدي: 71515

: البريد الالكتروني auiro@aun.edu.eg

Assiut University Administrative Building- Suite (b) , 1st Floor- Postal code : 71515- Tel :5345- E-mail :
auiro@aun.edu.eg

security, biodiversity conservation, and the development of sustainable freshwater resource management strategies.

2. Sustainable Fisheries, Aquaculture, and Tourism Programs

Assiut University offers specialized academic courses like Fish Biology (Z280) and Fish Farming (Z295).

The Aquatic Animals Medicine and Management Unit provide practical training in aquaculture management, fish disease diagnosis, and water quality testing.

3. Educational Outreach on Overfishing and IUU Fishing

The university conducts outreach campaigns raising awareness about:

- Overfishing
- Illegal, Unreported, and Unregulated (IUU) fishing
- Destructive fishing practices

Workshops engage local farmers, fish growers, and community members along freshwater systems.

4. Events to Promote Conservation of Water Resources

Assiut University organizes conferences, seminars, and community events promoting sustainable use of rivers, lakes, and aquatic resources.

Examples:

- Seminars on freshwater ecosystem health
- Water resources management conferences

5. Research Supporting Aquatic Ecosystems & Biodiversity

Our university conducts extensive research on local ecosystems, focusing on the conservation of threatened species and the renovation of degraded habitats. For example, the faculties collaborate with local environmental agencies to study and maintain ecosystems and their biodiversity native plant species that are at risk of extinction.

Key research projects include:

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البريد الالكتروني: auiro@aun.edu.eg

[Assiut University Administrative Building- Suite \(b\) , 1st Floor- Postal code : 715151- Tel :5345- E-mail :
auiro@aun.edu.eg](#)

- Degradation of harmful pollutants and antibiotics
- Studies on heavy metals in soil-water systems
- Marine and freshwater fungal responses to contamination
- Microplastics, chemical pollutants, and aquatic toxicity research

[Home](#) > [Current Status of Marine Water Microbiology](#) > Chapter

Responses of Marine Fungi to Heavy Metal Contamination

Chapter | First Online: 10 December 2023

pp 263–277 | [Cite this chapter](#)

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Ghada Abd-Elmonsef Mahmoud, Nitika Thakur & Mohamed Hefzy

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Abstract

The marine ecosystem, which makes up around two-thirds of the planet's surface, suffers from aggressive heavy metal contamination, especially in the last few years. This pollution causes shifting in many marine life forms threatening our fisheries and human health. The natural sources of marine heavy metal pollution are rock erosion, and volcanic dust, while the artificial sources are related to human attitudes like sewage, ship accidents, industrial wastes, and agricultural wastes. Because they are so common in nature, microorganisms also predominate in locations where heavy metals have been contaminated. Heavy metals are easily changed by them into harmless forms. Microorganisms have two responding mechanisms of heavy metal contamination that comprise enzymatic breakdown of the target contaminants and/or heavy metal resistance. In this chapter we will discuss marine heavy metal contamination sources, their risks to the marine life forms, and different responses of marine fungi to heavy metal contamination.

6. Reducing Damage to Aquatic Ecosystems

Assiut University collaborates with industries and agencies to develop:

- Pollution mitigation technologies

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البريد الالكتروني: auiro@aun.edu.eg

Assiut University Administrative Building- Suite (b) , 1st Floor- Postal code : 71515- Tel :5345- E-mail : auiro@aun.edu.eg

- Toxicity assessment frameworks
- Ecosystem monitoring methods

Studies include microplastic impacts, pollutant toxicity, and ecological stress indicators.

7. Water Quality Standards & Environmental Protection Policies

The university maintains policies based on WHO and Egyptian standards for:

- Drinking water quality
- Water discharge guidelines
- Ecosystem protection

Assiut University monitors water quality in local wells, the Nile basin, and campus facilities.

8. Minimizing Aquatic Ecosystem Alterations:

Assiut University maintains an official plan to minimize:

- Physical alterations
- Chemical pollution
- Biological changes in freshwater ecosystems

Efforts include biodiversity conservation, pollution control, and ecological monitoring.



RESEARCH ARTICLE

Monitoring the changes in the quality of drinking water through nine years in Assiut governorate, Egypt

Zeinab F. Ateya^{1,4}, Mohsen A. Gameh², Mohamed M. Abd El-Wahab³, Mohamed Abdelgaber⁴

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Abstract

The main aim of this study was to monitor the quality of surface and groundwater used for municipal and drinking purposes in Assiut governorate, Egypt over nine years (2009-2017). Therefore, the available data were collected from all official resources in the governorate. The data of 37789 drinking water samples from eleven districts plus East and west of Assiut governorate were summarized and compared with national and international drinking water standards of Arab Republic of Egypt A.R.E. law no-

Introduction

Water is becoming more and more important as a component of life on Earth with each passing day. Due to widespread environmental degradation, it is crucial to monitor the water quality, especially when it comes to sources of drinking water. The drinking water sources in Assiut governorate are surface Nile or its irrigation canals and groundwater from a quaternary aquifer which generally is semi-unconfined in the area. It is assumed that natural and unpolluted water taken

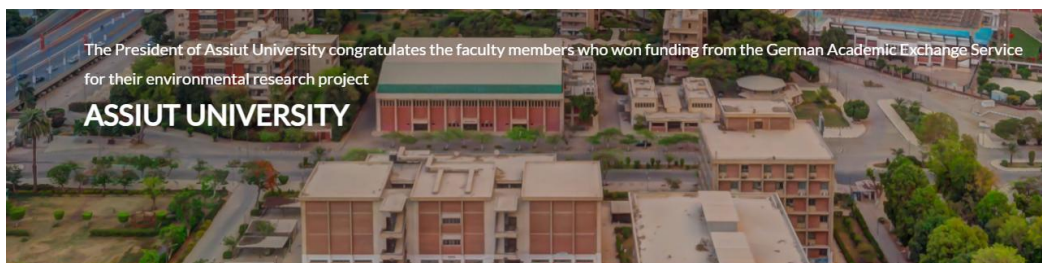
9. Monitoring Aquatic Ecosystem Health

Monitoring systems include:

- Water chemistry monitoring
- Groundwater quality studies
- Long-term water quality change analysis
- Pathogen and contamination tracking

Our university conduct research projects related to aquatic ecosystems

- 1. Environmental research project concerned with using green environmental analysis methods to protect water resources**



The President of Assiut University congratulates the faculty members who won funding from the German Academic Exchange Service for their environmental research project



Monitoring the changes in the quality of drinking water through nine years in Assiut governorate, Egypt

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Authors

Zeinab F. Attaya¹ ; Mohsen A. Gameeh² ; Mohamed M. Abd El-Wahab³ ; Mohamed Abdelgaber⁴

¹ Faculty of Sugar and Integrated Industries Technology (FSIIT), Assiut University, Assiut, Egypt.

² Department of Soils and Water, Faculty of Agriculture, Assiut University, Assiut, Egypt

³ Chemistry Department, Faculty of Sciences, Assiut University, Assiut, Egypt

⁴ Assiut and New Valley Company for Water and Wastewater, Assiut, Egypt.

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Abstract

The main aim of this study was to monitor the quality of surface and groundwater used for municipal and drinking purposes in Assiut governorate, Egypt over nine years (2009-2017). Therefore, the available data were collected from all official resources in the governorate. The data of 37789 drinking water samples from eleven districts plus East and west of Assiut governorate were summarized and compared with national and international drinking water standards of Arab Republic of Egypt A.R.E law no-458/2007 and WHO (World Health Organization) guidelines 2004. The initial high level of turbidity in 2009 and subsequent propensity to fall over time were mostly caused by the installation of new surface water pumping filtration stations as well as new Fe and Mn removal stations. The records for ammonia, Fe and Mn concentrations increased in the Northern part of Assiut (Dairut, ElQusiya and Manfalut), and in the Eastern part (Sahel Selim and ElBadari) of Assiut governorate. This trend may be due to infiltration of the excessive application of fertilizers and wastes derived from human and animal activities. Some parameters such as (turbidity, TDS, alkalinity, hardness, Fe, Mn and NH₃) showed increases in groundwater sources than those in municipal water. Some parameters (Alkalinity, Cl⁻ ion, NH₃, Fe and Mn) were temporally at the lowest concentration in winter for the same source compared to summer. Furthermore, research showed that the Assiut Governorate's drinking water has excellent (54%), good (38.5%), and acceptable (7.5%) TDS levels. The overall hardness values were 38.5% hard and 61.5% very hard.

10. Collaboration with Local Communities

Assiut University partners with:

- Ministry of Environment
- Ministry of Water Resources and Irrigation
- Local agricultural and fishery communities

Activities include irrigation training, ecosystem preservation, and pollution mitigation.

جامعة اسيوط - المبنى الاداري - الطابق الأول - جناح (ب) - تليفون الداخلي: 5345 - الرقم البريدي: 71515

البريد الالكتروني: auiro@aun.edu.eg

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