

1. Record Nr.	UNINA9910616395103321
Titolo	Sustainability of groundwater in the Nile Valley, Egypt // edited by Abdelazim M. Negm, Mustafa El-Rawy
Pubbl/distr/stampa	Cham, Switzerland : , : Springer, , [2022] ©2022
ISBN	3-031-12676-9
Descrizione fisica	1 online resource (353 pages)
Collana	Earth and Environmental Sciences Library
Disciplina	574
Soggetti	Groundwater
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia
Nota di bibliografia	Includes bibliographical references.
Nota di contenuto	Intro -- Preface -- Contents -- Introducing the Book -- Introduction to "Sustainability of Groundwater in the Nile Valley, Egypt" -- 1 Introduction -- 2 Summaries of the Book Chapters -- 2.1 Groundwater Modeling -- 2.2 Assessment of Groundwater Quality -- 2.3 Sustainability of Groundwater -- References -- Evaluation of the Groundwater Resources in the Nile Valley, Egypt -- 1 Introduction -- 2 Water Resources -- 2.1 Renewable Water Resources -- 2.2 Non-renewable Water Resources -- 3 Groundwater Usage -- 4 Groundwater Quality -- 5 The Nile Valley and Delta Aquifers -- 6 Geomorphology and Main Characteristics of the Nile Valley -- 7 Hydrological Settings -- 8 Discharge and Recharge -- 9 Vulnerability Assessment -- 10 Proposed Scenarios and Solutions -- 11 Conclusions -- 12 Recommendations -- References -- Groundwater Modeling -- Fundamentals of Groundwater Modeling Methods and a Focused Review on the Groundwater Models of the Nile Valley Aquifer -- 1 Background -- 2 Groundwater Modeling -- 2.1 Introduction -- 2.2 Defining the model's Objectives -- 2.3 Conceptual Model -- 2.4 Types of Models -- 2.5 Solution of Mathematical Formulation -- 2.6 Model Calibration -- 2.7 Model Validation: Acceptance or Rejection -- 2.8 Sensitivity Analysis -- 2.9 Uncertainty Analysis -- 2.10 Modeling Software/Codes -- 2.11 Limitations of Modeling Techniques -- 3 Application of Numerical Groundwater Modeling in the Nile Valley -- 4 Conclusions -- 5 Recommendations -- References -- Assessment

of Groundwater Quality -- Contamination Sources Along the Nile Valley, Egypt and Its Impact on Groundwater -- 1 Introduction -- 2 Study Area -- 3 Surface Water System in the Nile Valley -- 4 Contamination Sources -- 4.1 Domestic Sources -- 4.2 Agricultural Sources -- 4.3 Industrial Sources -- 4.4 Dewatering Water -- 4.5 Colling Water -- 4.6 Impact of Contamination on Groundwater. 4.7 Protection and Legislations -- 5 Conclusions -- 6 Recommendations -- References -- Environmental Impacts of Treated Wastewater Contaminates on Groundwater Quality in the Nile River Valley, Egypt -- 1 Introduction -- 2 Contaminants Seepage Between Groundwater and Surface Water -- 3 Environmental Impacts of Treated Wastewater Contamination -- 4 Wastewater Treatment Plants in Nile River Valley -- 5 Groundwater Assessment Methodologies -- 6 Investigations of Groundwater Contamination in Nile River Valley Aquifer -- 6.1 Case Study: Evaluation of Groundwater Resources Nearby the Main Wastewater Treatment Plants -- 7 Summary -- 8 Conclusions -- 9 Recommendations -- References -- Hydrochemistry and Hydrogeology Aspects of Alluvial Aquifer in Aswan City, Egypt -- 1 Introduction -- 2 Study Area -- 3 Data Collection and Methodology -- 3.1 Geomorphology -- 3.2 Geology -- 3.3 Hydrogeology -- 3.4 Water Chemistry -- 4 Numerical Groundwater Model -- 4.1 Model Setup -- 4.2 Calibration and Validation -- 4.3 Groundwater Head and Water Budget -- 5 Groundwater Table Rise Solutions -- 5.1 Bank Infiltration -- 5.2 Reduce the Water Losses from the Water Supply Network -- 5.3 Increase the Extraction Rates -- 6 Conclusions -- 7 Recommendations -- References -- Hydrochemical Analysis of Groundwater in the Area Northwest of El-Sadat City, West Nile Delta, Egypt -- 1 Overview -- 2 Methodology -- 3 Geological Settings -- 4 Hydrogeological Settings -- 4.1 Quaternary Aquifer -- 4.2 Pliocene Aquifer -- 4.3 Miocene Aquifer -- 4.4 Oligocene Aquifer -- 5 Results -- 5.1 Numerical Water Quality Indicators -- 5.2 Groundwater Hydrochemical Analysis -- 5.3 Water Quality Graphical Representation -- 6 Suitability of Groundwater for Irrigation Purposes -- 6.1 Sodium Content (SC) -- 6.2 Sodium Adsorption Ratio (SAR) -- 6.3 Residual Sodium Carbonate (RSC) -- 6.4 Permeability Index (PI). 6.5 EC and SAR Relationship -- 6.6 Magnesium Hazard (MH) -- 6.7 Kelly's Ratio (KI) -- 6.8 Chloride Classification -- 6.9 Chloro-Alkaline Indices (CAI) -- 6.10 Corrosively Ratio (CR) -- 7 Results and Discussion -- 8 Conclusions -- 9 Recommendations -- References -- As a Water Resources Management Tool, Groundwater Quality Assessment for Irrigation in the Young Alluvial Plain of Western Nile Delta, Egypt -- 1 Introduction -- 2 Study Area -- 3 Methodology -- 3.1 Groundwater Sampling and Parameters Analytical Procedure -- 3.2 Groundwater Quality Calculations -- 4 Results and Discussion -- 4.1 Individual Parameter -- 4.2 Irrigation Water Quality Index (IWQ) -- 5 Conclusions -- 6 Recommendations -- References -- Sustainability of Groundwater -- Agricultural Drainage Strategies in Egypt as a Protection Tool Against Groundwater Contamination by Fertilizers: An Overview -- 1 Introduction -- 2 Agricultural Drainage Practices -- 2.1 What Is Agricultural Drainage? -- 2.2 Agricultural Drainage Systems -- 3 Poor Drainage Conditions and Their Adverse Impacts on Groundwater Quality and the Surrounding Environment -- 3.1 Waterlogging -- 3.2 Salinity -- 4 Effect of Practicing Agricultural Drainage on Groundwater Quality, Agricultural Productivity, and the Surrounding Environment -- 4.1 Conventional Drainage Practices -- 4.2 Controlled Drainage Practices -- 4.3 Summary of Subsurface Drainage Practices' impacts on Groundwater -- 5 Agricultural Drainage in Egypt -- 5.1 Brief History and Authorities -- 5.2 Responsibilities and Targets -- 5.3 Exploring

Ways of Practicing Agriculture Drainage Strategies in the Nile Valley: A Case Study of El-Minia Governorate -- 6 Conclusions -- 7 Recommendations -- References -- Pliocene Aquifer Characterization Using TEM and VES Geophysical Techniques: Case Study at the Area to the East of Wadi El-Natrun City, West Nile Delta, Egypt. 1 Introduction -- 2 Geomorphological and Topographic Settings and Climatic Conditions -- 3 Geological and Tectonic Settings -- 4 Hydrogeological Background -- 5 Literature Review -- 6 Geophysical Surveys -- 6.1 Electrical Resistivity of Minerals and Rocks -- 6.2 Resistivity Survey -- 6.3 Transient Electromagnetic Survey -- 7 Results and Discussion -- 8 Conclusions -- 9 Recommendations -- References -- Evaluation of Groundwater Potential Zones Using Electrical Resistivity and Hydrogeochemistry in West Tahta Region, Upper Egypt -- 1 Introduction -- 2 Geology and Hydrology of the Study Area -- 3 Sampling, Data, and Methodology -- 4 Results and Discussions -- 4.1 Geoelectrical Analysis -- 4.2 Hydrogeochemical Analysis -- 4.3 Assessment of the Collected Groundwater for Different Purposes -- 4.4 Mechanisms Controlling Groundwater Chemistry -- 5 Conclusions -- 6 Recommendations -- References -- Mapping Groundwater Recharge Potential in the Nile Basin Using Remotely Sensed Data and GIS Techniques -- 1 Introduction -- 2 Geologic and Hydrologic Setting of the Nile Basin -- 3 Case Studies -- 4 Analytical Approach: Developing Thematic Maps -- 5 Wadis -- 5.1 Wadi Qena -- 5.2 Wadi Matula -- 6 Conclusions -- 7 Recommendations -- References -- Sustainability of Groundwater in the Nile River Valley: Is It Possible After the Construction of GERD? -- 1 Introduction -- 2 The Nile River Valley Aquifer -- 3 GERD Impacts on the Groundwater in the Nile River Valley -- 4 Impact of Filling GERD Reservoir in 10 years on Groundwater Level -- 4.1 Study Area and Groundwater Model -- 4.2 Results and Discussions -- 5 Conclusions -- 6 Recommendations -- References -- Conclusions -- Update, Conclusions and Recommendations for "Sustainability of Groundwater in the Nile Valley, Egypt" -- 1 Introduction -- 2 Update -- 2.1 Groundwater Modeling -- 2.2 Assessment of Groundwater Quality. 2.3 Sustainability of Groundwater -- 3 Conclusions -- 4 Recommendations -- References.
