

CLIMATE CHANGE AND THE WATER & WASTEWATER/SANITATION SECTOR

Review of Current Knowledge (RoCK)

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v1

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RoCK Table (1) - Egypt Information

No.	Document Title	Date	Description
1	Egypt Biennial Update Report (BUR). BUR 1 (English) (Arabic)	2018	The Government of Egypt has prepared this first Biennial Update Report (BUR) for submission to the UNFCCC in 2018 as part of its obligation as a party to the UNFCCC.
2	Egypt Third National Communication under the UNFCCC	2016	Egypt's Third National Communication, funded by the Global Environment Facility (GEF) through the UNDP Egypt, was submitted as part of Egypt's obligations as a party to the UNFCCC. Chapter 2 of the document includes Egypt National Greenhouse Gas Inventory.
3	Egypt Second National Communication under the UNFCCC	2010	Egypt's Second National Communication was submitted as part of Egypt's obligations as a party to the UNFCCC. Chapter 2 of the document includes Egypt National Greenhouse Gas Inventory.
4	Initial National Communication on Climate Change	1999	Egypt's Initial National Communication document was submitted as part of Egypt's obligations as a party to the UNFCCC. The document includes national circumstances, GHG inventory, expected impacts of climate change, mitigation and adaptation options, and any further steps taken by Egypt to deal with climate change. Also it presents the research gaps and needs related to the science of climate, impacts of climate change, increasing awareness, and policy oriented research.

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RoCK Table (1) - Egypt Information

No.	Document Title	Date	Description
5	Greenhouse Gas Emissions in Egypt. USAID	2015	This document presents Egypt's GHG profile in 2012 and the emissions from each economical sector.
6	Egypt's 2021 Voluntary National Review	2021	This report focuses on monitoring the implementation of Egypt's 2030 Agenda.
7	Egyptian Intended Nationally Determined Contributions	2015	In accordance with Decisions 1/CP.19 and 1/CP.20, Egypt submitted its report on the Intended Nationally Determined Contributions (INDCs) towards achieving the objectives of the UNFCCC.
8	Proposed Climate Change Adaptation Strategy for the Ministry of Water Resources & Irrigation in Egypt	2013	This report presents an adaptation strategy for the water sector in Egypt under the foreseen changes affecting water resources management and climatic conditions.
9	Effects of climate change on Egypt's water supply	2012	This paper presents the different impacts of climate change on Egypt's water supply and resources
10	Policy Brief for climate change adaptation for the Ministry of Water Resources and Irrigation	2013	This document provides a list of major policies that should be considered in addressing climate change impacts on water resources in Egypt.

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RoCK Table (2) - Climate Change, Water and Wastewater

No.	Document Title	Date	Description
1	Climate change, water, and wastewater in cities	2011	This book chapter includes the following sections: (1) Description of the water supply and wastewater treatment sector in cities, including sections on formal and informal water supply and wastewater treatment systems; (2) Vulnerabilities and impacts of climate change in urban areas; (3) Adaptation to climate change for urban water and wastewater systems; (4) Mitigation of climate change related to the water sector in cities; and (5) Policy considerations for urban water management.
2	Climate Change, Water and Wastewater Treatment: Interrelationship and Consequences	2019	This book chapter focuses on how climate will influence available water resources and wastewater treatment technologies.
3	Climate Change and Water and Sanitation: Likely Impacts and Emerging Trends for Action	2016	This paper investigates climate change impacts on the water and sanitation sector and discusses possible adaptation and mitigation actions.

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RoCK Table (2) - Climate Change, Water and Wastewater

No.	Document Title	Date	Description
4	Handbook Climate Change and Disaster Resilient Water, Sanitation and Hygiene Practices	2012	This handbook is a training manual which gives the field level workers and practitioners practical ideas about water supply, sanitation and hygiene practices in the context of climate change and disaster risk.
5	Transitioning to Clean Water and Sanitation	2021	This book contributes to an understanding of how transitions are underway for adapting water and sanitation systems to the projected impacts of climate change, with the aim of ensuring clean water, improved sanitation and proper hygiene conditions for a better protection of health in all parts of the world.
6	Climate Change and Water and Sanitation: Likely Impacts and Emerging Trends for Action	2016	This paper illustrates the impacts of climate change on the water and sanitation sector and discusses possible adaptation measures to address those impacts.
7	WASH Services and Climate Change Impacts and Responses	2018	The aim of this guide is to provide an insight into understanding the impacts of climate change on WASH services and to propose operational courses of action for climate change adaptation and mitigation for services in developing countries. It is intended for all water, sanitation and international solidarity stakeholders, all of whom are affected by this issue.

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RoCK Table (2) - Climate Change, Water and Wastewater

No.	Document Title	Date	Description
8	Guidelines for Climate Proofing Investment in the Water Sector. Water Supply and Sanitation	2017	This publication is intended to guide project preparation teams as they integrate climate risk management into the project cycle. The report encompasses lessons learned and good practices identified through several completed and ongoing ADB water supply and sanitation investment projects.
9	Adaptation of WASH services delivery to climate change	2011	This Thematic Overview Paper (TOP) is targeted at WASH professionals and practitioners who recognise the need for climate change adaptation but are not sure what to do or how to plan for it, and/or who themselves, may already be struggling with major challenges in improving or maintaining current WASH services.
10	Climate Change Adaptation in Water and Sanitation: Pertinent Issues and Way Forward for Adaptation Decision Making	2013	This paper discusses climate change adaptation measures in the water and sanitation sector and offers recommendations for the way forward.

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RoCK Table (3) - Climate Change and the Water Sector

No.	Document Title	Date	Description
1	Shaping the water sector to be more climate resilient	2021	This report describes important guidelines as well as specific approaches and regulatory framework conditions for cross-sectoral collaboration in country case studies from around the world. It shows that low-carbon and climate-resilient water and sanitation services are technically feasible and economically viable.
2	The United Nations world water development report 2020: water and climate change	2020	The 2020 edition of the UN World Water Development Report addresses the critical linkages between water and climate change in the context of sustainable development. It also serves as a guide for concrete actions to address these challenges.
3	Climate Change and Water. UN Water Policy Brief.	2019	This document addresses the interlinkages between climate change and water and discusses possible adaptation and mitigation measures within the context of policy.
4	Climate Change and Water. (Arabic)	2008	This technical paper was issued by the IPCC and it looks at the science of climate change, both observed and projected, as it relates to hydrological variables. It also presents a general overview of observed and projected water-related impacts of climate change, and possible adaptation strategies.

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RoCK Table (3) - Climate Change and the Water Sector

No.	Document Title	Date	Description
5	Application of ICT s for Climate Change Adaptation in the Water Sector	2012	This publication brought out by the International Development Research Centre (IDRC) and the Association for Progressive Communications (APC) discusses current trends, conceptual models and the need for an integrated research agenda in the domain of ICTs, climate change and water, with special reference to regions of high biophysical vulnerabilities to climate change and variability
6	Greenhouse-gas emissions from energy use in the water sector	2011	This paper defines the need to integrate energy use further into water resource management and identify opportunities for the water sector to understand and describe more effectively its role in greenhouse-gas emissions.
7	Climate change adaptation in the water sector.	2009	This book aims to stimulate activities in the water sector that contribute to managing the effects of climate variability and change, particularly for the most vulnerable countries.
8	Climate Change Adaptation in the Water Sector in the Middle East and North Africa: A Review of Main Issues	2007	This technical note prepared by METAP addresses adaptation measures in the water sector and focuses on the Middle East and North Africa.

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RoCK Table (3) - Climate Change and the Water Sector

No.	Document Title	Date	Description
9	Water Sector Climate Change Adaptation Guidance Note		This water sector guidance note was prepared by the World Resources Institute (WRI) for the Islamic Development Bank (IsDB) to enable IsDB project teams to integrate information on climate risks into project design. It applies to water sector projects involving physical assets.
10	Handbook on Climate Change Adaptation in the Water Sector	2011	This handbook provides a new approach to formulating and implementing projects for climate change adaptation.
11	Climate Change Adaptation in the Water Supply Sector	2016	This paper addresses the implications of climate change for water supply with a focus on adaptation measures.
12	Assessing the feasibility of climate change adaptation options in the water sector: examples from rural and urban landscapes	2020	This study aims to assess the growing literature on adaptation options related to water management and synthesise lessons on which options are feasible and under what conditions.
13	Climate change adaptation in the water sector	2014	This book chapter showcases many integrated water management approaches and illustrates how they have climate change adaptation benefits as well.

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RoCK Table (3) - Climate Change and the Water Sector

No.	Document Title	Date	Description
14	Climate Change Adaptation Technologies For Water. A Practitioner's Guide To Adaptation Technologies For Increased Water Sector Resilience	2016	This guide systematizes water adaptation technologies based on the immediate water challenges they address. This guide takes six current climate-related water challenges as an entry point to identifying relevant adaptation responses, followed by identification of the specific water adaptation technologies relevant for each response.
15	Technologies for Climate Change Adaptation – The Water Sector –	2011	This guidebook aims to provide expert information on the technologies most relevant for climate change adaptation in the water sector in developing countries. It is meant to be a practical tool for use by a broad range of stakeholders, including those in governmental agencies, water utilities, community water boards, non-governmental organizations, and private sector companies.

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RoCK Table (4) - Climate Change and the Sanitation/Wastewater Sector

No.	Document Title	Date	Description
1	Climate Resilient Urban Sanitation. Accelerating the Convergence of Sanitation and Climate Action	2021	This report has been commissioned by (GIZ), in collaboration with Resilient Cities Network (R-Cities) to better understand how climate change impacts will affect urban sanitation systems, and what needs to be done to address this.
2	A mini-review on the impacts of climate change on wastewater reclamation and reuse	2014	This paper aims to link these studies for providing a thorough understanding about the consequences of the climate change on the wastewater reclamation and reuse. It initially summarizes contemporary treatment processes and their reuse purposes before carrying out a systematic analysis of available findings.
3	Managing Wastewater in a Changing Climate	2019	This report highlights how climate pressures will complicate wastewater operations and describes how the wastewater sector is linked to water use and supply trends, including the growing use of recycled water. The report then recommends policy and management changes to help build resilience in the wastewater sector.
4	Effect of Climate Change in Wastewater Treatment Plants: Reviewing the Problems and Solutions	2015	This book chapter discusses the various problems associated with climate change and WWT operation and the solutions that can be applied to deal with them.

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RoCK Table (4) - Climate Change and the Sanitation/Wastewater Sector

No.	Document Title	Date	Description
5	Greenhouse Gases Emissions from Wastewater Treatment Plants: Minimization, Treatment, and Prevention	2016	This paper presents various options for the management of GHGs emissions from wastewater treatment plants and how to minimize them.
6	Greenhouse Gas Emissions From Wastewater Treatment Plants	2016	This paper investigates the direct & indirect GHGs emissions from two WWTPs, one designed with anaerobic digestion and the other with aerobic stabilization of sewage sludge.
7	Sustainable sanitation and gaps in global climate policy and financing	2020	This paper describes gaps in how sanitation is being addressed in mitigation and adaptation, how this results in little inclusion of sanitation in climate policy and financing at the global level, and implications of these gaps for different sanitation systems and geographic regions.
8	Opportunities for sustainable sanitation in climate action	2019	This factsheet sets out key interactions between climate change and sanitation. It examines the relevance of sustainable sanitation in light of the Paris Agreement on climate and the Sendai Framework for Disaster Risk Reduction 2015–2030. It also introduces some of the more climate-resilient, low-carbon sanitation solutions available, and practical advice on how to integrate climate and sanitation strategies.

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RoCK Table (4) - Climate Change and the Sanitation/Wastewater Sector

No.	Document Title	Date	Description
9	Climate, Sanitation and Health	2019	This paper provides an overview of the impacts of climate variability and change on sanitation and the implications for health. It outlines potential adaptation options for strengthening climate resilience of sanitation governance, policies, systems and services, and highlights further research needs and imperatives for policy and programming.
10	Are Wastewater Systems Adapting to Climate Change?	2019	This study aims to fill this critical gap in the literature. Data from surveys and interviews were used to understand what WW managers are doing to adapt to the current climate, what facilitates those adaptations, and if they are adapting to future climate change.
11	Climate change mitigation potential in sanitation via off-site composting of human waste	2020	This paper measures cumulative GHG emissions of carbon dioxide (CO ₂), methane (CH ₄) and nitrous oxide (N ₂ O) during the off-site composting of human waste to estimate scalable emission factors.

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RoCK Table (5) - Case Studies and Other Countries Experiences

No.	Document Title	Date	Description
1	Assessing the impact of climate change on water supply sources and WSS systems and inventory possible adaptation measures	2013	This report is part of a project comprises three tasks: (1) Task 1: Assess the impact of climate change on water sources and WSS systems and inventory possible adaptation measures; (2) Task 2: Analyze selected adaptation measures and propose a feasible adaptation strategy and (3) Task 3: Develop a viable business model for small towns and rural settlements in Moldova.
2	Impact of Climate Change on the Performance of Wastewater Treatment Plant: Case study Central Irbid WWTP	2019	This study aims to assess the consequences of climate change on the central Irbid WWTP which is located in northern Jordan. For this purpose the statistical downscaling Model (SDSM) and the outputs of the HadCM3 global climate model were used.
3	Climate change impacts on activated sludge wastewater treatment: a case study from Norway	2009	This paper presents an investigation on climate change effects on a wastewater treatment system that receive sewage collected in a combined sewer system in Oslo, Norway, during winter operation.
4	Review and assessment of the adaptive capacity of the water sector in Cyprus against climate change impacts on water availability	2015	The present paper presents a detailed review on the existing adaptation measures implemented in Cyprus in the field of water resources, as well as all water related aspects in the field of agriculture

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RoCK Table (5) - Case Studies and Other Countries Experiences

No.	Document Title	Date	Description
5	Impacts and implications of climate change on wastewater systems: A New Zealand perspective	2021	This paper considered direct climate-related impacts on a range of wastewater system elements (including reticulated wastewater systems, on-site wastewater systems and treatment plants), in both urban and peri-urban settings in New Zealand.
6	The Impacts of Climate Change on Wastewater Treatment Costs: Evidence from the Wastewater Sector in China	2020	This paper investigates the relationship between climate and costs of wastewater treatment with the objective of examining if changes in climate might have an impact on the costs of wastewater treatment.
7	Climate Adaptation in the Water Sector in India	2019	This paper investigates climate change impacts on the water sector in India and discusses various adaptation strategies.
8	Greenhouse Gas Emissions from Wastewater Treatment Plant	2019	In this study energy and carbon footprints of Navi Mumbai, wastewater treatment plants were estimated. For the estimation of energy consumption, mass-balance approach and the IPCC methodology for carbon emission were used.
9	A Blueprint for Carbon Emissions Reduction in the UK Water Industry	2013	This report offers an analysis of where the main opportunities for carbon emissions reduction lie for the water industry in the UK.

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RoCK Table (5) - Case Studies and Other Countries Experiences

No.	Document Title	Date	Description
10	Water and Sanitation Sector Policy on Climate Change	2017	This Water and Sanitation Policy on Climate Change provides a framework for the implementation of the Climate Change Response Strategy for the water and sanitation sector in South Africa.
11	Climate Change Vulnerability Assessment and Adaptation Planning for Water Supply	2012	This inception report provides the conceptual framework and implementation guidelines for IUWASH's work with water utilities to bolster resilience to climate change in Indonesia.
12	Pilot Water Sector Climate Change Adaptation Action Plan	2018	The Pilot Water Sector Adaptation Action Plan aims to drive adaptation across the water sector in Victoria in Australia.
13	Playing our part – reducing greenhouse gas emissions in the water and sewerage sectors - Supporting information	2010	This document sets out and considers the data collected from the water companies in England and Wales on the projected greenhouse gas emissions associated with the sectors over the five years.
14	Policy Implications of Climate Change Impacts on Wastewater Treatment Costs: Evidence from China	2019	Using data from China, this paper estimates a wastewater treatment cost function, focusing on climate impacts. The paper concludes that changes in climate significantly affect treatment costs, directly and indirectly—through changes to other cost determinants impact.