



Scientific Research in Water Sector: Future Perspectives



**Water Research Center
Sultan Qaboos University**

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Sultan Qaboos University

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معلومات عامة
General
INFORMATION
INFORMATION



18,858

عدد الطلبة
Number of Students

الدراسات الجامعية الأولى
Undergraduate 17,113

الدراسات العليا
Postgraduate 1,745

4

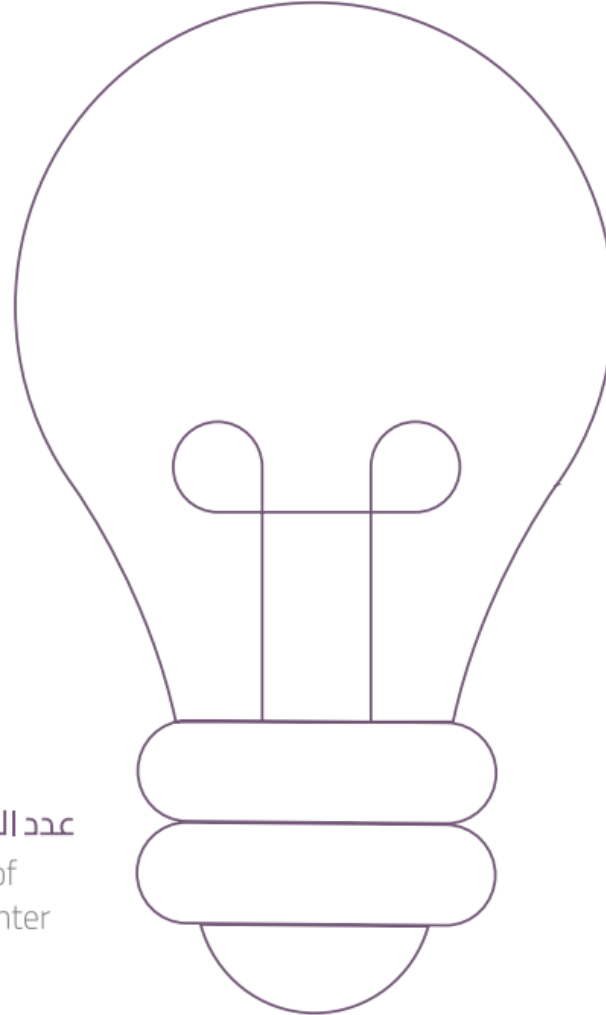
عدد العمادات
Number of
Deanships

14

عدد المراكز البحثية
Number of
Research Center

13

عدد المراكز الخدمية
Number of
Services Center



جامعة السلطان قابوس
Sultan Qaboos University

تأسست
Established 1986



5,570

عدد الموظفين
Number of Staff

موظفو المستشفى
SQUH 2,641

موظفو الجامعة
SQU 2,929



9

عدد الكليات
Number of Colleges

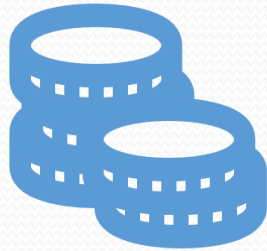
4 الكليات الإنسانية
Humanities Colleges

5 الكليات العلمية
Scientific Colleges

SQU Research & Innovation at a Glance



**Theoretical &
applied
research**



**Social &
economic
problems**



**Preparing
scholars,
researchers,
and experts**



**future skills in
research &
innovation &
build local
capacity**

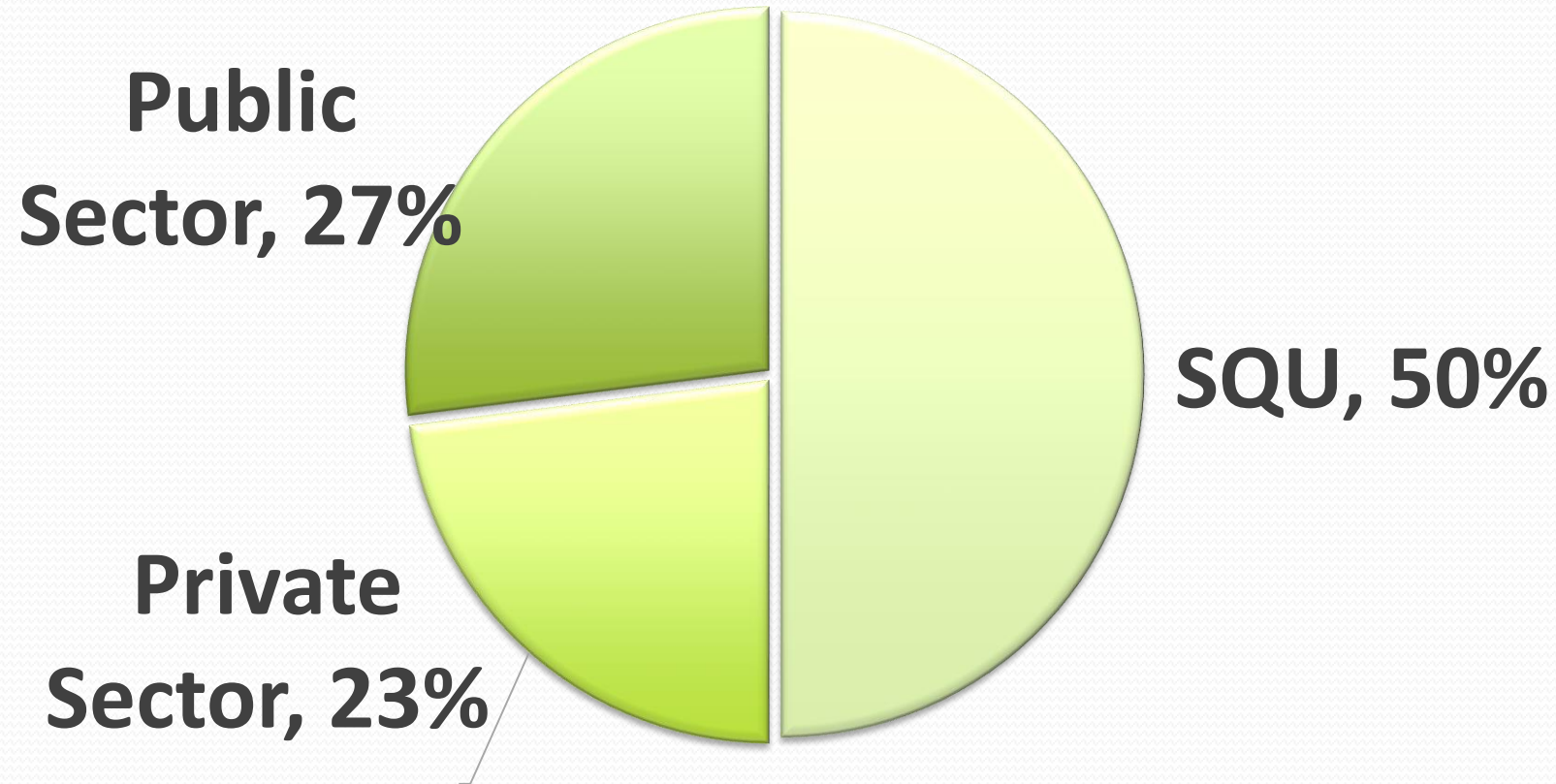


**social &
economic
added value
through
research &
development**



**knowledge
dissemination**

Sources of Research Fund



Research Outputs at SQU and Journals at SQU

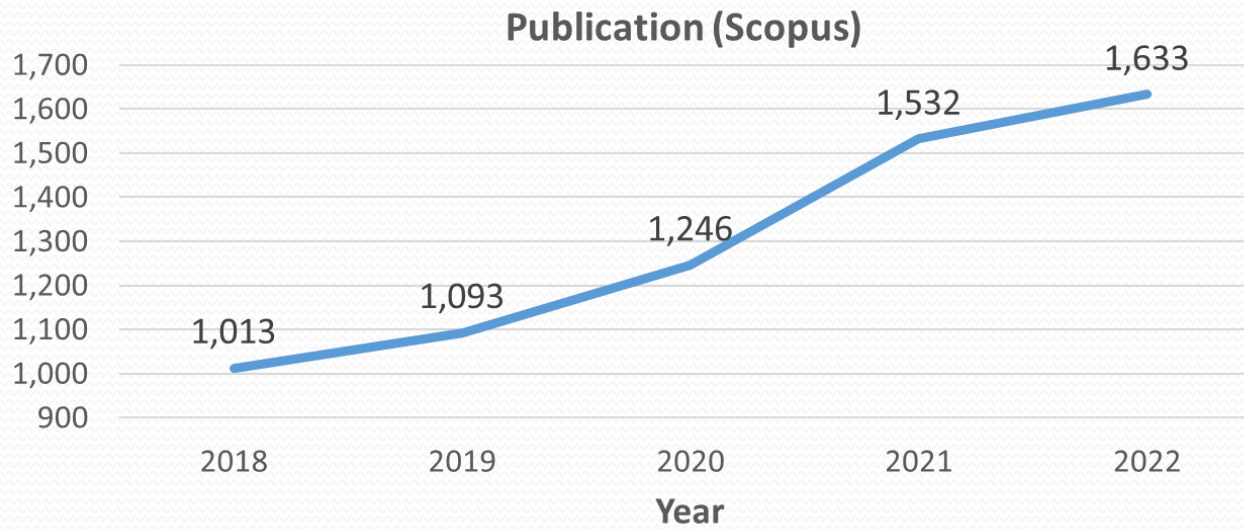
SQU MJ
Sultan Qaboos University Medical Journal
February 2022, Volume 22, Issue 1

Indexed in PubMed & SCOPUS

Highlights

- Oman, a Pathfinder Towards Tuberculosis Elimination - (Review)
- Integrating Palliative Care Services in Pandemics and Emergencies Preparedness and Response Plans - (Review)
- Physiological and Psychological Complications of Post-burn Patients in Pakistan - (Article)
- Domestic Violence against Infertile Women - (Article)
- Exploring Frequency of Self-Reporting as Perceived by Intensive Care Unit Nurses in Sultanate of Oman - (Article)
- Characteristics and Outcomes of Critically Ill Patients with Related Cardiac Response Assessed in the Intensive Care Unit - (Article)
- Depression in Urban Oman Adults with Type 2 Diabetes - (Article)
- Mid-Term Radiological and Functional Outcomes of Bicondylar Tibial Plateau Fractures Managed with Open Reduction and Internal Fixation Using Dual Plates

Content: journals.squ.edu.om/index.php/squmj
Submissions: www.edmgr.com/squmj



JAMS
Journal of Agricultural and Marine Sciences
Volume 27, Issue 1, 2022

ISSN (Print Edition): 2410-1060; ISSN (Online Edition): 2410-1079
Indexed in Google Scholar, DOI, Crossref, EBSCO, Jgate, CAB, and Al Manhal

Contents

- Wheat Production in Oman: Experiences, Challenges and Opportunities
- Biotic and Abiotic Stresses of Major Fruit Crops in Oman: A Review
- A 25 Year History of the use of Organic Soil Amendments in Oman: A review
- Shallow Water Table in Arid Urban Zone: Preliminary Study at Sultan Qaboos University Campus, Oman
- Optimum Stocking Density of 'Scar' Carp (*Cyprinus carpio*) in Combination with Different Plant Species in an Aquaponic System
- Relationship between Induction of Novel Somaclonal Variants and Types of Organogenesis in *Muskmelon* (*Cucumis melo* L.)
- Risks in the Sri Lankan Banana Supply Chain: Analysis through an Interpretive Structural Modeling
- Rehydration ability of native dried date (*Phoenix dactylofera* L.) fruits soaked in orange Juice

www.squ.edu.om/agri/jams
Sultan Qaboos University - Sultanate of Oman

TJER
The Journal of Engineering Research
ISSN: 1726 - 6009
Volume 19, Issue (1), 2022
Indexed in SCOPUS, Google Scholar, ScienceGate, DOI, CrossRef, EBSCO, J-gate, LOCKSS, ISC, and Al Manhal

The traditional machine learning process for breast cancer histology image classification. (P. 42)

https://journals.squ.edu.om/index.php/tjer/index
Sultan Qaboos University - Sultanate of Oman

SQUJS
Sultan Qaboos University Journal for Science
ISSN (Print Edition): 1627-524X; ISSN (Online Edition): 2414-536X
Volume: 27, Issue 1, 2021
Indexed in Google Scholar, DOI, Crossref, EBSCO, Jgate, LOCKSS, and Al Manhal

Contents

- Determination and Comparison of CO₂ and Air Pollutants Emitted From the Exhaust Gas of Selected Electric Generators
- Development and Validation of An RP-HPLC-FLD Method for the Determination of Biogenic Amines after Pre-column Derivatization with a New Pyrazolone Based Reagent, 3-Naphthyl-1-(4-Trifluoromethyl)-5-(4-Carboxy phenyl)-2-Pyrazolinone
- Archaeo-Geophysical Investigation of Simulated Settlement: Case Study in a Part of Basement Complex of Nigeria
- Engineering Properties of them or Radhuma Limonstone Ataq, yemim
- Negligence of geological site investigations Leading to Slope Failure Incidents: A case Study from Sali Al Ahmar in Bafrah, Northern Oman
- A compiled Synoptic Table of the Standard Microclimates Zone System of Phleg (2010): A practical tool.

<http://web.squ.edu.om/squjs/sci/index.html>
Sultan Qaboos University - Sultanate of Oman

مجلة الآداب والعلوم الاجتماعية
عدد خاص بالدراسات الدولية الرابع للكلية الآداب والعلوم الاجتماعية
رئيس تحرير: عبد الحميد العتيبي، د. فهد بن حازم العريسي
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العدد 17، العدد 1، 2022 - 2021
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العدد 17، العدد 1، 2022

تطوير التعليم الإلكتروني في التعليم التمهيدي بسلطنة عُمان في ضوء رؤية عُمان 2040 والتنمية المستدامة من وجهة نظر مديري المدارس (دراسة حالة على محافظة مسقط).

مستوى الوعي السياحي المستدام لدى طالبات الصف التاسع الأساسي بمدينة العزيم للتعليم الأساسي.

الوظائف والأبحاث والأدوار المتوقعة للباحثين في مجالات العلوم الاجتماعية والإنسانية في خطط التنمية المستدامة: (دراسة وصفية تحليلية لروية مصر 2030م).

«انكسرت التلال» العُماني والتنمية المُستدامة: دور المؤسسات البحثية وجهود منظمات المجتمع المدني المُتخصصية.

دور تقنيات الثورة الصناعية الرابعة في تحقيق التنمية المستدامة في مؤسسات التعليم العالي بسلطنة عُمان.

دور إدارة التوأمة في تحقيق الإنعاش الاقتصادي في الجامعات الحكومية بسلطنة عُمان

جامعة السلطان قابوس - سلطنة عمان

Water Research needs and Achievements (past to present)

- SQU research outputs (Scopus and WoS) in the water sector and related topics:
 - 3586 articles
 - 217 review articles
 - 194 chapters
- International collaboration in water related research:



Challenges and needs of water changes over year

Past

Future

Water Supply management
Destination
Nonrevenue water
Legislation
Wastewater treatment
Water harvesting systems
Basic groundwater and surface
water hydrology
Rainfall analysis

Efficient use of water
Conservation of water
Climate change
Modern irrigation water
Flood hazard
Impact of climate change
Water governance
**Assessment of recharge dam
efficiency**
**Desalination and treatment
technologies**
Optimization of water use
Finance of water

Use of emerging smart
technologies
AI, ML, IoT, etc in water
management, predictions, and
planning

Mitigation and increase of
resilience to the impact of
climate change

The Challenge is:

Too Much Water and Too Little Water

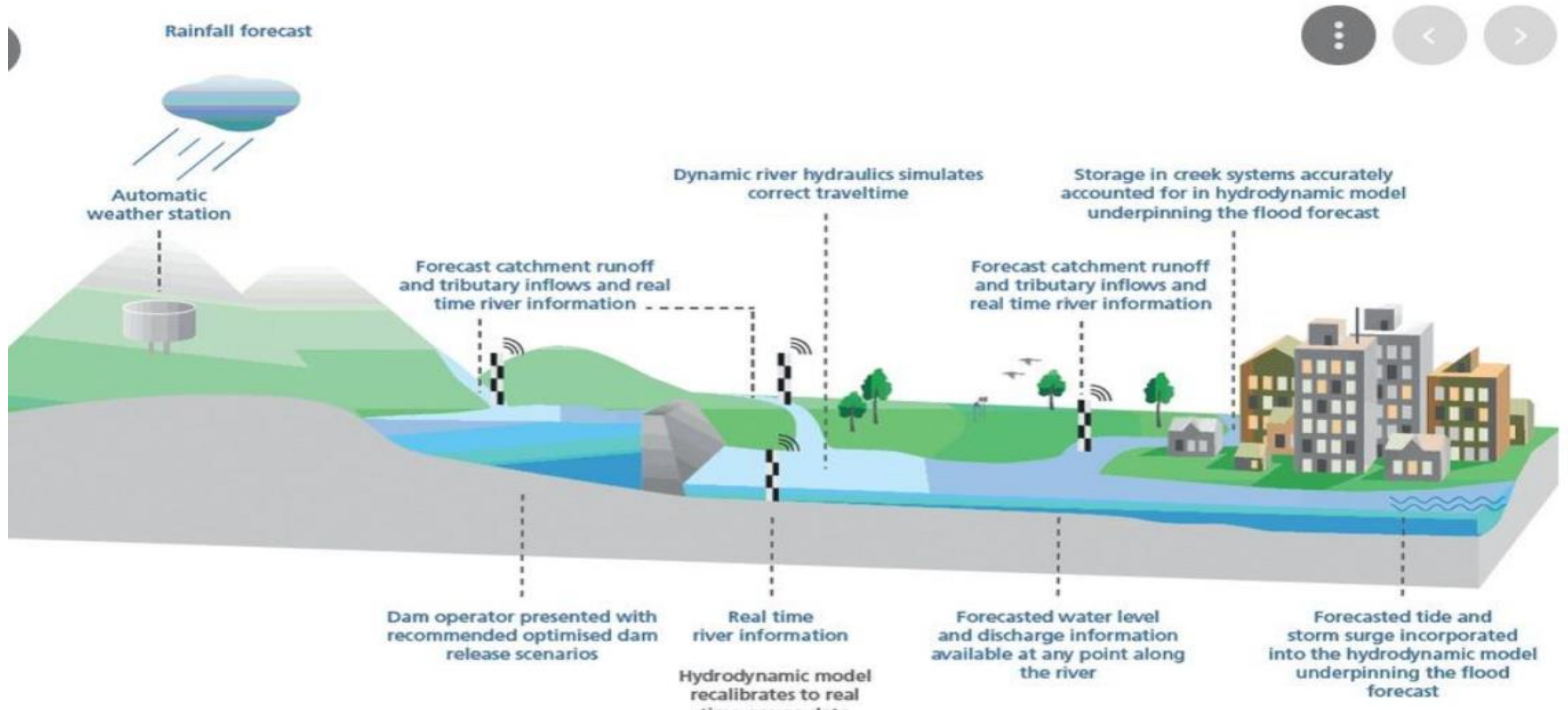
- Flash Flood Hazards, Extreme Events
- Destruction Of Cities And Infrastructure
- Casualties

- Water Scarcity
- Water Supply
- Water Demand
- Non Revenue Water
- Low Water Efficiency

There is no escape from the fact that the need and demand for finite and vulnerable water will continue to expand and so will competition for it. **More uncertainty in water availability, higher frequency of extreme weather events, and more rapid return flows of water to the atmosphere are expected in the future.** Given the changes in the hydrologic cycle as a result of land use and climate changes and the closed character of many basins, **allocations to, and patterns of future water use, will deviate from past trends**

Agriculture and irrigation consumes 70-80% of water resources, in the same time **we push for green initiatives**, that will definitely requires water which is already scarce!!!! **(proper analysis of short and long term impact on sustainability of resources is needed)**

AI, ML, Technology Guided Water Resources Management



Areas of Water Research: identified by Various Water Entities and experts in Oman

- Dams safety evaluation in Oman and GCC region considering climate change and recent dam failure events (physical and numerical models). **Geotechnical engineering of local dams.**
- Addressing the water quality delivered to homes to curb down the use of bottled water: Micro-pollutants, and PFAS
- Integrated management of desalinated water-treated wastewater and aquifers
- Adaptation and mitigation of climate change with scarce water resources: Impact of over-tree plantation on water resources sustainability
- What are the actual crop water needs that meet food security while ensuring water security?
- **How can sensors, IoT, AI, and ML be utilized to achieve sustainable water management in GCC agro-ecoregions? Capacity buildings is a must!**
- Maximizing the utilization of alternative water sources (i.e. rain harvesting, saline water, grey & black waters, etc.) for agriculture

Areas of Water Research: identified by Various Water Entities and experts in Oman

- How we can integrate AI with data management to predict future water demands. This will support the planning of the water utility and reduce capital investment in water supply networks (OWWSC).
- Develop/innovate technology that will help to predict the (Harmful Algal Blooms)HABs before affecting the desalination plants. In addition, developing and integrating treatment technologies that can filtrate and treat HABs before RO Stages.
- More ASR/MAR studies.
- **Surface water hydrology and flashflood hazards:**
 - [insufficient research], mitigation solutions to increasing the resilience of the urban and rural areas to flashflood hazards to be given a priority.
 - [UAE] announced the first correct step – restoration of original Wadi pathways
 - Urban planning must be based on drainage patterns and density within each catchment



Great Thanks

Water is the driving force of all nature