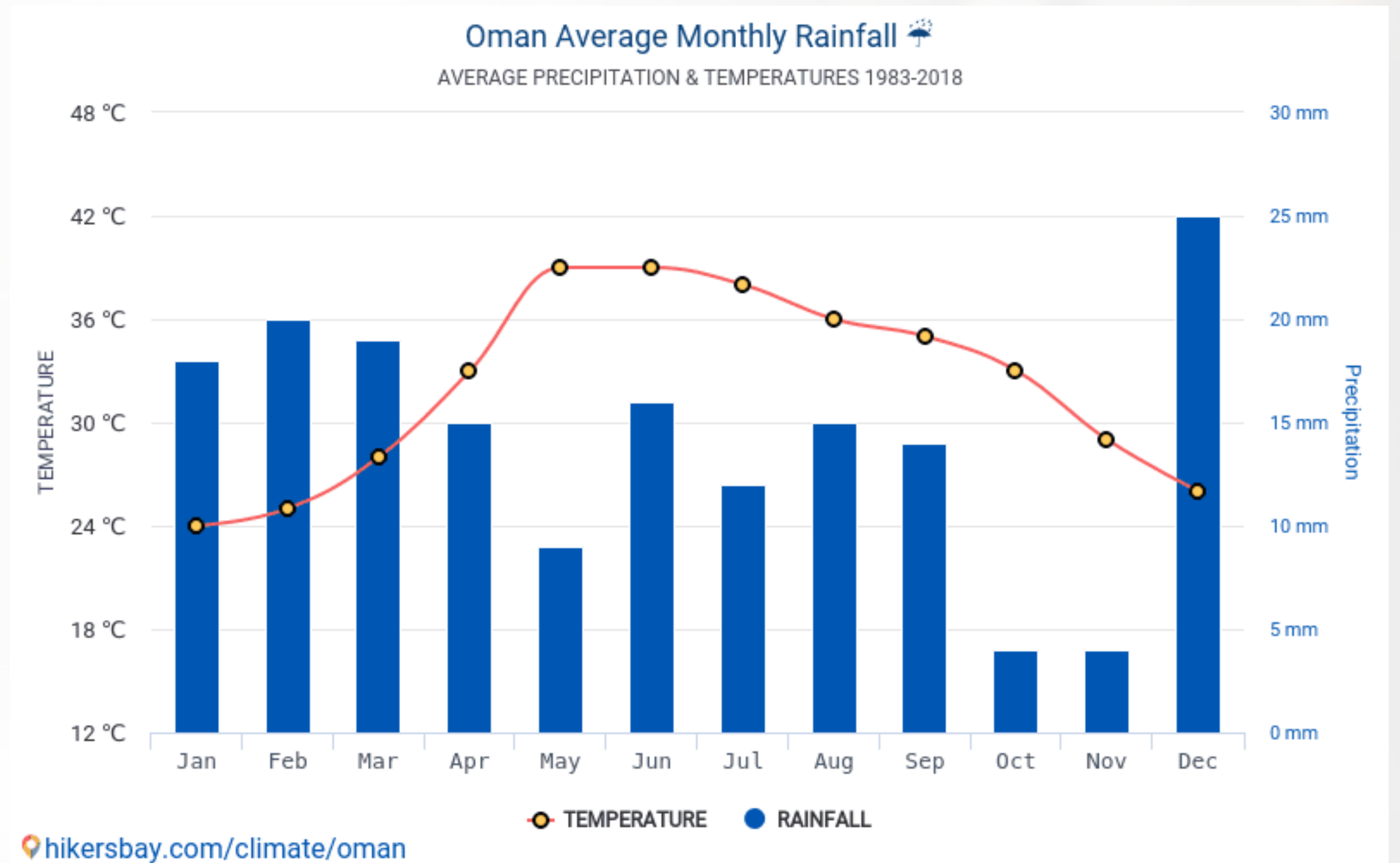


WATER SCARCITY AND GROUNDWATER DEGRADATION IN OMAN

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ECON 2675

INTRODUCTION

- Oman is one of the driest countries in the world, with very limited rainfall (~100 mm/year).
- The country has no permanent rivers and depends heavily on groundwater.
- About 94% of Oman's freshwater use comes from underground aquifers, making them the main source of water for homes, farms, and industries.
- Water is not only essential for people but also for agriculture and economic development, which makes scarcity a national concern.



THE PROBLEM

- Oman is using its groundwater faster than nature can replenish it, causing aquifers to decline.
- In coastal areas such as Al Batinah, overpumping has led to seawater intrusion, which makes the water salty and unusable for farming.
- Although Oman treats almost all wastewater (99%), only one third (33%) is actually reused.
- Inefficiencies in the water supply system cause major losses, with 177 million cubic meters wasted in 2024.



WHY IT MATTERS

1

Agriculture: Salinity reduces crop yields and threatens food security in key farming regions.

2

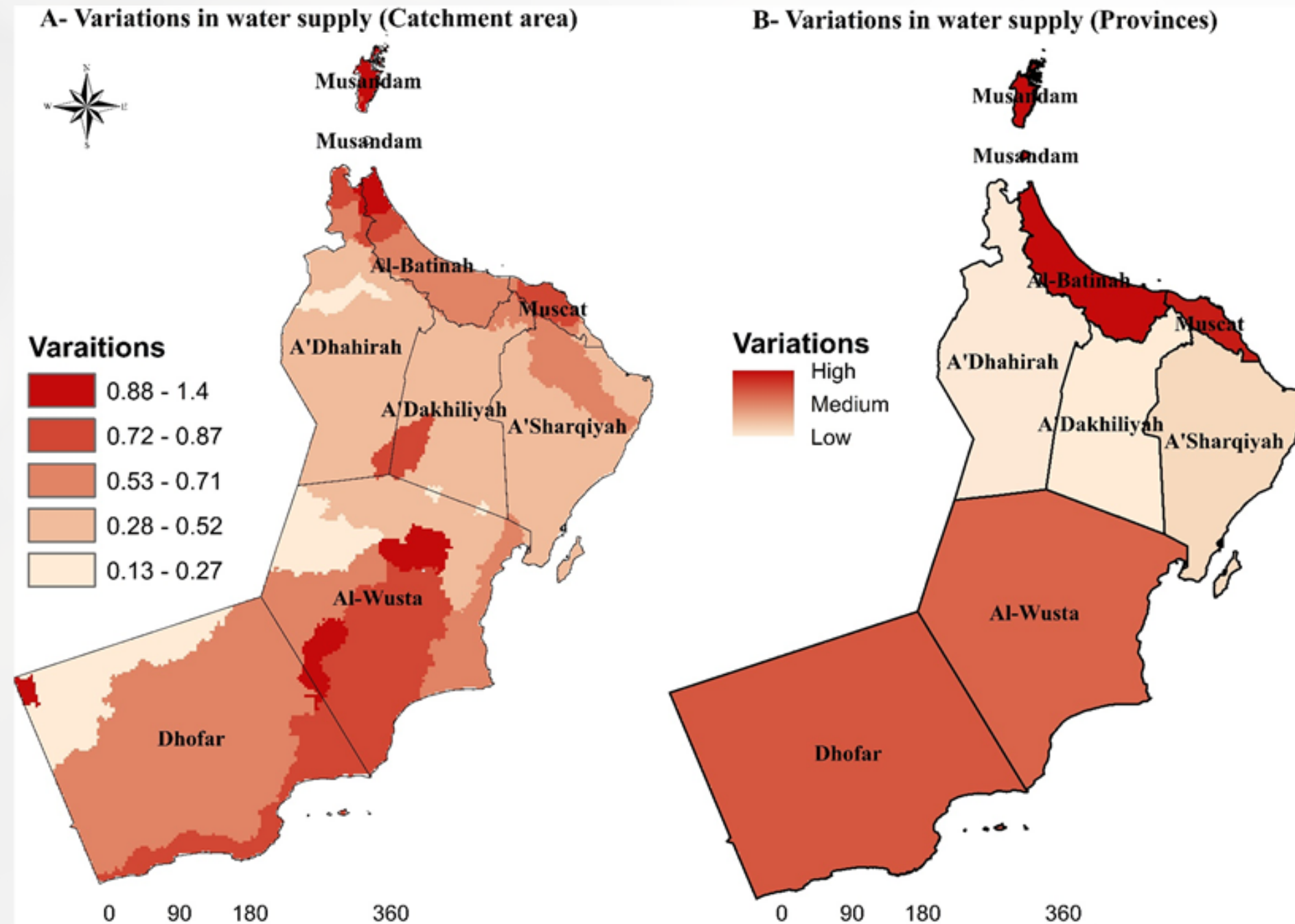
Economy: Desalination is reliable but extremely expensive and energy intensive.

3

Environment: Traditional irrigation systems (aflaj) are drying up, and ecosystems dependent on springs are at risk.

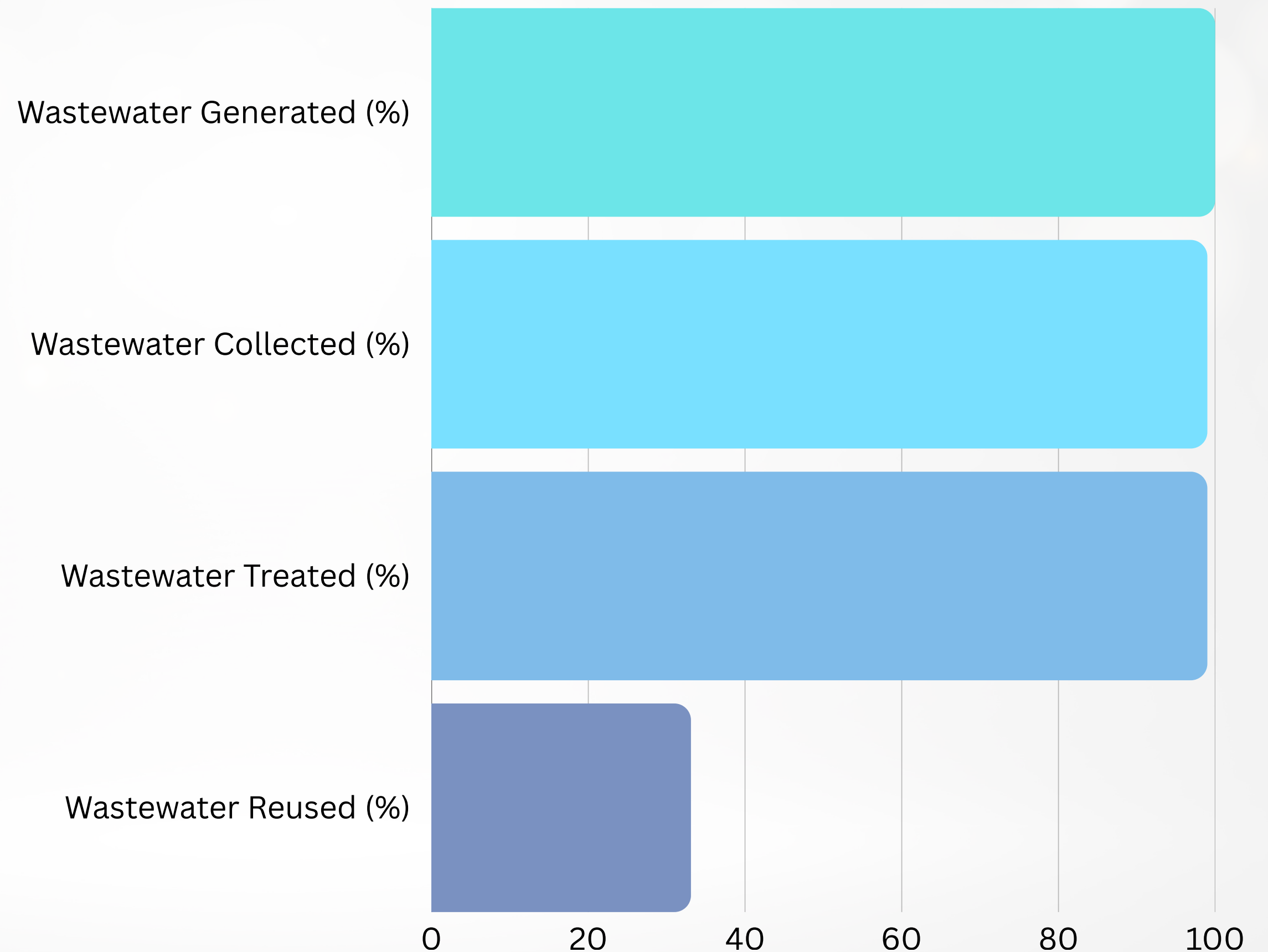
4

Society: Rising demand in cities creates inequality of access between urban and rural areas.



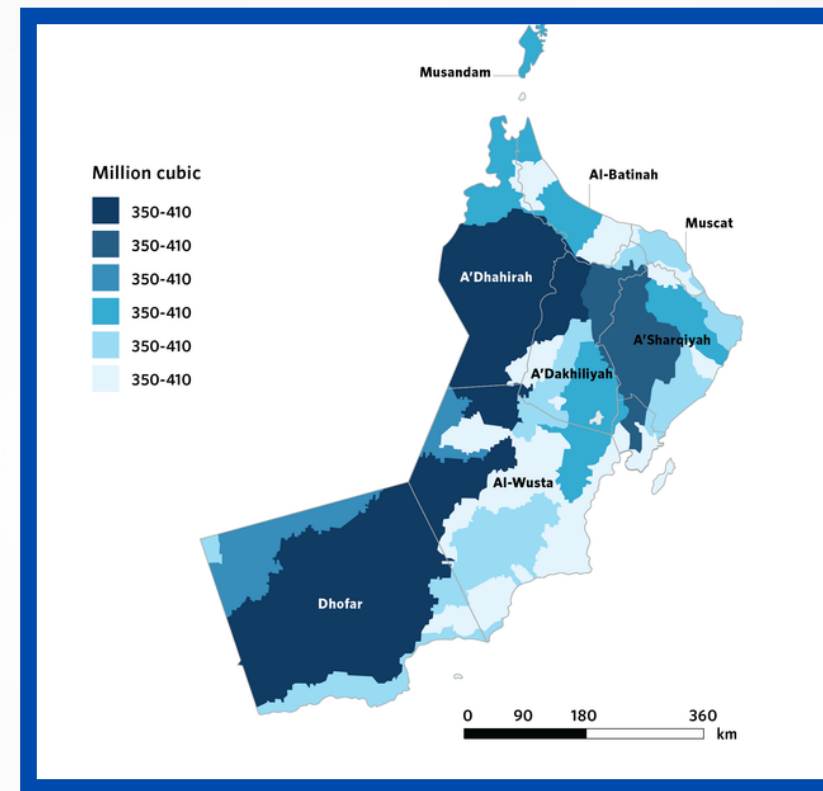
OMAN'S PERFORMANCE

- Oman ranked 10th globally in water resources management.
- 2nd in GCC, 3rd in Middle East.
- 99% wastewater collected & treated.
- But only 33% reused → wasted potential.



CASE STUDIES

Unsustainable farming practices, such as heavy groundwater pumping and inefficient irrigation, are worsening stress on local aquifers, showing that water scarcity is not only an environmental issue but also a serious threat to agriculture, livelihoods, and long term sustainability.



Salalah Aquifer: Water demand already exceeds natural recharge, leading to seawater intrusion and rising salinity in the groundwater.

Al-Batinah Plains: Once Oman's main farming hub, the region is now losing farmland as salinity spreads and crops fail.



POLICY & INFRASTRUCTURE RESPONSES

OMAN VISION 2040

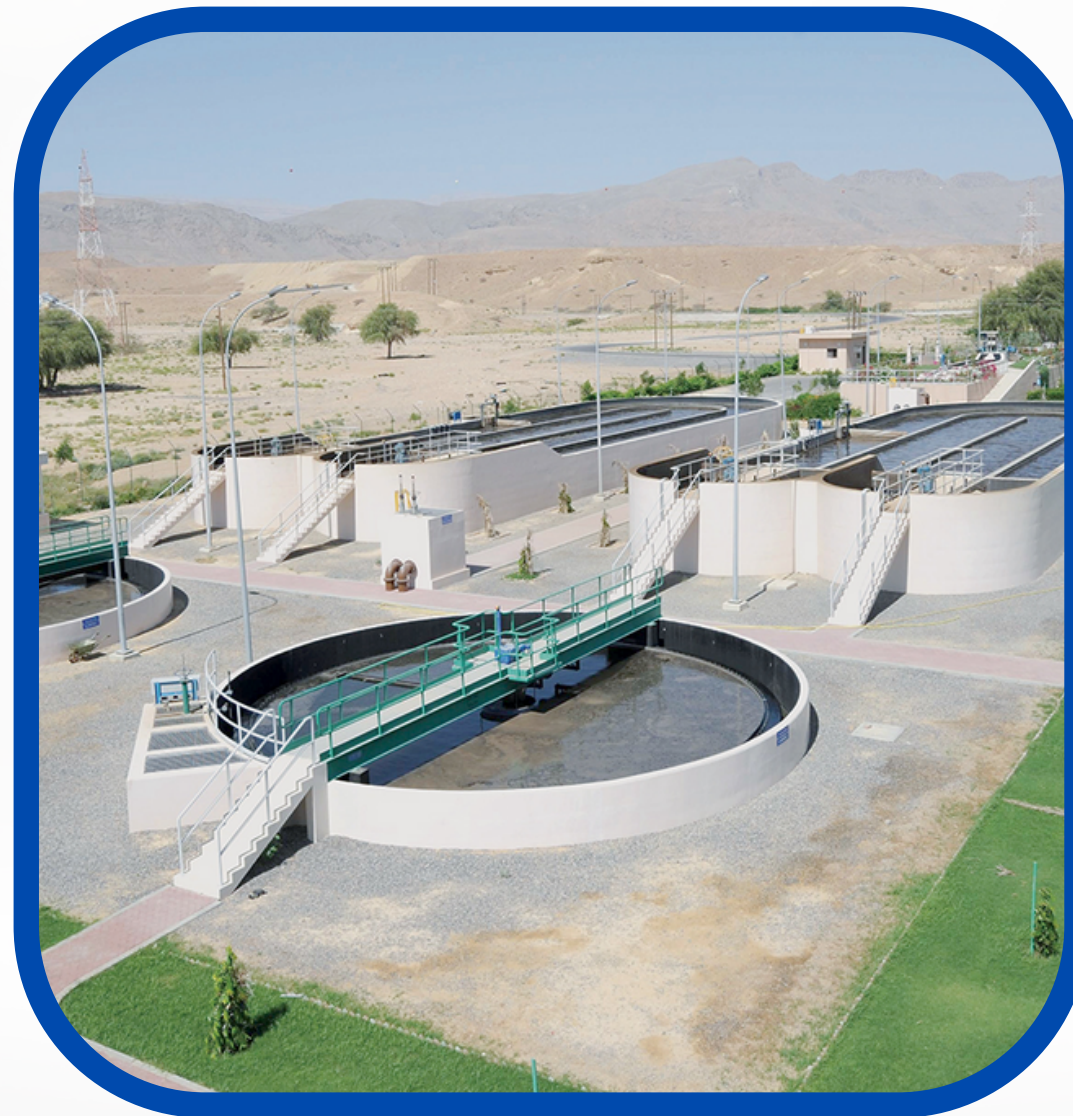
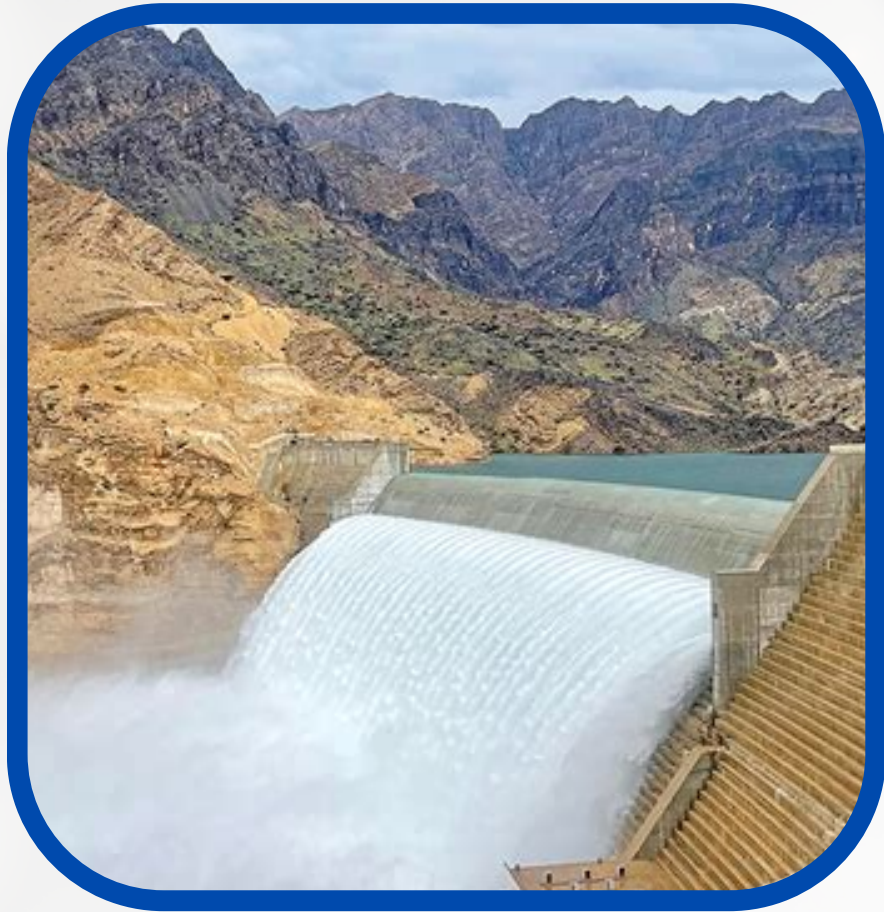
The country's long term development plan highlights water efficiency and sustainability as national priorities, aiming to balance economic growth with careful resource management.

WADI AL JIFNAIN DAM

A newly completed dam designed to protect Muscat from seasonal floods, while also storing 11.5 million cubic meters of water for agricultural and domestic use.

DESALINATION PLANTS

Oman has invested heavily in desalination facilities in Muscat, Sohar, and Salalah, which now supply a growing share of the urban water demand despite their high cost and energy use.



WHAT MORE CAN BE DONE

- Expand wastewater reuse for agriculture & industry.
- Promote drip irrigation and smart farming technologies.
- Invest in rainwater harvesting and recharge dams.
- Strengthen groundwater regulations + water pricing reforms.



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THANK YOU

