

Lesson Ten:	Managing water insecurity in Oman		
Aim:	To examine in detail how Oman uses both mitigation strategies and adaptation strategies to manage water insecurity.		
Specification Links:	<p>GCSE Geography AQA 8035: 3.1.1.4 adaptation and managing water supply 3.1.2.3 challenges of a hot desert environment: water supply; strategies to reduce risk of desertification – water management 3.2.3.1 matching supply and demand [for water] 3.2.3.3 strategies to increase water supply – water transfers and desalination; water conservation; groundwater management; recycling grey water</p> <p>GCSE Geography CIE 0460: 3.6 methods of water supply; management required to ensure future supplies</p> <p>GCSE Geography Edexcel A: 6.11b how technology (desalination) can resolve water-resource shortages 6.12 why water resources require sustainable management</p> <p>GCSE Geography Eduqas A: 6.3.1 the concepts of water footprints and water security 6.3.2 how and why people manage water supply</p> <p>GCSE Geography Eduqas B: 3.3.1 the concepts of water footprints 3.3.3 ways in which an imbalance in [water] supply and demand can be met</p> <p>GCSE Geography OCR B J384: 8.1 how environments and ecosystems are used and modified ...to provide water</p>		
Key Vocabulary:	water security desalination ground water	mitigation afraj efficiency	adaptation grey water conservation
Resources:		Learning Outcomes:	
PowerPoint: Managing water insecurity Water security graph Water insecurity management strategy cards Water insecurity management strategies in Oman Evaluating strategies table		<ul style="list-style-type: none"> • To know how Oman approaches water insecurity • To understand the difference between mitigation and adaptation in relation to water management • To be able to evaluate different water insecurity management strategies 	
Lesson Introduction:			
<p>This lesson looks the nature of water insecurity in Oman and how the country is attempting to manage this insecurity in a sustainable way. The concepts of mitigation and adaptation will be differentiated, and different strategies examined so that students can evaluate their relative effectiveness.</p>			
Starter: (10 mins)			

Slide 2-4: Defining water insecurity

Students can firstly look at each of the key words and the definitions and try to match them up correctly verbally. Then students should attempt to complete the gaps in the definitions, recording these in writing.

Main Activities (35 mins)

Slide 5-6: How water insecure is Oman?

Students should be shown the initial set of axes and asked to comment on what each of the four sectors might represent in terms of lived experience of people who might live in a country found in each of the sectors. Students can complete [Water security graph](#) with annotations to highlight some of these key points. The position of different countries, including Oman, can then be revealed and the need for water resource management can be highlighted. Teachers can ask students to think about how they might show a change or trend in water insecurity on this graph, and ask them to hypothesise how such a graph might look for Oman – i.e. are water supplies becoming more insecure (with the impacts of climate change) or more secure (with improvements in water technology)?

Slide 7-8: Mitigation v Adaptation

In pairs, students should look through the [Water insecurity management strategy cards](#) and sort them into two groups according to criteria of their own choosing. Feedback should then be given to the class about the criteria they used. Teachers can then explain two ways of looking at water insecurity management: mitigation and adaptation. Students should then attempt to resort their cards with this in mind. An extended discussion can be used where students will justify the positioning of certain strategies under each category.

Slide 9-12: Water insecurity management in Oman

Students should watch each of the three videos and make annotations around the photos on [Water insecurity management strategies in Oman](#). Teachers can then ask students to swap their work around the room (or use a visualizer if one is available) before they edit their work and include any extra points they feel need to be added.

Reflection: (15 mins)

Slide 13-26: Evaluating strategies

Students should look at each of the statements as they appear and decide whether they are connected to desalination, grey water recycling or the aflaj systems. They should record their ideas in [Evaluating strategies table](#). Then students can complete the exam style question using the table as a guide and prompt.

Extension & AS/A Level progression:

- Mid to long term social, economic and environmental impacts of Oman facing water insecurity

Bibliography:

Water usage data and rainfall data from World Bank Data <https://data.worldbank.org/>

Desalination video edited from The Signature Eco City <https://www.youtube.com/watch?v=vLgmFRceoVE>

Aflaj video edited from UNESCO https://www.youtube.com/watch?v=X_DbSjNJay4

Greywater recycling video edited from InvestingInWater <https://www.youtube.com/watch?v=y8kipgTJDUw>

Falaj photo from Grant Eaton; desalination photo from ro plant; greywater recycling photo from Gavin Anderson; all reproduced under the Creative Commons License.