

12.11 Review

12.11.1 Key knowledge summary

12.2 Wet and wonderful — inland water

- Inland water covers a range of different landforms and environments.
- Water that is stored in rivers, lakes and groundwater provides a wide range of environmental services.
- Changes as a result of human activities can alter the environmental functions of inland water bodies.

12.3 Damming rivers — the pros and cons

- Dams provide many benefits to societies from supplying water and electricity to preventing floods and providing irrigation water.
- At the same time, dams also create river fragmentation, displace communities and change river flows.
- Large-scale mega dams have always been associated with economic development and progress.
- Mega dams have brought significant environmental and social impacts.
- Globally, there are questions about the economic, social and environmental worth of mega dams.
- Indigenous and environmental groups have challenged the construction of a mega dam, the Belo Monte in Brazil.
- Partly as a result of the controversy, costs and corruption involved in the dam's construction, the Brazilian government will cease to build mega dams

12.4 Alternatives to damming

- More attention is now being paid to small-scale, community-based water management schemes.
- Rainwater harvesting schemes and micro hydro-dams are two alternatives.
- Use of traditional small water harvesting dams (*johads*) in India are providing significant benefits — both environmental and social.

12.6 Using our groundwater reserves

- Groundwater is an important section of the water table used by more than 2 billion people across the world.
- There are many benefits to the use of groundwater, particularly for water and food security.
- It can take up to several thousands of years to replenish groundwater if overused.
- Water availability is unevenly distributed in China with much more water available in the south than the north.
- In China's north, unsustainable use of water is lowering groundwater reserves.
- A large-scale transfer of water from the south to the north of China has been constructed.
- There are many social, economic and environmental impacts from such a scheme.

12.7 The impacts of drainage and diversion

- Wetlands are a very important biome.
- Wetlands are constantly under threat from a range of human activities.
- The overuse and diversion of water is causing over one-third of the world's major surface water supplies to dry up.
- Lake Urmia in Iran is an example of where over-extraction of water has led to the decline in the health and size of the lake.
- It is possible to restore Lake Urmia given enough funds and more sustainable farming practices.

12.9 Putting water back — managing the Murray–Darling

- Environmental changes have developed because of the overuse of water resources in the Murray Darling Basin
- Several Government plans have been put in place to provide environmental flows to improve the health of the river, but there are ongoing issues in balancing environmental, economic and social needs.
- Drought and water mismanagement contributed to a major fish kill in the Menindee Lakes.

12.11.2 Reflection

Complete the following to reflect on your learning.

12.11 ACTIVITIES

Revisit the inquiry question posed in the Overview:

<content to come>

1. Now that you have completed this topic, what is your view on the question? Discuss with a partner. Has your learning in this topic changed your view? If so, how?
2. Write a paragraph in response to the inquiry question outlining your views.

Resources

 **Interactivity** Inland water — dammed, diverted and drained crossword (int-xxxx)

 **eWorkbooks** Reflection (doc-xxxx)
Crossword (doc-xxxx)

KEY TERMS

aquifers layers of rock which can hold large quantities of water in the pore spaces

base flow water entering a stream from groundwater seepage, usually through the banks and bed of the stream

environmental flows the quantity, quality and timing of water flows required to sustain freshwater ecosystems

environmental impact assessment a tool used to identify the environmental, social and economic impacts, both positive and negative, of a project prior to decision-making and construction

ephemeral describes a stream or river that flows only occasionally, usually after heavy rain (e.g. Todd River, Alice Springs)

eutrophication: a process where water bodies receive excess nutrients that stimulate excessive plant growth

fertility rate the average number of children born per woman

flood mitigation managing the effects of floods rather than trying to prevent them altogether

green energy sustainable or alternative energy (e.g. wind, solar and tidal)

icon sites six sites located in the Murray–Darling Basin that are earmarked for environmental flows. They were chosen for their environmental, cultural and international significance.

impervious a rock layer that does not allow water to move through it due to a lack of cracks and fissures

infrastructure the basic physical and organisational structures and facilities (e.g. buildings, roads, power supplies) needed for the operation of a society

micro hydro-dams produce hydro electric power on a scale serving a small community (less than 10 MW). They usually require minimal construction and have very little environmental impact.

perennial describes a stream or river that flows permanently

rainwater harvesting the accumulating and storing of rainwater for re-use before it soaks into underground aquifers

recharge the process by which groundwater is replenished by the slow movement of water down through soil and rock layers

reservoirs large, natural or artificial lakes used to store water, created behind a barrier or dam wall

river fragmentation the interruption of a river's natural flow by dams, withdrawals or transfers

river regimes the pattern of seasonal variation in the volume of a river

subsidence the gradual sinking of landforms to a lower level as a result of earth movements, mining operations or over-withdrawal of water

terminal lake a lake where the water does not drain into a river or sea. Water can leave only through evaporation, which can increase salt levels in arid regions. Also known as an endorheic lake.

watertables level below which the rock layer is fully saturated with water

weirs walls or dams built across a river channel to raise the level of water behind. This can then be used for gravity-fed irrigation.

wetland an area covered by water permanently, seasonally or ephemeraly. They include fresh, salt and brackish waters such as rivers, lakes, rice paddies and areas of marine water, the depth of which at low tide does not exceed 6 metres.