Solutions

Marking: **M1** a correct method, **A1** the correct answer, **B1** an independent mark.

Each answer shows the steps, then the **result**.

2.1

physical: there is not enough water in the area for people's needs, e.g. desert countries of the Middle East; economic: water exists, but people cannot afford the pipes, pumps or treatment to use it, e.g. parts of sub-Saharan Africa

2.2

availability: enough food produced or imported; access: people can afford and reach it; utilization: safe and nutritious food the body can use; stability: all three continue through bad years, e.g. droughts or price rises

2.3

saving $= 0.40 \times 9{,}000 = 3{,}600$ m^3; new use $= 9{,}000 - 3{,}600 =$ **5,400** m^3

2.4

any one link, developed: power stations need large amounts of water for cooling, so in a drought they may have to cut output, e.g. lower river levels limiting power stations or hydropower; or: pumping, moving and desalinating water uses energy, so water supply depends on an energy supply, e.g. desalination plants in the Gulf states run on oil and gas

2.5

any two, explained: building solar and wind power, so less oil and gas has to be imported; electric cars cut the need for imported petrol; nuclear power gives a steady domestic supply; oil from several countries and by pipeline as well as by sea, so one blocked route does not stop supply

3.1

(a) growing maize (or sugar cane) for biofuel uses farmland and water that could grow food, which can raise food prices

(b) any two, explained: poor people cannot afford food when prices rise faster than wages, e.g. Sen on the Bengal famine of 1943; food cannot reach people because of poor roads or conflict, so access fails even though food exists; food is lost after harvest because of poor storage; unsafe water or disease means the body cannot use the food (utilization)

3.2

Mark with the markbands: [9-10] focused on the command term, detailed and accurate knowledge, well-developed explanation, specific named examples (places, dates, numbers), balanced evaluation and a supported conclusion; [7-8] mostly focused, good knowledge and examples, some evaluation; [5-6] relevant knowledge and examples, explanation partly developed, little evaluation; [3-4] general knowledge, few examples, mostly description; [1-2] little that is relevant. Points that may be included: dams and reservoirs store water and make electricity, e.g. the Three Gorges Dam; but they flood land and move

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people (about 1.3 million) and trap sediment; desalination supplies cities in dry places such as the Gulf states; but it uses a lot of energy and produces salty waste, so it links water to energy security; drip irrigation cuts farm water use, which is about 70 % of withdrawals; but small farmers may not afford it; water transfers move water between basins, e.g. China's South–North Water Transfer Project; pricing and cutting leaks reduce waste in cities, but higher prices can hurt the poor (economic water insecurity); conclusion: technical strategies increase supply, but water security lasts only with saving water and fair prices; the best choice depends on whether the problem is physical or economic

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