Write your name here

Surname	Other names

Centre Number	Candidate Number

Edexcel GCE

Geography

Advanced
Unit 3: Contested Planet

Tuesday 26 January 2010 – Morning
Time: 2 hours 30 minutes

Paper Reference
6GE03/01

You must have:
Resource Booklet (enclosed)

Total Marks

Instructions

- Use **black** ink or ball-point pen.
- **Fill in the boxes** at the top of this page with your name, centre number and candidate number.
- Answer **TWO** questions in Section A and **ALL** parts of Section B.
- Answer the questions in the spaces provided – *there may be more space than you need.*

Information

- The total mark for this paper is 90.
- The marks for **each** question are shown in brackets – *use this as a guide as to how much time to spend on each question.*
- The quality of your written communication will be assessed in ALL your responses – *you should take particular care on these questions with your spelling, punctuation and grammar, as well as the clarity of expression.*

Advice

- Read each question carefully before you start to answer it.
- Keep an eye on the time.
- Spend approximately 80 minutes on Section A and 70 minutes on Section B.
- Check your answers if you have time at the end.

Turn over ▶

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SECTION A

Answer TWO questions in this section.
You are reminded of the need to use examples to support your arguments.
You are advised to spend approximately 80 minutes on Section A.

Energy Security.

1 Study Figure 1.

(a) Explain why oil exploration in the areas shown could lead to high economic and environmental costs.

(10)

(b) Assess the relative importance of named players in the global **supply** of energy.

(15)

(Total for Question 1 = 25 marks)

Water Conflicts.

2 Study Figure 2.

(a) Explain how physical and human factors have contributed to the variation in water scarcity shown.

(10)

(b) Using named examples, assess the contribution of large scale water management projects in increasing water security.

(15)

(Total for Question 2 = 25 marks)

Biodiversity Under Threat.

3 Study Figure 3.

(a) Explain how human activities have contributed to the condition of ecosystem goods and services.

(10)

(b) Using named examples, evaluate the success of **global** actions designed to protect biodiversity.

(15)

(Total for Question 3 = 25 marks)

Bridging the Development Gap.

4 Study Figure 4.

(a) Using information in Figure 4, and your own knowledge, explain why it is difficult to measure **development**.

(10)

(b) Evaluate the role of **different** global organisations in narrowing the development gap.

(15)

(Total for Question 4 = 25 marks)

The Technological Fix?

5 Study Figure 5.

(a) Using information in Figure 5, and your own knowledge, explain how farming technologies might have different consequences for human and ecosystem wellbeing.

(10)

(b) Evaluate the contribution technology might make to tackling global environmental problems such as land degradation and global warming.

(15)

(Total for Question 5 = 25 marks)

Put a cross in the box indicating the first question you have chosen to answer ☒.
If you change your mind, put a line through the box ☒
and then put a cross in another box ☒.
You will be asked to indicate your second question choice on page 11.

Chosen Question Number:

Question 1 ☒ **Question 2** ☒

Question 3 ☒ **Question 4** ☒

Question 5 ☒

(Total for Question = 25 marks)

Put a cross in the box indicating the second question you have chosen to answer ☒.
If you change your mind, put a line through the box ☒
and then put a cross in another box ☒.

Chosen Question Number:

Question 1 ☒ **Question 2** ☒

Question 3 ☒ **Question 4** ☒

Question 5 ☒

Turn over ▶

(Total for Question = 25 marks)

TOTAL FOR SECTION A = 50 MARKS

SECTION B

Answer ALL parts of this section, referring to the advance information you have been asked to study.

You are reminded of the need to use examples from any part of your GCE Geography course to support your answers.

You are advised to spend approximately 70 minutes on Section B.

Superpower Geographies.

6 (a) Explain the factors that have led to rapid economic growth in the small Gulf States.
(12)

(b) Evaluate the possible environmental consequences of continued rapid urban and economic development in the small Gulf States.
(14)

(c) Explain how the growing economic power of the small Gulf States could lead to social and political tension within the region and beyond.
(14)

Turn over ▶

(Total for Question 6 = 40 marks)

TOTAL FOR SECTION B = 40 MARKS
TOTAL FOR PAPER = 90 MARKS

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RESOURCE BOOKLET

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Do not return this Resource Booklet with the question paper.

Turn over ▶

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SECTION A

The following resources are related to Questions 1–5.

Figure 1 Oil exploration in technically difficult and environmentally sensitive areas

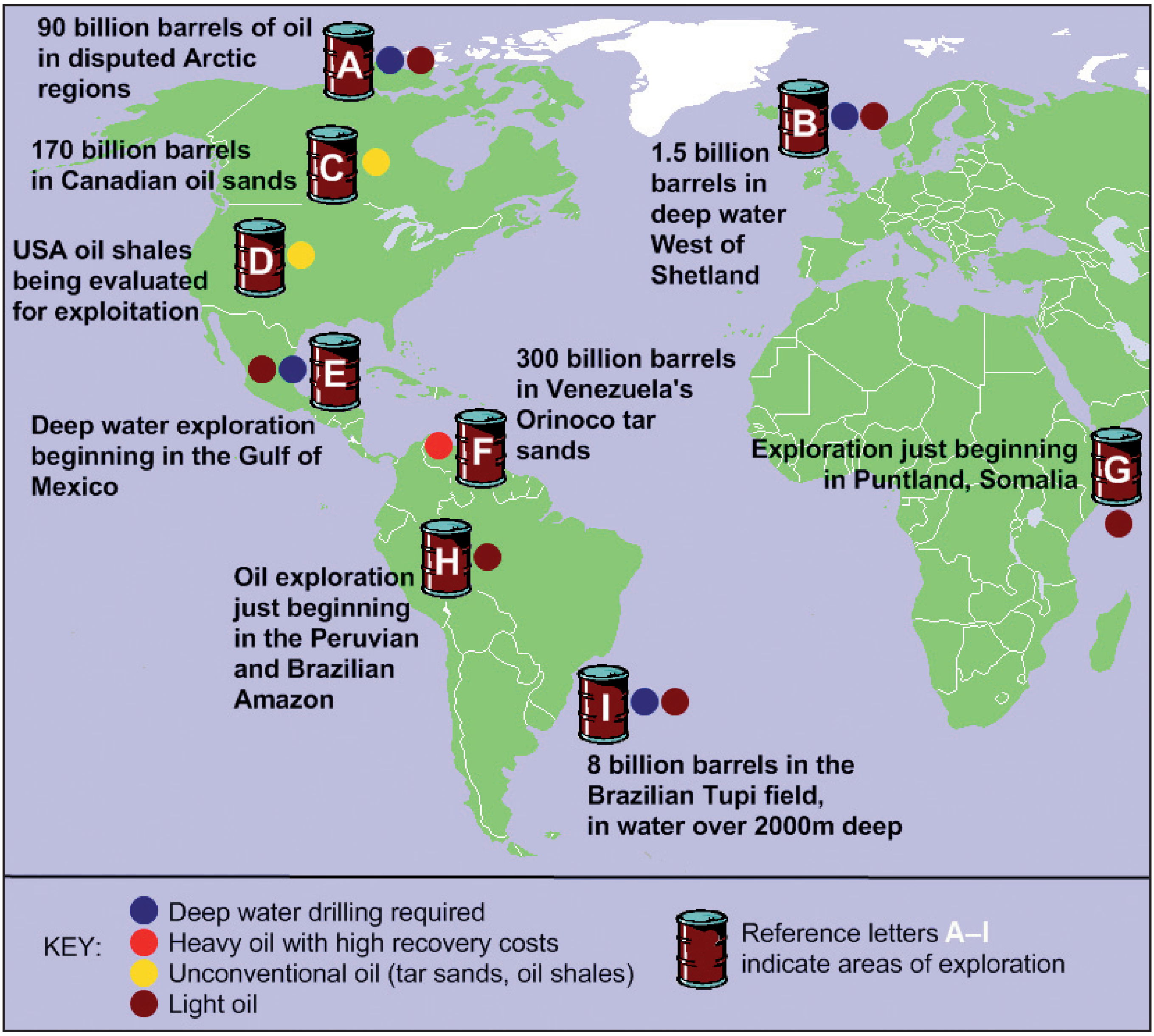
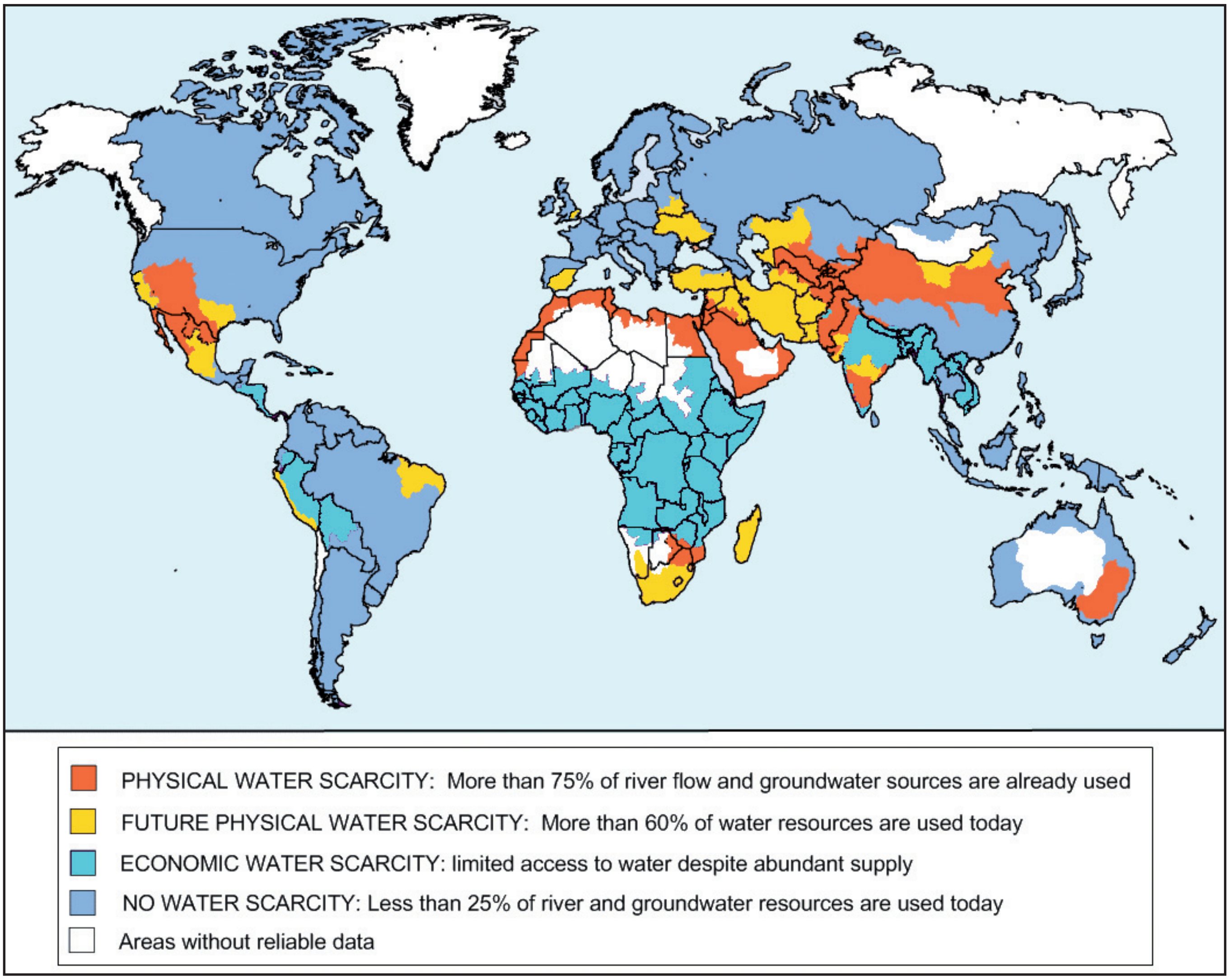
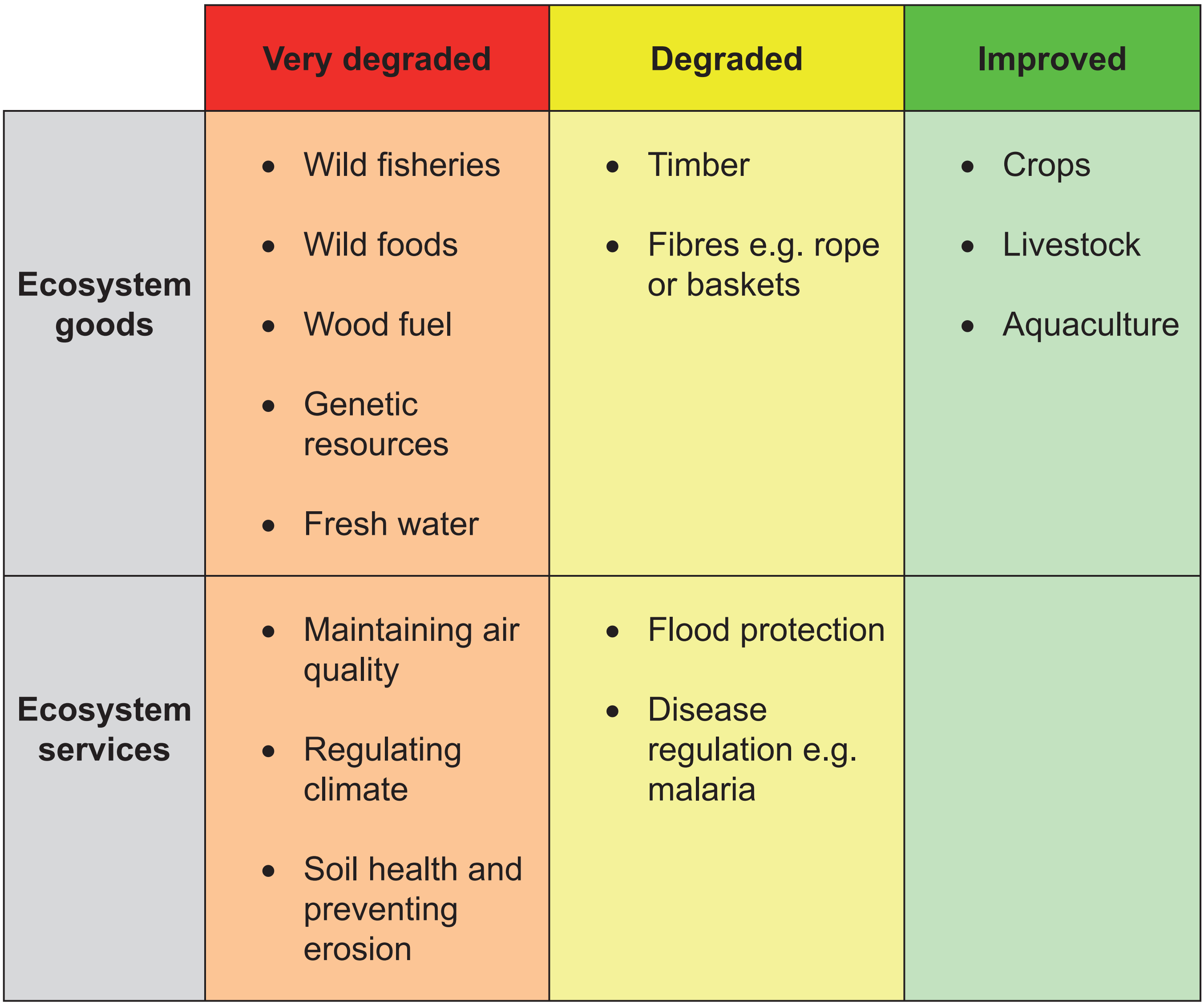


Figure 2 Water scarcity in 2007



(Source: adapted from the International Water Management Institute 2006)

Figure 3 **The condition of global ecosystems**



	Very degraded	Degraded	Improved
Ecosystem goods	• Wild fisheries • Wild foods • Wood fuel • Genetic resources • Fresh water	• Timber • Fibres e.g. rope or baskets	• Crops • Livestock • Aquaculture
Ecosystem services	• Maintaining air quality • Regulating climate • Soil health and preventing erosion	• Flood protection • Disease regulation e.g. malaria	

(Source: adapted from ‘Restoring nature’s capital’, 2007, World Resources Institute)

Figure 4 **Economic and social development indicators for four selected countries**

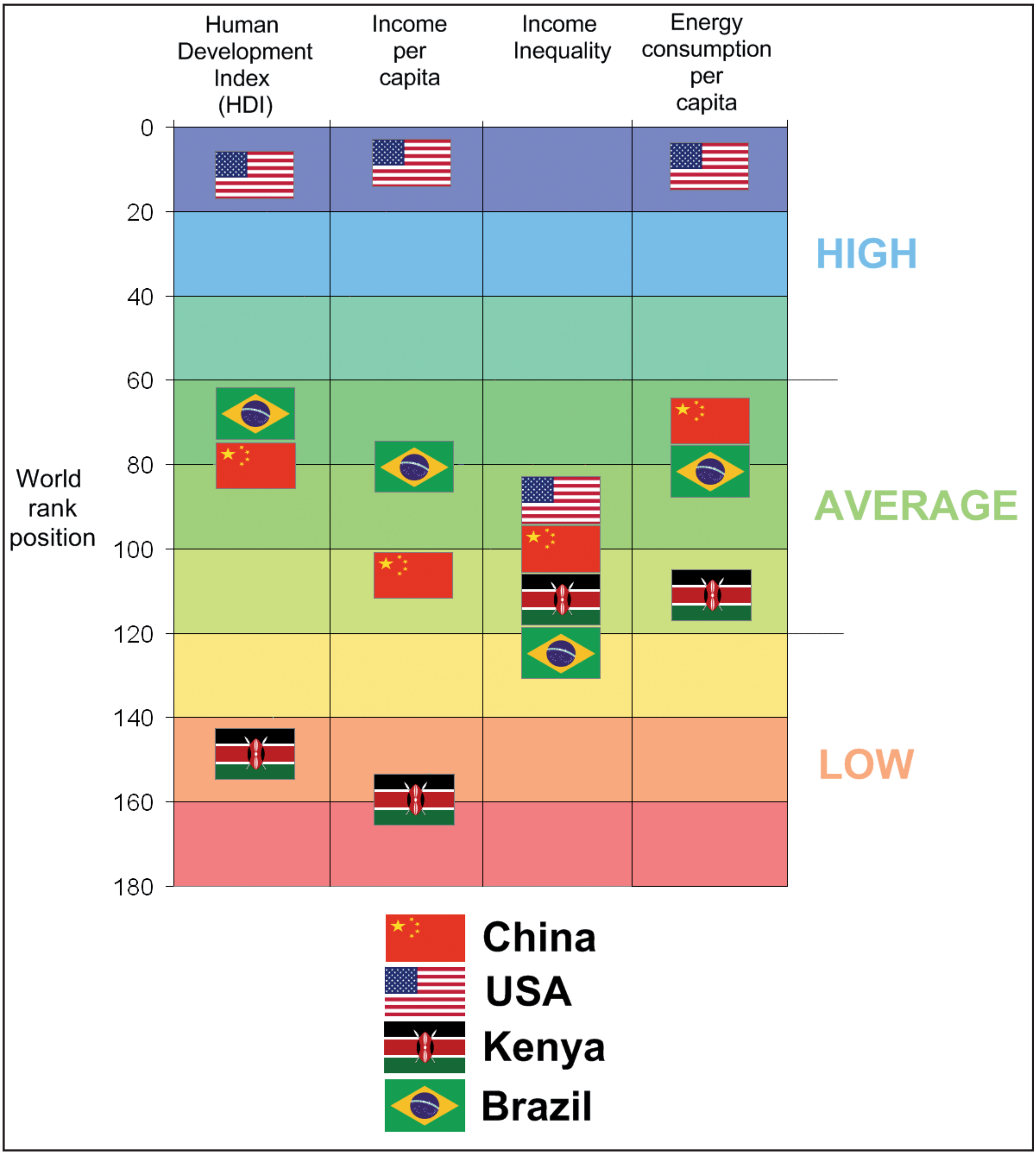
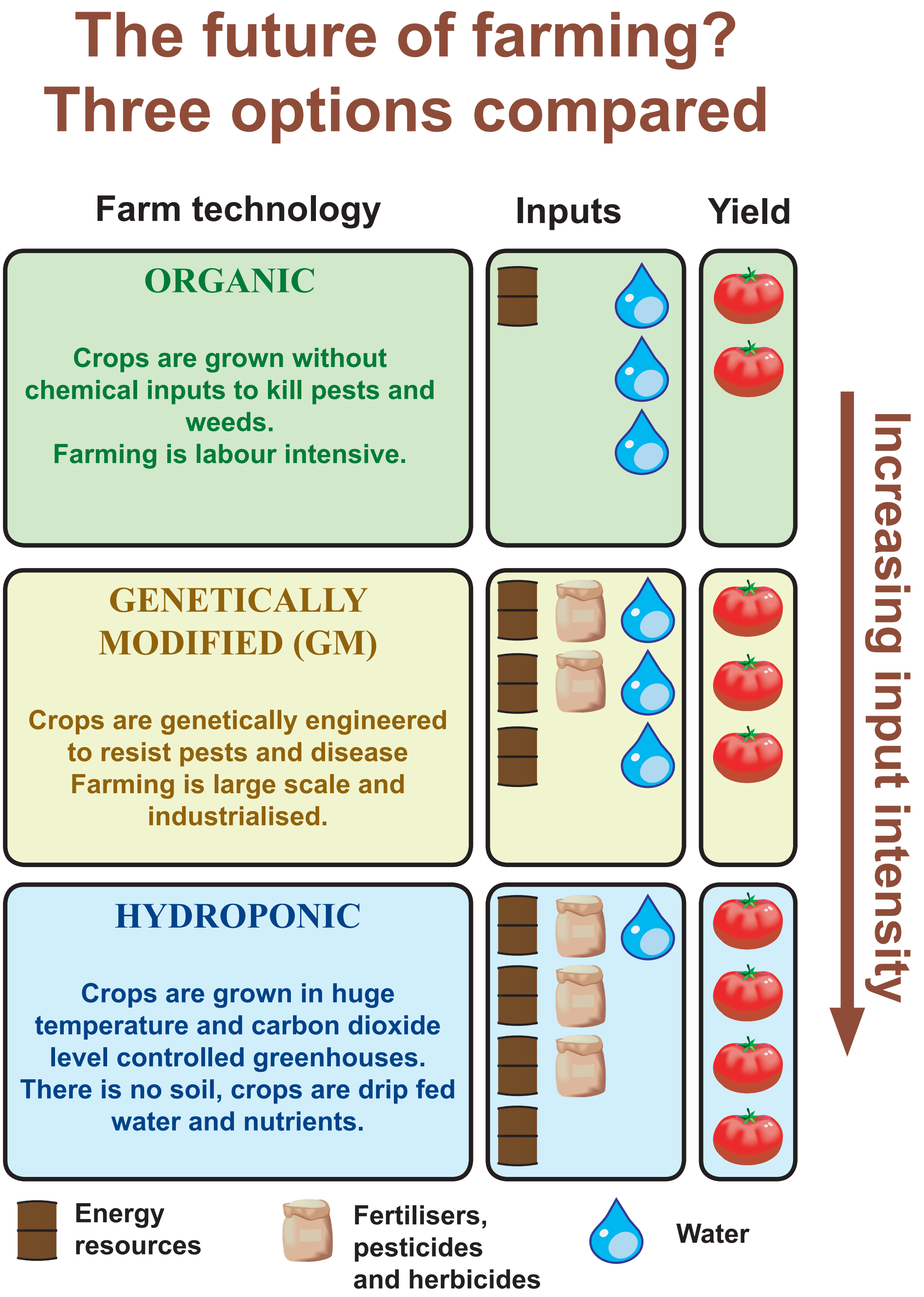


Figure 5 Three farm technologies compared



The future of farming?
Three options compared

ORGANIC

Crops are grown without chemical inputs to kill pests and weeds.
Farming is labour intensive.

GENETICALLY MODIFIED (GM)

Crops are genetically engineered to resist pests and disease
Farming is large scale and industrialised.

HYDROPONIC

Crops are grown in huge temperature and carbon dioxide level controlled greenhouses.
There is no soil, crops are drip fed water and nutrients.

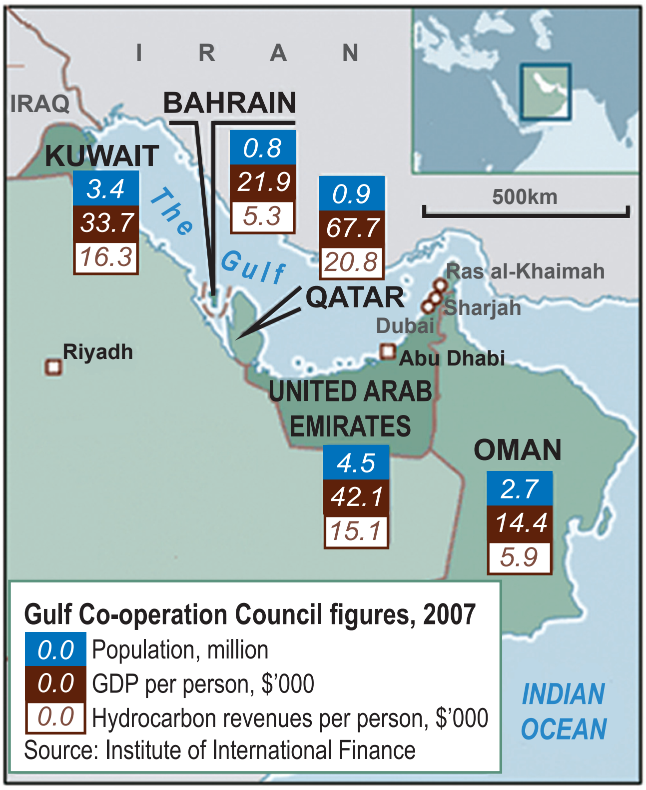
SECTION B

The following resources relate to Question 6

THE SMALL GULF STATES: EMERGING POWERS?

On the western shore of the Persian Gulf is a cluster of small, mostly oil rich states (Figure 1). These are emirates or sultanates. Most have recently moved towards a constitutional monarchy form of government where women have only very recently gained the right to vote.

Figure 1: The small Gulf States



Source: Institute of International Finance

The United Arab Emirates (UAE) is a federation of seven emirates (Abu Dhabi, Ajman, Dubai, Fujairah, Ras al-Khaimah, Sharjah and Umm al-Quwain).

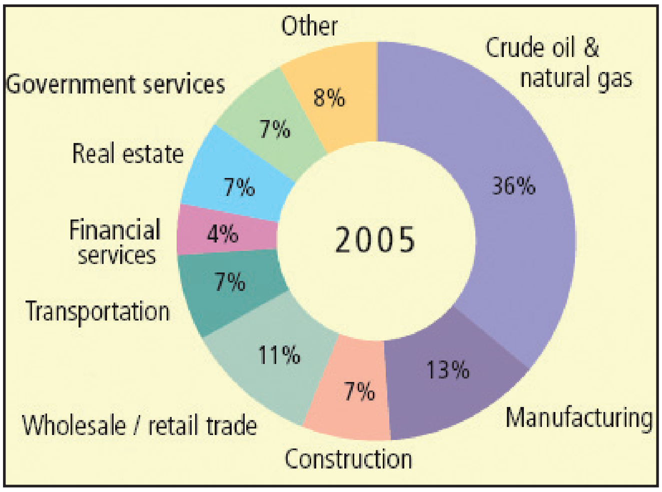
The Gulf States' wealth is largely based on oil and gas. Many have significant oil and gas reserves (Figure 2). These reserves make the area of considerable importance to a world still dependent on fossil fuels. The wider Middle East contains over 40% of global gas reserves and over 60% of global oil reserves. Much of the oil and gas is transported out of the region by tanker, through the narrow Straits of Hormuz between Oman and Iran.

Figure 2: Gulf States oil and gas reserves, 2007

	OIL		GAS	
	Thousand million barrels	% of world reserves	Trillion cubic metres	% of world reserves
Kuwait	101.5	8.2	1.78	>0.05
Qatar	27.4	2.2	25.6	14.4
Bahrain	-	-	0.09	>0.05
UAE	97.8	7.9	6.09	3.4
Oman	5.6	0.5	0.69	>0.05

Gulf States are aware that their oil and gas production will peak, if it has not done so already. Oman's oil production peaked in 2000, Kuwait's is expected to peak in 2013. The smaller Gulf States are rapidly diversifying their economies away from dependency on fossil fuel exports (Figure 3).

Figure 3: Economic sectors in the UAE in 2005



Oil and gas wealth has allowed Gulf States to accumulate huge budget surpluses. Much of the money is transferred to **sovereign wealth funds** and invested around the world. These are government owned investment companies (Figure 4).

Some developed countries have become concerned that sovereign wealth funds (effectively governments of foreign countries) could end up owning strategic assets in their country. Gulf States have used their sovereign wealth funds to invest in companies around the world, buying up significant chunks of business and industry:

- UK based P&O shipping, bought by Dubai World in 2006 for $7 billion
- Abu Dhabi Investment Authority bought a 4.9% stake in Citigroup, the USA's largest bank in 2007
- UAE wealth funds also own stakes in HSBC and Standard Chartered, Travel Lodge, Sony and MGM Mirage
- Manchester City was bought by Abu Dhabi United Group Investment in 2008. In 2008 Barclays plc saw a £5.3 billion investment from Qatar and Abu Dhabi.

Figure 4: Sovereign Wealth Funds

Country	Name of Fund	Value in 2008 ($ billions)
Abu Dhabi	Abu Dhabi Investment Authority (ADIA)	**875**
Kuwait	Kuwait Investment Authority	**264**
Qatar	Qatar Investment Authority	**60**
UAE (Dubai)	Dubai World	**100**

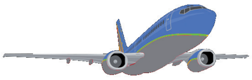
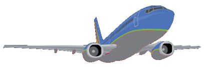
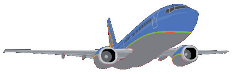
Transport is a key area of growth for the Gulf States. As the region has a harsh climate and is isolated by desert from other regions, shipping and air transport are playing a more important role than road and rail. International airports are growing very rapidly. The region has a role as a **hub** between the developed economies of Europe and the rapidly expanding economies in Asia.

Figure 5: Gulf State airports in 2008

Airport & passenger numbers	Expansion
Dubai International 34.4 million	Terminal 3 for Airbus A380 being constructed (capacity 70 million)
Doha International 10 million	New airport to be completed in 2015 with 90 million capacity
Abu Dhabi International 7 million	Terminal 3 for A380 expected to open 2008, increasing capacity to 12 million
Kuwait International 6 million	Expanded 1999–2000; terminal 2 opening 2010 increasing capacity to 12 million
Al Maktoum International *New, 6-runway airport in the UAE with planned passenger capacity of 120 million and cargo capacity of 12 million tonnes. To be completed 2017.*	

Airlines in the Gulf are some of the fastest growing in the world, including Etihad and Emirates (both UAE) and Qatar Airways. All are expanding aggressively, increasing their fleet size including orders for the **Airbus A380**. Within 10 years they are likely to be major players, similar in size to major European carriers such as British Airways and KLM. Emirates Airline already ranks 7th in the number of international passengers carried. It was only founded in 1985.

Figure 6: Airline fleet size and orders, 2008

Number of aircraft	Fleet 2008	Orders, 2008	
Emirates Airline	119	250	
Qatar Airways	62	165	
Etihad Airways	26	226	

Qatar, the UAE and Bahrain have invested heavily in moves to develop global connections and enter the **knowledge economy**. Trade and information exchange are crucial to this diversification and the Gulf States have invested heavily in an attempt to ensure a successful transition from their petroleum economies.

- Dubai's port at Jebel Ali is the 2nd largest man-made port in the world and the 8th by container traffic volume.

- **Free Trade Zones** have been set up, including **Dubai Internet and Media cities** and **Dubai Knowledge village**. TNCs such as Microsoft, IBM and CNN have been attracted.

- Numerous landmark megaprojects have been built including the $4 billion **Burj Dubai** planned to be the world's tallest building and the 7 star Burj-al-Arab hotel.

- In Abu Dhabi, **Masdar City** is an entirely new, $22 billion research and development 'conservation' city powered by renewable energy and planned to become a global centre for renewable energy research.

- Qatar opened its Science and Technology Park in 2004.

- Kuwait has the second largest stock exchange in the Arab world.

- Bahrain has used the F1 Bahrain Grand Prix to gain international status and the current round of **WTO** world trade talks began in Doha, Qatar.

Figure 7: The Dubai Marina development is the second largest marina in the world

Considerable investment in education and high quality research characterises the small Gulf States. In general, education is free from primary to higher education, including free uniforms, books, transport and meals. Many Gulf States have scoured the world to develop links with world-class institutions. Masdar City in Abu Dhabi is supported by MIT. In Qatar, Education City has campuses of Texas A&M University and Cornell Medical College. In the UAE, numerous UK and USA universities and schools have outposts, including Heriot-Watt, Harvard and New York University.

This investment has improved school completion rates and increased the number of females entering the labour force (Figure 8). However, gender equality remains a major issue in the Gulf States with some considering the talents of women as under-utilised.
As a result of education, infrastructure developments and free trade policies and zones, **Foreign Direct Investment** (FDI) in the region has risen sharply in most countries (Figure 9).

Figure 8: Education and labour force data

	Females as % of labour force		Primary school completion rate (male)		Primary school completion rate (female)	
Country	**1999**	**2006**	**1999**	**2006**	**1999**	**2006**
Bahrain	18	19	97	100	100	100
Kuwait	22	26	99	90	99	92
Oman	12	17	82	95	83	92
Qatar	14	14	89	99	89	99
UAE	12	15	80	100	82	100

Figure 9: Net flows of FDI

US$ billions	1996–99 annual average	2007
Bahrain	–0.6	2.0
Kuwait	0.4	–6.4
Oman	0.1	0.4
Qatar	1.2	4.7
UAE	0.3	6.1

Overall economic growth has been strong as investment and diversification has occurred at break-neck speed (Figure 10). Inflation and price rises are threats to the long-term affordability of the Gulf for people and FDI.

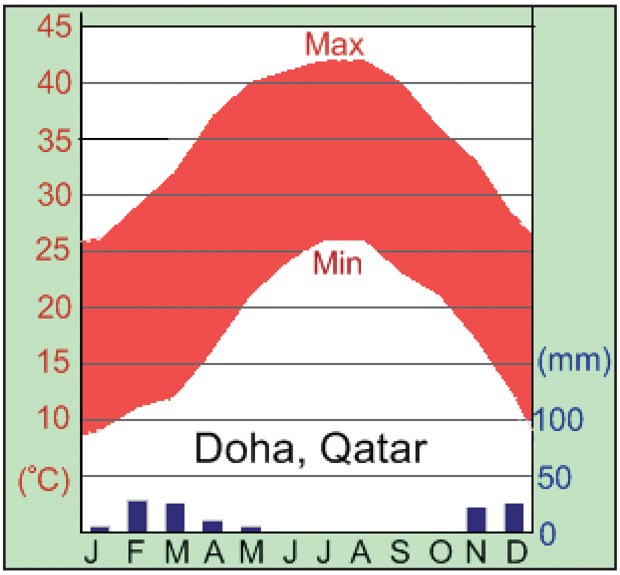
Figure 10: Annual GDP growth (%)

%	2000–2005 average	2006	2007	2008
Bahrain	6.0	6.5	6.6	6.7
Kuwait	7.6	6.4	4.6	7.8
Oman	4.8	7.0	6.9	4.8
Qatar	9.1	10.3	14.2	9.3
UAE	7.7	9.4	7.7	6.6

The small Gulf States are significant labour importers. They have small indigenous populations and rely heavily on imported labour to generate economic growth. Cultural traditions and religious norms mean that foreigners living in the region can find life very different from home. Nevertheless, the region has become a **migration hot spot** initially for the oil and gas industry, but more recently in the construction, property development, education, retail, financial and tourism sectors. Immigration has led to a situation where a large percentage of the population are foreign born (about 33% in Bahrain, 85% in the UAE, 60% in Qatar and Kuwait and 30% in Oman). The small Gulf States have some of the largest **gender imbalances** in the world, as most immigrant workers are male. Some have twice as many men as women. Immigrant workers, even if they are long-term residents, do not have voting rights and property rights are often restricted. Conditions for 'expat' property developers and TNC workers are very good, but severe criticism has been levelled at the treatment, working conditions, pay and living conditions of the hundreds of thousands of temporary construction workers from India, Bangladesh and Pakistan who are building the Gulf's dreams.

The Gulf States have an arid climate (Figure 11). Most settlement clings to the thin coastal strip. In the past fishing and pearl diving were important industries.

Figure 11: Climate graph for Doha, Qatar



In this climate, it is perhaps not surprising that water scarcity is rising as population and industry expands (Figure 12). Filling the gap demands huge investment in desalinisation plants to turn seawater into freshwater. This is a highly energy intensive process. Demands for air conditioning and increased car use have pushed energy and resource use to some of the highest levels in the world. **Ecological footprints** in the small Gulf States are very high at 7.3 global hectares per person (gha) in Kuwait and 11.9 in the UAE. This compares to the world average of 2.2 gha and 9.6 in the USA.

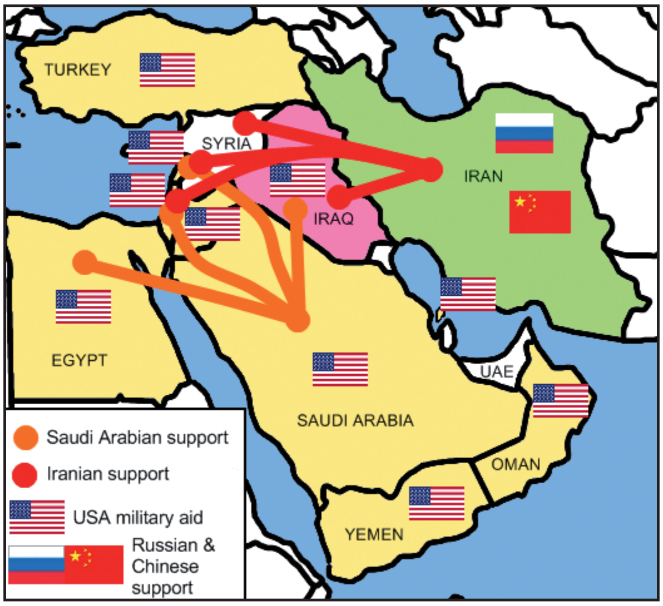
Figure 12: Population and water availability

	Population (millions)		Annual renewable freshwater (km^3)	Per capita annual renewable water availability (m^3)	
	2001	***2025***		**2001**	***2025***
UAE	3.3	*4.5*	0.2	60	*44*
Bahrain	0.7	*1.0*	0.1	140	*97*
Qatar	0.6	*0.8*	0.1	170	*129*
Kuwait	2.3	*4.2*	0.02	9	*5*
Oman	2.4	*4.9*	1.0	416	*206*

As coastal land is developed, pressure for residential and hotel development has led to the construction of artificial islands offshore such as The World, the Palm Islands and the Waterfront in Dubai, Durrat Al Bahrain in Bahrain, and the Pearl in Doha. There are concerns that these islands will destroy coastal and offshore habitats. The UAE, in particular, faces growing air pollution problems due to a combination of desert dust storms, construction dust and vehicular air pollution. The number of cars in Abu Dhabi grew by 650% between 2001 and 2006.

Tensions in the Gulf remain high. Following the first and second Gulf Wars, USA **military aid** (and economic support) was provided to many countries including Bahrain, Saudi Arabia and Israel. In the wider Middle East there is considerable superpower involvement. Despite USA support for Saudi Arabia, that country supports Hamas in Palestine and possibly Sunni muslims in Iraq. Iran's long running war of words with the USA is backed up by support for Syria in the form of cheap oil, and military support for Hezbollah in Lebanon. Historic tensions between Israel and Palestine, as well as their neighbours have proved a constant source of destabilisation. Iran supports Shiite muslims in Iraq. China and Russia support Iran both economically and politically and with Chinese and Russian-made arms (Fig13).

Figure 13: Tensions in the Middle East Region



Opinions on the small Gulf States:

Opinion 1:
Homeland Security Secretary Michael Chertoff is defending the Bush administration's review of an international shipping deal two days after one company in the Port of Miami sued to prevent an Arab-owned firm from taking over port operations. Chertoff said the US Committee on Foreign Investment in the United States had carefully reviewed the Dubai World purchase of London-based P&O, which runs ports in New York, New Jersey, Baltimore, New Orleans, Miami and Philadelphia. 'We make sure there are assurances in place, in general, sufficient to satisfy us that the deal is appropriate from a national security standpoint,' Chertoff told ABC.

Fox News, 2006

Opinion 2:
It was the birth of his second daughter that finally forced Raju Singh's decision to leave home. The stonemason borrowed $2,500 from a labour recruiter in his village in Rajasthan to pay for an air ticket to Dubai. Three years on, his dream seems as elusive as a desert mirage. In February he finally paid off his debts to the labour recruiter in Rajasthan, including 42% interest on the loan. Sitting in a labour camp in the sprawling workers' district of Sonapur outside Dubai, Singh says he now spends most of his monthly income of about $190 feeding himself. Six days a week he wakes at 4am to travel to the building site, where he begins his 11-hour day at 6:30am.

Time Magazine, 2008

Opinion 3:
The potential for greater instability and conflict is growing. Poverty is increasing in some areas of the region. A new Oxfam study indicates that the people of Iraq are in dire need of emergency assistance. There are other familiar areas of political volatility in the region.

Al Jazeera, 2008

Opinion 4:
In Oman the inflation rate is 11.1%. In the UAE and Qatar it is also well into double digits. Behind these disturbing numbers lie three economic forces. First is the rise in the world price of commodities, especially food. Second is the fall of the dollar, to which all Gulf currencies are pegged except the Kuwaiti dinar. The third force is less familiar. It is the rise in the price of non-traded goods, principally housing and office space, which is arguably a natural result of the oil boom. The high price of food can tax even the hardiest consumer.

The Economist, 2008

Opinion 5:
The next president of the USA will face a Middle East in turmoil and an American public weary of engagement there. That challenge requires a return to diplomacy in order to begin the withdrawal from Iraq, cap Iran's nuclear ambitions and promote a comprehensive Arab-Israeli peace.

Brookings Institute, 2008

Internet research sources
These websites represent a range of sources which will provide you with background information:

www.bp.com allows you to access the most recent annual Statistical Review of World Energy produced by BP.

http://english.aljazeera.net an international news website based in Qatar.

http://uaeinteract.com is a website containing detailed economic data on the United Arab Emirates. It has a wide range of links to other useful websites.

www.worldbank.org contains detailed data on the gulf states including a major report, the '2008 MENA Economic Developments and Prospects'.