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Pearson
Edexcel GCE

Centre Number

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Geography

Advanced

Unit 3: Contested Planet

Monday 5 June 2017 – Afternoon

Time: 2 hours 30 minutes

Paper Reference

6GE03/01

You must have:

Resource Booklet (enclosed)

Total Marks

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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.
- Spend approximately 80 minutes on Section A and 70 minutes on Section B.
- Check your answers if you have time at the end.

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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) Using Figure 1 and your own knowledge, suggest reasons why a country's energy security might increase or decrease over time. (10)
- (b) Using named examples, assess the extent to which TNCs are the most powerful players influencing the global supply of energy. (15)

(Total for Question 1 = 25 marks)

Water Conflicts

2 Study Figure 2.

- (a) Using Figure 2, suggest reasons for the changes in water demand between 2000 and 2050. (10)
- (b) To what extent does the extraction and use of water always lead to environmental problems? (15)

(Total for Question 2 = 25 marks)

Biodiversity under Threat

3 Study Figure 3.

- (a) Using Figure 3, explain why some threats to ecosystems are larger than others. (10)
- (b) Using named examples, assess the relative importance of physical and human factors influencing levels of biodiversity. (15)

(Total for Question 3 = 25 marks)

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Superpower Geographies

4 Study Figure 4.

- (a) Using Figure 4, suggest possible geopolitical and economic consequences of the three futures shown. (10)
- (b) Using named examples, assess the extent to which superpower status is determined largely by military power. (15)

(Total for Question 4 = 25 marks)

The Technological Fix?

5 Study Figure 5.

- (a) Using Figure 5, comment on how the types of technology shown could improve the lives of people in Bangladesh. (10)
- (b) To what extent can variations in access to different technologies be explained by personal and national income? (15)

(Total for Question 5 = 25 marks)



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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**

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TOTAL FOR SECTION A = 50 MARKS



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(Total for Question 6 = 40 marks)

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



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Geography

Advanced

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SECTION A

The following resources relate to Questions 1–5

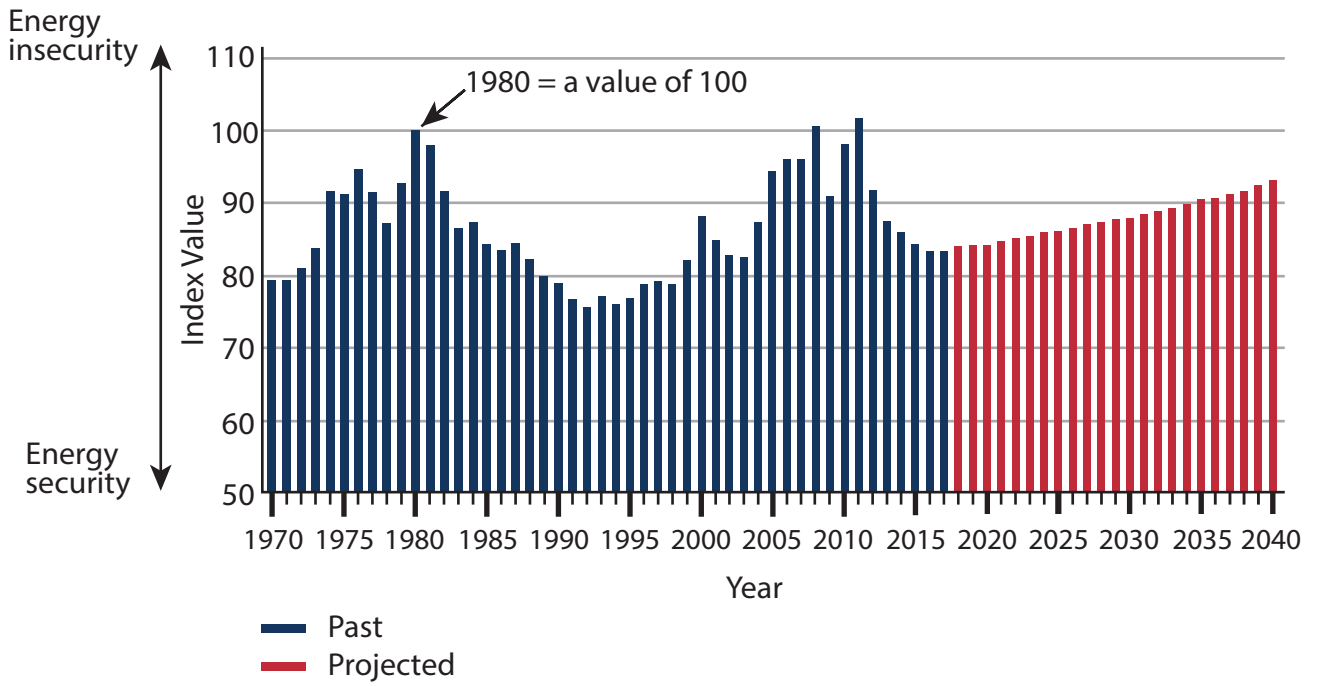


Figure 1

Energy Security Risk Index for the USA 1970–2040

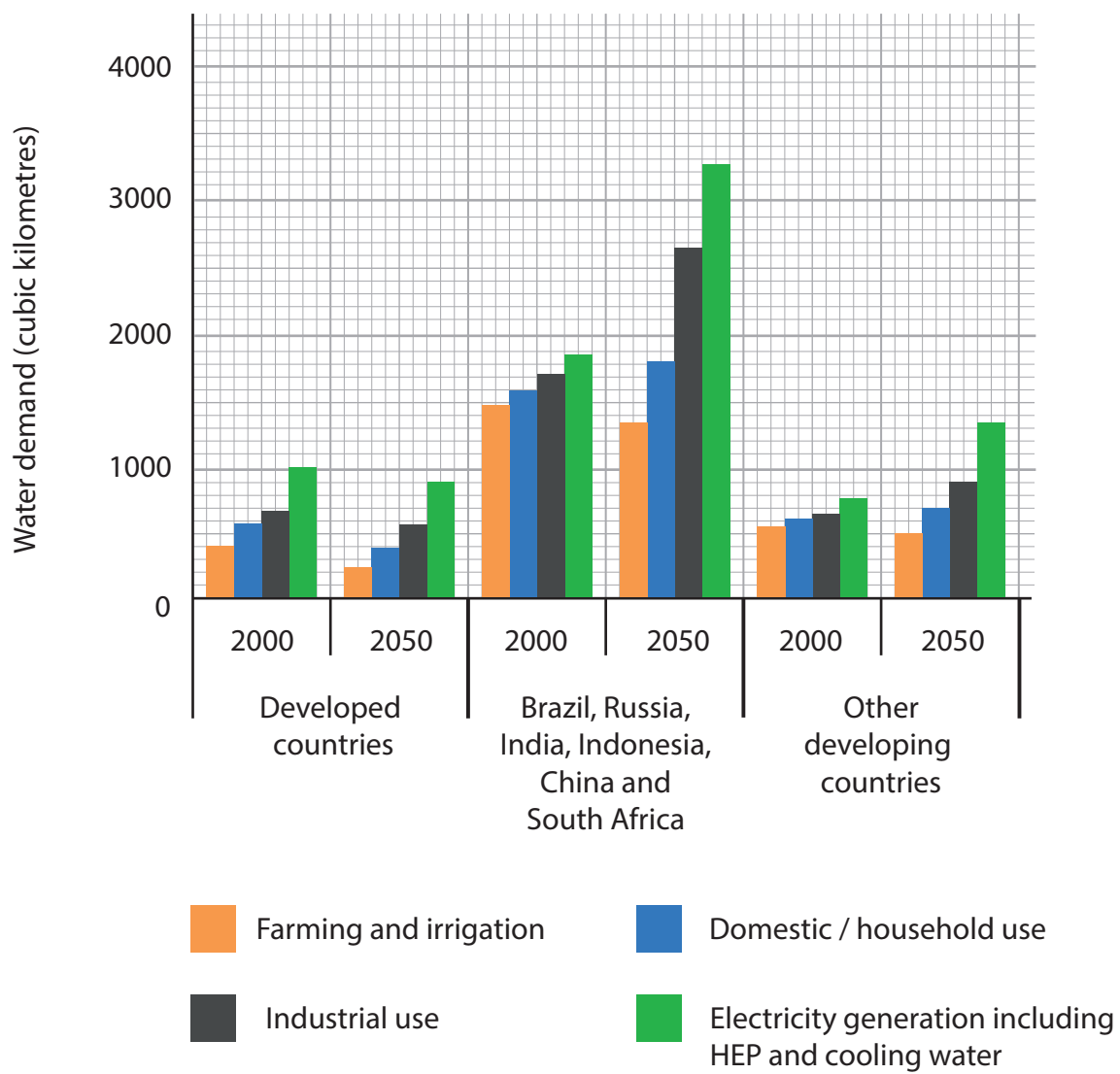
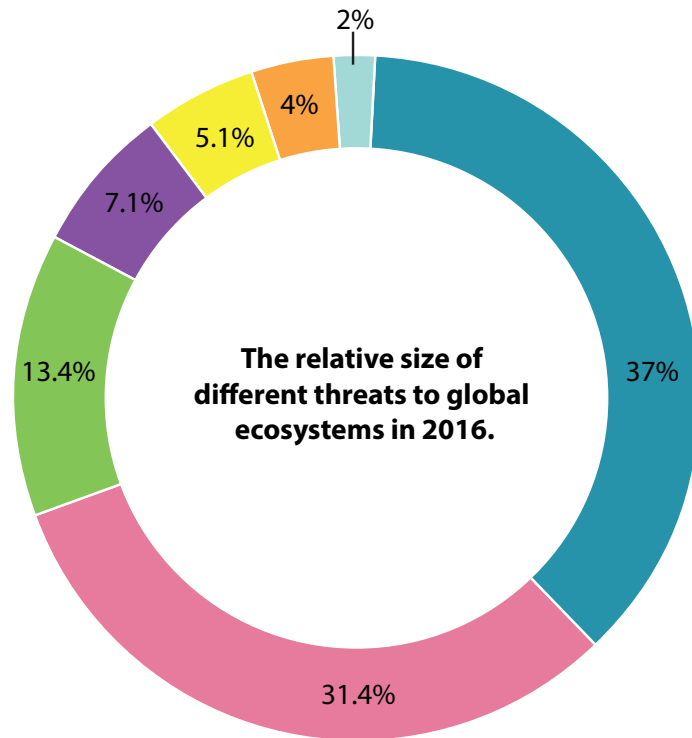


Figure 2
World water demand in 2000 and projected to 2050

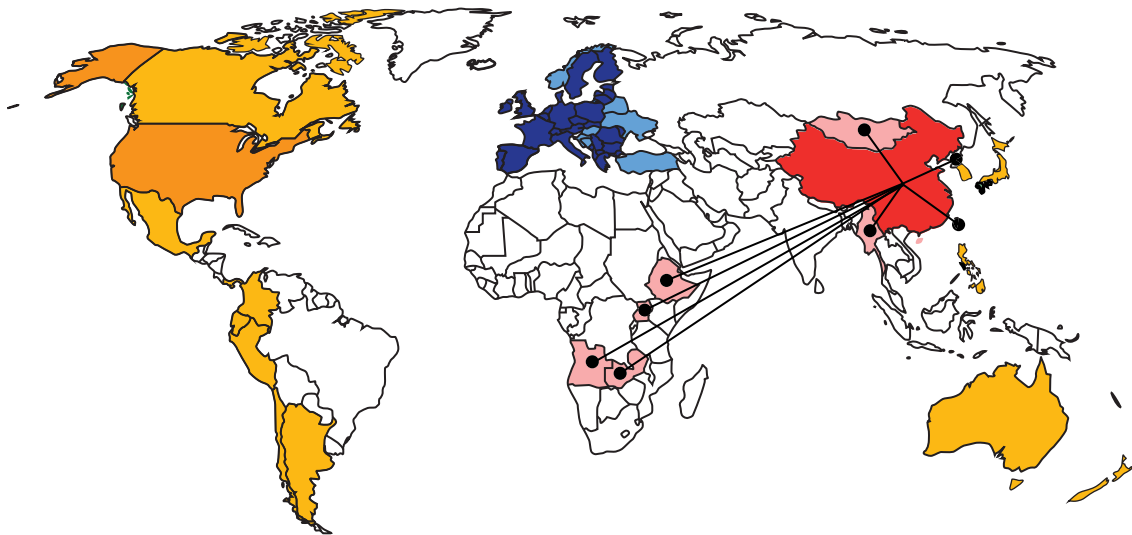


- Exploitation (over-hunting, over-fishing)
- Habitat degradation / change
- Habitat destruction / removal
- Climate change
- Alien species / invasive species
- Pollution
- Disease

(Source: http://wwf.panda.org/about_our_earth/all_publications/living_planet_report/living_planet_index2)

Figure 3

Major threats to ecosystems in 2016



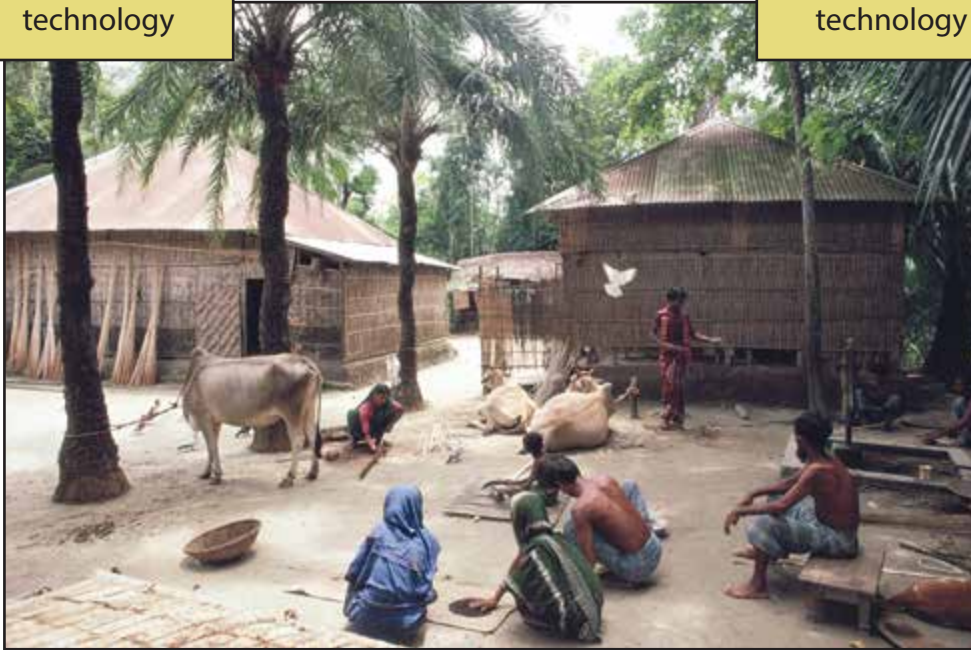
<p>European super-state</p>	<ul style="list-style-type: none"> • The EU expands east and south, creating a borderless single market of over 700 million consumers. • Political and economic union are completed: the EU operates as a single state.
<p>Colonial China</p>	<ul style="list-style-type: none"> • China's economic involvement in some Asian and African countries becomes more direct in political and economic terms. • China expands its military operations into these territories.
<p>Pacific free trade zone</p>	<ul style="list-style-type: none"> • Led by the USA, the world's largest free trade area is created encircling the Pacific Ocean. • This is essentially a huge expansion of the North American Free Trade Agreement (NAFTA).

Figure 4
Three possible geopolitical futures

Quality of life in Bangladesh.

Communications
technology

Intermediate
technology



Civil
engineering

GM farming
technology

A collapsed flood embankment in Bangladesh caused by a tropical cyclone.

Figure 5

Four types of technology that could be used to improve the lives of people in Bangladesh

Section B
Bridging the Development Gap
Development in Panama, Costa Rica and Nicaragua

Panama, Costa Rica and Nicaragua are three countries in Central America (Figure 1). They are located on the narrow **isthmus** that separates the Atlantic Ocean and Caribbean Sea from the Pacific Ocean. The region is a land bridge between North and South America and since the construction of the Panama Canal in 1914, it has been a crossroads for **global shipping**. These countries were all at one time colonies of Spain:

- Costa Rica has been stable since a short civil war in 1949, and is one of a very few countries in the world with no standing army.
- Panama’s complex history has involved past US influence as well as invasion by the USA in 1989, but stability in the last few decades.
- Nicaragua became independent from Spain in 1821, but was occupied by the USA between 1912–1933. Military dictatorship was ended by a long running civil war between the 1960s and 1990.



Figure 1: Location of Panama, Costa Rica and Nicaragua in Central America

Figure 2 shows Freedom Index scores for selected countries. Published by the CATO Institute, the index scores countries’ **personal and economic freedom** on a scale of 0 – 10, with 10 representing most freedom.

World Rank	Country	Freedom Index
1	Hong Kong	9.04
9	UK	8.51
39	Costa Rica	7.86
49	Panama	7.49
79	Nicaragua	6.86
81	Haiti	6.83
152	Iran	4.48

Figure 2: Selected 2012 Freedom Index

An interesting feature of countries in this region is how well they score in the New Economics Foundation’s **Happy Planet Index (HPI)**, which measures human well-being and environmental impact, as shown in Figure 3.

Rank	Country	Human well-being	Life expectancy (yrs)	Ecological footprint (Gha)	HPI score
1	Costa Rica	7.3	79.3	2.5	64.0
2	Vietnam	5.8	75.2	1.4	60.4
3	Colombia	6.4	73.7	1.8	59.8
4	Belize	6.5	76.1	2.1	59.3
5	El Salvador	6.7	72.2	2.0	58.9
6	Jamaica	6.2	73.1	1.7	58.5
7	Panama	7.3	76.1	3.0	57.8
8	Nicaragua	5.7	74.0	1.6	57.1
41	UK	7.0	80.2	4.7	47.9
60	China	4.7	73.5	2.1	44.7
105	USA	7.2	78.5	7.2	37.3
108	Rwanda	4.0	55.4	0.7	36.9

Figure 3: Selected 2012 HPI data

HPI is only one way of measuring development and it has been criticised for ignoring issues such as freedom and human rights. Ecological footprints are a contested measure. Figure 4 shows additional data on the three countries.

Data from 2012–2014	Costa Rica	Panama	Nicaragua
Income per person (US\$ PPP)	13900	19630	4670
Population aged 0 – 14 (%)	23	28	32
Population with electricity (%)	99.5	90.9	77.9
Infant mortality rate (per 1000 live births)	10	18	24
Urban population (%)	79	66	58
Percentage of workforce in agriculture (%)	13	17	30

Figure 4: Statistical data

Despite their geographical proximity the countries have very different **economic profiles**, as shown by their exports (Figure 5).

Costa Rica	<ul style="list-style-type: none"> • Integrated circuit boards 44% • Office machine parts 11% • Medical instruments 6% • Bananas 5% • Tropical fruits 5%
Nicaragua	<ul style="list-style-type: none"> • Coffee 14% • Gold 12% • Frozen beef 10% • Raw sugar 6% • Knitwear 4%
Panama	<ul style="list-style-type: none"> • Crude oil 17% • Passenger & cargo ships 15% • Medicines 7% • Bananas 4% • Special purpose ships 4%

Figure 5: Top five exports as a percentage of all exports

Poverty and inequality

Central American countries have experienced emigration for work and many people live abroad. In some cases, **remittances** make up a significant proportion of total GDP (Figure 6). The most popular destinations for economic migrants are the USA and Spain. Numbers working abroad tend to increase and decrease with economic cycles.

Year	Costa Rica	Nicaragua	Panama
2000	0.9%	6.3%	0.1%
2014	1.2%	9.7%	1.6%

Figure 6: Remittances in 2000 and 2014 as a percentage of annual GDP

Despite economic growth, **poverty** remains persistent in the region. The number of people living below the internationally recognised \$1.25 per day poverty level is small. If measured by **country specific national poverty rates**, the levels are higher:

Costa Rica

- In Costa Rica in 2014 19% of households in urban areas were below the national poverty line and 30% in rural areas.
- Extreme poverty was 5% in Costa Rica's cities and 11% in the countryside. Both rural and urban poverty rates increased between 2011 and 2014.

Nicaragua

- In Nicaragua about 40% of the population in 2013 lived on less than \$2 per day, and 9% lived on less than \$1 per day (View 3 on the last page).

Panama

- Despite rapid economic growth in the banking, tourism and finance sectors, about 25% of Panama's population live below the national poverty line.
- This rises to 50% in Panama's rural areas and 80% among **indigenous groups** (about 5% of the overall population).
- While Panama City's population is mostly ethnically European, cities such as Colon are majority Black and on average much poorer.



Figure 7a: Panama City



Figure 7b: Indigenous house in rural Panama



Figure 7c: Colon, a city in Panama

Informal employment is common in Central America, especially among young people aged 16–24 and youth unemployment is also a problem. The percentage of all non-agricultural workers employed in the informal sector varies from around 20% in Panama to close to 50% in Nicaragua. Partly as a result of the **Millennium Development Goals** primary school enrolment rates have increased in the three countries, but there is some evidence these gains have stalled

(Figure 8). Secondary education enrolment in 2013 was about 72% in Costa Rica, 69% in Panama and 40% in Nicaragua.

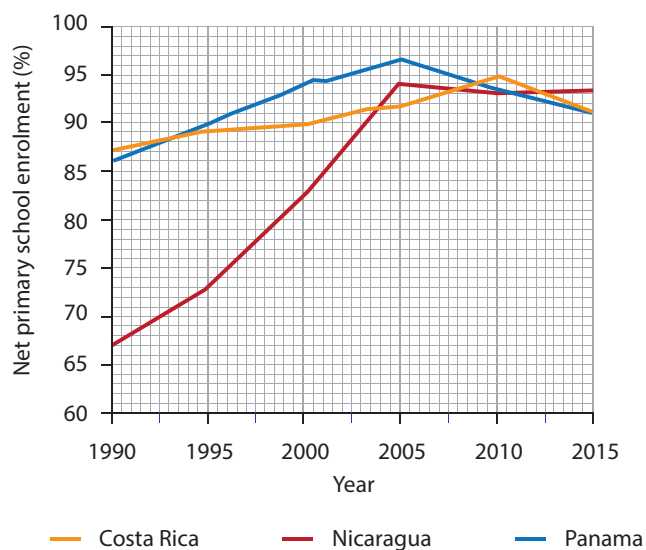


Figure 8: Net primary school enrolment 1990-2015

Costa Rica was one of the first countries to embrace **ecotourism**, capitalising on its beautiful tropical coast and forests. As a result of **globalisation**, Central America has become an increasingly accessible region and tourism in the area has grown.

2014 data	Costa Rica	Nicaragua	Panama
International tourist arrivals	1,250,000	1,300,000	5,600,000
Tourism employment	257,000	212,000	305,000
Tourism jobs as a % of all employment	12%	8%	8%
Tourism as a % of GDP	12%	10%	18%

Figure 9: Tourism in the three countries

Transoceanic mega-projects

The 48 mile long Panama Canal opened in 1914. It drastically cut time and distance required to sail between the Atlantic and Pacific. The canal consists of a series of waterways and locks, and takes about 6 hours to navigate. The locks limit the size of the ships that can use it to so-called Panamax vessels, 290m long and 32m wide. Many modern container and tanker ships cannot use the canal.

Global shipping has grown as world trade and the global economy have grown. It consists of trans-modal container ships, oil tankers and bulk carriers (grain, coal, iron ore etc) as well as cruise ships. Figure 10 shows the growth in global container shipping 1996-2013, measured in million TEUs (TEU = Twenty-foot Equivalent Unit, or the length of one standard 20 foot shipping container).

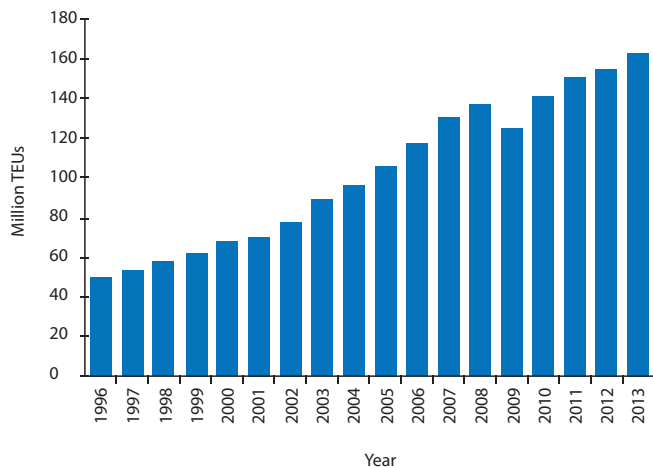


Figure 10: Global container trade

Several projects aim to increase capacity across the isthmus (Figure 11) to take advantage of shipping between the Atlantic and Pacific Oceans.

These projects might appear to have little competition, but:

- The Suez Canal provides an alternative route between the Atlantic and Pacific.
- Inter-modal shipping containers can travel by rail across the USA between ports of the East and West coasts.
- Longer term, the opening up of shipping routes in the Arctic (Northwest Passage Northern Sea Route) could provide a direct link between the Atlantic and Pacific Oceans.

The **Panama Canal Expansion Project** aims to increase the capacity of the canal, and accommodate much larger ships (but not the very largest container ships) by building new locks, widening and deepening existing channels. 76% of Panamanians approved the expansion in a national referendum in 2006.

- Construction: 2007–2016
- Cost: US\$ 5.2 billion
- Employment: about 30,000 construction jobs

The Panama Canal Authority revealed in 2014 that it was considering plans for a **4th set of locks** for the canal, which would increase capacity to accommodate the largest ships afloat. A Chinese business, China Harbour Engineering Company, has expressed interest in the idea.

- Construction: 2020–unknown
- Cost: US\$ 17 billion
- Employment: unknown

The **Nicaragua Canal** project is a proposal to build a canal across Nicaragua. It would be around 170 miles long with locks 520m long and 75m wide. There are question marks over the technical feasibility of the project in a seismically active area. Finance for the project appears to come from Hong Kong based HKND Group which is owned by a Chinese billionaire.

- Construction: 2014–approximately 2020
- Cost: US\$ 50 billion+
- Employment: about 50,000 construction jobs.

China has proposed a **Transoceanic Railway** across Honduras, linking the Atlantic and Pacific with a 600km, 10 line railway to transport containers across the country between two new ports.

- Construction: unknown, planning stages only
- Cost: US\$ 20 billion
- Employment: unknown



Figure 11: Transoceanic projects in Central America

Environmental challenges

One problem facing the Panama Canal, and potentially its expansion and the Nicaragua Canal, is **water supply** to operate locks. Locks transport ships up and down gradients on the canal routes, and require huge volumes of water to operate. The Panama Canal is supplied by gravity water flow from Gatun Lake. The Nicaragua Canal could be supplied from Lake Nicaragua (the largest natural lake in Central America). During dry seasons both lakes could struggle to supply sufficient water, or prevent water being used for purposes other than canal navigation. A further problem is ship-borne alien species which may be a risk to aquatic ecosystems.

The Mesoamerica **biodiversity hotspot** extends from Central Mexico south to the Panama Canal. It consists of a complex mosaic of ecosystems including dry forests, lowland moist forest, and mountain forests. There are also coastal swamps and mangrove forests as well as broad-leaved and coniferous forests at higher altitudes. The original area of intact ecosystems covered 1,130,000 km² but this has declined to around 225,000 km² today. Figure 12 shows details of biodiversity in the hotspot.

Group	Species	Endemic species	Percentage (%) endemic
Plants	17,000	2,941	17.3
Mammals	440	66	15.0
Birds	1,113	208	18.7
Reptiles	692	240	34.7
Amphibians	555	358	64.5
Freshwater fish	509	340	66.8

Figure 12: Biodiversity in the Mesoamerica hotspot

View 1

“The links between leaving school and child labour are multifarious, but poverty plainly drives both. Nicaragua – a country of 6.1 million people – is the second poorest in the Americas after Haiti. It has the largest youth bulge in Latin America with more than 2 million school-aged children, according to UNESCO. Half of all children and adolescents live in poverty.

The UN children’s agency, UNICEF, estimates that 500,000 Nicaraguan children aged 3–17 are not in the educational system. Most live in rural areas, or are poor, indigenous or disabled.”

The Guardian, May 2015

View 2

“Because Costa Rica has no army to support, it is able to provide money for universal medical care and free and subsidized educational programs. The well-run national healthcare system means that the country’s people are strong and healthy. Costa Rica is considered to have one of the best low-cost medical care systems in the world.”

International Living magazine, 2015

View 3

“Most of Nicaragua’s indigenous and Afro-descendant peoples, with their considerable ethnic and cultural diversity, live in the Caribbean region of Nicaragua, known as the Atlantic Coast. Although the area is rich in natural resources, almost 80% of its population face extreme poverty. The advance of the agricultural frontier, immigration, population resettlement after the armed conflict, and uncontrolled development have put pressure on natural resources and land occupation patterns. As a result, land conflicts and inter-ethnic rivalry have increased.

**International Development Association
(part of the World Bank)**

View 4

“The Nicaraguan government, which granted HKND, a Hong Kong-based firm, a 50-year concession to build and run the canal two years ago, believes the new canal will boost the country’s economy and lead to faster growth. “This project is an important way for Nicaragua to grow its economy, generate jobs, reduce poverty and raise our competitiveness,” said Telémaco Talavera, chief spokesperson for the Nicaraguan canal authority.”

International Business Times, 2015

View 5

“Under the blue and white flag of Nicaragua and homemade banners accusing the president of selling out the country, some 10,000 peasant farmers marched against the government’s efforts to expropriate land to make way for a \$50 billion private Chinese canal project. Saturday’s march against the canal was the 47th massive protest against the canal since the ruling Sandinista Front rammed the sweetheart concession law through congress, giving unknown Chinese businessman Wang Jing 50-year ownership rights to what’s being called the largest infrastructure project ever attempted.”

Huffington Post, June 2015

Websites for further research:

Website of the World Bank’s online database:
<http://data.worldbank.org/>

CIA World Factbook:
<https://www.cia.gov/library/publications/the-world-factbook/>

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