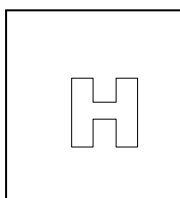


Candidate Name: \_\_\_\_\_

Class      Adm No

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## 2019 Preliminary Exams Pre-University 3

### GEOGRAPHY

Paper 1 Structured Essay Questions

**9751/01**

**16 September 2019**

**3 hours**

Additional Materials:      Answer Paper  
                                    World Outline Map

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### INSTRUCTIONS TO CANDIDATES

Write your name, admission number and class on all the work you hand in.

Write in dark blue or black pen on both sides of the paper.

You may use a soft pencil for any diagrams, graphs, or rough working.

Do not use staples, paper clips, highlighters, glue or correction fluid.

Answer **three** questions. **One** from each section.

You should make reference to appropriate examples studied in the field or the classroom, even where such examples are not specifically requested by the question.

Diagram and sketch maps should be drawn whenever they serve to illustrate an answer.

The world outline map may be annotated and handed in with relevant answers.

You are reminded of the need for good English and clear presentation in your answers.

At the end of the examination, fasten all your work securely together.

The number of marks is given in brackets [ ] at the end of each question or part question.

### Section A – Tropical Environments

Answer **one** question from this section.

- 1 (a) Explain the climatic characteristics of the humid tropics.  
[12]
- (b) 'Monsoon is the most crucial factor influencing tropical climates.'  
  
Evaluate the validity of this statement.  
[20]
- 2 (a) Explain the formation of various landforms in the arid tropics.  
  
Support your answer with relevant diagram(s).  
[12]
- (b) Discuss the factors that affect the formation of landforms in the tropics.  
[20]

### Section B – Development, Economy and Environment

Answer **one** question from this section.

- 3 (a) Explain the role of Transnational Corporations (TNCs) in governing the global economy.  
[12]
- (b) 'The benefits that Transnational Corporations (TNCs) bring to their host economies outweigh the negative impact resulted.'  
  
To what extent do you agree with the statement above?  
[20]
- 4 (a) Explain why the management of natural resources is difficult in the world today.  
[12]
- (b) 'The endowment of natural resources is to be blamed for the underperformance of resource-rich countries.'  
  
Discuss the validity of the statement.  
[20]

### Section C – Sustainable Development

Answer **one** question from this section.

- 5 (a) Explain the promises and issues associated with hydropower and **either** nuclear energy **or** biofuels in countries at low levels of development.  
[12]
- (b) Evaluate the extent to which sustainable development can be achieved.  
[20]
- 6 (a) Explain the difficulties of measuring sustainable urban development in countries

at low levels of development.  
[12]

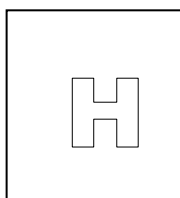
**(b)** 'It is easier to achieve sustainable urban development than urban liveability.'

How far do you agree with the statement?  
[20]

Candidate Name: \_\_\_\_\_

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## 2019 Preliminary Exams Pre-University 3

### GEOGRAPHY

Paper 2 Data Response Questions

**9751/02**

**4 September 2019**

**3 hours**

Additional Materials:      Answer Paper  
   1 Insert  
   World Outline Map

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### INSTRUCTIONS TO CANDIDATES

Write your name, admission number and class on all the work you hand in.

Write in dark blue or black pen on both sides of the paper.

You may use a soft pencil for any diagrams, graphs, or rough working.

Do not use staples, paper clips, highlighters, glue or correction fluid.

Candidates answer **all** questions.

The Insert contains all the Resources referred to in the questions.

You should make reference to appropriate examples studied in the field or the classroom, even where such examples are not specifically requested by the question.

Diagram and sketch maps should be drawn whenever they serve to illustrate an answer.

The world outline map may be annotated and handed in with relevant answers.

You are reminded of the need for good English and clear presentation in your answers.

At the end of the examination, fasten all your work securely together.

The number of marks is given in brackets [ ] at the end of each question or part question.

## Section A

### Theme 4: Geographical Investigation

- 1 A group of 10 students from Millennia Institute was given a task to conduct a geographical investigation at the upper course of Kallang River located at Bishan-Ang Mo Kio Park in Singapore. They were tasked to determine how the Active, Beautiful, Clean Waters (ABC Waters) Programme by the Public Utilities Board (PUB) had modified flood risk in the area.

The students went to the field site on a Saturday morning during the June holidays. They decided that the flood risk of a river is associated with river discharge, which can be calculated by multiplying the cross-sectional area of the channel by the velocity of the river flow. As inclement weather started to approach, the students only managed to obtain velocity data for one segment of the river. They had access to the following equipment to aid them in their investigation:

- Ranging poles
- Oranges
- Stopwatch
- Tape measure

An online research was done to obtain data on river discharge for Kallang River prior to the ABC Waters Programme for comparison. Besides measuring river discharge, the group also did an on-site environmental assessment via a bi-polar survey. They also found a photograph of the same section of the river prior to the ABC Waters Programme online to compare the changes done to the locality in managing flood risk.

Resource 1 shows the field site that the group did their investigation in, as well as a photograph they found online of the same segment prior to the ABC Waters Programme. Resource 2 shows the recording sheet the group used to record data at the field site. Resource 3 shows the environmental assessment done by the group.

- (a) Using Resource 1 and the information above, suggest a suitable hypothesis for the group's investigation and state why the investigation is capable of research.  
[4]
- (b) Explain **two** potential risks that the group might face and suggest relevant precautions that should be taken to minimise these risks.  
[4]
- (c) With reference to Resources 1, 2 and the information above, describe how the students can collect data on river discharge.  
[6]
- (d) Represent the data shown in Resource 3 with a suitable form of data representation and explain why it is suitable.  
[5]
- (e) The group concluded that their investigation may have limited usefulness in ascertaining how flood risk has changed.

Explain how the group can improve their investigation.  
[6]

## Section B

### Theme 1: Tropical Environments

#### Tropical Environment of Assam, India

- 2** Assam is a state in north-eastern India. Resource 4 shows the development of Cyclone Fani across India and Bangladesh in 2019. Resource 5 shows characteristics of selected major rivers in the world. Resource 6 shows an aerial photograph of the Brahmaputra River in Assam, India. Resource 7 shows a news excerpt on a monsoon that hit Assam, India in July 2019.
- (a)** With reference to Resource 4, describe the movements and intensity of Cyclone Fani.  
[3]
- (b)** Explain the development of Cyclone Fani as shown in Resource 4.  
[6]
- (c)** Using Resource 5, compare the characteristics of Brahmaputra River with selected major rivers in the world.  
[3]
- (d)** With a well-labelled diagram, describe the characteristics of the Brahmaputra River shown in Resource 6.  
[4]
- (e)** Using Resources 4, 5, 6, 7 and your own knowledge, assess the relative importance of the different physical factors in influencing the channel morphology of the Brahmaputra River.  
[9]

## Theme 2: Development, Economy and Environment

### Water Scarcity and Privatisation

- 3** Resource 8 shows the proportion of population around the world using an unimproved drinking water source (i.e. drinking water that is not protected from contamination) in 2015. Resource 9 shows the global physical and economic water scarcity\* in 2012. Resource 10 shows the proportion of population by level of expenditure on water services as a percentage of total expenditure between 2010 and 2012. Resource 11 shows an online article regarding water privatisation.

\*According to the Food and Agriculture Organisation of the United Nations (FAO), physical water scarcity occurs when there is insufficient water to meet all demands, while economic water scarcity is a result of lack of investment in water or a lack of human capacity to satisfy the demand for water, even in places where water is abundant.

- (a)** With reference to Resource 8, describe the global distribution of population using unimproved drinking water sources.  
[4]
- (b)** Using Resources 8 and 9, suggest reasons for the relationship between percentage of population using unimproved drinking water sources and economic water scarcity.  
[4]
- (c)** Using Resource 10, compare the proportion of population by level of expenditure on water services between Colombia and Mexico.  
[3]
- (d)** Suggest possible reasons for the generally high proportion of population with 'no payment recorded' as shown in Resource 10.  
[5]
- (e)** Using Resources 8, 9, 10, 11 and your own knowledge, recommend if United Republic of Tanzania should privatise its water resources.  
[9]

### Theme 3: Sustainable Development

#### New York City Transport System

- 4 Resource 12 shows a list of the top 10 most congested cities in the world in 2016. Resource 13 shows the performance of urban transportation system in New York City ranked against 23 other global cities in 2018. The ranking includes i) results of objective indicators, ii) survey results of residents' satisfaction with current transport situation and iii) survey results of residents' satisfaction with changes in the transport system introduced by urban authorities since 2017. Resource 14 shows New York's planned congestion charge zone.
- (a) Describe the patterns in traffic congestion ranking as shown in Resource 12. [4]
- (b) Using Resource 13, explain the possible causes of traffic congestion in New York City as shown in Resource 12. [5]
- (c) Explain the strengths and limitations of the data shown in Resource 13 as information for urban planners to manage traffic congestion. [7]
- (d) Using Resource 14, explain how the planned congestion charge zone may help New York City achieve sustainable urban development. [5]
- (e) With reference to Resource 13, recommend **two** other strategies that urban authorities in New York City can implement to alleviate the issue of traffic congestion. [4]

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#### Copyright Acknowledgements

Question 1 Resource 1	<a href="https://upload.wikimedia.org/wikipedia/commons/thumb/f/f0/Bishan_Park_vor_und_nach_renaturierung.jpg/800px-Bishan_Park_vor_und_nach_renaturierung.jpg">https://upload.wikimedia.org/wikipedia/commons/thumb/f/f0/Bishan_Park_vor_und_nach_renaturierung.jpg/800px-Bishan_Park_vor_und_nach_renaturierung.jpg</a> (last accessed 23 August 2019)
Question 1 Resource 3	Table adapted from <a href="https://www.geography-fieldwork.org/a-level/water-carbon/flooding/method/#bi">https://www.geography-fieldwork.org/a-level/water-carbon/flooding/method/#bi</a> (last accessed 3 August 2019)
Question 2 Resource 4	<a href="https://www.mapsofindia.com/my-india/india/what-is-cyclone-fani-live-blog#">https://www.mapsofindia.com/my-india/india/what-is-cyclone-fani-live-blog#</a> and <a href="http://www.newindianexpress.com/states/odisha/2019/apr/29/cyclone-fani-odisha-alerts-district-collectors-1970565.html">http://www.newindianexpress.com/states/odisha/2019/apr/29/cyclone-fani-odisha-alerts-district-collectors-1970565.html</a> (last accessed 23 August 2019)
Question 2 Resource 5	a. <a href="https://www.researchgate.net/figure/Large-rivers-in-the-world-in-terms-of-suspended-sediment-load-water-discharge-and_tbl1_229151197">https://www.researchgate.net/figure/Large-rivers-in-the-world-in-terms-of-suspended-sediment-load-water-discharge-and_tbl1_229151197</a> b. <a href="https://www.mdpi.com/2076-3263/8/9/343/html">https://www.mdpi.com/2076-3263/8/9/343/html</a> c. <a href="https://en.prothomalo.com/environment/news/109277/Erosion-rates-of-Brahmaputra-river-on-the-rise">https://en.prothomalo.com/environment/news/109277/Erosion-rates-of-Brahmaputra-river-on-the-rise</a> d. <a href="https://onlinelibrary.wiley.com/doi/abs/10.1002/%28SICI%291099-1085%2819991215%2913%3A17%3C2907%3A%3AAID-HYP906%3E3.0.CO%3B2-E">https://onlinelibrary.wiley.com/doi/abs/10.1002/%28SICI%291099-1085%2819991215%2913%3A17%3C2907%3A%3AAID-HYP906%3E3.0.CO%3B2-E</a> e. <a href="https://www.researchgate.net/publication/288029718_Sediment_loads_estimate_in_the_lower_Mekong_River">https://www.researchgate.net/publication/288029718_Sediment_loads_estimate_in_the_lower_Mekong_River</a> f. <a href="https://acwi.gov/sos/pubs/3rdJFIC/Contents/9E-Knuuti.pdf">https://acwi.gov/sos/pubs/3rdJFIC/Contents/9E-Knuuti.pdf</a> g. <a href="https://www.nature.com/articles/278161a0">https://www.nature.com/articles/278161a0</a> h. <a href="https://www.nature.com/articles/srep12581">https://www.nature.com/articles/srep12581</a> (all last accessed 4 August 2019)
Question 2 Resource 6	<a href="https://www.amusingplanet.com/2016/02/the-stunning-beauty-of-braided-rivers.html">https://www.amusingplanet.com/2016/02/the-stunning-beauty-of-braided-rivers.html</a> (last accessed 4 August 2019)
Question 2 Resource 7	<a href="https://www.bbc.com/news/world-asia-india-49028155">https://www.bbc.com/news/world-asia-india-49028155</a> (last accessed 4 Aug 2019)
Question 3 Resource 8	<a href="https://www.theguardian.com/global-development-professionals-network/2017/mar/17/access-to-drinking-water-world-six-infographics#img-2">https://www.theguardian.com/global-development-professionals-network/2017/mar/17/access-to-drinking-water-world-six-infographics#img-2</a> (last accessed 14 August 2019)
Question 3 Resource 9	<a href="https://www.eoi.es/blogs/imsd/water-scarcity-the-main-causes/">https://www.eoi.es/blogs/imsd/water-scarcity-the-main-causes/</a> (last accessed 14 August 2019)
Question 3 Resource 10	<a href="https://www.theguardian.com/global-development-professionals-network/2017/mar/17/access-to-drinking-water-world-six-infographics#img-6">https://www.theguardian.com/global-development-professionals-network/2017/mar/17/access-to-drinking-water-world-six-infographics#img-6</a> (last accessed 14 August 2019)
Question 3 Resource 11	<a href="https://ourworld.unu.edu/en/water-privatisation-a-worldwide-failure">https://ourworld.unu.edu/en/water-privatisation-a-worldwide-failure</a> (last accessed 14 August 2019)
Question 4 Resource 12	<a href="https://www.visualcapitalist.com/congested-cities-world/">https://www.visualcapitalist.com/congested-cities-world/</a> (last accessed 27 August 2019)

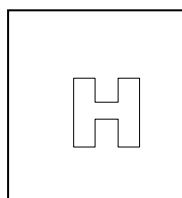


Question 4 Resource 13	<a href="https://www.mckinsey.com/~media/McKinsey/Business%20Functions/Sustainability/Our%20Insights/Elements%20of%20success%20Urban%20transportation%20systems%20of%2024%20global%20cities/Urban-transportation-systems_e-versions.ashx">https://www.mckinsey.com/~media/McKinsey/Business%20Functions/Sustainability/Our%20Insights/Elements%20of%20success%20Urban%20transportation%20systems%20of%2024%20global%20cities/Urban-transportation-systems_e-versions.ashx</a> (last accessed 27 August 2019)
Question 4 Resource 14	<a href="http://news.bbc.co.uk/2/hi/americas/6962970.stm">http://news.bbc.co.uk/2/hi/americas/6962970.stm</a> (last accessed 27 August 2019)

Candidate Name: \_\_\_\_\_

Class    Adm No

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## 2019 Preliminary Exams Pre-University 3

### **GEOGRAPHY**

Paper 2 Data Response Questions

**9751/02**

**4 September 2019**

**3 hours**

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### **READ THESE INSTRUCTIONS FIRST**

This Insert contains all the Resources referred to in the questions.

**Resource 1 for Question 1**

**Field site the group did their investigation in (top) and photograph of field site found online prior to the ABC Waters Programme (bottom)**



### Resource 2 for Question 1

#### Recording sheet to calculate river discharge

##### For Wetted Perimeter

Section	1 (Start)	2	3	4	5	6	7	8	9	10	11 (End)
Depth/ cm											

Each section is 50cm apart.

##### For River Velocity

Length of River Segment:

Time (seconds)			
1	2	3	Average

Average velocity:

### Resource 3 for Question 1

#### Environmental assessment of the upper course of Kallang River

	-3	-2	-1	0	1	2	3	
Vulnerable to overtopping			B			A		Effective against overtopping
Aesthetically unpleasing		B					A	Aesthetically pleasing
Prevents public access to river	B					A		No limit on public access to river

Adapted from: <https://www.geography-fieldwork.org/a-level/water-carbon/flooding/method/#bi>

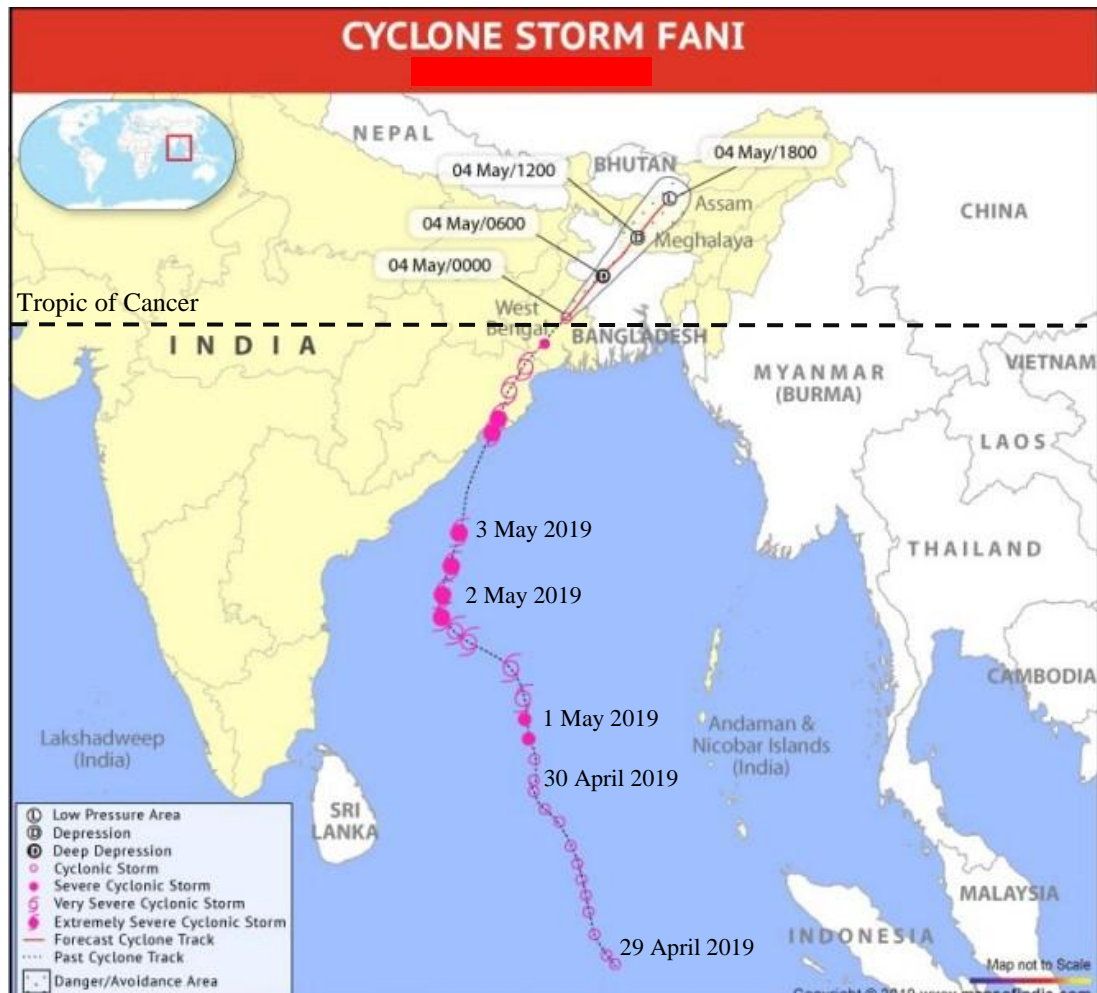
Legend:

A – Current Kallang River

B – Kallang River prior to ABC Waters Programme

## Resource 4 for Question 2

## Development of Cyclone Fani



## Resource 5 for Question 2

## Characteristics of selected major rivers in the world

River	Average Discharge (m <sup>3</sup> /s)	Annual Average Suspended Load (million tonnes/year)	Total Sediment Load (million tonnes/year)	Extent of bank erosion
Amazon	200,000	850	950	High
Brahmaputra	19,830	402	721	Severe
Mekong	14,900	160	165	Moderate
Mississippi	18,400	80	150	High
Yangtze	28,500	480	507	High



**Resource 6 for Question 2****Aerial photograph of Brahmaputra River****Resource 7 for Question 2****News excerpt on a monsoon that hit Assam in July 2019****Monsoon floods kill dozens and displace millions in India**

18 July 2019

Millions have been stranded or displaced as devastating floods continue to ravage large parts of India, Nepal and Bangladesh.

In India, the eastern state of Bihar and the north-eastern state of Assam have been the worst hit.

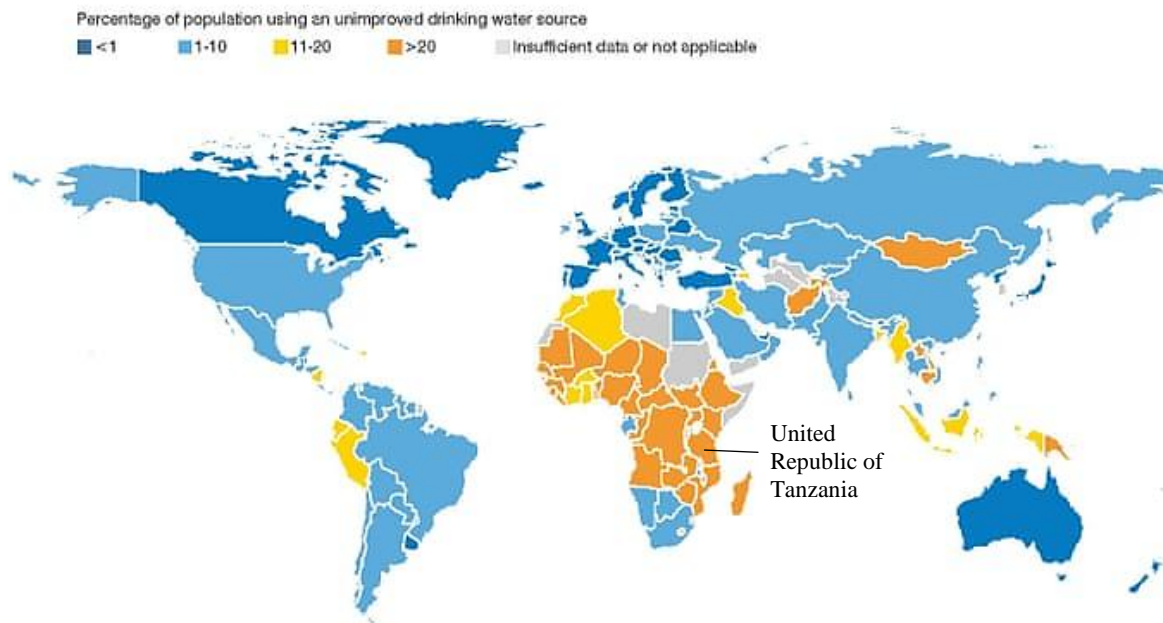
The region was hit by monsoon rains which triggered floods and landslides, submerging homes and transport links.

In Assam, the water level in the Brahmaputra river and its tributaries is showing a "rising trend", officials told Reuters. They added that it is "flowing above the danger mark in at least 10 places".

Residents are waiting for the water to recede in Assam's Barpeta district, which, according to some reports, is the worst hit in the state.

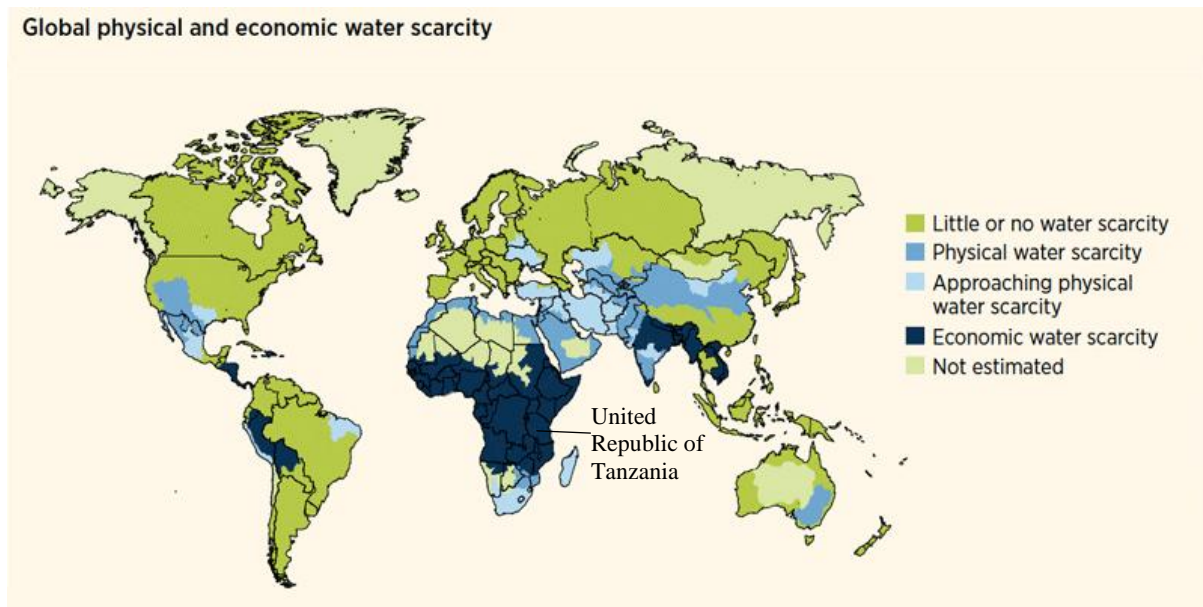
### Resource 8 for Question 3

#### Proportion of population around the world using an unimproved drinking water source in 2012



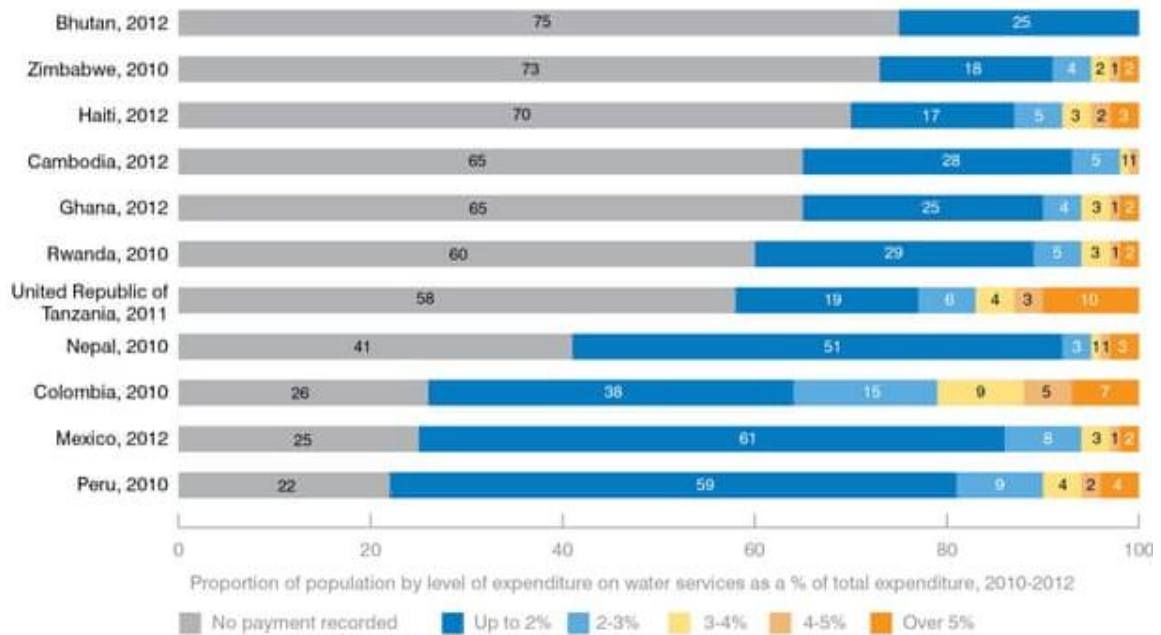
### Resource 9 for Question 3

#### Global physical and economic water scarcity in 2012



## Resource 10 for Question 3

## Proportion of population by level of expenditure on water services as a percentage of total expenditure, 2010-2012





**Resource 11 for Question 3****Online Article on Water Privatisation**

## Water Privatisation: A Worldwide Failure?

2015•02•20 [John Vidal](#) [The Guardian](#)

### **The tide has turned on privatisation**

Research shows that the tide of water privatisation has now turned. Many cities that rushed to sign 20-year or longer concessions with water companies in expectation of clean water at a socially acceptable cost have chosen to terminate agreements and return urban water provision to public control.

A report by the Transnational Institute (TNI), Public Services International Research Unit and the Multinational Observatory suggests that 180 cities and communities in 35 countries, including Buenos Aires, Johannesburg, Paris, Accra, Berlin, La Paz, Maputo and Kuala Lumpur, have all “re-municipalised” their water systems in the past decade. More than 100 of the “returnees” were in the US and France, 14 in Africa and 12 in Latin America. Those in developing countries tended to be bigger cities than those in richer countries.

“Direct experience with common problems of private water management — from lack of infrastructure investments, to tariff hikes to environmental hazards — has persuaded communities and policymakers that the public sector is better placed to provide quality services to citizens and promote the human right to water,” said the report’s author, Satoko Kishimoto, water coordinator with the Transnational Institute in Brussels.

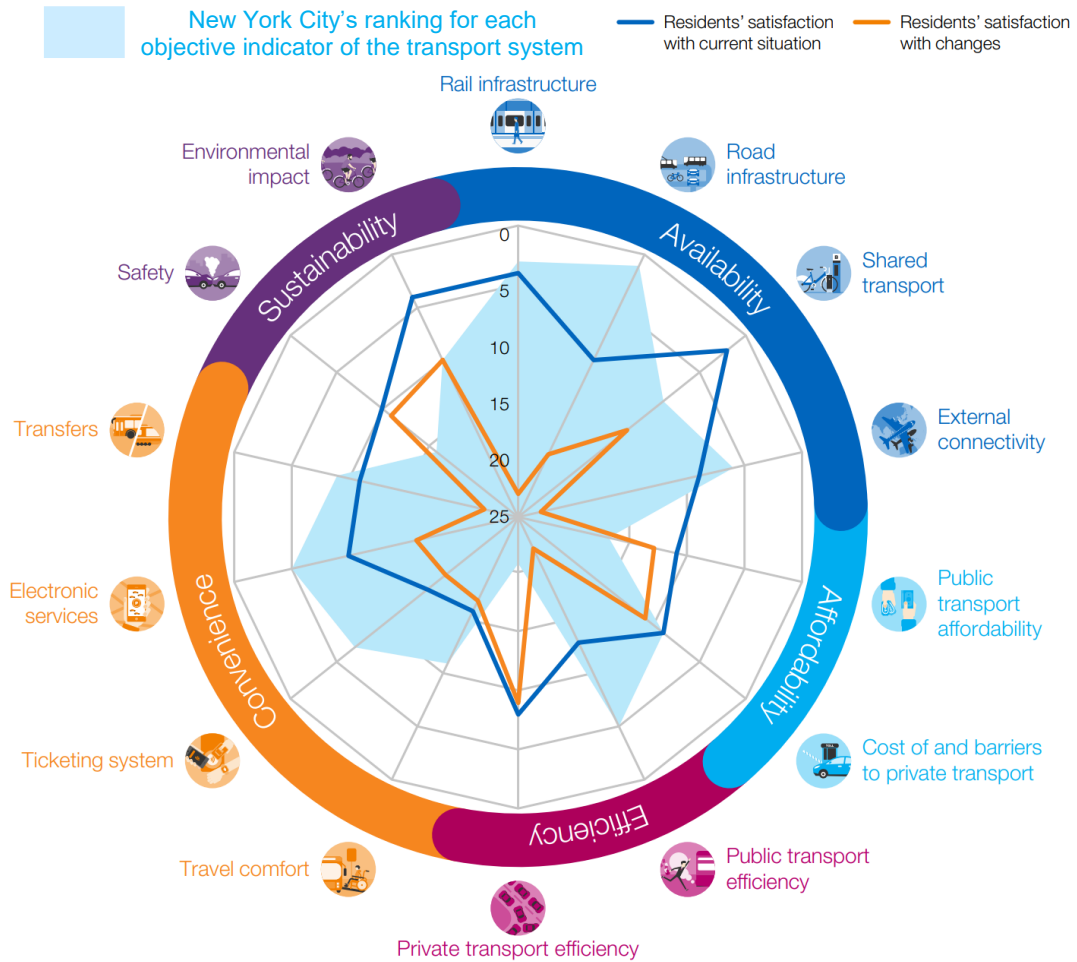
“A growing number of water utilities that have gone through a re-municipalisation process are increasingly ready, along with other institutions, to share experiences and provide practical support. Cooperation between public services is the most efficient way to improve water services and promote the human right to water,” she said.

**Resource 12 for Question 4****Top 10 most congested cities in the world in 2016**

Rank	City	Country	Hours Spent in Congestion	Driving Time in Congestion
#1	Los Angeles	USA	104.1	13%
#2	Moscow	Russia	91.4	25%
#3	New York	USA	89.4	13%
#4	San Francisco	USA	82.6	13%
#5	Bogota	Colombia	79.8	32%
#6	Sao Paulo	Brazil	77.2	21%
#7	London	UK	73.4	13%
#8	Magnitogorsk	Russia	71.1	42%
#9	Atlanta	USA	70.8	10%
#10	Paris	France	65.3	11%

### Resource 13 for Question 4

#### New York City Transport System Profile in 2018



Urban transportation systems in 24 global cities were assessed and ranked in 2018. The results above show New York City's ranking for each objective transport indicator, as well as results from survey on residents' satisfaction with current situation and with changes introduced by urban authorities since 2017.

Dimension	Indicators
Availability	<ul style="list-style-type: none"> <li>Rail Infrastructure</li> <li>Road Infrastructure</li> <li>Shared Transport</li> <li>External Connectivity</li> </ul>
Affordability	<ul style="list-style-type: none"> <li>Public Transport Affordability</li> <li>Cost of and barriers to private transport</li> </ul>
Efficiency	<ul style="list-style-type: none"> <li>Public Transport Efficiency</li> <li>Private Transport Efficiency</li> </ul>
Convenience	<ul style="list-style-type: none"> <li>Travel Comfort</li> <li>Ticketing System</li> <li>Electronic Services</li> <li>Transfers</li> </ul>
Sustainability	<ul style="list-style-type: none"> <li>Safety</li> <li>Environmental Impact</li> </ul>

## Resource 14 for Question 4

## New York City Planned Congestion Charge Zone

