



KWAZULU-NATAL PROVINCE

EDUCATION
REPUBLIC OF SOUTH AFRICA

CURRICULUM GRADE 10 -12 DIRECTORATE

NCS (CAPS)

LEARNER SUPPORT DOCUMENT

GRADE 10

GEOGRAPHY

STEP AHEAD PROGRAMME

2023

PREFACE

This support document serves to assist Geography learners in how to deal with curriculum gaps and learning losses because of the impact of COVID-19 in 2021. It also addresses the challenging topics in the Grade 10 curriculum in Term 3.

Activities serve as a guide on how various topics are assessed at different cognitive levels and prepare learners for informal and formal tasks in Geography. It covers the following topics:

No.	Topic	Page
A.	POPULATION DISTRIBUTION & DENSITY	3-6
B.	POPULATION STRUCTURE	7-10
C.	POPULATION GROWTH	11-19
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Population Geography Concepts

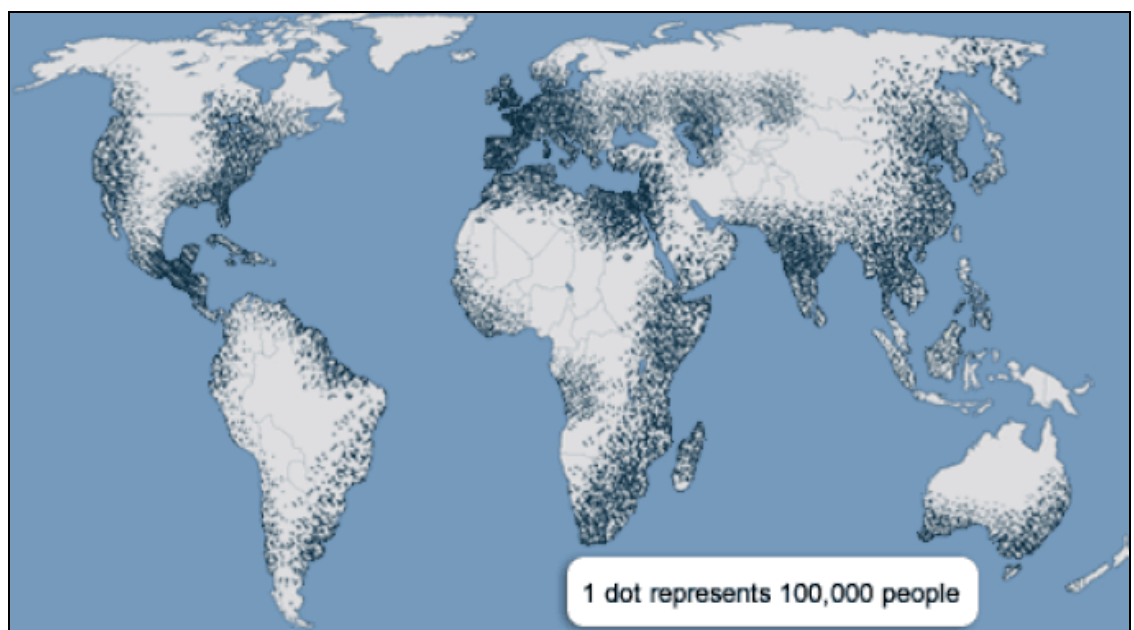
- **Population Geography** is the branch of Human Geography about the composition, structure, size, distribution, and density of population.
- **Population structure** refers to how a population is made up with regards to gender and age group.
- **Population distribution** is to the spreading of population across the earth.
- **Population density:** is the number of people occupying an area, expressed as people per square kilometre (people/km²).
- **Demography** is to the study of population statistics.
- **Ecumene** is the parts of earth that are suitable for people to live in.
- **Non-ecumene** is part of the earth that are not suitable for people to live in.
- **Infant mortality rate** is the number of infant deaths per 1000 live births.
- **Economically active population** are people who are at employable age
- **Economically dependent** are people who do not work and economically dependent.
- **Literacy rate** is the percentage of the total population who can read and write.
- **Dependency ratio** is the relationship between the economically active population and economically dependent population.
- **Zero population growth** is birth rate equals to death rate.
- **Population growth** is the natural change in the world's population.
- **population growth rate** is the rate/speed at which the world's population is growing.
- **Overpopulation** is when the number of people living in an area is greater than the number of people the area can support.
- **Population distribution:** is the spreading of population across the earth.
- **Birth rate:** refer to the number of babies born per 1000 of population per year.
- **Death rate** is the number of deaths per 1000 of the population per year.
- **Fertility rate** is an average number of children a woman is expected to have within her child-bearing age.
- **Natural increase (growth rate):** is the rate at which a country's population is growing excluding immigration (birth rate minus the death rate).
- **Life expectancy:** is an average number of years a person can expect to live.

Population distribution and population density

Population distribution: is the spreading of population across the earth. The world's population is not evenly distributed across the earth.

- The world's population is not evenly distributed across the earth.
- About half of the world's population lives on only 5% of the Earth's land.
- About 60% of the world's population lives in one continent, Asia.
- Even within a country, certain places have lots of people, and some other parts have few people.

Figure 1.1 Global population distribution

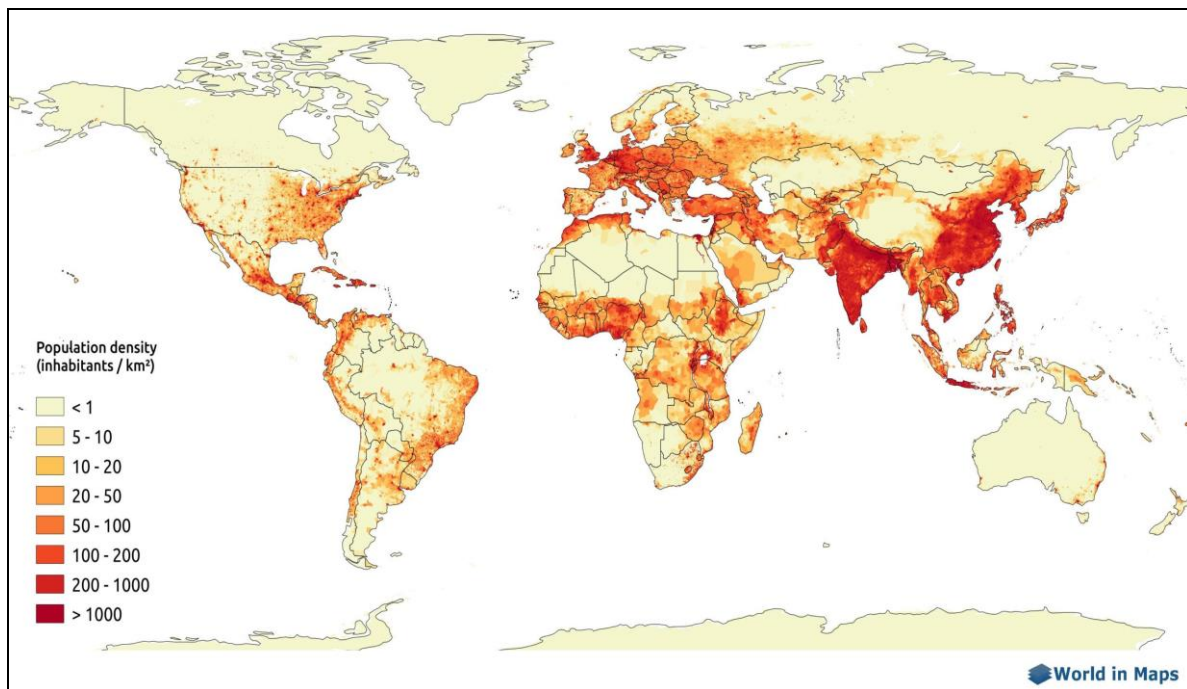


Source: <https://www.jkgeography.com/physical-and-human-factors-affecting-global-population-distribution.html>

Population density: is the number of people occupying an area, expressed as people per square kilometre (people/km²).

- To calculate population density, we divide the total population by the area in which they live.
- We then express this as the number of people/km².
- The higher the country's population density the crowded the country is.

Figure 1.2: Global population density



Source: <https://worldinmaps.com/world/population-and-settlement/population-density/>

Factors that affect the distribution and density of the world's population

- Some countries have larger populations, while others have smaller populations.
- Millions of people live in certain areas, while other places have almost no people.
- Some parts of the Earth are suitable for living in (ecumene).
- Some parts of the Earth are not suitable for living in (non-ecumene)
- Factors affecting population distribution and population density fall into two categories, physical and social factors.

Physical factors	Social factors
Climate: good climate patterns and weather patterns	Economy: well developed economy.
Water: Availability of fresh drinking water	Politics: stable political conditions
Relief: gentle relief is better over steep topography	Cultural factors: old traditions of human settlement.
Resources: natural resources must be readily available	Transport and communication: availability of transport network.
Soil: fertile soil provides a good base for farming	Infrastructure: well developed infrastructure and services.

Population Indicators

Population indicators: are different measurements which give us information about a country's population.

- Population characteristics differ from one country to another.
- Population indicators compare the characteristics of different populations.

The following population indicators all tell us something about a country's population:

- **Birth rate:** is the number of babies born per 1000 of the population per year.
- **Death rate:** is number of deaths per 1000 of the population per year.
- **Fertility rate:** is an average number of children a woman is expected to have within her child-bearing age.
- **Natural population increase (growth rate):** is the rate at which a country's population is growing excluding immigration (birth rate minus the death rate).
- **Life expectancy:** is an average number of years a person can expect to live.

Factors affecting population indicators.

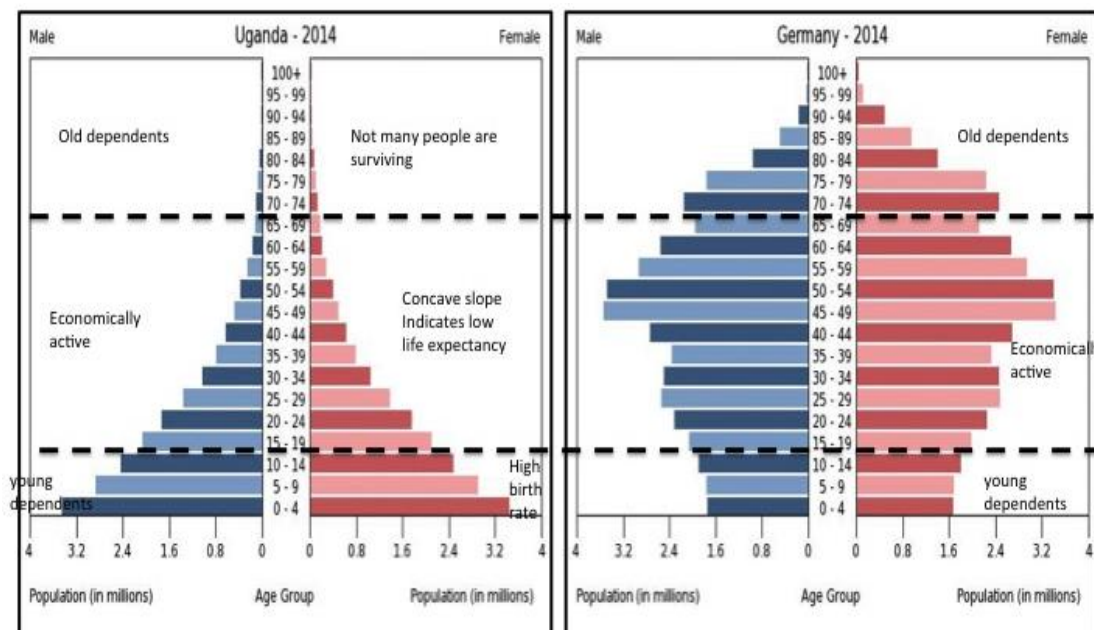
- **Culture:** polygamy, a man with more than one wife is likely to have many children
- **Religion:** some religions believe that contraceptives should not be used; therefore, the birth rate is higher in countries where those religions are predominant.
- **Migration:** is the movement of people so that they change their place of residence.
- **War:** many men killed in wartime will mean a decrease in the birth rate.
- **Education:** people who are educated about family planning usually have fewer children.
- **Natural disasters:** such as earthquakes, volcanoes, tsunamis, and drought.
- **Diseases:** outbreak of severe diseases such as Ebola and Covid19.

Population Structure

A country's population consists of people of different genders (male and female) and ages. The most common method to show the structure is using a population pyramid.

- It gives information about birth rate, death rate, life expectancy, male-female migration, working and dependent population.
- demonstrate population growth pattern that helps in population projection.
- Help in demographic and economic planning- what kinds of services and facilities will be needed in future.

FIGURE 1.3 Interpreting population pyramids

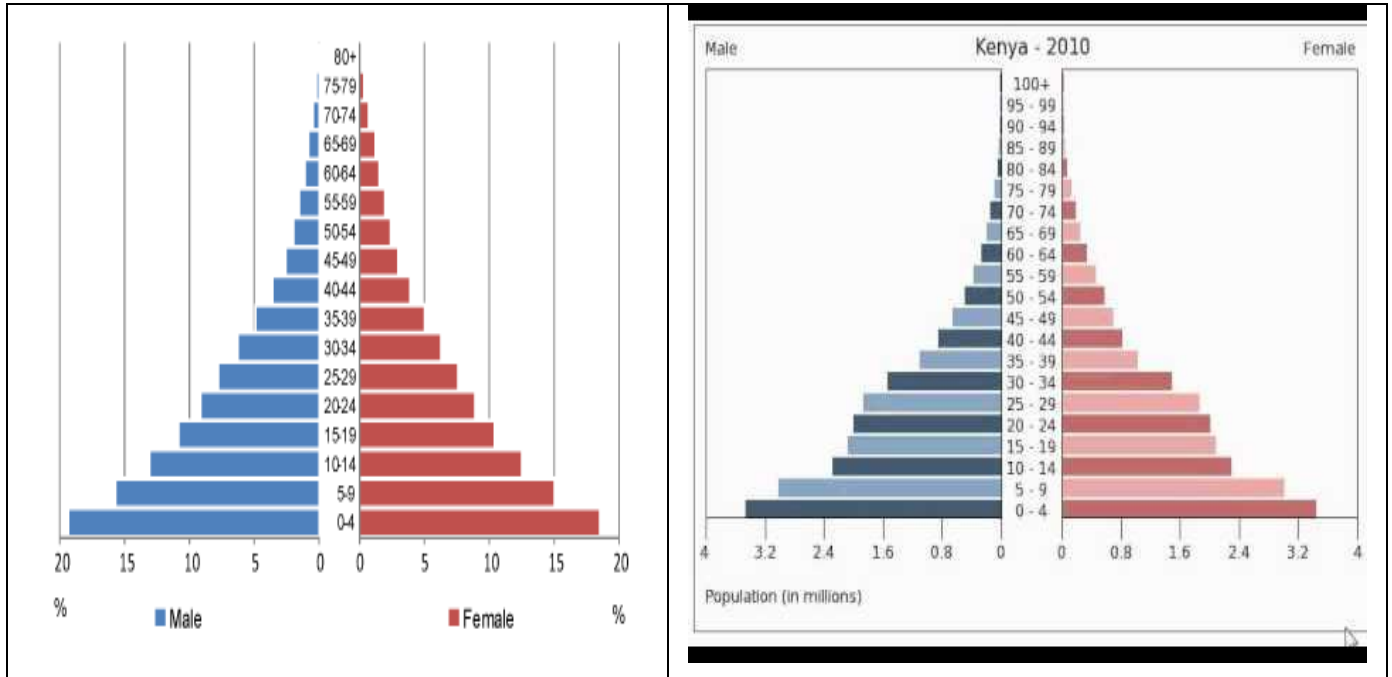


Source: <https://www.coolgeography.co.uk/GCSE/AQA/Population/Population%20Pyramids/Population%20Pyramids.htm>

- The shape of pyramids gives a clear image of the extent of the development of the country.
- A symmetrical-shaped pyramid shows a developing country. The birth rate is high (there are many young people) and the death rate is high (there are few old people)
- A bell shaped pyramid shows a developing country. It has a low birth rate (fewer young people) and a low death rate (more old people), so the pyramid has a narrow base and a broader top.
- A wide base of population pyramid indicates a high birth rate.
- A narrow base of population pyramid is indicative of low birth rate.
- Straight or slightly vertical sides of population pyramid suggests low death rate.

Types of Population Pyramids

1. Rapid Growth, Expanding Population Pyramid

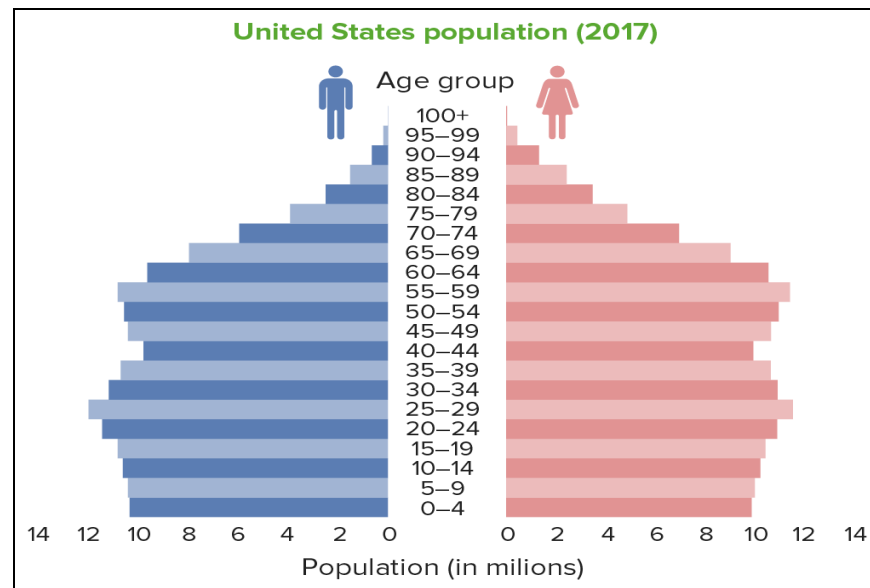


Source: <https://www.coolgeography.co.uk/GCSE/AQA/Population/Population%20Pyramids/Population%20Pyramids.htm>

- Rapid growth, expanding population pyramid depicts population with fast rapid growth and expanding population.
- Males and females are usually equal in number.
- Pyramid has symmetrical (triangular) shape.
- Birth rates and death rates are high.
- Older people are fewer.

2. Low growth rate, gradually expanding population.

Figure 1.5 Population pyramid of USA.

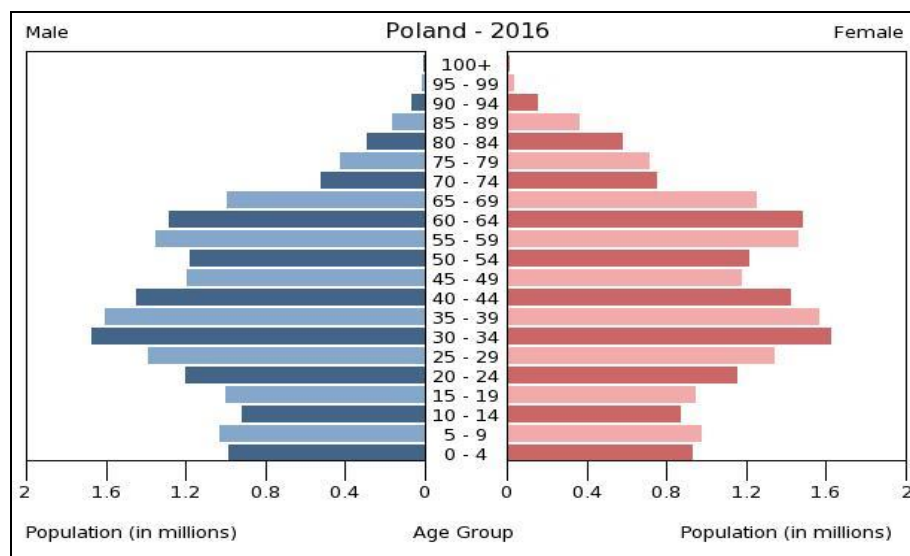


Source: <https://www.lecturio.com/concepts/population-pyramids/>

- Slow growth, gradually expanding population pyramid indicates population which grows slowly and expands gradually.
- The pyramid has a bell shape.
- Birth rates and death rates are low.
- Middle aged people are more.
- Females live longer than males.

3. Stable, Static Population Pyramid

Figure 1.5 Population pyramid of Poland

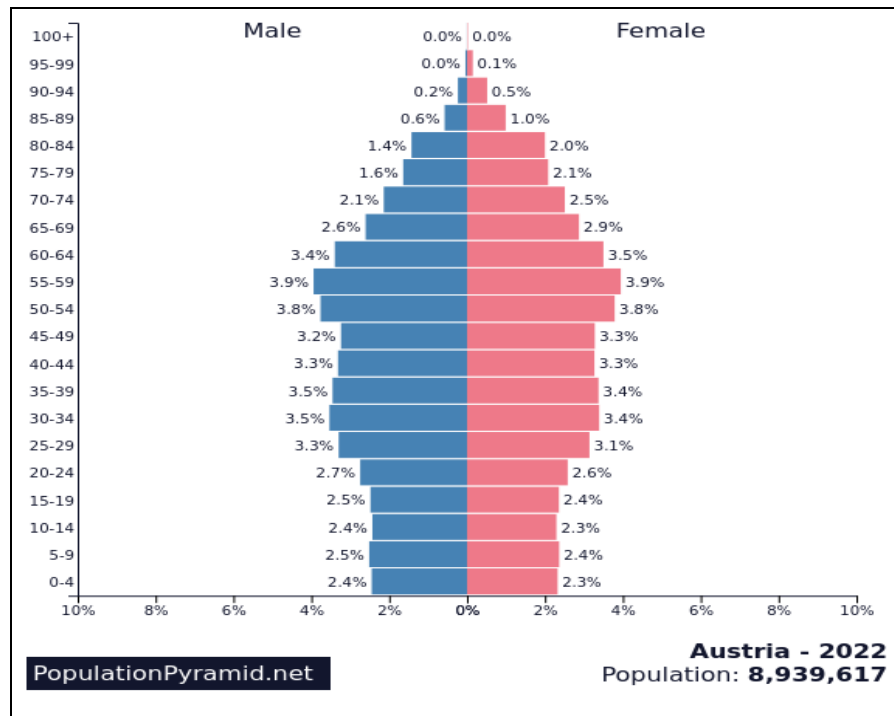


Source: https://commons.wikimedia.org/wiki/File:Population_pyramid_of_Poland_2016.png

- Stable, static population pyramid illustrates country's population which is stable and static.
- The pyramid has a bell shape.
- Birth rates and death rates are at low levels.
- Females have longer life expectancy.

4. Declining, Diminishing Population Pyramid

Figure 1.7 Population pyramid of Austria/



Source: <https://www.populationpyramid.net/austria/2022/>

- Declining, diminishing population pyramid shows country's population that is declining and diminishing.
- The pyramid is asymmetrical.
- Birth rates and death rates are low.
- There are more middle-aged people.
- Older people outnumber younger people.
- Females live longer than males.

5. Zero population growth

- Occurs in a population when births + immigration = deaths + emigration.
- This means the population remains stable.
- It either expands or shrinks.

- This means population is 'shrinking' over time.

OVERPOPULATION AND MANAGING POPULATION GROWTH

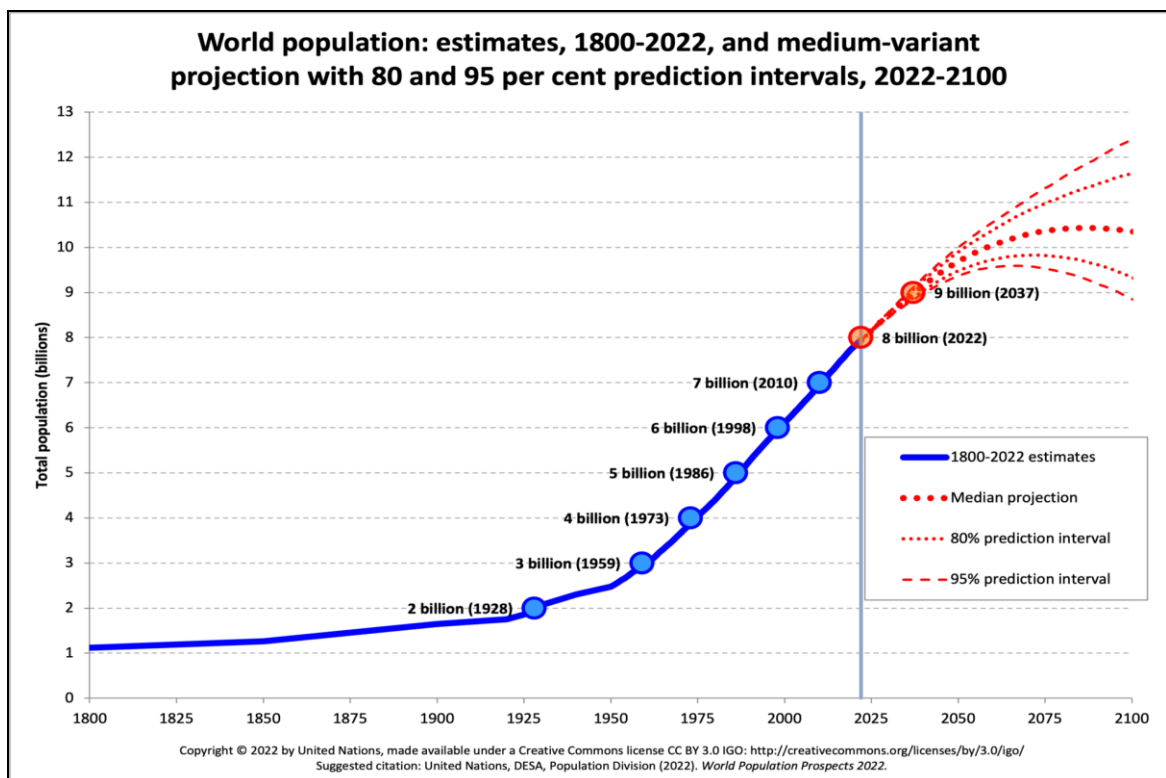
Population growth: refers to the increase in the number of people on earth or in a population group. The current global population growth rate is about 1.1% per year.

- Two metrics determine the change in the world population: the number of babies born and the number of people dying.
- Human population has rapidly increased due to innovation and industrialization; food, energy, water, and medical care became more reliable and available.

Population growth overtime

- The world's population has changed overtime.
- There are more than twice as many people on Earth today as there were in the 1960.

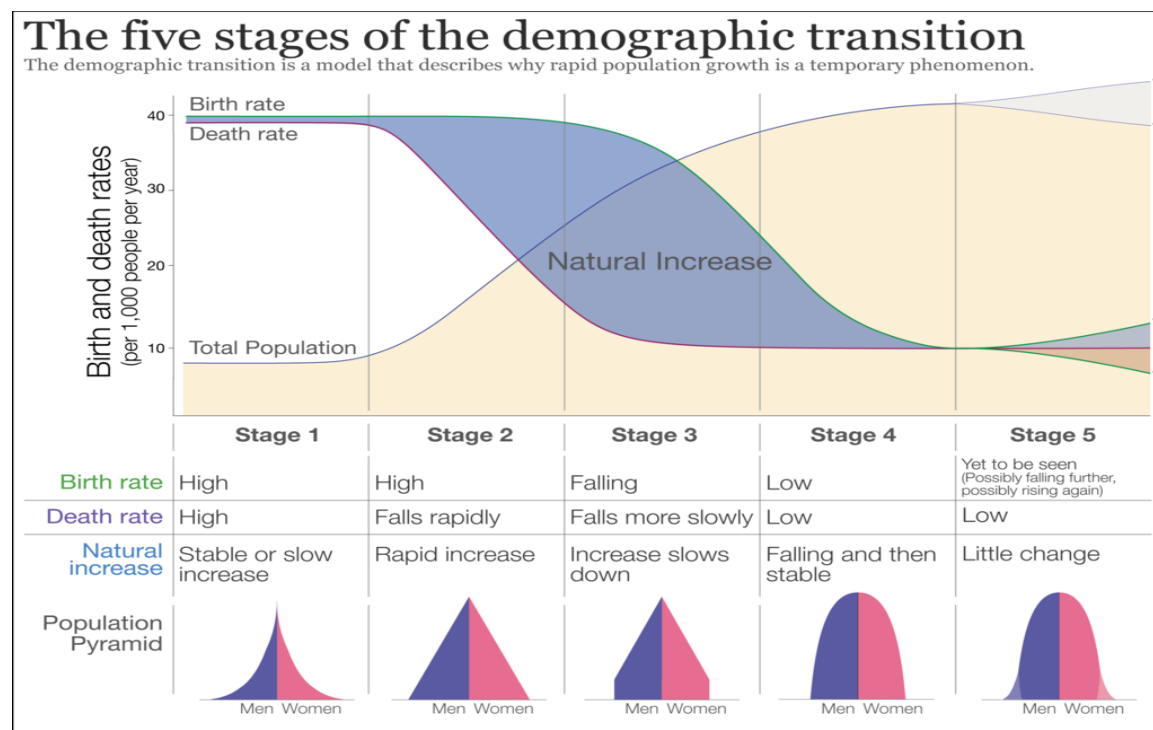
Figure: 1.8 Human population growth overtime



Source: <https://populationconnection.org/blog/world-population-milestones-throughout-history/>

Demographic transition model: a model explaining how country's population changes overtime.

Figure 1.9 Demographic transition model



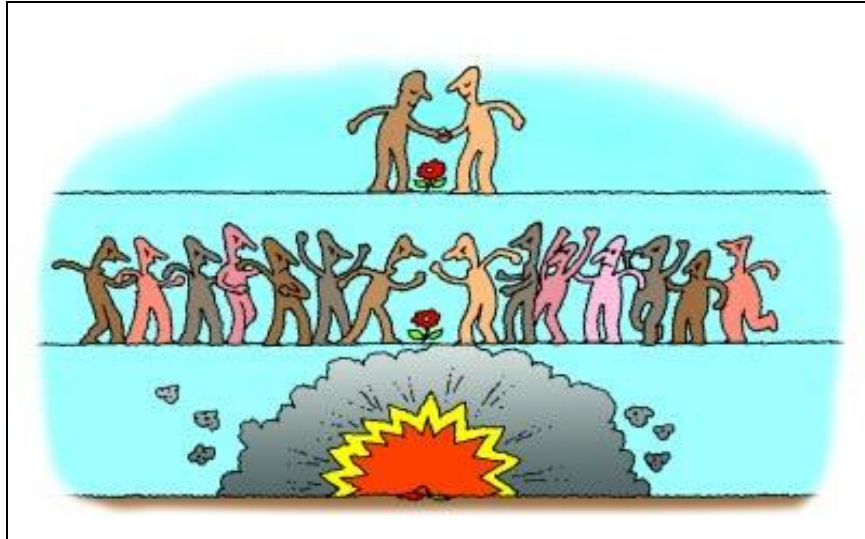
Source: https://en.wikipedia.org/Demographic_transition

Stage 1 – High Stationery Phase	Stage 2 – Early Expanding Phase
- Birth rate and death rate are high. - Total population is low.	- Birth rate remains at high level. - Infant mortality rate and death rate start to decline due to improved medical services, nutrition, peace and stability
- Birth rate is high because of lack of birth control. - Death rate and infant mortality rate are high due to disease, famine, malnutrition, and all factors affecting death rate.	- Life expectancy increases and total population starts to grow. - This stage is called population explosion.

Stage 3 – Late Expanding Phase	Stage 4 – Low Stationery Phase
- Death rate continues to decline at low level, and birth rate begins to drop. - Total population continues to rise to upper level. - Birth rate decreases to low level due to urbanization and	- Birth rate stabilizes at low levels. - Death rate remains at low levels. - Total population remains at high levels.

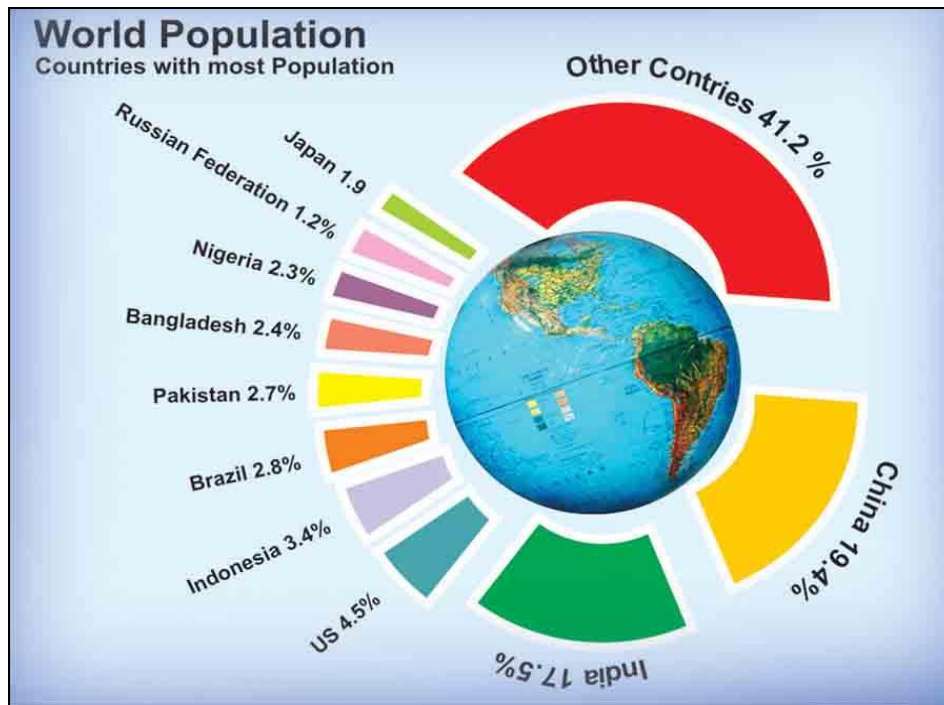
industrialization.	
• Total Population begins to level out.	• If birth rate declines below death rate, there is a negative natural increase, and the population decreases.

Overpopulation: refers to a population which exceeds its sustainable size or carrying capacity within a particular area or habitat.



Source: issuesonline.co.uk

- This occurs when the number of people is more than the resources available such as transport, water, shelter, food, or social amenities.
- The population is unable to retain adequate standard of living with the available resources and technology.
- Overpopulation is currently a threat in some regions of the world, but not in others. It depends on the regions' balance between population and resources.



Source: <https://thecountriesof.com/top-10-most-populated-countries-in-the-world-2013/>

Causes of overpopulation

- Decreased mortality rate.
- Better healthcare
- Growth in food production
- Depletion of resources
- Poor contraceptive usage
- Lack of family planning
- Immigration
- Child labour
- Technological advancement in fertility treatments

Effects of overpopulation

- The environment is degraded (i.e., pollution, climate change, land degradation)
- Depletion of natural resources
- Conflict and war
- Increased standard of living
- Increased rate of unemployment
- Social ills (crime, drug abuse, prostitution)
- Starvation and famine
- Increased risk of pandemics and epidemics
- lower life expectancy
- climate change occurs at a much faster rate.

Managing Population Growth

- better education
- availability of free contraceptives
- educating girl children
- tax incentives for families with few children
- creating awareness campaigns about overpopulation

Sterilisation	• Sterilization refers to an act of making a person to be unable to produce bear children.
Vasectomy – male operation	• Vasectomy refers to a surgical operation that is done in order to sterilize a man by cutting off the tube that carries sperm cells to the penis. • Vasectomy denotes a medical procedure of cutting off the small tube that carries sperm cells done to make a man unable to produce children.
Tubectomy – female operation	• Tubectomy means a medical operation a woman does by cutting off her fallopian tubes so that she may be permanently sterile. • Tubal ligation is a surgical procedure in which a woman's fallopian tubes are block to stop the passing of egg cells.
Abortion	• Abortion means an act of terminating pregnancy before the period is completed. • Abortion refers to a practice of stopping the development of a child during pregnancy.
One Child Policy	• One child policy means the measure to control population that was introduced by China to force couples to give birth only to one child.

POPULATION MOVEMENTS

Population movements takes place when people move from one place to another. Population movements have influenced the growth and development of countries, and they continue to do so today.

- **Migration:** refers to the movement of people so that they change their place of residence.

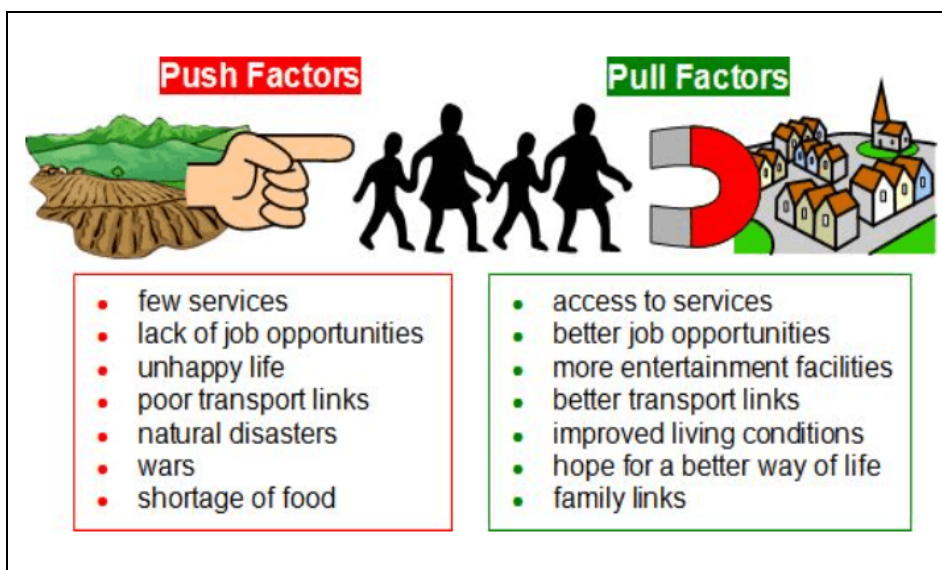
Kinds of population movements

- **International migration:** refers to the moment of people across a country's border.
- **Emigration:** refers to the movement of people out of their home country to another country.
- **Immigration:** this is the movement of people into a new country of residence.

Regional migration

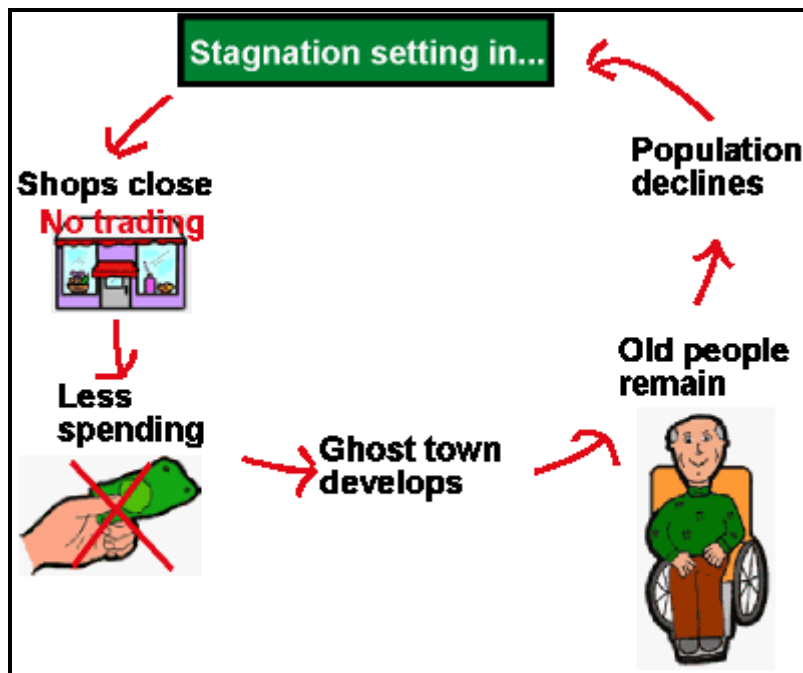
This is the movement of people within a region or country.

- **Rural urban migration** is the movement of people from rural areas to urban areas.



Source: <https://quizizz.com/admin/presentation/push-and-pull-factors>

Effects of rural-urban migration:



Source: <http://www.stagnationinruralareas.uk>

Rural	Urban
Reduced labour force	Increased unemployment
Reduces agricultural production	Overpopulation
Aged population left behind	Strain on basic services
Increase in food prices	urbanisation
Services close	Growth of informal settlements
Rural depopulation	
Brain drain	

- **Urbanisation:** is the increase in the percentage number of people living in urban areas (towns and cities)
- **Voluntary migration:** people move from one place to another voluntarily without being forced, in search of a better life.
- **Forced migration:** people are forced to move from one place to another because they face danger or death if they do not move.

Causes and effects of population movements.

People move from one place to another for various reasons:

- People move in search of jobs.
- Political oppression wars, conflict.
- Religious persecution
- Some people migrate for health reasons (to cleaner and safer environments)
- Some people migrate to places with better services (housing and school).
- Some people migrate for security reasons (crime).
- Political stability
- Gender equality

Migration can have positive and negative effects.

Negative effects include:

- Cultural clash
- Smuggling and human trafficking

Positive effects include:

- Integration overtime
- Increased cultural diversity.

Temporary and permanent movements

- **Permanent movement:** is when someone moves from one place to another and has no plan to return to the original home.
- **Temporary movement:** is when people move from their place of residence for a certain period (limited by time).

Temporary and permanent movements include:

- **Migrant labour:** is a person who migrates within a home country or outside for work.
- **Economic migrant:** is a person who moves to improve the standard of living by gaining a better job.
- **Political migrant:** a person who moves to escape political persecution or war.
- **Refugees:** people who are forced to leave their homes for their own safety. This could be due to war, oppression, climate change and natural disasters.

Attitudes Towards Political Migrants and Refugees

Political asylum is the protection that is granted to foreign nationals by the hosting country.

- Political migrants and refugees receive unfair treatment from the country's indigenous people.
- Local people usually complain that political migrants and refugees take their jobs, and increase strain on housing, and basic services.
- Political migrants and refugees are associated with crime drug trafficking, human trafficking.
- The total dislike and hatred that is directed to political migrants and refugees is known as xenophobia.
- Xenophobia: includes expelling group of political migrants and refugees, brutal assaults, murder, destruction to their property, and looting their shops.

Learner activities

1.1	Give ONE word/term for each of the following descriptions by choosing a word/term from the list below. Write only the word/term next to the question number (1.1.1–1.1.7) in the ANSWER BOOK.
International migration, Migration, Emigration, Immigration, Regional migration, Rural urban migration, urbanisation, Rural depopulation.	

- 1.1.1 When people move from one country to another. (1x1) (1)
- 1.1.2 Is when a person from another country settles in a new country. (1x1) (1)
- 1.1.3 When a person leaves his or her country. (1x1) (1)
- 1.1.4 This is a movement of people within a region such as South Africa. (1x1) (1)
- 1.1.5 This is the movement of people from rural areas to urban areas. (1x1) (1)
- 1.1.6 The increasing percentage of people living in urban areas. (1x1) (1)
- 1.1.7 The movement of people so they can change their place of residence. (1x1) (1)

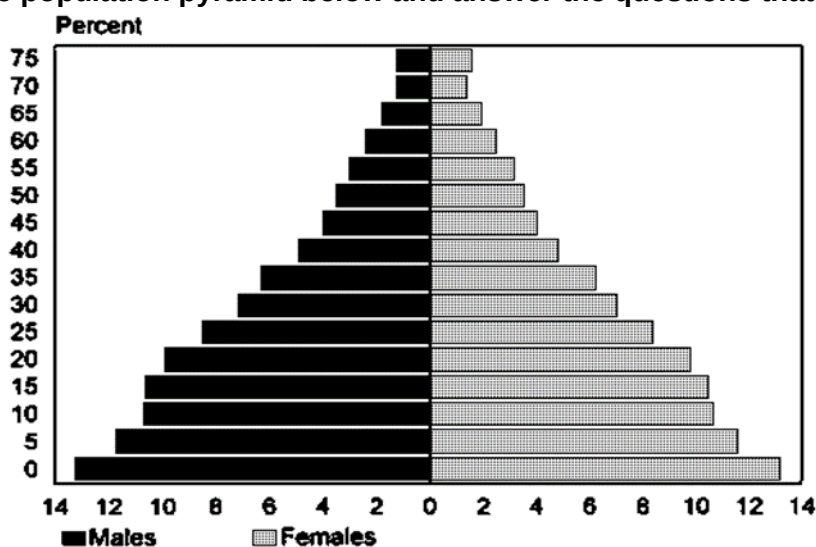
(7 x 1) (7)

1.2 Match a term in column **B** with the correct statement in column **A**. Write only the letter next to the question number, for example: 1.2.8 I.

COLUMN A		COLUMN B	
1.2.1	Total fertility of 2.1	A	Doubling time
1.2.2	Factors that encourage people to leave a particular place	B	Population
1.2.3	Number of people in a square km	C	Economically active
1.2.4	Factors that attract people towards a particular area	D	Replacement rate
1.2.5	Number of years it will take for the population to double in size	E	Push factors

1.2.6	Number of people in a given area	F	Dependency ratio
1.2.7	People who work in a population	G	Pull factors
		H	Population density
			(7 × 1) (7)

1.3 Refer to the population pyramid below and answer the questions that follow.



www.googleimages.com

- 1.3.1 Define the term population pyramid. (1x2) (2)
- 1.3.2 State whether the population pyramid above is that of a developing country or developed country. (1x2) (2)
- 1.3.3 The population pyramid reflects high infant mortality rates. Identify ONE piece of evidence from the population pyramid to justify this statement. (1x2) (2)
- 1.3.4 Provide TWO possible reasons for low life expectancy reflected by the population pyramid above. (2x2) (4)
- 1.3.5 Discuss the significance of population pyramids for the government. (3x2) (6)

[16]

2. Study the table below and answer the following questions:

Country	Crude Birth Rate	Crude Death Rate	Natural Increase
Japan	7,44	9.83	-2,39
South Africa	21,33	13,90	_____
Nigeria	36,07	16,31	19,76

2.1 Differentiate between birth rate and death rate. (2x2) (4)

2.2 Name a country which will have a decrease in population in the table above and give one reason for your answer. (3)
(1+2)

2.3 Calculate Natural increase for South Africa (2x1) (2)

2.4 Name and briefly explain factors influencing the distribution of the world's population. (3x2) (6)

[15]

FIGURE 3: A COUNTRY VILLAGE

Study FIGURE 3, a cartoon about a country village.



<http://jolgri.org/index.php/jolgri/article>

3.1 Define the term rural-urban migration. (1 x 2) (2)

- 3.2 Give the population size of this country village on weekends (2 x 1) (2)
and during the week respectively
- 3.3 State and explain ONE pull factor that could explain the size (2 x 2) (4)
of the population during the week.
- 3.4 In a paragraph of approximately EIGHT lines, outline the (4 x 2) (8)
consequences of rural-urban migration on people and the
local economy of the country village

[15]

FIGURE 4: URBANISATION

Read the article about urbanisation in FIGURE 4 and then answer the questions that follow.

URBANISATION

11 APRIL 2014, LAUREN ROYSTON, MICHAEL CLARK

There is still no formal plan to cover the need for cheaper inner-city accommodation.

Approximately 60% of the South African population currently lives in urban areas. This figure will increase as due to a natural population growth and the further migration of people to cities in search of economic opportunities.

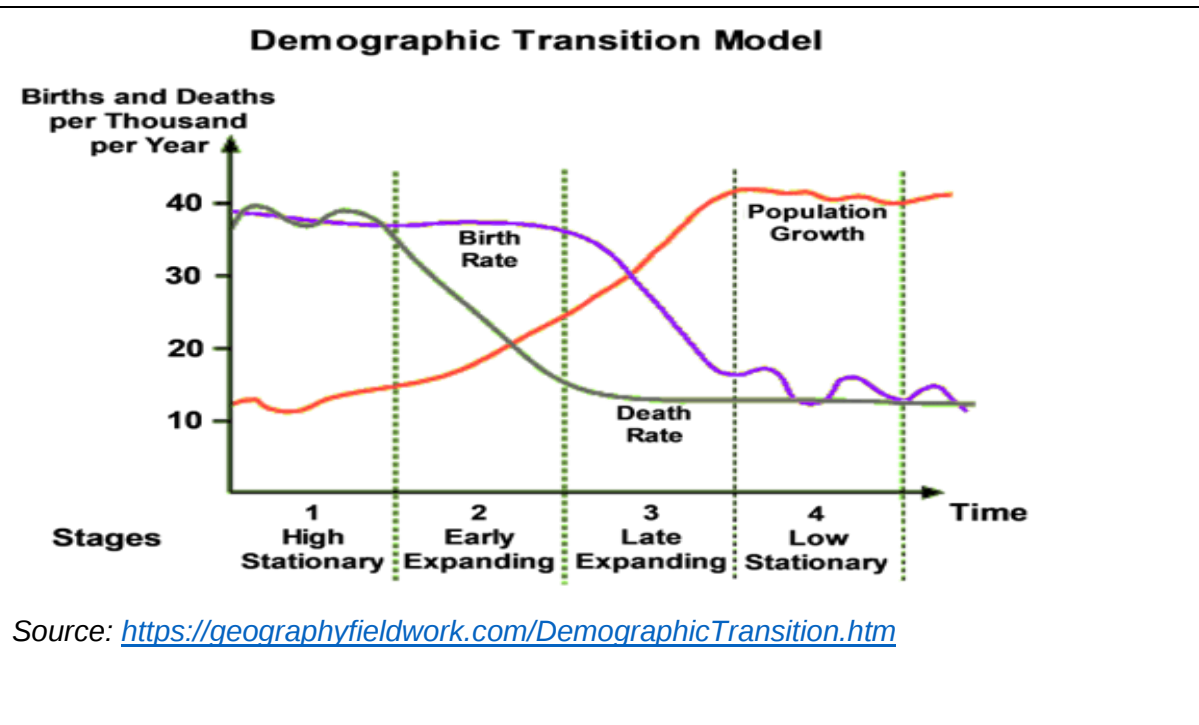
In many African countries, including South Africa, the standard government response to poverty associated with urbanisation (where people live in backyard shacks, informal settlements, and 'bad' buildings) has been to focus on improving standards of living in rural areas in order to prevent rural-urban migration, and to criminalise poverty in urban areas by evicting people from their shacks and clamping down on informal livelihoods.

<https://www.britannica.com>

- 4.1 Define the term urbanisation. (1 x 1) (2)
- 4.2 What is the percentage of the people living in urban areas in (1 x 2) (2)
South Africa?
- 4.3 What are the causes of urbanisation in South Africa? (2 x 1) (2)
- 4.4 Discuss FOUR problems associated with urbanisation in (4 x 2) (8)
South Africa.

[14]

5. Study the demographic model in FIGURE 5 and answer questions that follow.



- | | | | |
|-----|--|---------|-----|
| 5.1 | Define demographic transition model. | (1 x 2) | (2) |
| 5.2 | List three characteristics of a population group in stage 1. | (3 x 1) | (3) |
| 5.3 | Explain why the death rate has decreased in Stage 2. | (1 x 2) | (2) |
| 5.4 | Suggest a country that could reflect the graph for Stage 2. | (1 x 1) | (1) |
| 5.5 | Give two reasons for your answer in 1.4.4. | (2 x 2) | (4) |

[12]

GEOGRAPHICAL INFORMATION SYSTEMS (GIS)

Use the map of Phalaborwa to answer the following questions.

6. The orthophoto map shows a high resolution.

6.1 Explain the term resolution. (1 x 2) (2)

6.2 Give evidence that the orthophoto map has a high resolution. (1 x 1) (1)

6.3 Due to the increase in population and human activities in block A1, the possibility of increased environmental degradation is very likely. The local municipality can use remote sensing to assess the impact of environmental degradation in block A1.

6.3.1 Explain the term remote sensing. (1 x 2) (2)

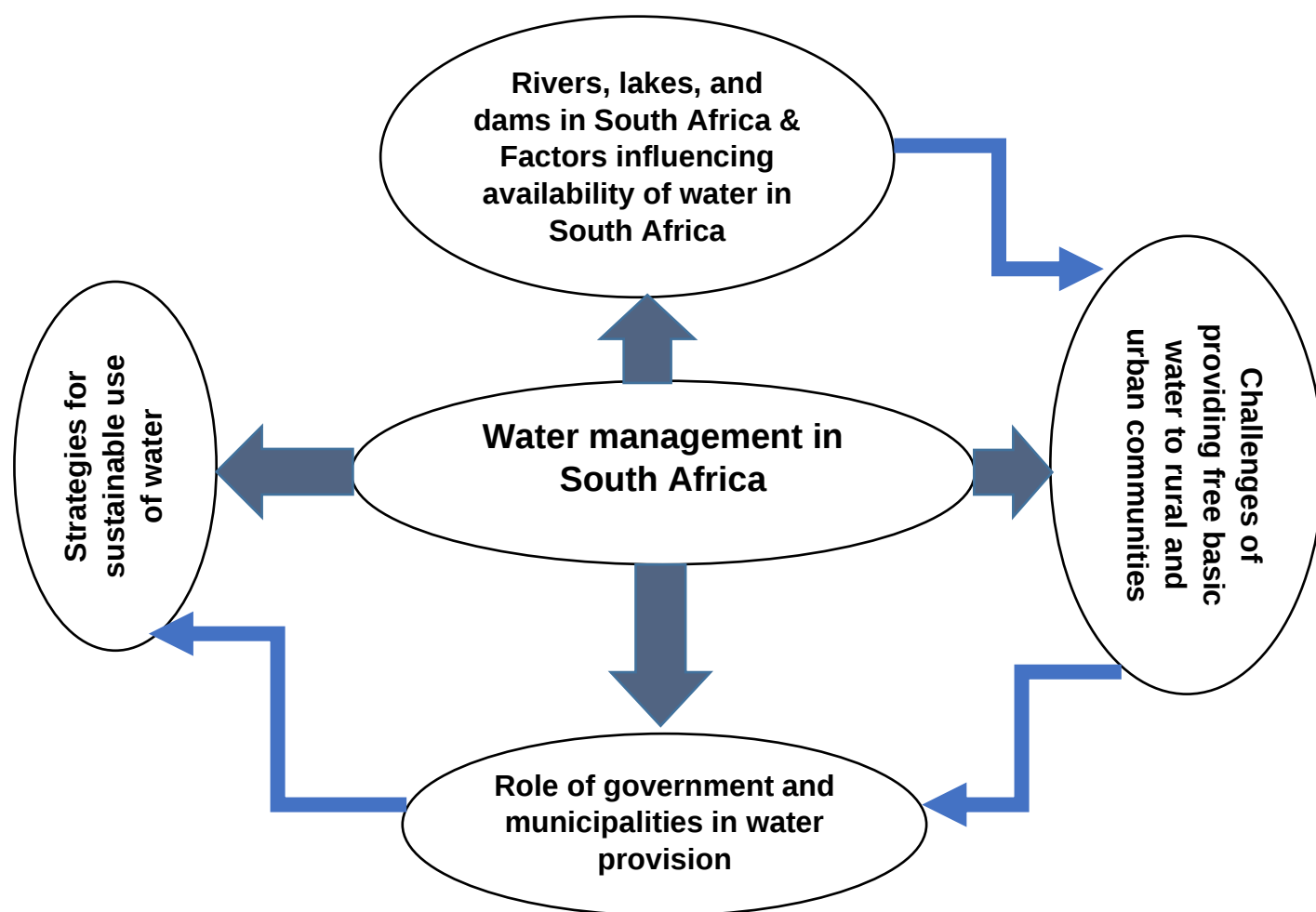
6.3.2 Explain how the local municipality will use remote sensing to monitor the negative impact of the increased environmental degradation in block A1 (2 x 2) (4)

6.4 A Developer had to choose between sites in block D1 and site H in block A1 to build a shopping mall:

6.4.1 Explain why he/she chose site D1 to build a mall. (3 x 2) (6)

[15]

WATER MANAGEMENT IN SOUTH AFRICA



KEY CONCEPTS

TERM	EXPLANATION
Water management	Process of planning, developing, and managing water resources, in terms of both water quantity and quality, across all water uses.
Rainfall distribution	The spread of rainfall across an area
Lake	A body of water that is surrounded by land
Groundwater	Water that exists underground in saturated zones beneath the Earth's surface
Water table	Upper limit of groundwater
Inter-basin water transfer	Moving water from one drainage basin to another
Evaporation	Process whereby liquid water is converted into water

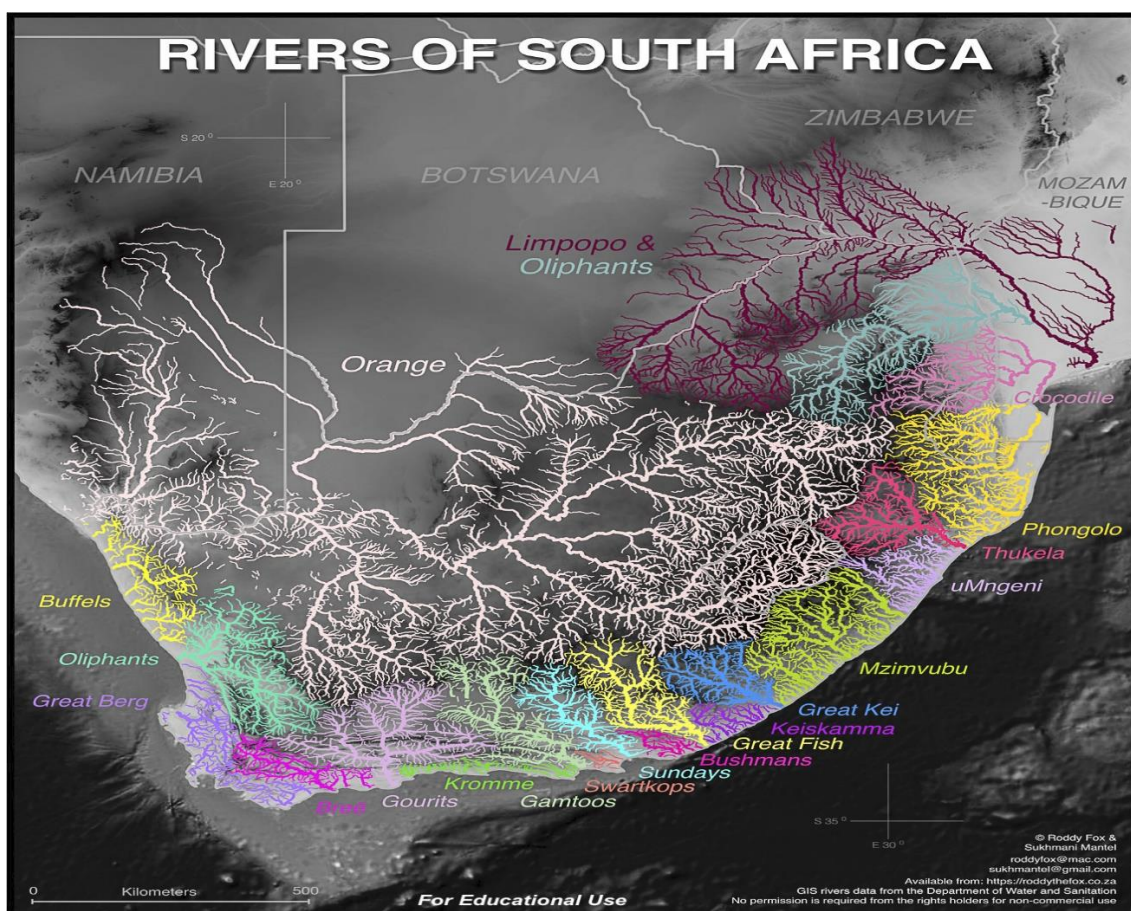
	vapour
Evaporation rate	Amount of water that is lost through evaporation in an area
Invasive Alien Plants	Plants, introduced into South Africa from other countries, that spread very quickly and crowd local plants

RIVERS, LAKES, AND DAMS IN SOUTH AFRICA

Rivers and lakes are natural storage areas for fresh water all over the world.

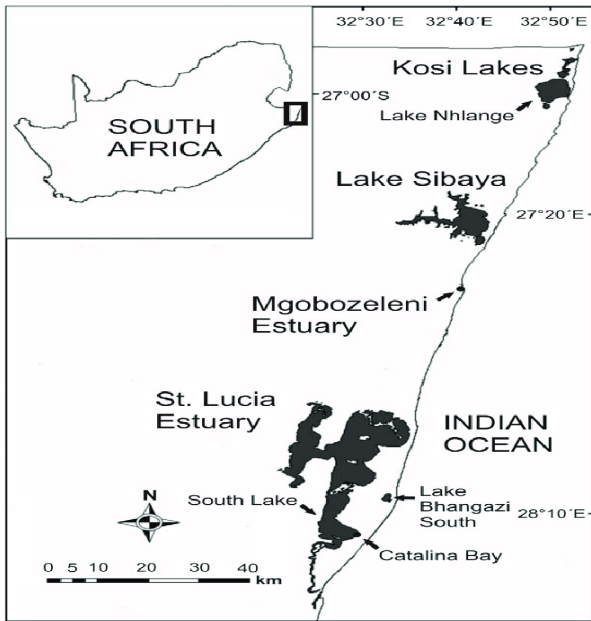
Large percentage of rural and urban population largely depends on rivers for fresh water supply.

Map showing network of rivers that supply fresh water to South African citizens.



Source: <https://weatherblog.co.za/water-management-rivers-dams/south-africa-water-management-areas-dam-river-systems-maps/>

MAP SHOWING SOME OF THE LAKES FOUND IN SOUTH AFRICA



This map shows a system of lakes that form part of iSimangaliso Wetland Park, a UNESCO World Heritage Site in the northern KwaZulu Natal, South Africa.

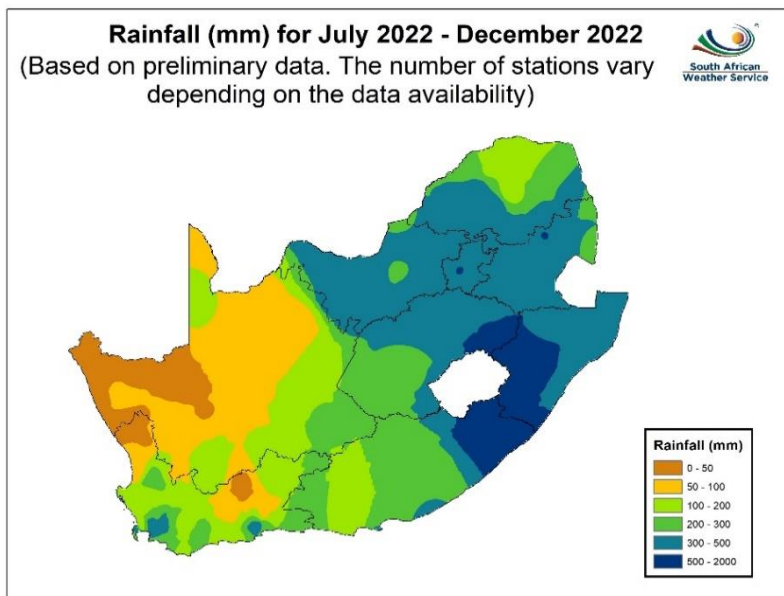
These lakes act as tourist attractions, and they are visited by many tourists annually which boost the tourism industry of the country.

These lakes also act as natural storage areas for fresh water and habitat to several plants and animal species.

Source: https://www.researchgate.net/figure/Map-of-Maputoland-The-Kosi-Lakes-Lake-Sibaya-and-St-Lucia-Estuary-are-Ramsa_fig6_51636234

Factors influencing the availability of water in South Africa

- Rainfall is the main source of fresh water in South Africa
- The eastern part of the country receives more annual rainfall compared to the western part.
- For this reason, more water is available in the eastern part than western part.

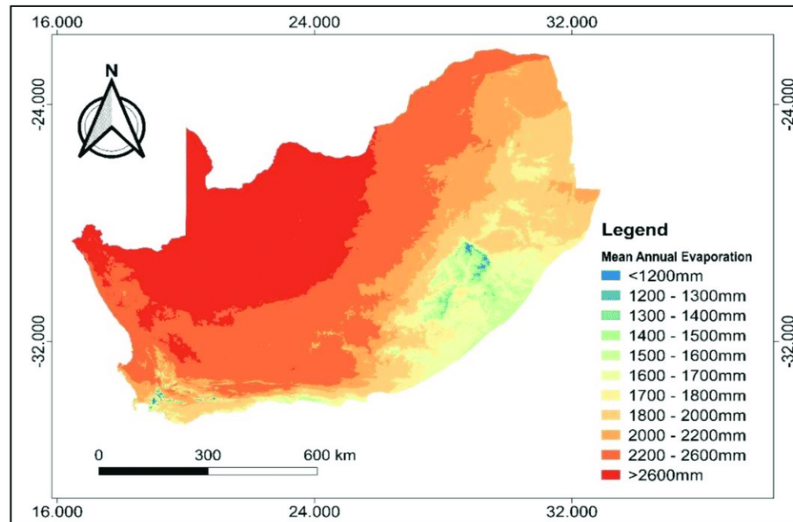


<https://www.weathersa.co.z/>

This map shows unequal distribution of rainfall in South Africa. The map clearly indicates that the eastern part of the country generally receives high amount of rainfall that western part.

EVAPORATION RATES

- High evaporation rates reduce the volume of water in rivers, lakes and dams which might lead to drying up of these water bodies.
- Hot summers in South Africa increase evaporation rates which reduce water levels in dams, rivers, and lakes.



https://www.researchgate.net/figure/Overall-evaporation-in-South-Africa-Data-Source-WRC-72_fig2_348464918

This map shows overall evaporation rates in South Africa. The map shows evaporation of above 2000 mm for most parts of the country which is very high.

Groundwater Availability

- Availability of groundwater increases freshwater access for mostly rural dwellers and farmers in South Africa
- Groundwater is extracted by drilling boreholes.
- An estimated 80 000 – 100 000 boreholes are being drilled annually in South Africa to access groundwater.



<https://www.aquaeearth.co.za/borehole/>

Above is an example of borehole drilling to extract groundwater

South Africa is a seasonal rainfall country.

-Most places receive summer rainfall except for the Western Cape which receives its annual rainfall in winter.

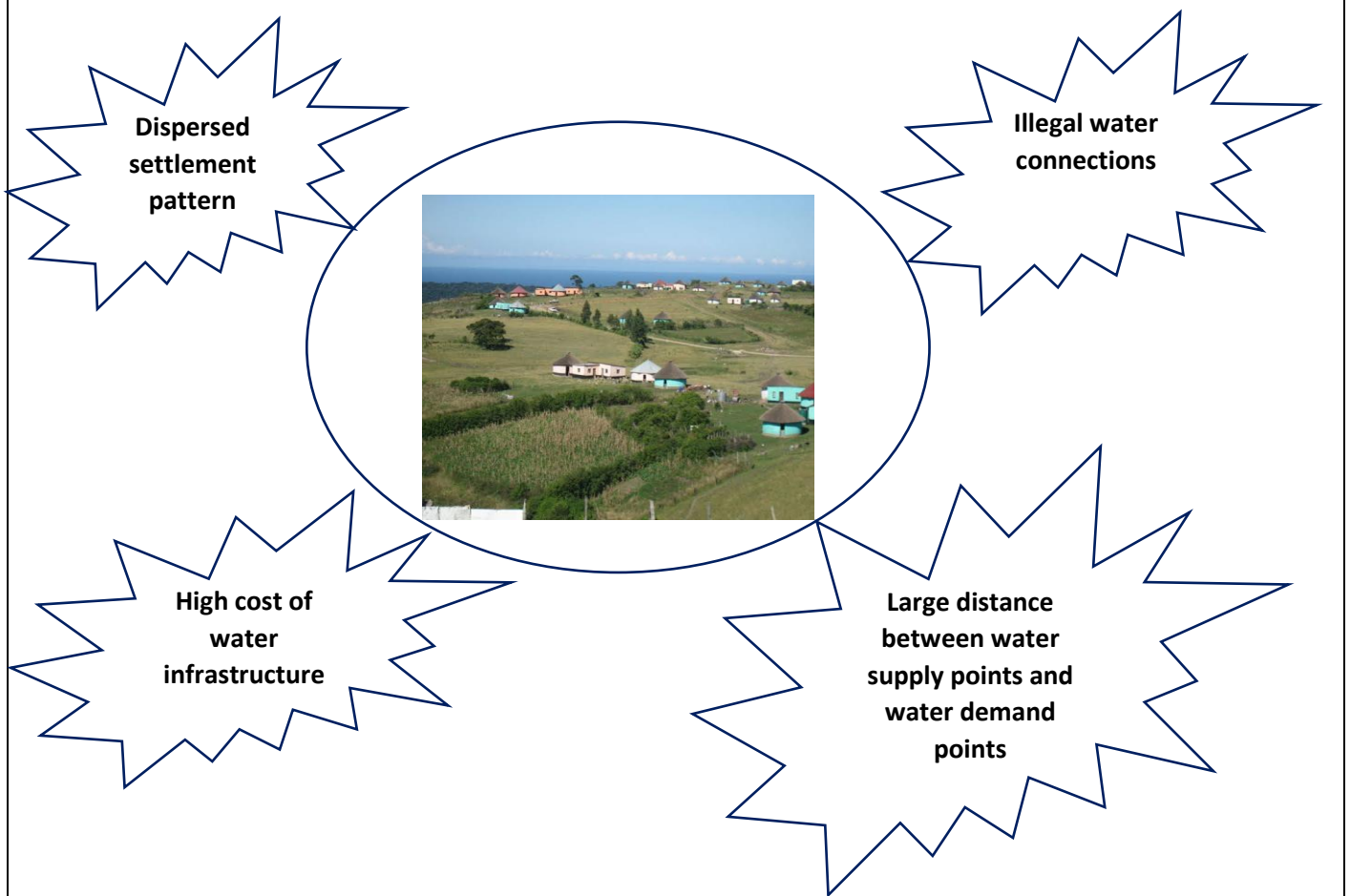
-To increase water supply during dry season, many dams have been built for water storage in rainy season.



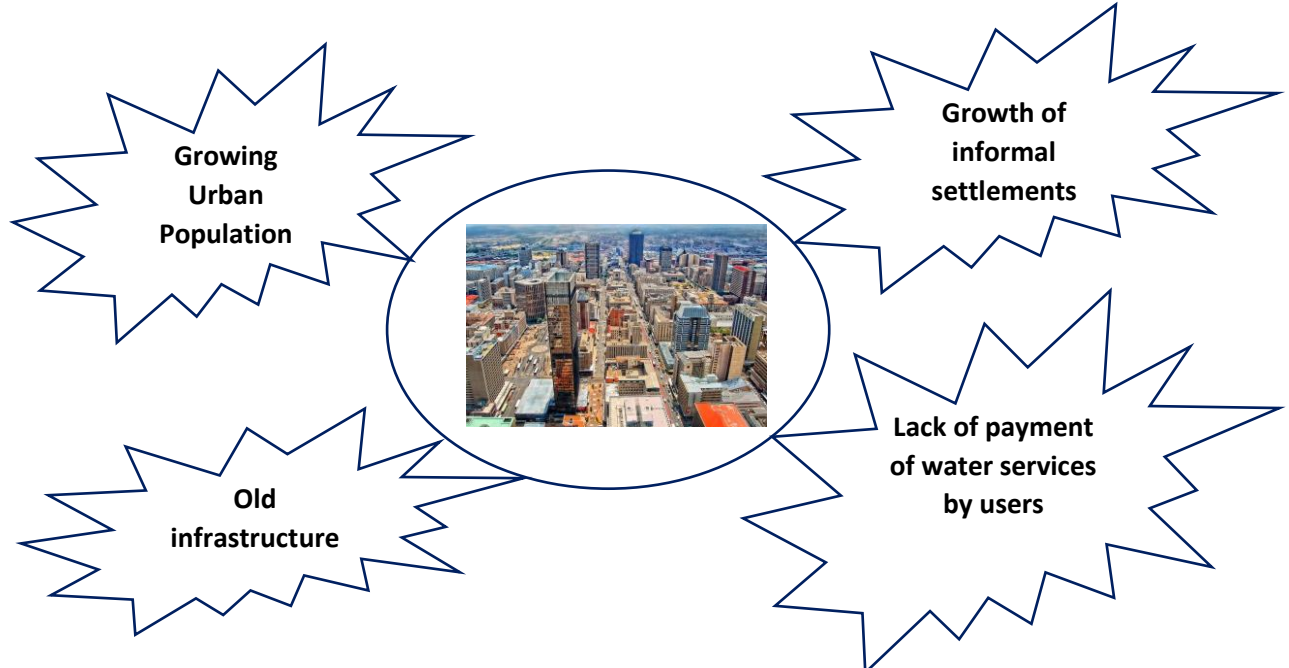
<http://www.gariepdam.sa>

Above is the Gariep dam (the largest in South Africa with approximately 5 340 000 megalitres capacity). The Gariep dam is in the Free State province and covers more than 370m²

CHALLENGES OF PROVIDING FREE BASIC WATER IN RURAL AREAS



CHALLENGES OF PROVIDING FREE BASIC WATER IN URBAN AREAS



THE ROLE OF GOVERNMENT AND MUNICIPALITIES

INTER-BASIN WATER TRANSFER

- This is the movement of water from one drainage basin to another.
- Inter-basin water transfer helps to transfer water from places of plenty to places of deficit.
- Inter – basin water transfer has its advantages and disadvantages.

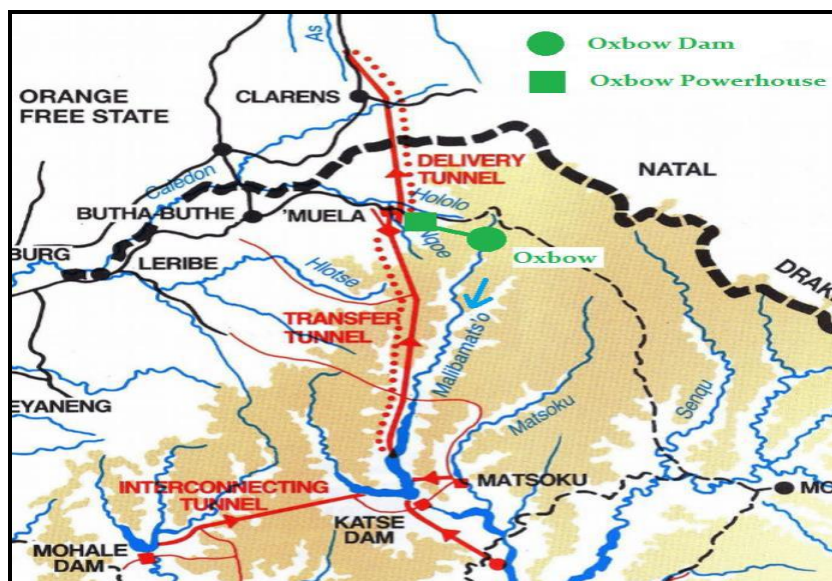
ADVANTAGES

- Water – deficient areas receive water.
- Preservation of endangered wild fauna and flora
- Repairing damaged ecological systems
- Recipient basins can use water for irrigation, electricity generation, industry, domestic etc.

DISADVANTAGES

- Inter – basin water transfer can lead to water shortages for donor basins in future.
- Salinization and aridification of donor basins
- Reduction in volume of water increases deposition leading to siltation of donor basins.

AN EXAMPLE OF AN INTER – BASIN WATER TRANSFER SCHEME IS (TUGELA – VAAL WT)



https://en.wikipedia.org/wiki/Lesotho_Highlands_Water_Project

DAM BUILDING

- A dam is a structure built across a river or stream to hold back water.
- South Africa relies heavily on its system of dams to supply its water needs.
- Dams ensures continuous availability of water even during dry seasons.



<http://www.google.com/search?q=Dam+building+in+South+Africa>

Examples of dam building projects

ROLE OF MUNICIPALITIES

WATER PURIFICATION

- Once water has been collected and transferred to a river basin or dam, it needs to be purified before it is distributed to consumers.
- Water boards such as **Rand water** and **Umngeni water** are responsible for purifying water.
- The main role of municipalities is to **distribute purified water to private users**.
- In areas where there is poor water infrastructure, municipalities use water tankers to deliver clean water to local communities.

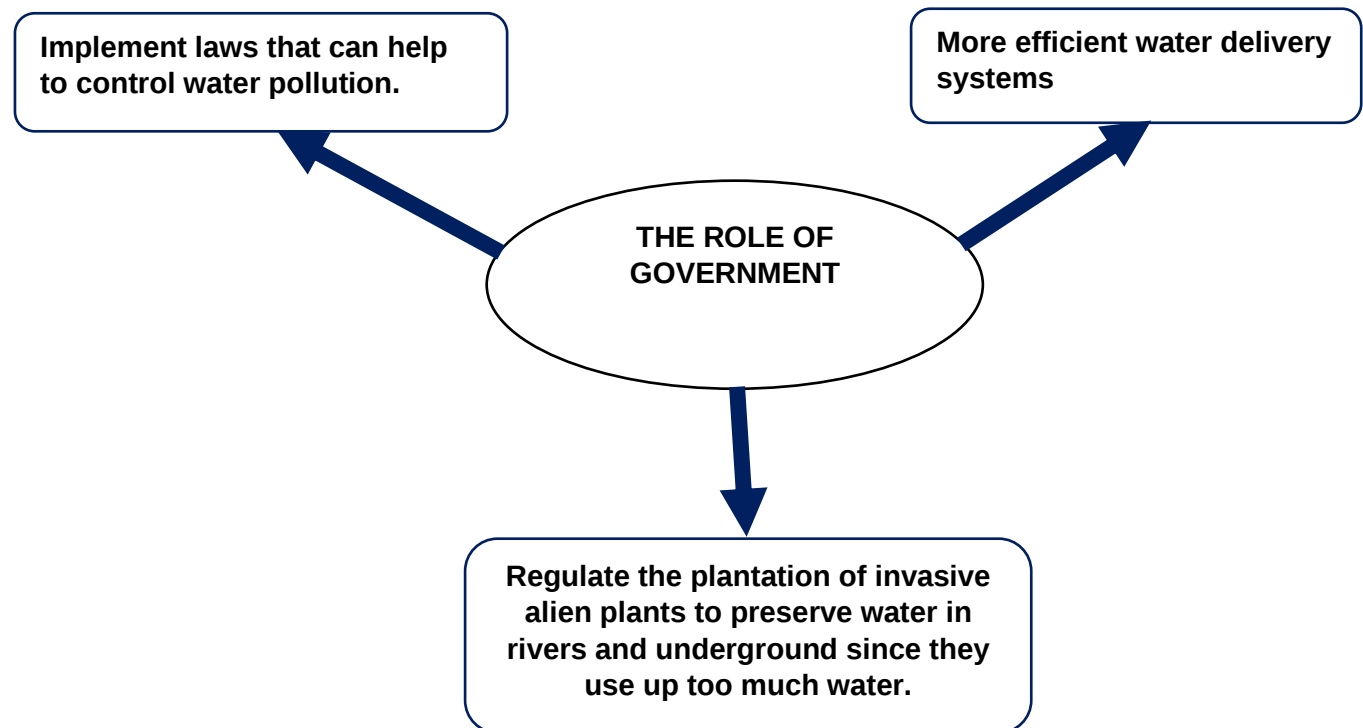


Source: <https://infrastructurenews.co.za/wp-content/uploads/sites/4/2016/11/wastewater-treatment-plant.jpg>

Water treatment plant

Water trucks supplying fresh water for local people.

STRATEGIES FOR SUSTAINABLE USE OF WATER



THE ROLE OF INDIVIDUALS

- Switching off taps when not using water
- Fix dripping taps and leaks
- Re-use dirty water for cleaning
- Use watering cans in gardens instead of pipes.
- Water plants in the evening
- Use bath water to water vegetables.
- Report leaking pipes to the municipality.
- Remove invasive alien plants.
- Educate others about using water sustainably.

GRADE 10		GEOGRAPHY
MARKS: 14		DURATION: 20 MINS
ACTIVITY ONE		
1.1	Read the case study below based on Komati water transfer scheme	
KOMATI WATER SCHEME AUGMENTATION PROJECT IN MPUMALANGA The KWSAP is a new water-transfer scheme from Rietfontein weir to the Matla Duvha Power stations. In Mpumalanga. The KWSAP will be able deliver an additional 57 million cubic metres of water a year to the Komati water scheme. The project involves the construction of an additional pump station at the Rietfontein weir, with a total flow rate capacity of 2.16 m³; a 600 mm nominal-diameter steel pipeline from the Rietfontein weir to the Matla power station over 12.9 km with a flow rate capacity of 0.474m³/s; a 1100 mm nominal-diameter steel pipeline from the Rietfontein weir to Duvha power station over 58.4 km with a flow rate capacity of 1684m³/s Source: https://www.engineeringnews.co.za/print-version/komati-water-scheme-augmentation-project-south-africa-2013-04-19		

- | | | | |
|-------|---|---------|-----|
| 1.1.1 | Define the term inter-basin transfer scheme | (1 × 2) | (2) |
| 1.1.2 | State TWO infrastructure project mentioned in the case study that will form part of the project | (2 × 1) | (2) |
| 1.1.3 | According to the article, what is the main objective of Komati Water Scheme Augmentation Project? | (1 × 2) | (2) |
| 1.1.4 | In a paragraph of approximately eight lines, discuss how Komati Water Scheme Augmentation Project will disrupt human activities in Rietfontein. | (4 × 2) | (8) |

[14]

GRADE 10
MARKS: 15

GEOGRAPHY
DURATION: 20 MINS

ACTIVITY TWO

1.1 Read the case Study below on sustainable water management

The Fight against invasive alien plants

Of the estimated 9000 plants introduced to this country, 198 are currently classified as being invasive. It is estimated that these plants cover about 10% of the country and the problem is growing at an exponential rate.



The fight against invasive alien plants is spearheaded by the Working for Water (WfW) programme launched in 1995 and administered previously through the department of water affairs and forestry and now the department of Environmental affairs.

This programme works in partnership with local communities, to whom it provides jobs, and with Government departments including the departments of Environmental Affairs and Tourism, Agriculture, and Trade and Industry.

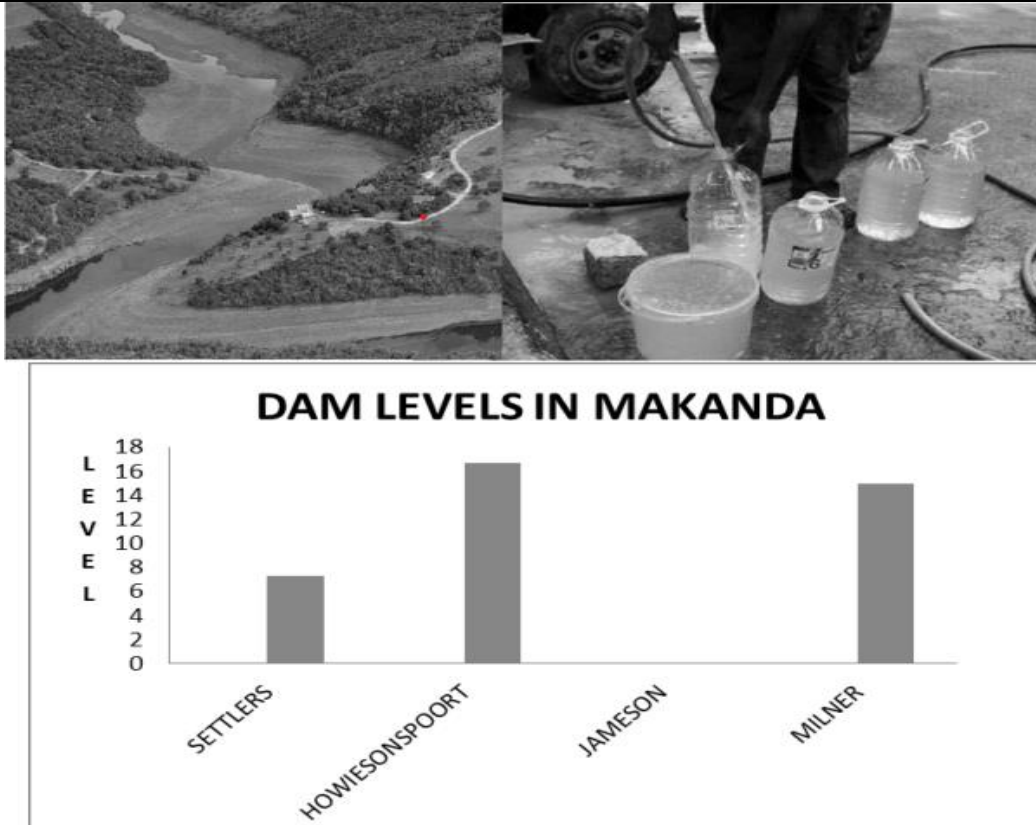
Source: <https://www.dffe.gov.za/projectsprogrammes/wfw>

- | | | | |
|-------|--|---------|-----|
| 1.1.1 | What are invasive alien plants | (1 × 2) | (2) |
| 1.1.2 | Name the organisation that is spearheading the fight against invasive alien plants | (1 × 1) | (1) |
| 1.1.3 | Explain why there is an urgent need to fight against invasive alien plants | (2 × 2) | (4) |
| 1.1.3 | In a paragraph of approximately eight lines, outline other sustainable water management strategies that the government together with local communities can implement to manage water resources in South Africa | (4 × 2) | (8) |

[15]

ACTIVITY THREE

1.1 Refer to the infographic below depicting water crisis in Eastern Cape



Makhanda is currently using 18 megalitres of water each day – about 180 litres per person. The crippling drought has nearly emptied dams and it is unlikely to recover until/unless we receive significant rainfall. And so we are restricting consumption to 50 litres per person a day with immediate effect, to be able to use the Settlers supply for longer and push back the date at which it ceases to be viable. We are also trying to stabilise the output as well as increase the number of town reservoirs filled by the James Kleynhans Purification Works to supply parts of the city immediately, alleviating some pressure on Settlers.

Source: <http://www.makana.gov.za/water-crisis>

1.1.1 Refer to the bar graph and write down the following:

- a) The driest dam (1 × 1) (1)
- b) The fullest dam (1 × 1) (1)

1.1.2 List TWO ways Makhanda Municipality is currently using to manage the water crisis (2 × 1) (2)

1.1.3 Explain TWO uses of dams. (2 × 2) (4)

- 1.1.4 In a paragraph of approximately EIGHT lines, discuss how people can sustainably save water at home (4 × 2) (8)
- [16]**

GRADE 10		GEOGRAPHY
MARKS: 16		DURATION: 20 MINS
ACTIVITY FOUR		
1.1	Carefully read the case study based on water transfer scheme in South Africa	
A complicated canal and tunnel system takes water from the Gariep Dam to the Nelson. Mandela Metropolitan area via the Fish and Sundays Rivers. This system transfers water from the Gariep-Orange River basin to the Fish and Sundays River basins. The extra water is used for irrigation in the rural areas as well as supplying the urban centres in the Nelson. Mandela Metropolitan area. -Water is piped from the Gariep Dam into the Great Fish River basin. -A weir, Elandsdrift, diverts water from the Great Fish River into a canal and through a tunnel into the Little Fish River. -A pipeline pipes water into a canal and into Darlington Dam on the Sundays River -A pipeline pipes water from the Sundays River to the Nelson Mandela Metropolitan Area		

- 1.1.1 Explain what is meant by water transfer. (1 × 2) (2)
- 1.1.2 Mention ONE municipality and the province that benefits from this water transfer (2 × 1) (2)
- 1.1.3 Give TWO activities that water is used for in this municipality. (2 × 1) (2)
- 1.1.4 Explain the way water is transferred from the Great Fish River basin to the Sundays River basin. (2 × 2) (4)
- 1.1.5 There is an increased demand for water in South Africa, but the supply of usable water is decreasing. Discuss THREE human and physical factors influencing the availability of water in South Africa. (3 × 2) (6)
- [16]**

GRADE 10
MARKS: 15

GEOGRAPHY
DURATION: 20 MINS

ACTIVITY FIVE

1.1 Refer to the photograph below and answer the questions that follow



<https://blog.wika.us/knowhow/how-does-a-hydroelectric-plant-work-a-brief-history-and-basic-mechanics-of-hydropower/>

- 1.1.1 Give a suitable term that describes electricity generated from water. (1 × 1) (1)
- 1.1.2 Is water a renewable or non-renewable resource? (1 × 1) (1)
- 1.1.3 What is water used for in photographs above? (1 × 1) (1)
- 1.1.4 Provide TWO other examples of how rural communities use their water resources excluding the one illustrated by the photograph above. (2 × 1) (2)
- 1.1.5 Briefly explain how groundwater contributes to the availability of water in South Africa (1 × 2) (2)
- 1.1.6 In a paragraph of approximately EIGHT lines suggest how individuals can sustainably save water at home, garden and in the community (4 × 2) (8)

[15]

FLOODS

Flood: is defined as a situation where there is too much water on the surface at a particular time.



Source:

<https://th.bing.com/th/id/R.4591f72b543a56e753bc4d974b2c4fcd?rik+Zw5o175VX2uAqg&pid+ImgRaw&r+0>

- Floods occur when water cannot drain out in time and accumulates above the ground leading to human and environmental impact.
- When there are high tides and strong winds on coastal areas it leads to **coastal floods** on low lying areas e.g. tsunami.
- Some floods occur on the banks of the river. This common kind of flooding is termed **river flooding**.

CAUSES OF FLOODING- PHYSICAL AND HUMAN

- Floods are caused by physical and human factors. A combination of these factors leads to high risk of floods in rivers.
- Physical causes include natural causes such as type of precipitation, relief, type of soils, melting snow and vegetation cover.
- Human causes include poor farming practices, deforestation, and poor drainage systems.

PHYSICAL CAUSES

Type of precipitation: the sudden heavy rain over several days causes rivers to flood. These heavy rains emerging from weather phenomenon such as tropical storms cause river levels to rise quickly leading to **flash floods**.

Relief: low-lying areas are susceptible to floods since they cause water to accumulate on the level ground.



Melting snow:
global warming results to snow melting into rivers while excessively increasing the volume of water flowing.

Source: <http://www.bing.com/images/search?view>

Vegetation cover: sparse vegetation promotes high surface runoff, leading to floods. Dense vegetation promotes the soaking of water into the ground.

HUMAN CAUSES

Poor farming practices: human activities such as overgrazing and cultivation, soil erosion result to the siltation of water sources hence floods.

Deforestation:

clearing of trees
from the surface
results to soil
erosion which silts
up rivers that can
cause overflows
and floods.



Source: <http://www.bing.com/images/search?view>

Poor drainage systems: urban areas are the most affected with floods due to poor storm-water drainage systems.

CHARACTERISTICS OF FLOODS

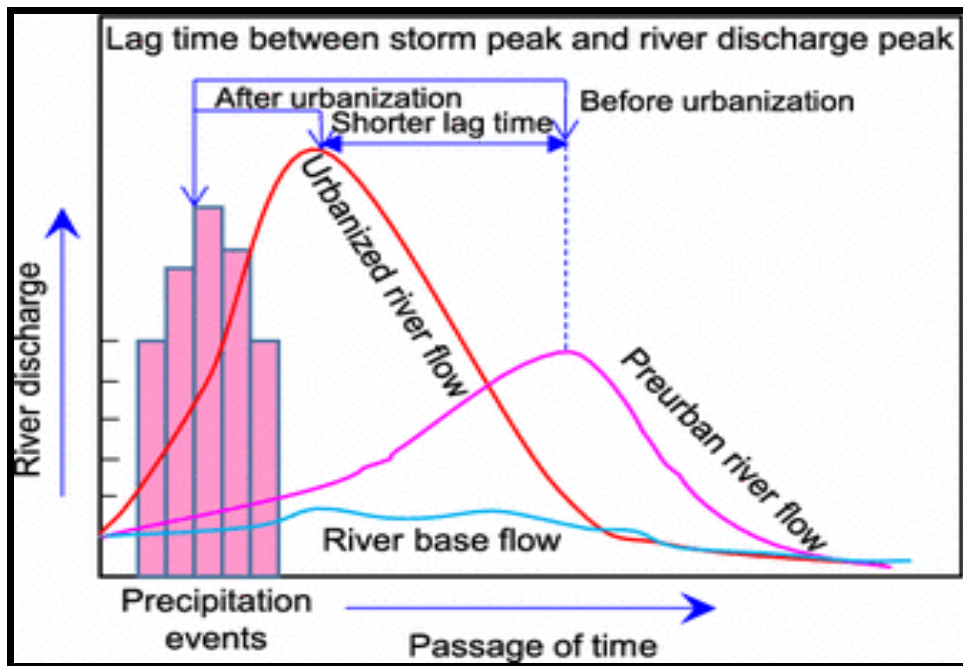
KEY CONCEPTS

Flood hydrographs: a graph showing a river's discharge over time.

Discharge: the amount of water across the width of a river flowing past a given point.

A hydrograph

- River discharge rises soon after the rainstorm puts water into a river basin.
- The peak of a hydrograph shows the highest flow in m³/ second.
- There is a lag between the rainstorm peak and the discharge peak.
- Discharge increases rapidly, before the peak and decrease slowly after the flood has peaked.
- Before an area is urbanized, the hydrograph will be flatter due to vegetation absorbing a lot of water.
- After an area is urbanized, the hydrograph will be steeper due to sparse vegetation promoting surface runoff.



Source: <https://www.researchgate.net/figure/Hydrological-effect-of-urbanization-on-river-flow>

NB: A STORM HYDROGRAPH IS NOT FOR EXAMINATION PRUPOSE!

IMPACT OF FLOODS

SOCIAL	ECONOMIC	ENVIRONMENTAL
• Loss of human life • Loss of livestock • Loss of crops • Damage to property • Disruption of electricity	• Transportation of goods disrupted. • Damage to industries • Increase in food prices. • Insurance costs • Decreased tourists	• Erosion of riverbanks • Damage to wetlands • Aquatic habitats destroyed. • Lower water quality • Removal of vegetation

MANAGING FLOODING

Ways of managing floods include:

- Taking steps to reduce flooding.
- Cope with floods during their occurrence
- Awareness to people whose lands, homes, businesses, and services are at risk from flooding.

Ways of preparing for floods include:

- Adjusting to simple ways of purifying water
- Stocking up canned food and bottled water
- Stocking up enough medication
- Stocking up batteries
- Having mosquito nets to reduce the risk of malaria.

A CASE STUDY

Durban Floods: Is It a consequence of Climate Change?

South Africa's government has declared a state of disaster in an area in the east of the country which was hit by severe flooding over the past week, leaving hundreds

Most of the destruction has been in the Durban area of KwaZulu-Natal province, the country's third most populous city.



dead and causing major damage.

President Cyril Ramaphosa claims the disaster "is part of climate change", but some locals have blamed poor infrastructure for the scale of the flooding. An excess of 300mm of rainfall which was dumped over a 24-hour period on 11 April 2022 triggered the floods.

Some residents have blamed the state of local infrastructure for the disaster, citing a lack of progress in improving drainage systems, as well as strengthening roads and poorly built housing. Durban's mayor, Mxolisi Kaunda, said one of the factors to the disaster is a landslide.



Source: <https://www.bbc.com/news/61107685>

GRADE 10
MARKS: 16

GEOGRAPHY
DURATION: 20 MINS

ACTIVITY ONE

1.1 Refer to the cartoon based on floods and answer the questions that follow



Source: <http://th.bing.com>

- 1.1.1 Define the concept *flood*. (1 × 2) (2)
- 1.1.2 The possible phenomenon evident in the cartoon is likely to be coastal flooding. Justify the statement. (2 × 2) (4)
- 1.1.3 How do the people in the cartoon suddenly express their worry over their relaxation time? (1 × 2) (2)
- 1.1.4 Identify TWO natural causes of floods that are depicted in the cartoon. (2 × 1) (2)
- 1.1.4 In a paragraph of approximately SIX lines explain the social and environmental effect of coastal flooding. (3 × 2) (6)

[16]

ACTIVITY TWO

2.1. Read the case study below and answer the questions that follow.

INFORMAL SETTLEMENTS FLOODED BY HEAVY RAINS

Residents of informal settlements battled against flooding on Thursday as heavy rains fell across Cape Town.

The city's Disaster Risk Management Centre on Thursday said that approximately 500 structures have been affected. In Masiphumelele's wetlands residents piled up stones, tyres, and old wood to make paths.



Zimkhitha Sihlo lives with her three-month-old baby and 60-year-old mother. She says the rain wet most of their clothes stored in suitcases on the floor. When GroundUp visited she was using a paraffin stove to warm up the house. Her floor was wet. Moses Makundo from Zimbabwe was sitting with his wife and brother outside in front of a fire. In their two-room shack they had placed most of their clothes on top of the bed. Bricks are used to elevate the bed, so it doesn't get wet when the water comes in.

Source: <https://www.groundup.org.za/article/informal-settlements-flooded-heavy-rains/>

- 2.1.1. What physical factor triggered (caused) flooding over the informal settlements? (1x1) (1)
- 2.1.2. Explain how the factor identified in QUESTION 2.1.1 above could have caused flooding. (2x2) (4)
- 2.1.3. Quote ONE piece of evidence from the picture and ONE from the text supporting that people faced difficulties to walk in between the settlements. (2x2) (4)
- 2.1.4. Discuss THREE precautionary measures and management strategies that the victims could have exercised in the event of flooding. (3x2) (6)
- [15]**