

Grade 11 Geography

Study Notes — Term 3 & Term 4

Development Geography • Resources and Sustainability

Based on the WCED Revision Booklet, cross-checked against the CAPS topic list. Topics missing from the booklet have been added and marked ? NEW.

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Term 3: Development Geography

1. The Concept of Development

Development = means positive change over time in a country's economy, society, and people's well-being – improving income, health, education, and opportunities.

Two components of development:

Standard of living	Quality of life
Material well-being — income, savings, possessions (car, TV, washing machine), type of home	General well-being — education, health care, access to services/utilities, environmental quality, political & religious freedom

The Brandt Line

divides the world into:

- **Developed North** — high GNP, low birth & death rates, high literacy, exports manufactured goods, good access to water/sanitation, mostly urbanized, more elderly people, larger tertiary sector.
- **Developing South** — low GNP, high birth rates, falling death rates, low literacy, limited water/sanitation access, mostly rural, more children, larger primary sector.

Indicators used to measure development:

Indicator	Meaning
GDP (Gross Domestic Product)	Total value of goods & services produced inside a country in one year
GNP (Gross National Product)	GDP + income earned from abroad (foreign investments, remittances)
HDI (Human Development Index)	Composite index of standard of living, life expectancy and education
GINI Coefficient	Measures inequality (usually of income) within a country — 0 = perfect equality, 1 = perfect inequality
Infant Mortality Rate	Number of infants under 12 months who die per 1 000 live births
Life Expectancy	Average number of years a person is expected to live

? Extra point: No single indicator gives a full picture — geographers usually combine an economic indicator (e.g. GDP) with a social indicator (e.g. HDI) to get a more balanced view of a country's development.

2. Frameworks for Development

Factors that influence how developed a country becomes:

- Access to resources (minerals, agriculture, fisheries)
- Energy availability and reliability
- History (e.g. colonialism, past conflict)
- Trade imbalances
- Population growth (rapid growth can strain services and slow development)
- Education and training
- Natural resource limitations
- Environmental degradation

Extra point: These factors interact — e.g. a country with poor education and training will struggle to add value to its raw materials, which worsens trade imbalances and keeps it dependent on exporting cheap primary goods.

3. Trade and Development

International trade = exchange of goods and services between countries.

- **Imports** = goods brought into a country.
- **Exports** = goods sent out of a country.

Balance of trade = the difference in value between a country's imports and exports.

- **Negative balance of trade** → value of imports > value of exports (country spends more than it earns from trade).
- **Positive balance of trade** → value of exports > value of imports (country earns more than it spends).

Types of trading relationships:

Term	Definition
Free trade	Goods, capital and labor move between countries without regulations/barriers
Trade barriers	Restrictions on trade — tariffs (taxes on imports), quotas (limits on quantity), subsidies (government support that makes local goods artificially cheap)
Fair trade	Trade between LEDCs and MEDCs where producers (often in developing countries) are guaranteed a fair price for their goods

Globalization:

- The process links economies, societies and technologies across the world, making political and geographic boundaries less important.

Impact of globalization on development:

Benefits (mainly to MEDCs)	Costs (mainly to LEDCs)
MEDCs become wealthier	Poverty persists in LEDCs
Access to cheap labor from LEDCs	Brain drain — skilled workers leave LEDCs for

Benefits (mainly to MEDCs)	Costs (mainly to LEDCs)
	MEDCs
—	Trade imbalances continue
—	LEDCs remain dependent on MEDCs
—	LEDCs mostly export raw materials (low value) while importing expensive manufactured goods
—	Inflation and price increases in LEDCs

? Extra point on COVID-19 and globalization (useful for exam-style questions): Globalization spread the coronavirus rapidly because of high volumes of international air travel, tourism and trade links between countries — the virus could move from one country to another within days. The economic impact was worse in LEDCs because they have weaker health systems, less savings/government funding to support businesses and workers, greater dependence on informal-sector jobs (no safety net during lockdowns), and greater reliance on tourism and raw-material exports, both of which collapsed during the pandemic.

4. Development Issues and Challenges

Effect of development on the environment:

- **Air pollution** — from coal-burning power stations → contributes to acid rain, global warming, and climate change.
- **Water pollution** — harmful to humans, animals, plants and aquatic life.
- **Land pollution** — caused by dumping of refuse/builder's rubble, poor agricultural practices, industry and mining.
- **Deforestation** — leads to soil erosion and reduced oxygen production.
- **Loss of natural space** — land is converted for homes, industry, infrastructure, mining, farms and pastures.
- Development increases the supply of material goods, but this can happen at the cost of a deteriorating quality of life (pollution, overcrowding, stress, loss of green space).

5. Role of Development Aid

Development aid = aid given by governments and agencies to support the economic, environmental, social and political development of developing countries.

Types of aid:

Type	Description
Bilateral aid	Given directly from one country's government to another — includes grants, loans, technical assistance
Multilateral aid	Given by large international organizations (UN, World Bank, IMF), often pooled from many donor countries
Conditional aid	Aid with performance conditions attached (e.g. policy reforms, human rights standards)

When aid is effective:

- Builds technical skills and trains personnel
- Provides humanitarian relief in emergencies
- Encourages industrial development and creates jobs
- Improve infrastructure
- Supports better economic/social policy
- Funds investment and development projects
- Develops power supply, clean water and sanitation

When aid is ineffective:

- Poor countries struggle to repay loans (debt burden)
- Aid doesn't reach the poorest people who need it most
- Corruption — officials misuse aid funds
- Conditions may force projects to be run by foreign companies, with profits/resources flowing back to the donor country
- Aid may be "tied" — recipient must buy goods/services from the donor country, limiting real benefit

6. Geographical Skills — Mapwork Skills & Using Atlases

 **NEW** — was missing from booklet content, added per CAPS

Mapwork skills you need for Grade 11:

- **Grid references** — using latitude/longitude and alphanumeric grids (e.g. block C2) to locate features on a topographic map.
- **Scale** — calculating real-world distance from map distance using the map's scale (e.g. 1:50 000 means 1 cm on the map = 50 000 cm / 500 m on the ground).
- **Contour lines & relief** — reading elevation, identifying steep vs gentle slopes, valleys and ridges.
- **Land use identification** — recognizing symbols for mining (open-cast pits, mine dumps), farming, settlements, roads, rivers, dams etc. (as seen in the Witbank/eMalahleni topographic map activity).
- **Cross-sections** — drawing a side-view profile of the land along a given line on the map.
- **Calculating area** — using grid squares to estimate the area of a feature (e.g. size of a dam or mine).
- **Using an atlas** — locating countries/regions, reading thematic maps (climate, population, resources, vegetation), and comparing map layers to draw geographic conclusions (e.g. linking rainfall maps to farming patterns).

Term 4: Resources and Sustainability

1. Using Resources

NEW — added per CAPS, general resource concepts underpin the rest of this term

A **resource** = anything from the natural or human environment used to satisfy human needs.

Types of resources:

Type	Definition	Examples
Renewable	Naturally replenished over a short time / will not run out if managed sustainably	Sunlight, wind, water, soil (if cared for), forests (if replanted)
Non-renewable	Finite — takes millions of years to form, cannot be replaced once used	Coal, oil, natural gas, minerals

Sustainable use of resources

means using resources in a way that meets the needs of the present without compromising the ability of future generations to meet their own needs. This involves:

- Conserving non-renewable resources
- Preventing overexploitation of renewable resources (e.g. overgrazing, overfishing)
- Reducing pollution and waste
- Promoting recycling and efficient use

This concept is the foundation for the rest of Term 4 — soil, energy and mineral resources all need to be managed sustainably.

2. Soil and Soil Erosion

Soil erosion = the removal of the top layer of soil by water, wind or ice, so that plants can no longer grow because nutrients have been lost.

Causes of soil erosion:

Human	Physical	Animal	Historical
Deforestation	Wind	Overgrazing	Occurred over millions of years naturally
Poor farming practices	Ice	Trampling paths	Increasing demand for soil (population growth)
Urban development	Water	Overstocking	More land needed for settlement
Road construction	Steep slopes	—	—
Mining	Low rainfall	—	—

Effects of soil erosion:

- Fertile topsoil removed → less land available for farming
- Increased pressure on remaining soil
- Reduced food production
- Dams silt up (fill with sediment)
- Increased sand deposits on the continental shelf
- River ecosystems destroyed
- Drinking water polluted

Managing/preventing soil erosion:

Strategy	How it helps
Planting trees/vegetation	Roots bind soil, canopy reduces raindrop impact
Contour ploughing	Ploughing along the contour (not up/down the slope) slows water runoff
Crop rotation	Growing different crops preserves soil nutrients
Retaining walls	Physically prevent soil from being washed/blown away
Reducing livestock numbers	Prevents overgrazing
Windbreaks	Rows of trees reduce wind speed and wind erosion

3. Conventional Energy Sources

Conventional energy sources = the traditional, most widely used sources: fossil fuels (coal, oil, gas), water (hydroelectric) and nuclear power. Coal is the most widely used in South Africa.

South Africa's electricity production mix:

- Coal: 92%
- Nuclear: 5%
- Hydro: 2%
- Other: 1%

Location of major power plants:

Type	Examples
Thermal (coal)	New Castle, Sasolburg/Vereniging, Witbank/Middelburg, Lephalale-Waterberg
Hydroelectric	Palmiet, TUVA, Van der Kloof, Muela, Gariep
Nuclear	Koeberg

How thermal (coal) electricity is generated:

1. Coal extracted from a mine

- 2. Coal pulverized into a fine powder
- 3. Coal burned in boilers to heat water
- 4. Water turns into steam
- 5. Steam turns the blades of a turbine
- 6. An electrical current is produced
- 7. Electricity sent to homes and factories via power lines

Impact of coal mining:

- Open-cast mining scars the landscape
- Land covered by mine dumps
- Ecosystems disrupted
- Dust reaches the atmosphere
- Noise pollution

Impact of thermal power stations:

- Unsightly, take up large areas of land
- Use large amounts of water
- Produce greenhouse gases (contributing to climate change)
- Produce harmful acid rain

Nuclear energy — advantages vs disadvantages:

Advantages	Disadvantages
Sustainable — no shortage of fuel	Potentially dangerous
Produces large amounts of energy	Nuclear waste disposal is problematic
Saves valuable non-renewable fossil fuels	Very expensive to build
Reduces carbon emissions	Vulnerable to earthquakes/tsunamis
Clean — no greenhouse gas emissions	Radiation causes serious health risks; strong negative public perception

4. Non-Conventional Energy Sources

Non-conventional energy source = a less commonly used, renewable energy resource. Examples: wind, solar, tidal, biomass, geothermal energy.

Wind energy in South Africa:

- 33 wind farms at various stages of development
- Best wind potential: Western Cape, Northern Cape, Eastern Cape, KwaZulu-Natal
- Examples: Darling (WC), Cookhouse (EC), Copperton (NC)

Future of non-conventional energy in SA:

- Enormous potential to expand wind and solar operations
- Could reduce electricity costs over time
- Reduces negative environmental impact of ageing coal-fired power stations

Economic impact of non-conventional energy:

Advantages	Disadvantages
Creates jobs	Job losses in coal mining/coal power
Lower pollution-reduction costs	Weather-dependent — can be unreliable
Free energy source (sun, wind)	High start-up costs for new plants
No water needed	—
Lower public health/safety costs	—
Lower cost per unit of electricity long-term	—

Environmental impact of non-conventional energy:

Advantages	Disadvantages
Renewables won't run out	Wind turbines create noise pollution
Clean, no greenhouse gases	Turbines can harm/kill birds, bats, insects
Land between turbines is still usable for farming	Solar panel glare can harm/blind birds & insects
Less habitat/biodiversity damage	Large wind/solar farms reduce visual/aesthetic value of landscapes
No air/water pollution during operation	—

5. Energy Management in South Africa

 **NEW** — required CAPS topic not covered in the original booklet

South Africa faces serious challenges in managing its energy supply:

- **Ageing infrastructure** — most coal-fired power stations are old, poorly maintained, and prone to breakdowns.
- **Load shedding** — Eskom (the state power utility) has implemented scheduled power cuts since demand regularly exceeds reliable supply capacity.
- **Over-reliance on coal** — coal supplies ~92% of electricity, making SA's energy sector a major source of greenhouse gas emissions and vulnerable to coal price/supply shocks.
- **Integrated Resource Plan (IRP)** — the government's long-term energy planning policy, which sets targets for diversifying the energy mix (increasing the share of renewables, gas and other sources, and reducing reliance on coal over time).
- **Renewable Energy Independent Power Producer Procurement Programme (REIPPPP)** — a government programme that allows private companies to build renewable energy projects (mostly wind and solar) and sell electricity to the national grid, helping to diversify supply without the state having to fund all new capacity itself.
- **Energy efficiency initiatives** — public campaigns and regulations to reduce electricity demand (e.g. efficient appliances, solar water heating incentives, demand-side management).
- **Managing the transition sustainably** requires balancing:
 - Economic needs (jobs in coal mining regions like Mpumalanga)
 - Environmental needs (reducing emissions, meeting international climate commitments)
 - Social needs (reliable, affordable electricity for households and industry)

Exam tip: If asked to "discuss how South Africa can manage its energy resources sustainably," combine points from both non-conventional energy sources AND this section — e.g. diversify the energy mix, invest in renewables, improve efficiency, upgrade/maintain existing infrastructure, and manage the socio-economic impact on coal-dependent communities.

6. Geographical Skills — Geographical Information Systems (GIS)

NEW — required CAPS topic, completely missing from the booklet

What is GIS?

A **Geographical Information System (GIS)** = a computer-based system used to capture, store, manage, analyze and display spatial (location-based) data.

Key GIS concepts:

Term	Meaning
Spatial data	Data that describes the location of a feature (e.g. coordinates of a school)
Attribute data	Data that describes the characteristics of a feature (e.g. the school's name, number of learners) — this is the non-spatial information linked to a location
Layers	GIS data is organized in layers (e.g. a roads layer, a rivers layer, a land-use layer) which can be switched on/off and combined to analyze relationships
Remote sensing	Collecting data about the Earth's surface from a distance, e.g. using satellite imagery or aerial photographs

Term	Meaning
GPS (Global Positioning System)	Satellite-based system used to determine exact location (latitude, longitude, altitude) — often used to collect the spatial data that feeds into GIS

How GIS is used:

- Urban and regional planning (e.g. deciding where to build new housing or roads)
- Disaster management (e.g. mapping flood-risk zones)
- Environmental monitoring (e.g. tracking deforestation or soil erosion over time)
- Agriculture (e.g. precision farming, monitoring crop health)
- Mining (e.g. mapping mineral deposits and planning extraction)
- Business (e.g. choosing the best location for a new store based on population density layers)

Advantages of GIS:

- Allows quick, accurate spatial analysis of large amounts of data
- Data layers can be combined to reveal patterns not visible on a single map
- Easy to update as new data becomes available
- Supports better-informed decision-making

 *Link to mapwork: On a topographic map, the mine boundary, road, or dam symbol you see is essentially spatial data; details like the mine's name or the year it opened would be its attribute data — this is exactly the kind of question asked in Revision Activity 2, Question 2.7 in your booklet ("Give ONE example of attribute data with respect to mine course in block D2").*

Quick Concept Glossary

All key terms in one place, for quick revision.

Term	Definition
Development	The stage a country has reached economically, culturally, socially and technologically
Standard of living	Material well-being of a person (possessions, savings, home)
Quality of life	General well-being — education, healthcare, freedoms, environment
MEDC	More Economically Developed Country
LEDC	Less Economically Developed Country
GDP	Total value of goods/services produced in a country in one year
GNP	GDP + income from abroad
HDI	Composite measure of standard of living, life expectancy and education
Infant mortality	Deaths of infants under 12 months per 1 000 live births
GINI Coefficient	Measure of income inequality in a country
Life expectancy	Average number of years a person is expected to live
Balance of trade	Difference in value between a country's imports and exports
Positive balance of trade	Exports worth more than imports
Negative balance of trade	Imports worth more than exports
Free trade	Trade without regulations/barriers
Trade barriers	Tariffs, quotas, subsidies that restrict trade
Fair trade	Trade ensuring producers get a fair price
Globalization	The linking of the world's economies, societies and technologies, reducing the importance of borders
Development aid	Aid from governments/agencies to support development of poorer countries
Soil erosion	Removal of topsoil by water, wind or ice
Conventional energy source	Widely-used traditional energy source — coal, oil, gas, hydro, nuclear
Thermal electricity	Electricity generated by burning coal to produce steam that turns turbines
Non-conventional energy source	Less commonly used, renewable energy source — wind, solar, tidal, biomass, geothermal
Resource	Anything from the natural or human environment used to meet human

Term	Definition
	needs
Renewable resource	Naturally replenished; won't run out if managed sustainably
Non-renewable resource	Finite; cannot be replaced once used up
GIS	Computer-based system for capturing, storing, analyzing and displaying spatial data
Spatial data	Data describing the location of a feature
Attribute data	Data describing the characteristics of a feature