# Population and Natural Resources

Lesson plan and teacher's notes · Form 1 Geography · 1 period of 40 minutes

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| **School** | (write school name) | **Teacher** | (write name) |
| **Date** | (date) | **Class** | Form 1 |
| **Subject** | Geography | **Enrolment** | Boys ___ Girls ___ Total ___ |
| **Time** | 40 minutes | **Topic** | Population and Natural Resources |

Learners explain how a growing population raises the demand for food, water, energy, land and raw materials, describe what happens when resources are overused, and suggest ways of keeping a balance. The lesson is built on scenarios from Zambian communities and ends with practical habits for school and home.

## Specific outcomes

By the end of the lesson, learners should be able to:

1. Explain how population growth increases the demand for natural resources
2. Describe the effects of using resources faster than they can be renewed
3. Suggest technology, policy and daily actions that keep a balance between population and resources
4. Apply Reduce, Reuse and Recycle to a school situation

## Prior knowledge

## Teaching and learning materials

- Chalk and board
- Four large sheets of paper or the back of old calendars, and marker pens
- Learner notes: Population and Natural Resources
- Charts or pictures of population and natural resources, if available
- Sticky notes or small pieces of paper

## References

Ministry of Education (CDC) Form 1 Geography syllabus and module; 25Schools learners' note: Population and Natural Resources.

## Lesson development

| Stage and time | Teacher activities | Learner activities |
|---|---|---|
| **5 min** | Describe a village well that served ten families and now serves fifty. Ask what will happen to the well and to the families, and write learners' answers on the board. | Suggest what will happen and say which resource is under pressure. |
| **10 min** | Draw the cycle on the board: population grows, demand for resources rises, resources are overused, resources run short, pressure on people grows. Give each of four groups one resource: food, energy, water or raw materials, and ask them to say how more people raise demand for it. | Discuss in groups, record one point on a sticky note and stick it beside the matching part of the cycle. |
| **10 min** | Lead a short discussion on soil degradation, water shortages, loss of biodiversity and pollution. Ask learners to link each effect to the resource their group studied. | Match effects to resources and give a local example for each. |
| **10 min** | Draw three columns on the board: technology, policy and daily habits. Ask groups to place the examples from their notes in the columns and add one idea of their own. | Fill the columns and read out one action their class can do at school. |
| **5 min** | Ask two learners to state the main link between population and natural resources in one sentence each. Set the homework scenario. | State the link and note the homework. |

## Teacher's content notes

Read these before the lesson. They are what you need to know, not what to copy onto the board.

### The link works both ways

More people raise demand for resources, and the resources available influence how well people can live and how the population can grow. Balance is the aim.

### What more people demand

Demand rises for food and agricultural land, water for the home and irrigation, energy such as biomass and hydroelectricity, and raw materials such as minerals, metals and timber. Expanding cities need more construction, water and energy. Rising standards of living also raise how much each person uses.

### Effects of overuse

Overconsumption can lead to soil degradation, water shortages, loss of biodiversity, and air and water pollution. It can also contribute to desertification, overfishing and climate

change. When demand goes beyond what an area can support, competition grows and can lead to conflict, higher costs and inequality.

### Ways of keeping a balance

Technology includes renewable energy, water purification and recycling, and climate-smart farming such as crop rotation, agroforestry and mulching. Policy includes education and family planning, sustainable development, environmental laws, international agreements and a circular economy. Daily habits include Reduce, Reuse and Recycle, saving energy and water, sustainable land use and protecting trees.

## Questions to ask during the lesson

| Question | Expected answer |
|---|---|
| A village has grown from ten families to fifty families, but the one well that served it has not changed. (a) Which resource is under pressure? (b) Give one effect that may follow. (c) Suggest one way the village could reduce the pressure. | (a) Water. (b) The well may run dry or become dirty, or people may compete for water. (c) Fix leaks, avoid waste or share the use of water fairly. |
| A town is expanding and builders need more timber, water and energy for new houses and roads. (a) Why does city expansion raise demand for resources? (b) Name one raw material needed. (c) What can happen when competition for these resources becomes strong? | (a) Construction, water supply and energy supply all need resources. (b) Timber, minerals or metals. (c) Conflict, higher costs and inequality. |
| A community decides to use solar energy, recycle water at its school and plant trees on bare land. (a) Which of these is technology? (b) Which protects land and soil? (c) Explain why the three actions help keep a balance between population and resources. | (a) Solar energy and water recycling. (b) Planting trees. (c) They reduce demand or help resources renew, so use does not go beyond supply. |

## Worked examples for the board

### Linking a cause to an effect

A community cuts trees for firewood faster than new trees grow. The resource is forest. The cause is rising demand for energy from a growing population. The effects include soil damage and loss of habitat. An action is to plant trees and use energy-efficient stoves.

### Placing actions in the three columns

Solar energy and water purification belong to technology. Environmental laws and family planning education belong to policy. Turning off lights and fixing leaking taps belong to daily habits.

## Board plan

Left: the cycle (population grows, demand rises, resources overused, resources run short, pressure on people). Middle: effects of overuse (soil, water, biodiversity, pollution). Right:

three columns for technology, policy and daily habits. Key words along the bottom: scarcity, sustainability, overutilisation.

## Mistakes to expect

| Learners often think | Put it right |
|---|---|
| Natural resources will never run out because nature always renews them. | Resources are finite, and when they are used faster than nature can renew them, they run short. |
| Only large cities put pressure on resources. | Villages and farming areas also put pressure on land, water, forests and fish when demand grows. |
| Population growth is the only cause of resource shortage. | Rising standards of living and waste also raise the use of resources, so habits and technology matter as well. |

## Differentiation

### Learners who struggle

Give learners who find the work hard a table with the four resources on the left and blank spaces for demand, effect and action, and let them fill it in pairs with a stronger learner reading each line aloud.

### Learners who finish early

Ask learners to choose one resource in their district and write a short plan with three actions that a school, a family and a council could take to protect it.

### Hearing or visual impairment

Read all scenarios aloud for learners with visual impairment and describe the board diagram in words. For learners with hearing impairment, face the class when speaking and write each key word on the board before discussing it.

### No projector, no printing

Everything can be done with chalk and board. Draw the cycle and the three columns on the board, and use small pieces of paper from old exercise books in place of sticky notes.

### If time is short

Teach the cycle on the board and the three columns of ways to keep a balance, and give the other stages as homework.

## Evaluation

| Question or task | A correct answer shows |
|---|---|
| A trading centre has doubled in size in ten years and its single borehole now runs dry each dry season. (a) Ask the learner to name the resource under pressure. (b) Ask for one reason why demand has risen. (c) Ask for one action that could reduce the pressure. | Fresh water; more people use it at home and for farming; fixing leaks, avoiding waste or using water recycling. |

| | |
|---|---|
| A farming community clears forest to grow food for growing families and the soil is becoming poor. (a) Ask the learner to name two effects of overuse. (b) Ask which resource is being lost. (c) Ask for one climate-smart farming practice that could help. | Soil degradation and desertification or loss of biodiversity; forest; crop rotation, agroforestry or mulching. |

### Homework

A school with a small borehole and an old electricity supply plans to double its enrolment next year, and the head teacher asks the pupils for ideas. (a) Name two resources that will come under pressure and say why. (b) Suggest two actions the school can take to use these resources wisely. (c) Say how one family at home could help with Reduce, Reuse and Recycle.

## Extra practice with answers

| Question | Answer |
|---|---|
| 1. A school canteen throws away much food and the school uses a lot of electricity and water every day. (a) Give one way to Reduce waste. (b) Give one way to Reuse something. (c) Give one way to save energy. | (a) Cook only the amount needed. (b) Reuse containers or paper. (c) Turn off lights and fans when not needed. |
| 2. Farmers in an area plant maize on the same fields every year and the soil is becoming weak. (a) Name the problem. (b) Name one farming practice that can help. (c) Explain how this practice helps the soil. | (a) Soil degradation. (b) Crop rotation, agroforestry, mulching or fallowing. (c) It helps the soil recover and keeps it fertile and covered. |
| 3. A council wants to slow the pressure on water in a growing town and asks learners for advice. (a) Give one law or policy it could use. (b) Give one technology it could use. (c) Give one habit residents could follow. | (a) Environmental laws or education and family planning. (b) Water purification and recycling. (c) Fix leaks and avoid wasting water. |
| 4. Two learners argue about a statement: only a smaller population can protect natural resources. (a) Give one reason that supports it. (b) Give one reason against it, using technology or habits. (c) Say which view you agree with and why. | (a) Fewer people means lower demand. (b) Technology and wise habits can reduce use even when population grows. (c) Any reasoned answer using the lesson. |

## Answers to the learners' check-yourself questions

1. A trading centre in Zambia has doubled in size in ten years, and the single borehole that serves it now runs dry every dry season. (a) Which resource is under pressure? (b) Name one way the larger population has caused this. (c) Suggest one action to reduce the pressure.
   **(a) Fresh water. (b) More people use water for the home and for irrigation, so demand has risen. (c) Fix leaks and avoid waste, or use water purification and recycling.**

2. A farming community clears more and more forest to grow food for its growing families, and the soil is becoming poor and dry. (a) Name two results of overuse of land mentioned in the lesson. (b) Which resource is being lost when trees are cut carelessly? (c) Name one climate-smart farming practice t
   **(a) Soil degradation and desertification, or loss of biodiversity. (b) Forest and the trees. (c) Crop rotation, agroforestry or mulching.**
3. A school council wants to reduce waste at the school, which uses a lot of electricity and water. (a) State what Reduce, Reuse and Recycle means in this case, with one example. (b) Give one way to save energy. (c) Give one way to save water.
   **(a) Use less, use again and turn waste into something useful, for example reuse paper or collect bottles to recycle. (b) Turn off lights when they are not needed. (c) Fix leaks and turn off taps when not in use.**
4. Explain in your own words why a growing population and its natural resources are said to be linked in both directions. (a) How does population affect resources? (b) How does the availability of resources affect people? (c) Why is balance important?
   **(a) More people increase demand for resources. (b) Resources decide how well people can live and how the population can grow. (c) Without balance, resources run short and people and the environment suffer.**
5. A town council is planning for a city that is expanding, and it is worried about timber, water and energy for new houses. (a) Why does city expansion increase demand for these resources? (b) What can happen when competition for resources becomes strong? (c) Suggest one policy the council could use.
   **(a) Construction, water supply and energy supply need more resources as cities grow. (b) Conflicts, higher costs and social inequality. (c) Environmental laws, or promoting a circular economy or green technologies.**
6. Two groups in a class debate this statement: technology is a better answer than controlling population growth. (a) Give one example of technology that helps manage resources. (b) Give one way of slowing population growth. (c) Say which is more helpful for your community, with one reason.
   **(a) Solar or wind energy, water purification and recycling, or climate-smart farming. (b) Education and family planning. (c) Any reasoned answer that uses the lesson, such as both together because technology saves resources and education slows demand.**

### Teacher's reflection

What went well:

What I will change next time:

Learners who need follow-up: