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**GGY2012**  
**EARTH RESOURCES AND THE ENVIRONMENT**

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**Purpose of Course**

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To examine/explore:

- a range of Earth's resources that have been identified as useful to humans.
  - specifically, *geologic origin, availability, exploitation & use of nonrenewable natural resources* – metallic & nonmetallic, as well as energy resources
- renewable energy resources, along with frequently underappreciated resources of water and soil.
- impacts of resource procurement, use and disposal on the environment.

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**Expected Learning Outcomes**

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At the end of the course, students are expected to:

- Demonstrate understanding of **what Earth Resources are**, including their (natural) formation, exploitation and extraction
- Identify **impacts of Earth Resources' exploitation + use** and environmental concerns with regard to;
  - *their overexploitation, pollution and climate change*
- demonstrate knowledge of the means, by which humans have attempted to address resource-use and environmental concerns through changes in practice, use and law.

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**Definition**

**What is a Resource?**

- Anything that:
  - is part of earth.
  - can be got from earth over and over again.
  - satisfies human need, and
  - adds value to human life.

**Natural resources are:**

- Endowments of a country or region
  - used to create wealth and improve well-being of citizens.

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**Examples of Natural Resources**

- Vegetation and biotic life it supports
- Land
  - for Agricultural activities
  - as a base for infrastructure development
- Fresh and Ocean water resources
- Mineral deposits
- Landforms
- We might also add to this list **The Atmosphere**

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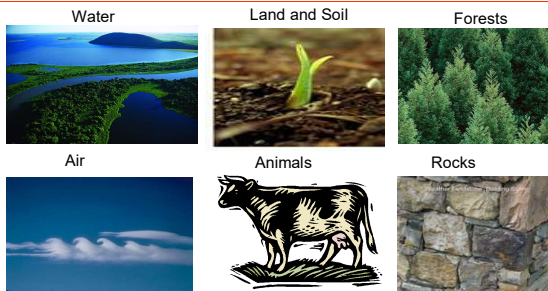
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**Examples of Natural Resources.....contd.**



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### Natural Resources' uses

Used to **MAKE** & to **GROW** things needed by humans, e.g.:

- **Water** – used to **drink** and to **grow plants** for food, shelter, and clothing
- **Soil** – used to **grow plants** for food, shelter, and clothing
- **Rocks** for **building**
- **Metals** to **make cans, building parts, & jewellery**
- **Sand** to **make glass**
- **Oil** to **make plastics & gasoline**

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### Challenges of Natural Resources' use.....contd.

Earth 'was' very rich in Natural Resources, such that:

- its endowment could meet demands of its inhabitants for a long time.

However:

There has been unprecedented **increase in population** in last few decades, creating formidable problem of reduced:

- Water
- Food, and
- other essential requirements.



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### Challenges of Natural Resources' use.....contd.

#### Land Resource –

- is facing degradation due to **water erosion, wind erosion,** etc., which is associated with:
  - loss of soil nutrients, leading to:
    - decrease in stream capacity
    - siltation of reservoirs.
    - reduced crop yields
  - water pollution from agricultural nutrients + chemicals transported with soil particles.



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**Challenges of Natural Resources' use.....contd.**

**Vegetation**

- Acts as protective cover for the planet and sink of the CO<sub>2</sub> emissions, but
- Deforestation and over grazing have caused tremendous soil erosion and land slides.



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**Challenges of Natural Resources' use.....contd.**

**Other human activities**

- about **90 million** cattle graze, while capacity of forests is estimated to support about **31 million** units only.
- annually about **235 million m<sup>3</sup>** of firewood are taken against **40 million m<sup>3</sup>** that can be supplied on a sustainable basis.



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**Some Mitigation Measures**

Realizing **importance** of natural resources, **United Nations Conference on Environment and Development (UNCED)** at Earth Summit in **Rio-de-Janerio, 1992** declared adoption:

- **Agenda 21** – 'Global blue print for **environmental action**', one of whose themes was;
    - *Efficient use of natural resources of land, water, energy, forests and biological resources*
- (these + other issues to be discussed in detail later).*

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**What the Course is About**

In a nutshell, it is about:

- ⇒ **HOW, WHY & WHERE** geologic or earth resources develop.
- ⇒ Their Distribution
- ⇒ Processes by which they are **formed, altered, transported, deposited & distorted.**
- ⇒ Sustainable methods of exploiting them

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**Course Outline**

This will comprise, but not limited to:

- Earth Systems
- Earth Cycles
- Plate Tectonics & the origin of Resources
- Earth Resources
  - Mineral Resources
  - Energy Resources
  - Building Materials & other Industrial Minerals
  - Water Resources
  - Soil as a Resource
- Environmental Impacts of Resource Exploitation & Use
- Some Examples of Zambia's Resources

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**Method of Teaching**

- Lectures – 4 hours per week
- Field trips – at least 1 during the term(???)

**Method of Assessment**

1. Continuous assessment – 40%, comprising:
  - ⇒ Tests – 20%
  - ⇒ Quizzes – 10%
  - ⇒ assignments – 10%
2. Final Examination – 60%

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**Readers**

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**PRESCRIBED**

Press and Siever (1998) – **Understanding Earth** (2<sup>nd</sup> Edition), 682pp.  
(Book should be available in the reading room)

**SUPPLEMENTARY MATERIAL**

Any other Physical Geology book

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**Course Lecturer**

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