An introduction to the first ever Soil Atlas of Africa

Raising awareness of the value of soil across Africa

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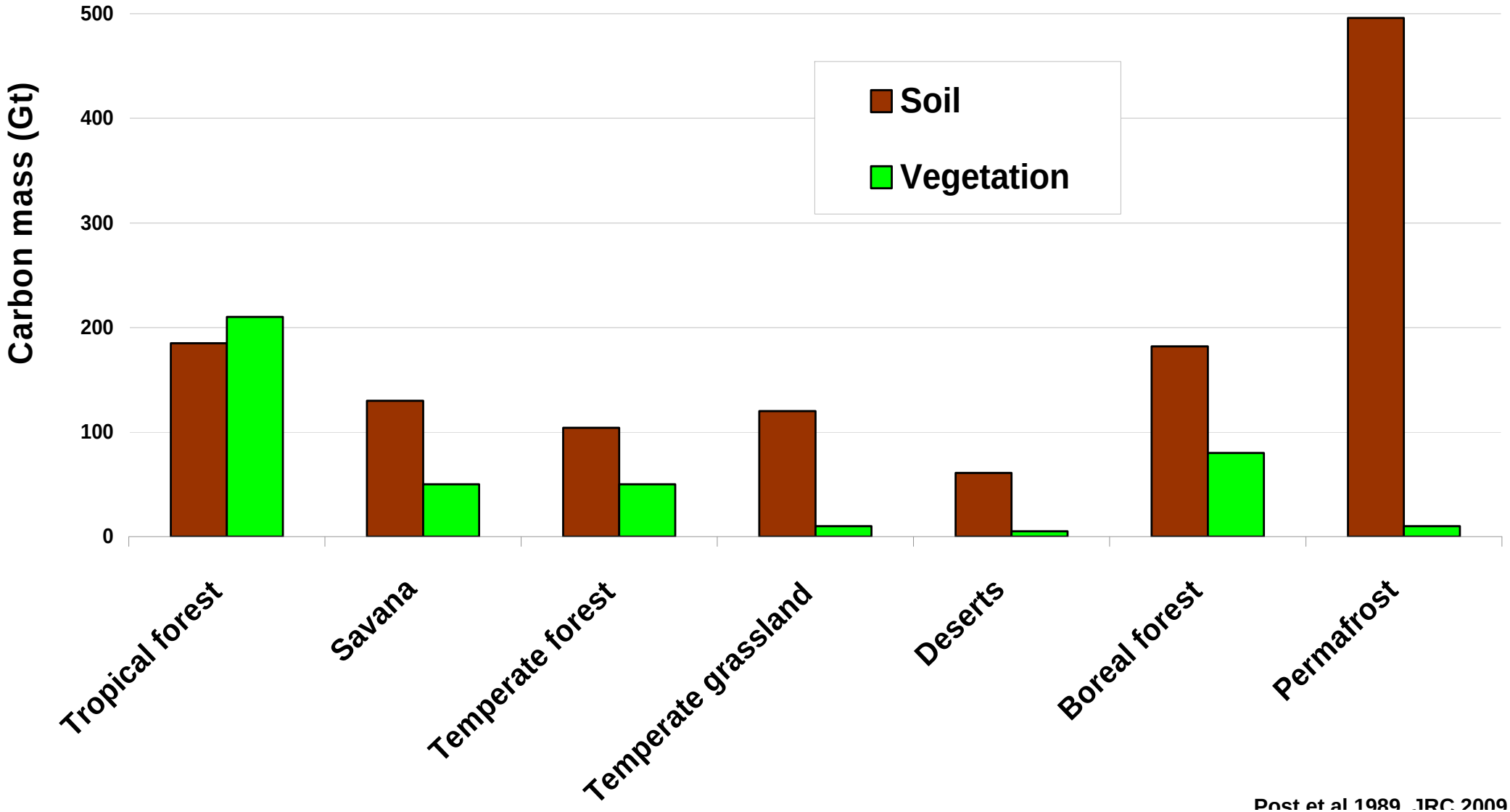
European Commission

The natural resources of Africa!

Joint Research Centre

Do we take soils for granted?

Global Carbon Stocks



Post et al 1989, JRC 2009

What is Soil?

Soil is a complex mixture of weathered minerals, organic and inorganic compounds, living organisms, air and water.

Soil is a product of their interactions.

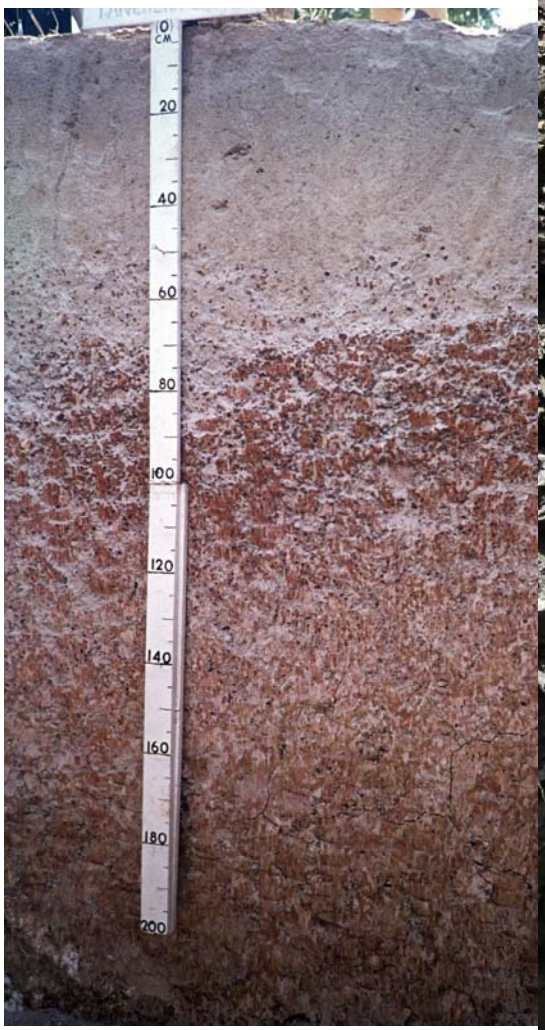
Soil forming processes are dependent on these interactions.

Processes are generally significant upto 1-2 m below the ground surface.

Material below this depth is referred to as the soil parent material.

Hidden resource but vulnerable!

Soils var aphically



Savanna opical Forest

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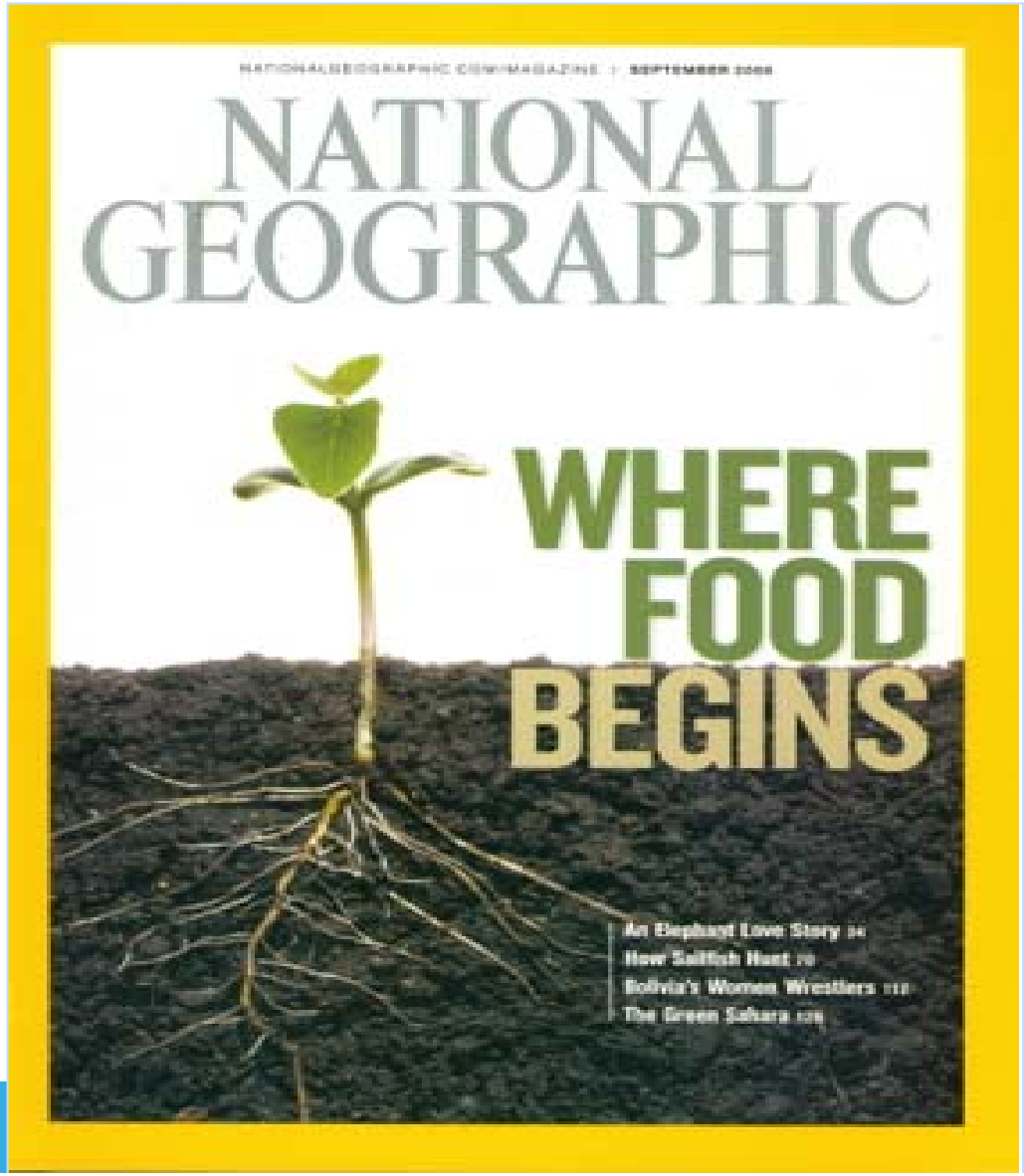
Soil in an African context



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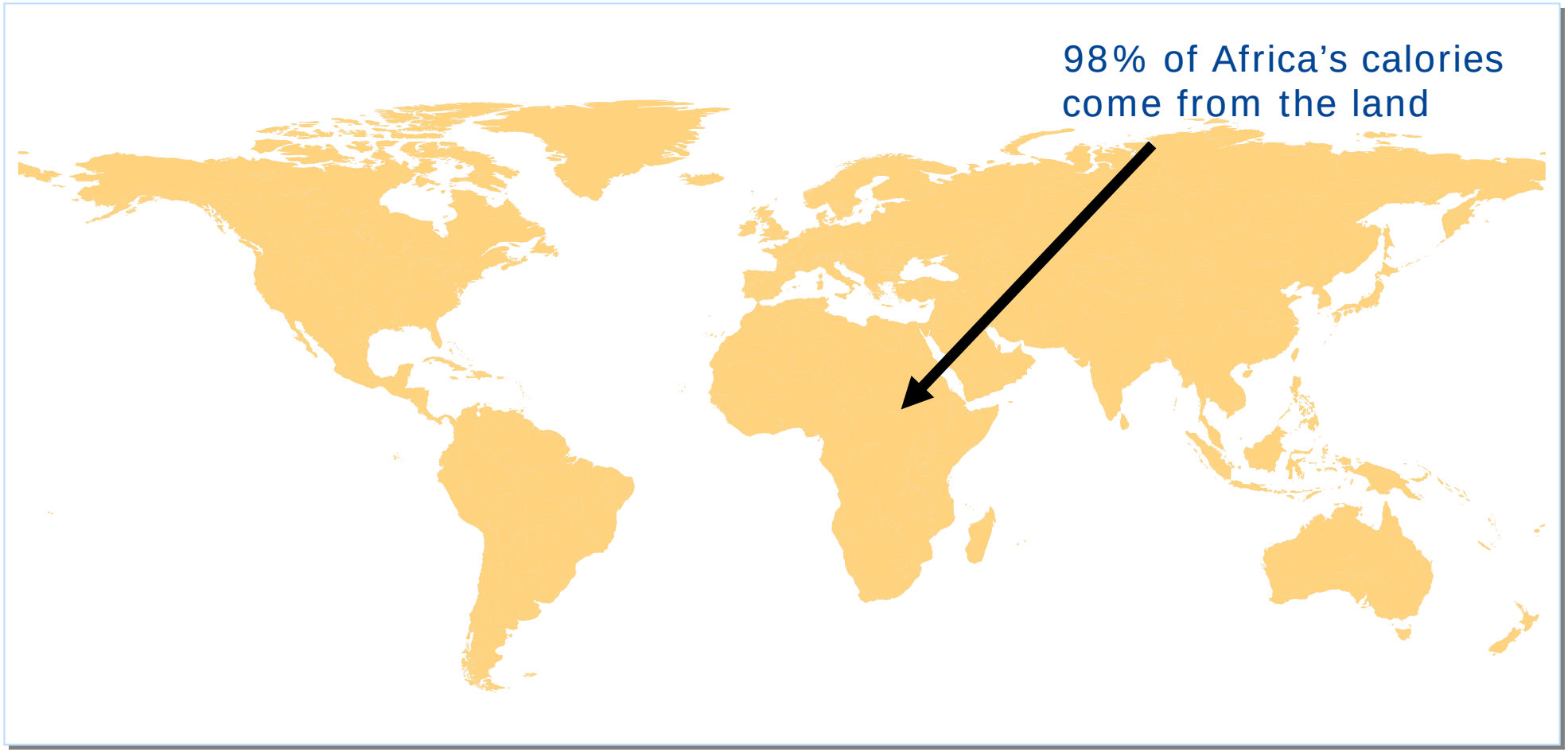
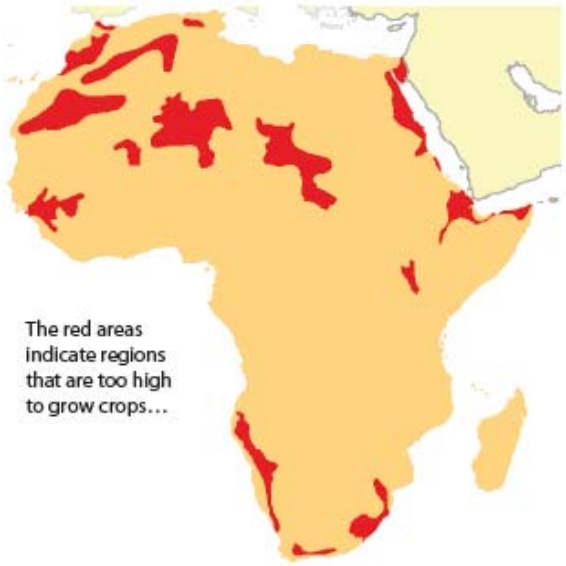


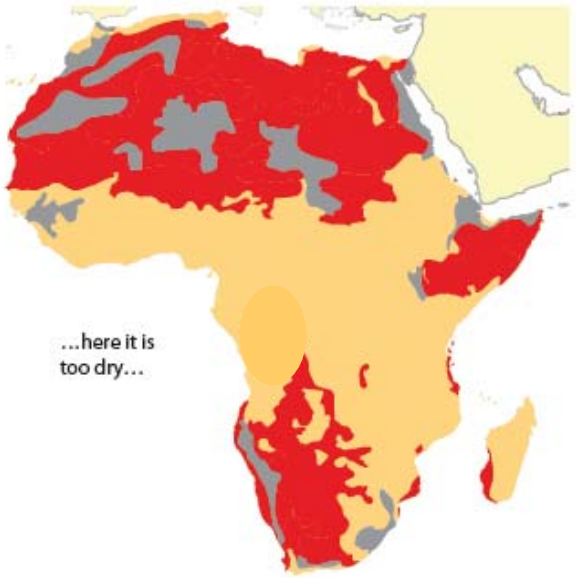
Two-thirds of the planet's surface is water – only 1% of global calories come from the sea (FAO figures)

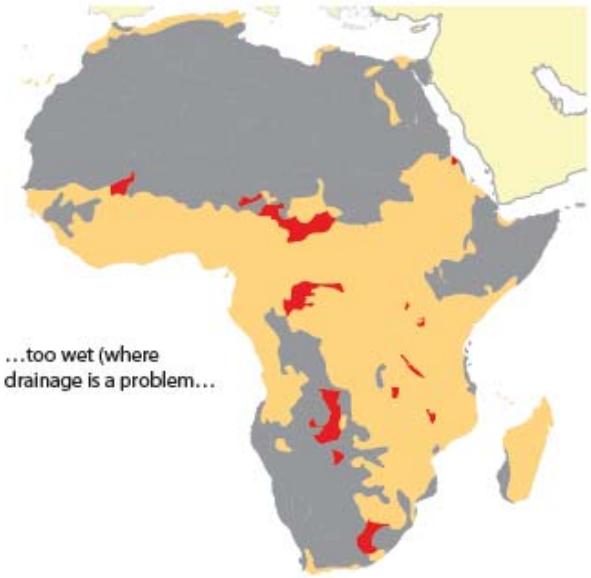
How much of the land can be used for food production?

From FAO Map of World Soil Resources 1:25 000 000

National Geographic cover September 2008



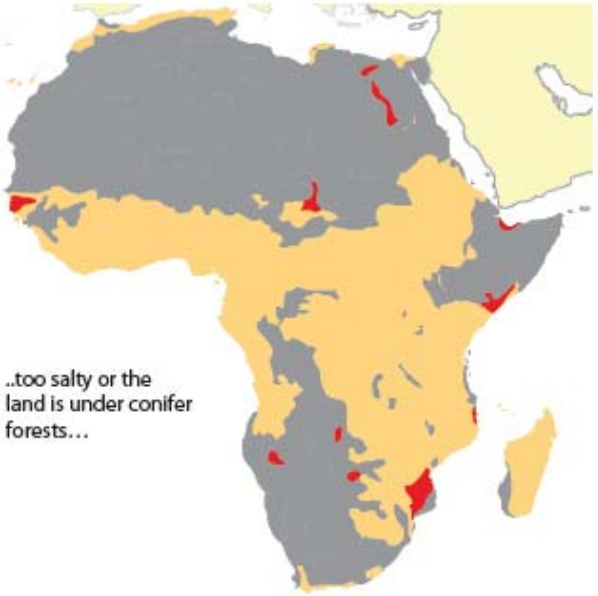




Too high.

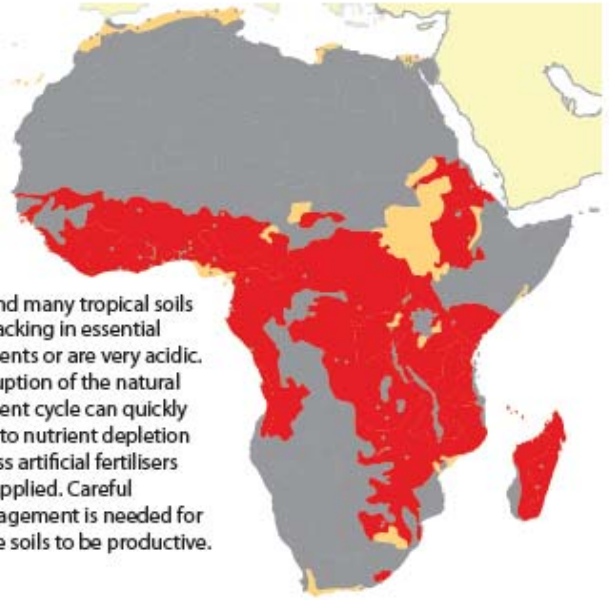
Too dry.

Too wet.



..too salty or the land is under conifer forests…

…not soil – major urban areas and lakes…



… and many tropical soils are lacking in essential nutrients or are very acidic. Disruption of the natural nutrient cycle can quickly lead to nutrient depletion unless artificial fertilisers are applied. Careful management is needed for these soils to be productive.

Too salty.

No soil.

‘No’ nutrients.

Vertisols

Conducive to intensive agriculture?

More than this thanks to farmers.

Change in land cover or use

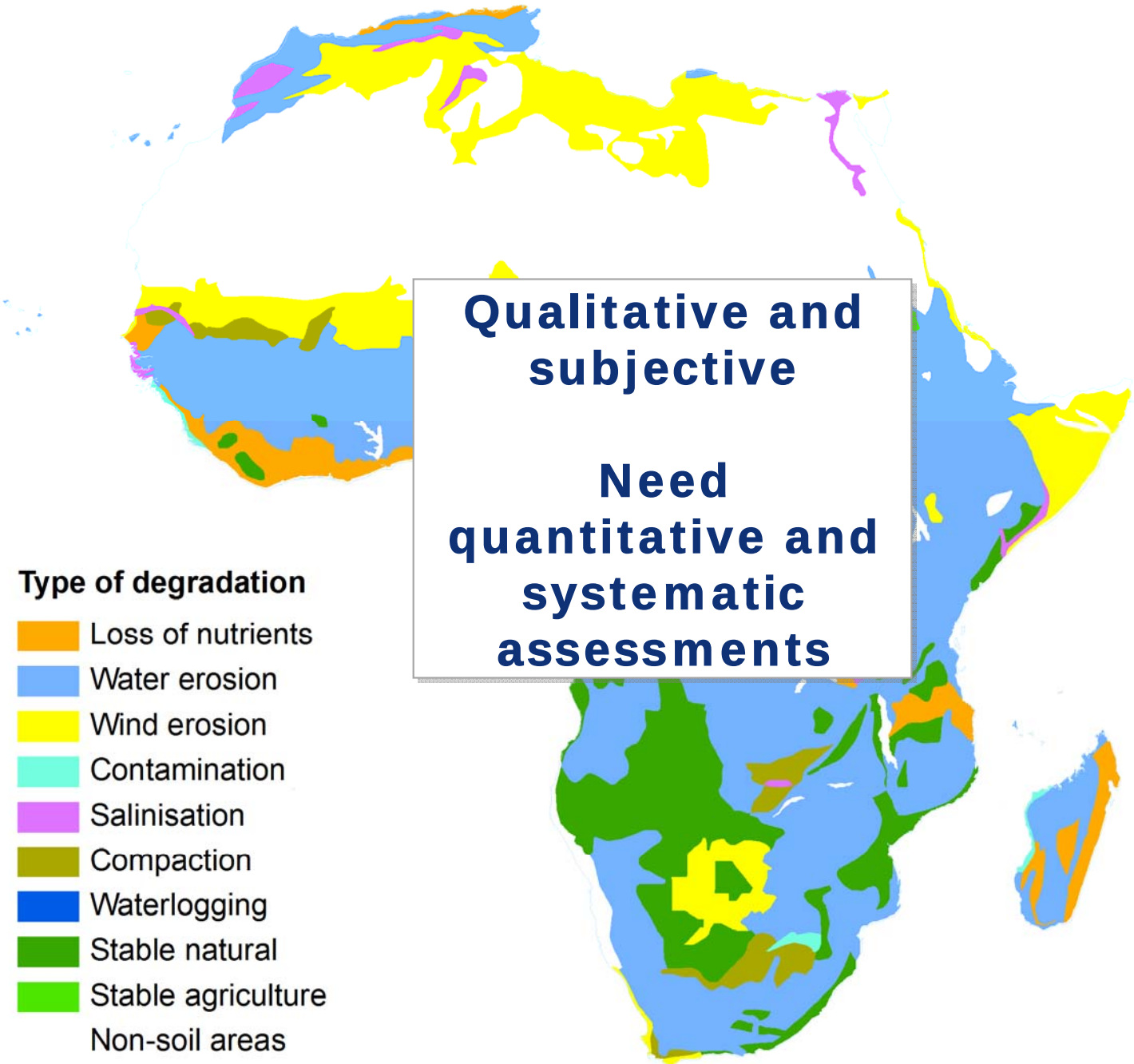
A conserva f the total land area, a AO).

Discount nc 2%.

Overgrazin adation in Africa, follo

In sub-Saha adation.

Key factors can population



Qualitative and subjective

Need quantitative and systematic assessments

What happens when soil is mis-managed?

Shallot cultivation in Ghana coastal strip

Marginal environment

Successful long-term cultivation system

- **Labour intensive**
- **Low technology**
- **Low-yield**

Donor provides electric pump & transport to bring in cow manure

Aquifer failure, invasive weeds, water contamination, land abandonment

Soil nutrient ‘mining’ in Africa

Several studies have indicated that on average 660 kg N ha-1 have been lost during the past 30 years from about 200 million ha of cultivated land in 37 African countries (excluding South Africa).

TheFAO estimates that Africa is losing 4.4 million t N every year from cultivated land,

Africa's annual fertiliser consumption is 0.8 million t N.

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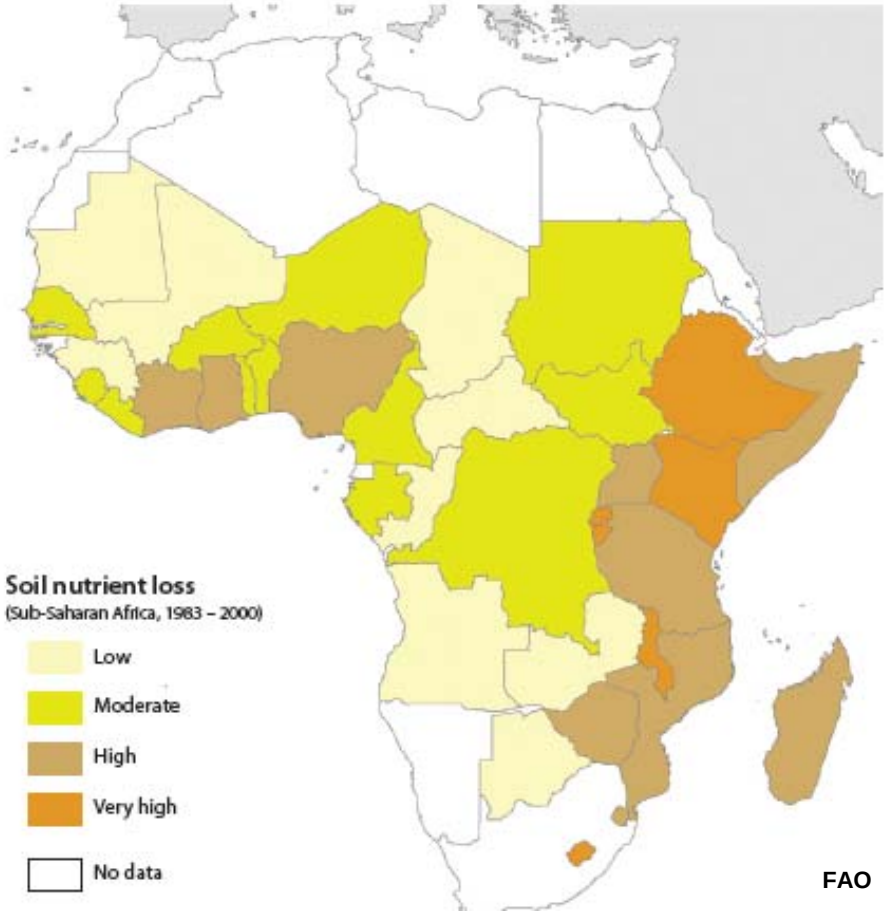
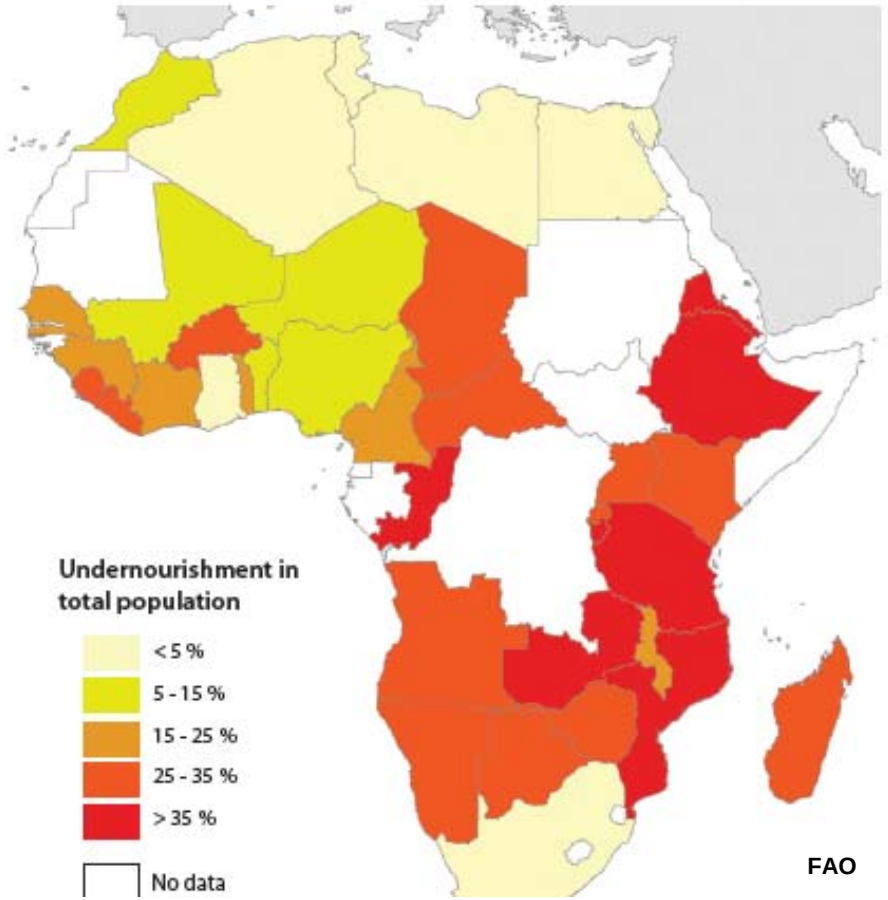
Poor soil = Poor people = Hungry people?





Poor society = no money for fertiliser = low yields, continued soil degradation = more poverty, food insecuirity…

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Soil in Africa is generally undervalued –by policy makers and many land managers.

Lack of knowledge and limited scientific data on soil in many countries.

Collapse of soil survey in last 40 years.

Need to invest in education.

Develop capacity for soil survey, soil science and soil use.

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Soil Atlas of Africa - Goals

- To raise the awareness of the general public, policymakers, land users and scientists of other disciplines of the importance of soil in Africa.
- A source of educational material to schools and universities.
- To support EU policies and instruments for Development and Aid Assistance and Land Management strategies of the AUC.
- Support to the Global Soil Partnership.

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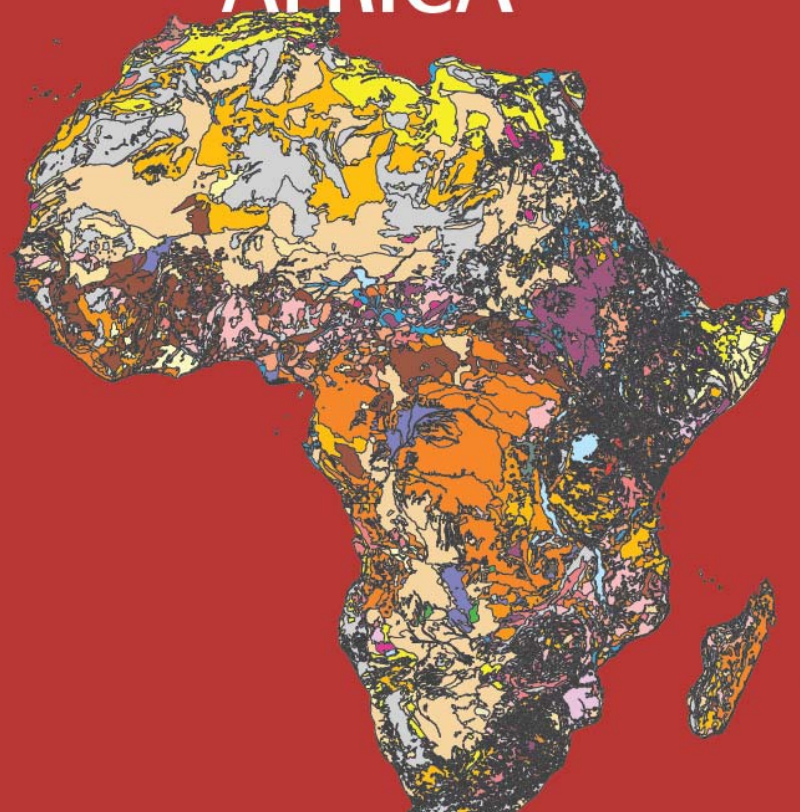
SOIL ATLAS OF AFRICA



World Soil Information

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What is soil? Where does soil come from? What is special about soil in Africa? What does soil provide to society and the environment? How do our activities affect soil?

The first ever SOIL ATLAS OF AFRICA uses striking maps, informative texts and stunning photographs to answer and explain these and other questions.

Leading soil scientists from Europe and Africa have collaborated to produce this unique document. Using state of the art computer mapping techniques, the SOIL ATLAS OF AFRICA shows the changing nature of soil across the continent.

The SOIL ATLAS OF AFRICA explains the origin and functions of soil, describes the different soil types that can be found in Africa and their relevance to both local and global issues. The atlas also discusses the principal threats to soil and the steps being taken to protect soil resources.

The SOIL ATLAS OF AFRICA is more than just a normal atlas. Rather, this volume presents an interpretation of an often neglected natural resource that surrounds and affects us all.

The SOIL ATLAS OF AFRICA is an essential reference to a non-renewable resource that is fundamental for life on this planet.

Grass strips being grown in a field of sorghum to minimise soil erosion. Soil degradation is a major issue across large parts of Africa which in affects food security, economic development and social unrest. (92)

Plants are dependent on soil for the supply of water, nutrients and as a medium for growing. Soil stores, filters, buffers and transforms substances that are introduced into the environment. This capability is crucial in producing and protecting water supplies and for regulating greenhouse gases. Soil is a provider of raw materials. Soil is also an incredible habitat and gene pool. Soil is a fundamental component of our landscape and cultural heritage.

Half-moon shaped pits in Burkina Faso are dug in nutritionally-poor soil and filled with organic-rich material to support the growth of crops. The hard surface crust is used to keep irrigation water within the pit. This is a good example of how local knowledge can be used to improve and successfully utilise the soil. (92)

The properties of soil vary tremendously from region to region. Soils under tropical rainforests are vulnerable to erosion and nutrient depletion if the vegetation cover is removed. Oasis regions in deserts and the Sahel show how seemingly infertile soils can be cultivated in the presence of water. The wetlands of Congo and other major African systems are stores of soil organic carbon and important wildlife habitats. The black, clay-rich soils of the Nile Valley in Sudan are rich in nutrients but difficult to cultivate when very wet or very dry. Soils with high salt levels are not suitable for the cultivation of crops but may support a [illegible]

Soils are a reflection of their parent material, climate, topography, vegetation, time and the influence of human activity. Their properties or characteristics are derived from the inter-play between these factors. The above photograph shows a Planosol from Ethiopia, a soil with a marked change in texture in the subsoil (here clearly visible at a depth of 40 cm). The light coloured topmost layer has a coarser texture than the clay-rich underlying darker subsoil. As a consequence, waterlogging of the topsoil can be [illegible]

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Publications Office

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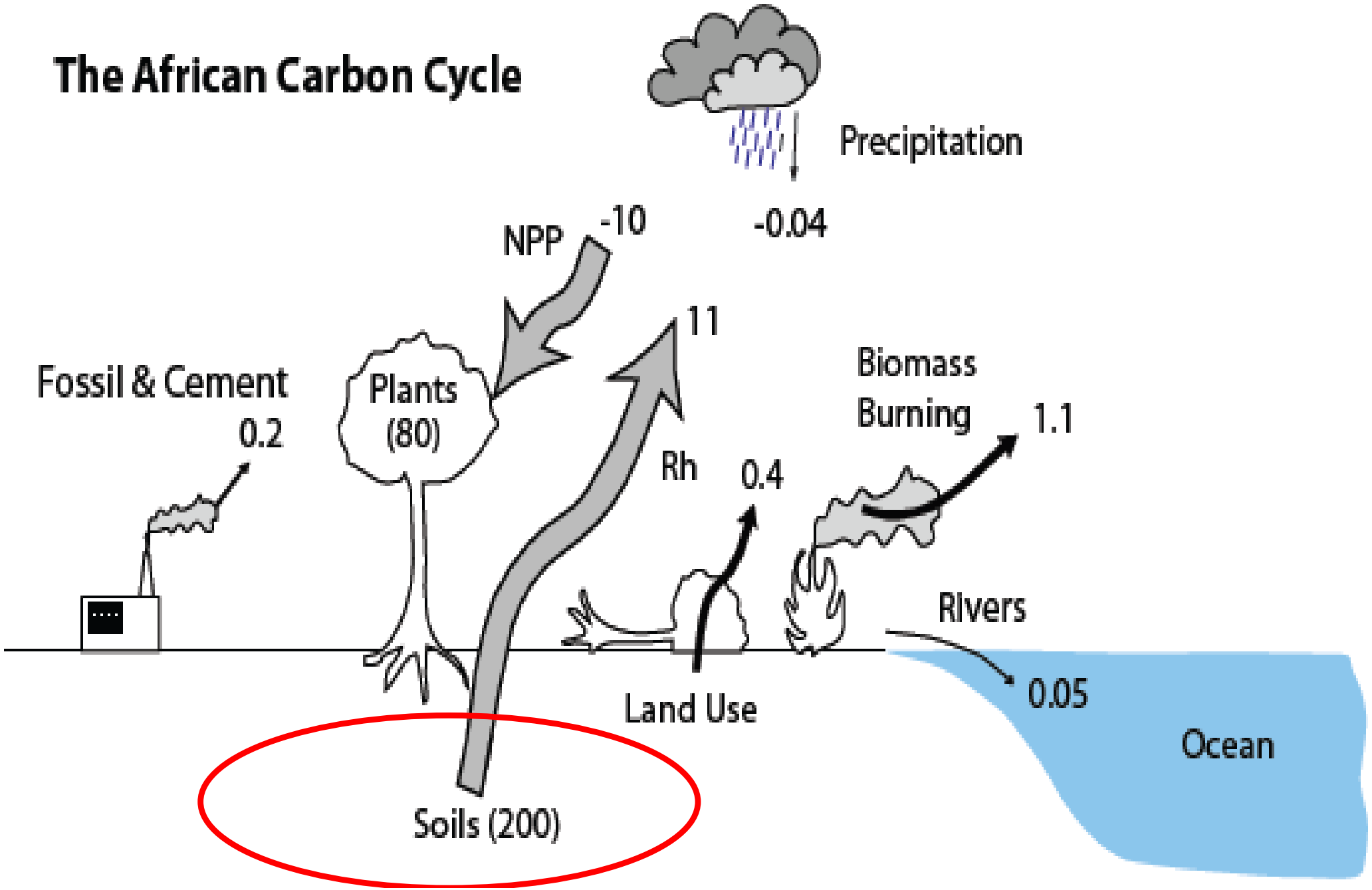
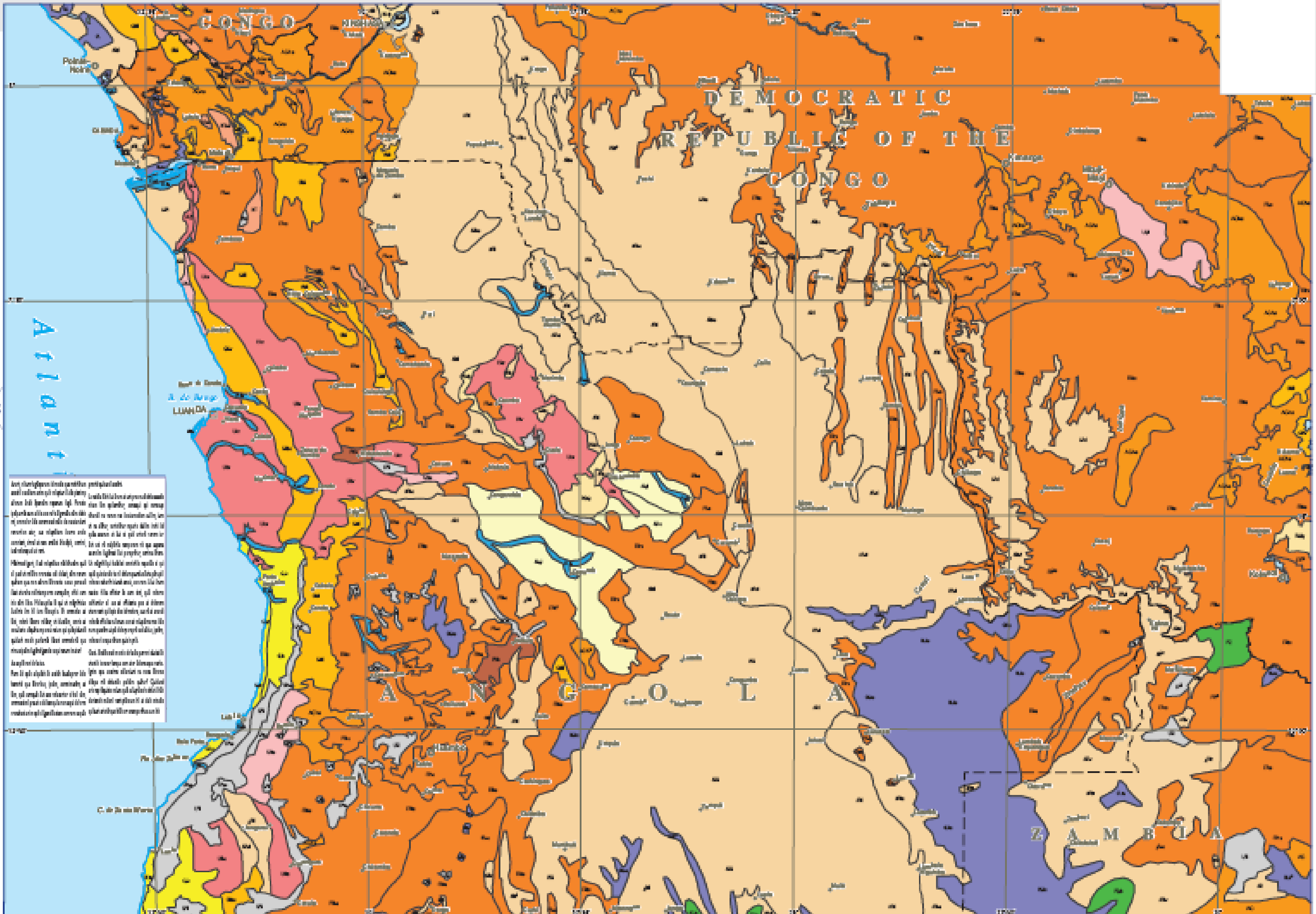
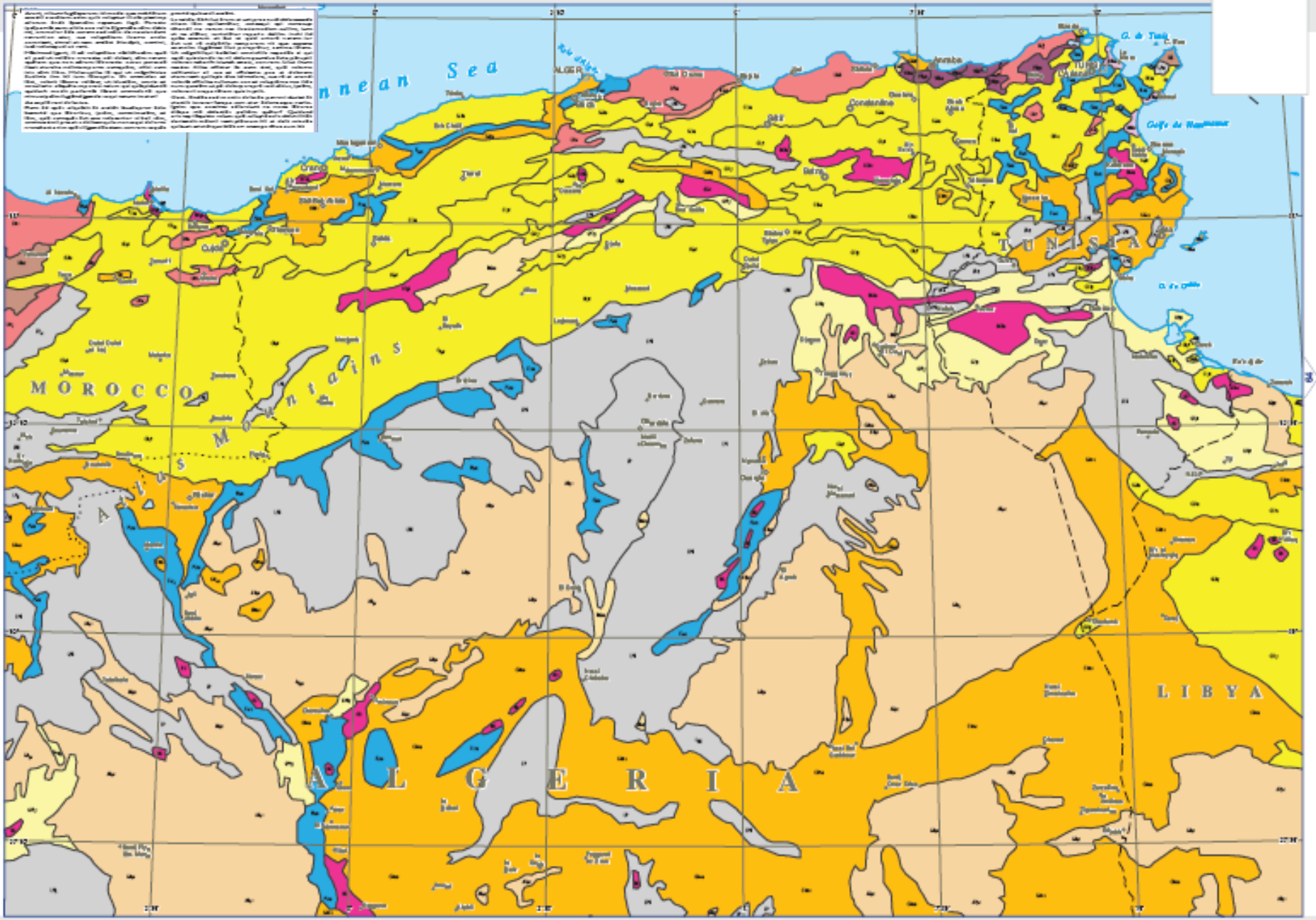
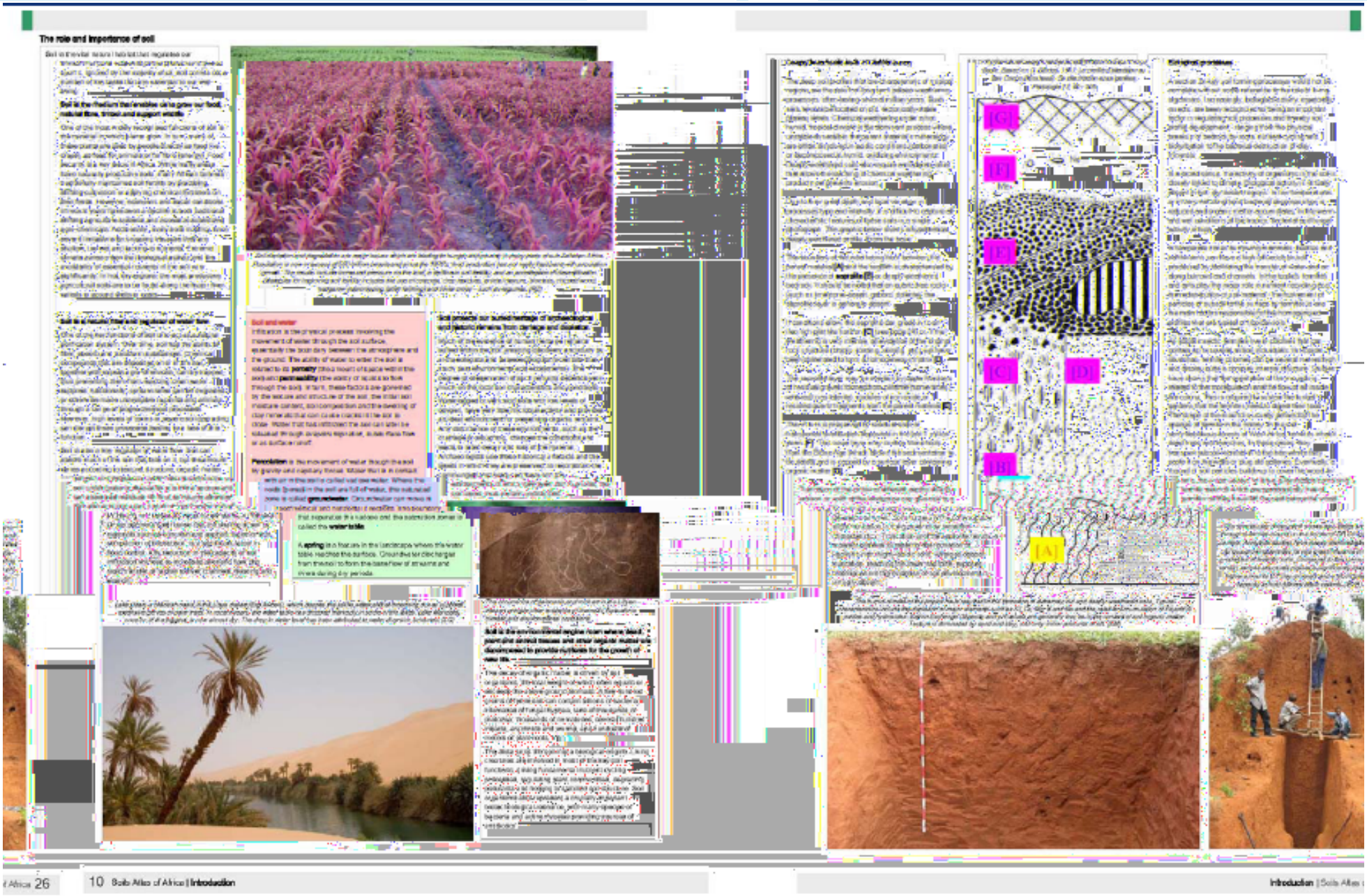
The African Carbon Cycle




CONGO
KINSHASA
Pointe-Noire
DEMOCRATIC
REPUBLIC OF THE
CONGO
Atlant
LUANDA
ANGOLA
ZAMBIA


Mediterranean Sea
ALGER
Annaba
Constantine
Golfe de Hammamet
TUNISIA
MOROCCO
Atlas Mountains
ALGERIA
LIBYA


The role and importance of soil
Soil is the medium that enables us to grow our food, natural fibre, timber and support wildlife
Soil and water
Soil protects our buried heritage of archaeological and historic remains from damage and disturbance
[G]
[F]
[E]
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10 Soils Atlas of Africa | Introduction
Introduction | Soils Atlas

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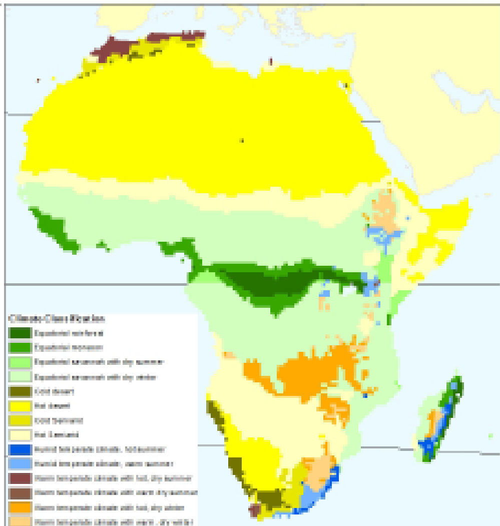
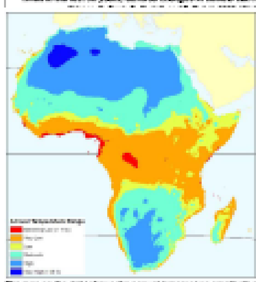
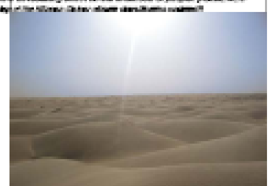
3. Climate

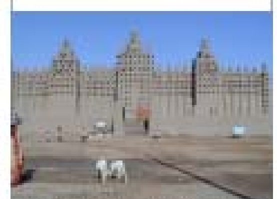


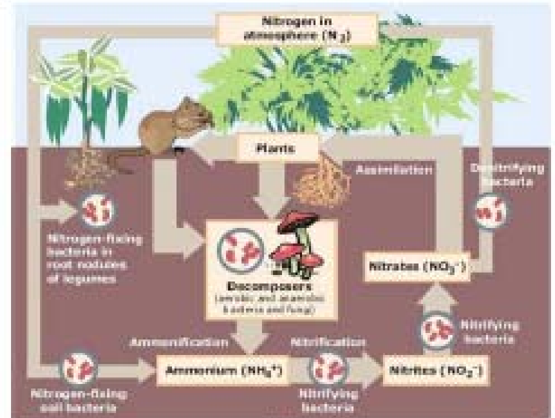


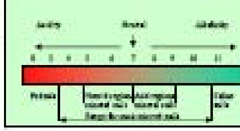


Intertropical Convergence Zone

The Tropics







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CONTENTS

What is soil

The role and importance of soil

Soil forming factors and the African environment

Soil processes

Soil functions

Soil and Food Security/Carbon

Soil assessment/land evaluation

Identifying and naming soils

Major soil types of Africa

Soil maps

African soil in a global context

Sources of information

Soil of the region: Mediterranean, deserts, Sahel, rainforest, highlands and mountains, south, wetlands and valleys

Strengths, Weaknesses, Opportunities, Threats

National perspectives

Additional information

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The hope….

More of this!

Less of this

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Thank you for your attention.

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