Laurea / B.A.
in Global Governance

4. BIOMES

Savannah

2020/2021

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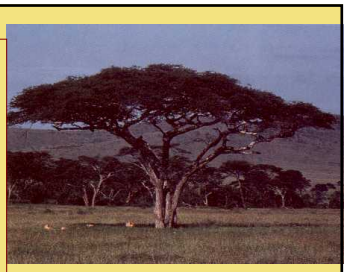
The savannah is a plant formation consisting of a herbaceous layer more or less continuous, mainly of Poaceae, (tall grass) in which there are scattered shrubs and isolated trees, belonging mostly to the genus *Acacia*.



The savannah meets the level of the belts between the Equator and the tropics of Cancer (23.27 'N) and Capricorn (23.27' S).

They occupy an area equal to 13% of the land

With respect to the origin there are three distinct types of savannah:

1) Savane climatic result of the particular climatic conditions

2) Savane edaphic: proved by the particular soil conditions

3) derived Savane: of human origin

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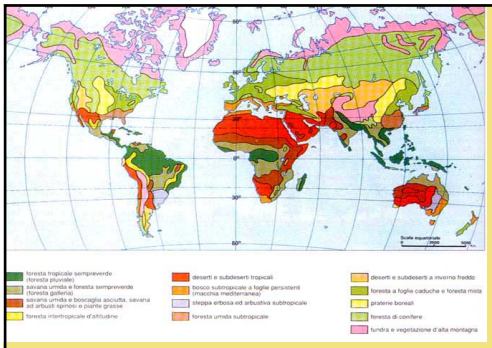

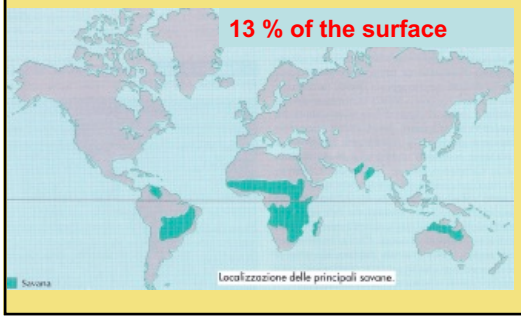

The savannah is represented on all continents except Europe

Africa-Sudan, Nigeria, East Africa, western Madagascar, Angola, Zimbabwe

Asia- India
Siam and Indo-China (Burma, Laos to the north)

Central America – west Mexico

Latin America-the Orinoco River basin, plateau of Mato Grosso and in the Gran Chaco

Australia - north of the Great Sandy Desert, north of the Northern Territory, area Quennsland

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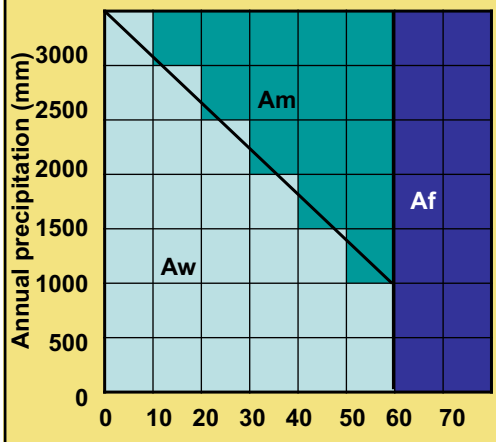
Tropical savanna climate



The climate of the savannah belongs to Humid and Tropical climate

the range between the two tropics
T in which the medium does not fall
below 15 ° C even in the coldest month

1. **Equatorial climate or rainforest (Af)**
2. **Tropical savanna climate (AW)**
3. **Monsoon climate (Am)**

These three types are different climate for the rainfall pattern

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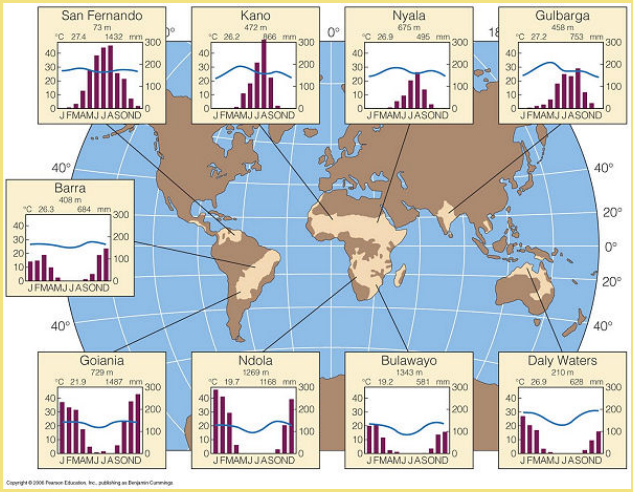
climate characterized by an alternation of a wet season and a dry falling in winter.

The average annual rainfall varies from 200 to 600 cm, with rainfall distributed especially in the monsoon season, at other times of drought is mostly complete.

savannah climate Aw



The temperature remains more or less constant throughout the year at 20-25 ° C in winter, 25-30 ° C in the summer, but with very high daily temperature (such as deserts).

Tropical dry

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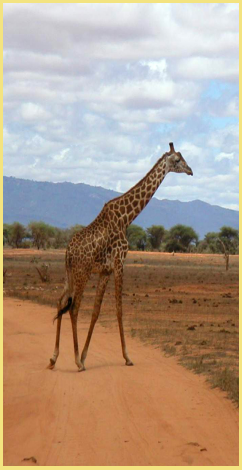
Type of soil



The savannah is characterized by

FERSIALITIC/ ferruginous TROPICAL soils

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soil

The soil is very primitive, or lateritic sandy (siliceous), always acid and low in nutrients.

The water supply is poor so that the plants develop roots that reach great depths.

The soil is poorly permeable and in the rainy season marshes are created, when the drought returns the ground dries and crusts of silt or salt efflorescence are formed

In addition, soil flows rainwater to water courses, occur so extensive flooding.

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SAVANNA

The term "SAVANNA" was introduced in the sixteenth century in Venezuela by Spanish "conquistadors" to indicate the vegetation that covered tropical regions

Continuity herbaceous with some scattered trees of the genus *ACACIA* or *Prosopis*

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The general structure of the vegetation is divided into three layers, however, constituting a very complex spatial structure.

1. **low umbrella-trees, 5-7 m high (10-15%), at least in part belonging to the genus *Acacia*.**
2. **Acacias grow spaced without forming a real tree cover with a distance between different individuals of 10-15 m.**
3. **This distribution is probably determined by the development of the roots that occupying a rather large area and without interference with other roots provide a greater water supply to the plant**

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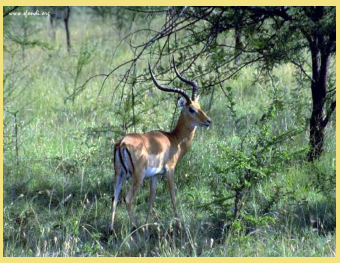
Shrub layer which is not higly developed, represented mostly by species of the genus *Acacia*, but with *habitus* of large shrubs 2-5 m high (10%), in which are also present other bushes 1-3 m (10%): *Solanum jubae*, *Uvaria denhartiana*, *Maerua angolensis*, *Anisotes involucratus*, *Courbonia nummularifolia*, *Commiphora* sp.

- **the herbaceous layer (80%) is a dense carpet in prevalence of Graminaceae, annual therophytes in dry savanna, hemicryptophytes in the wet.**
- **can be present a layer of liane coverage**



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Plants of the savannah

Presence of **XEROMORPHIC** plants

1. **Deciduous (eg. ... *Acacia* deciduous, evergreen but *Curatella*)**
2. **Reduction of leaf area**
3. **Photosynthetic activity very efficient in the rainy season**
4. **Leaves that help to absorb water**
5. **Tough layers to protect the leaves (sclerophyllous. eg. *Euphorbia*)**
6. **Transformation of the leaves into thorns (..eg. *Acacia*)**
7. **Highly developed root system**
8. **Distancing arboreal (eg. ... *Acacia*)**
9. **Increase in the thickness of the cortex to resist the passage of fires**
10. **Presence of bitter substances in grasses to deter grazing**
11. **Basal meristems to oppose the destruction of the walking surface (es.*Cynodon dactylon*)**
12. **Succulence in the roots, rhizomes, stems**

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Curatella americana L.

Acacia tortilis var. raddiana

Acacia tortilis

Associazione ad Acacia-Panicum con arbusti di Zilla spinosa

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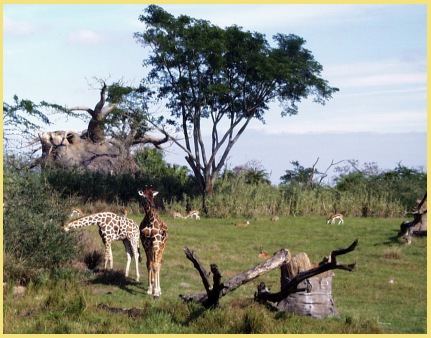

The savannah appears as the confluence mosaic more different plant associations

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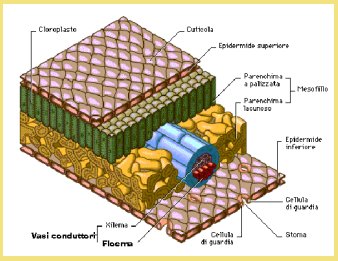
Sclerophyllous leaves



Euphorbia *stenoclada*

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LEAVES ... THORNS...

Acacia *tortilis*

Acacia *aneura (fillodi)*

Zilla *spinosa*

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Distancing arboreal ... TYPICAL SAVANNAH

Acacias grow spaced from each other, they do not form a real tree cover, because their very roots expand to improve the absorption of water

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THICK BARK

kokerboom, “quiver trees”

thorny acacia Bark

Colophospermum *mopane*
“Butterfly tree ”

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… RESIST THE FOOTSTEPS …

Cynodon *dactylon*

"*Habitus*" vegetative prostrate, meristems basal shoots with short internodes and basal attitude to the issue of stolons and rhizomes for propagation side.

Sporobolus pyramidalis

Rottboellia *exaltata*

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Succulence ...

A characteristic of many kinds of trees of the bush is to have a bulge in the stem, adaptation to conserve water, like a "bottle".

Evident in bobab (*Adansonia*) of the African savannah, plant that can reach 1000 years of age, the stem of 5-7 m in diameter and up to 100 m^3 of water.

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THE BAOBAB ... A GIGANTIC SPONGE …

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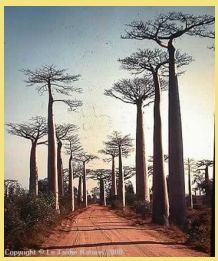
A. digitata (Africa)

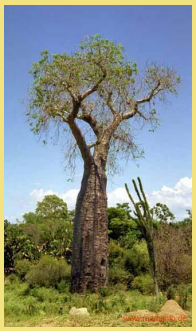


A.Grandieri

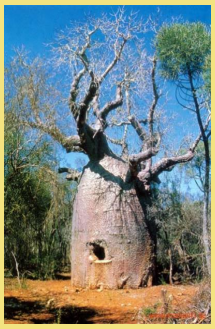
A. *madagascariensis*

A. *Gregorii* (Australia)

A. *suarezensis*



A. *perrieri*



A. *rubrostipa*

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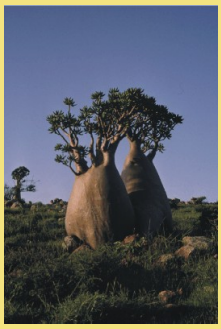
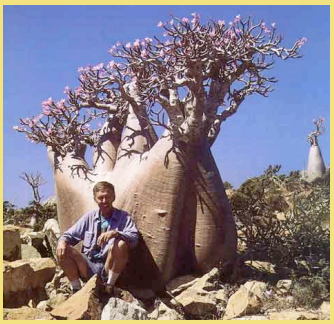
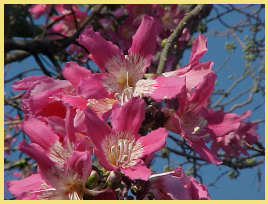


THE DESERT ROSE



Adenium *obesum*



Chorisia *speciosa*

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grassy savannah

bushy savannah

savanna tree-lined

The difference is the percentage moisture in the soil ...

If the percentage of humidity is low (dry soil) dominate species, for protection, putting down the gems ... herbs (grasses and weeds) and the bushes ... with the increase of moisture (soil less arid) savanna tree-lined ...

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African Savannah

It is very variable but unmistakable dominance of grasses and *genus Acacia*

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Brachystegia boehmii

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The herbaceous layer of grasses



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RISK FACTORS

The main problem is the "desertification"

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1. Wells and combating the tsetse, increased grazing

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2. AGRICULTURE

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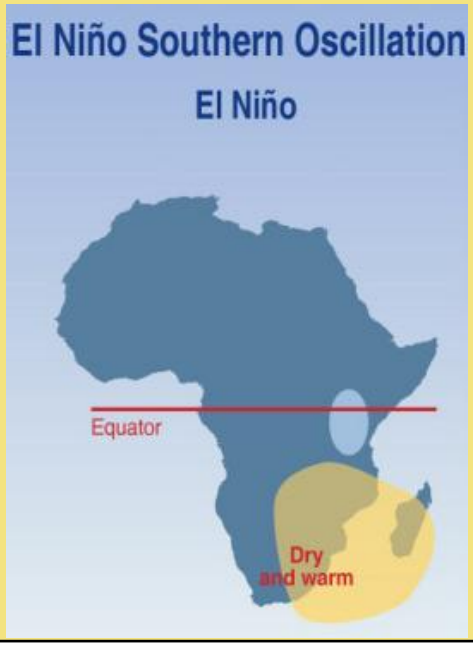
3. Overheating of the globe



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the Acacias

- The Acacia (*Acacia aneura* F. Muell .; A. *purpureipetala*) are the most represented tree species in the savanna (about 1000 species):
- Both:
- species, which do not have true leaves but flattened stems photosynthetic.
- species that have normal leaves.

Adaptations to the environment:
Small foliage to reduce perspiration
Stomata sunken and protected by trichomes
Roots are capable of accumulating large amounts of water
Symbiotic relationship with ants
Symbiotic relationships with bacteria

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termites

- Termites play a crucial ecological role in the Australian bush:

- Main decomposers, also active in the dry season
- Mixing of substances in soil
- Food source for many animals

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Fire

- The ecology of the savannah is closely related to the occurrence of periodic fires, and in the driest areas are biennial.

- **Natural fires: are frequent during the dry season. The turf is dry favoring the development of the flames.**

- **Anthropogenic fires: since before the European colonization Aborigines used fire for control of territory.**

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Change the system of fire with the arrival of European settlers

No more controlled burning by the Aborigines (small fires concentrated during the first months of the dry season).

Intense fires concentrated at the end of the dry season, when there is the greatest accumulation of "fuel".

The change in the management of fire is changing the landscape of the savannah

Reconquest of the forest in the wetter areas.

Desertification, erosion and soil depletion due to fires too intense and delayed.

In 2004 in the Tanami Desert burned over 60.000 square kilometers of savannah (two and a half times the area of Sicily!)

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- **Alien species introduced for grazing have greatly increased the power of the fires:**

Andropogon gayanus Kunth.(gamba grass)

Pennisetum polystachion L.

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