LATERITE PROFILE AND LATERIZATION

6th semester(Hons.) Paper DSE 4

Department of Geography
Mankar College
Presented by
Dr. Srabanti Ghosh, Assistant Professor

Session: 2019-2020

LATERITE

- Mainly found in hot & humid climatic condition of Tropical & sub tropical climate

- In 1807 Buchanan first suggested the name “Laterite”

- The word is derived from the Latin word “Later” means brick

Laterite Soils

Laterite has been derived from the Latin word 'later' which means brick.

This is the result of intense leaching due to heavy rain. Humus content of the soil is low because most of the micro organisms, particularly the decomposers, like bacteria, get destroyed due to high temperature.

These soils are mainly found in Karnataka, Kerala, Tamil Nadu, Madhya Pradesh, and the hilly areas of Orissa and Assam.

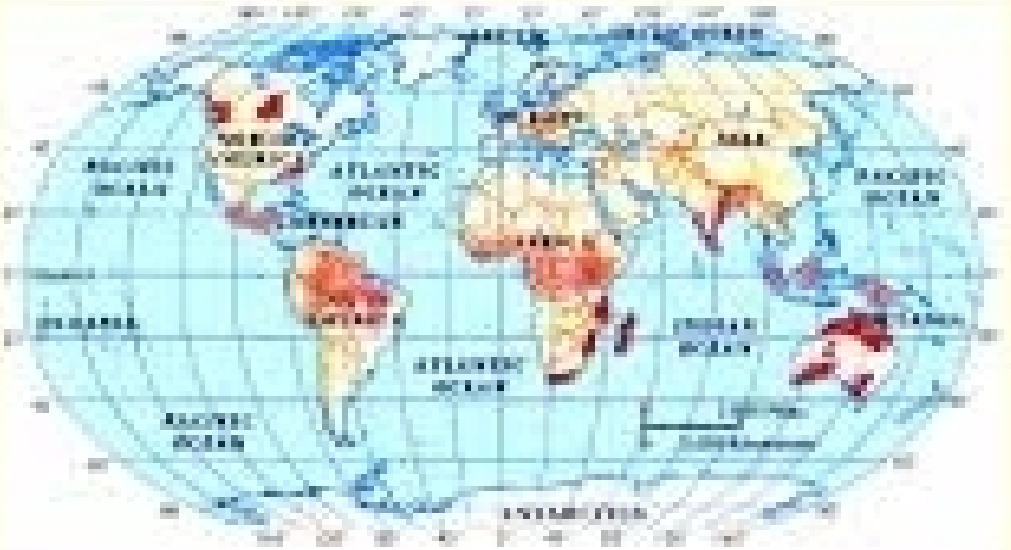
Red laterite soils in Tamil Nadu, Andhra Pradesh and Kerala are more suitable for crops like cashew nut.

FAVOURABLE CONDITION

1. Climate- Warm and humid climate with 200-250 cm. Rainfall
2. Natural vegetation- In rain forest of tropical region organic matters are quickly decomposed due to high temperature and rainfall and high leaching . Soil remain low in humus.
3. Parent material having sufficient ferro-magnesium material capable of releasing iron.

GEOGRAPHICAL DISTRIBUTION

World wide distribution of laterite



- Laterite: weathered rock found in tropical and subtropical humid regions of the world.
- Major part of the Indian peninsula, which falls within Kappen's 'A' climate, is subjected to formation of laterite

Process of Laterization

- Two chemical processes responsible

1.Desilication or loss of SiO_2 i.e. Hydrolytic separation of silica

2. Accumulation of sesquioxide mainly Fe and Al

- By hydrolysis aluminium hydroxide and hydrogen ions are formed and Al is released
- Al oxides imparts grey coating to clay. Silt or sand particles

- High temperature, intense leaching, basic parent material favour removal of silica
- Release and mobility of soluble basic ions like ca, Mg, K, Na PH goes up to nutrality
- Bases of organic matter is released
- Under basic condition liberated silica is solubilised and leached
- Silica releases due to solubility of quartz(2-5 microns)
- Leaching of alkaline bases make the remaining soil acidic in reaction
- Instead of considerable eluviations no distinct horizon formation
- Accumulation of sesquioxide as it being more stable

- Sesquioxoide reprecipitate at the foot of slope under favourable condition

- Difference of deposition of sesquioxide in wet and dry season and formation of horizon dominated by sesquioxide

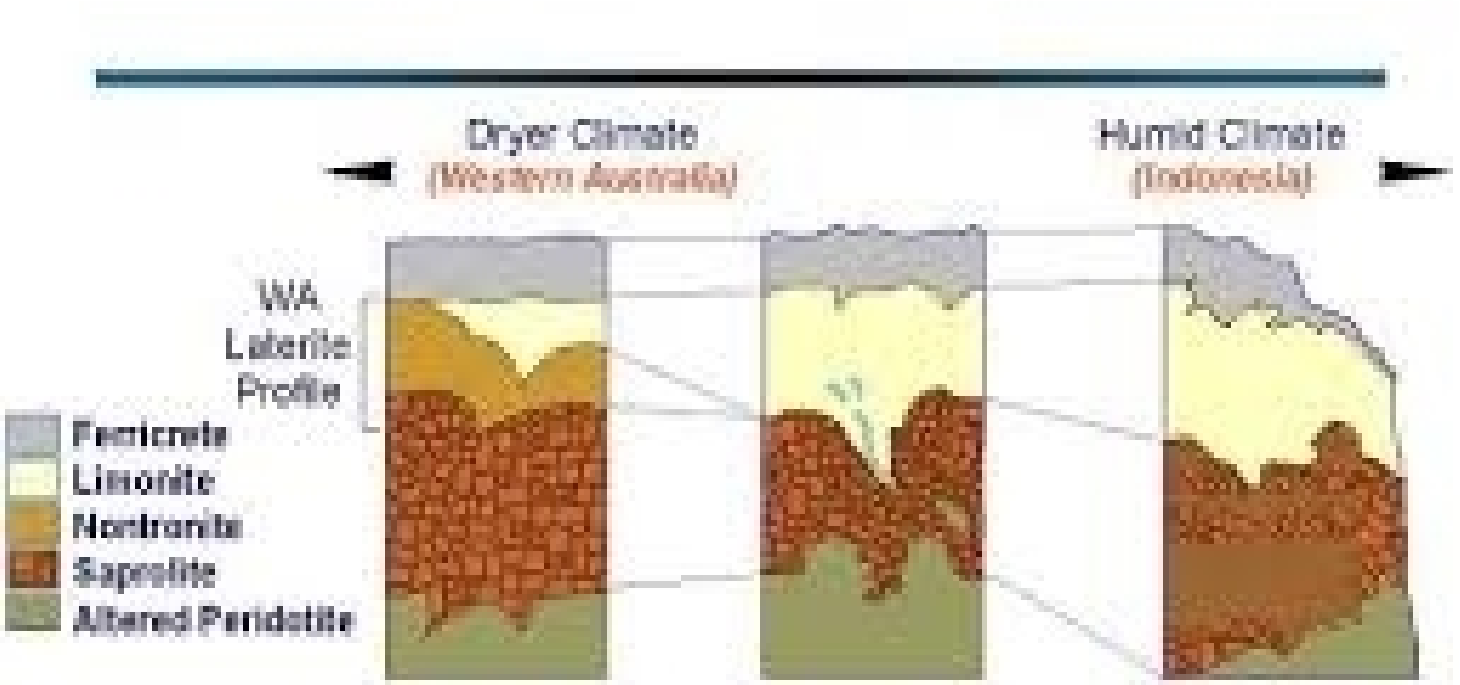
- Phosphate tends to accumulate in upper layer

- P from organic matter is mineralised and combines with Fe and Al

- Low in P2o5 due to erosion of A layer

Laterite Brick Soil

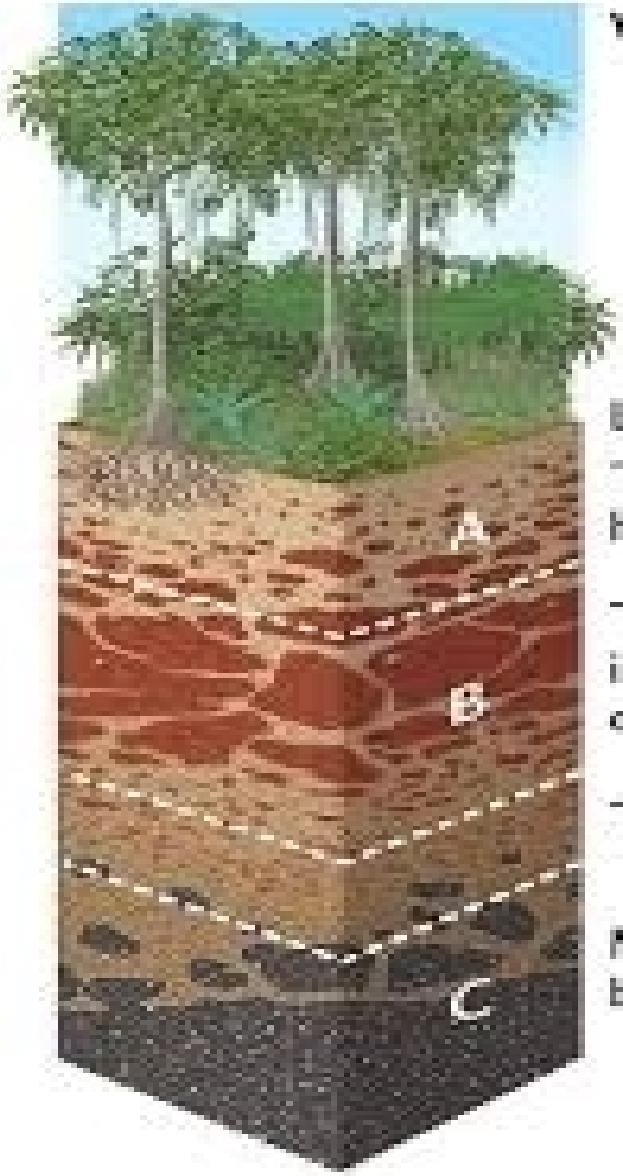
Laterite Profiles: Wet and Dry Laterites



	%Ni	%Co	%Mg	%Fe	%Ni	%Co	%Mg	%Fe	%Ni	%Co	%Mg	%Fe
Ferricrete	.2-.5	.02	.6	35+	.2-.5	.02	.6	35+	.2-.5	.02	.6	35+
Limonite	.6-1.4	.1-.2	1-2	45	1.2-1.7	.1-.2	1-2	45	1.2-1.7	.1-.2	1-4	45
Nontronite	1.2	.08	3.5	18								
Saprolite	.4	.02	12.0	9	1.5-3	.05-.1	18-20	10-25	1.5-3	.05-.1	18-30	10-20

LATERITE PROFILE

- A: Dark brownish grey to reddish brown, clay to clay loam in texture, granular structure, porous, free drainage, friable, absence of Ca and Mg carbonates, high in humus, slightly to moderately acidic in reaction
- B: Red to brownish red, slight infiltration of clay and humus, cellular structure, prominent vein and concretion



Wet climate

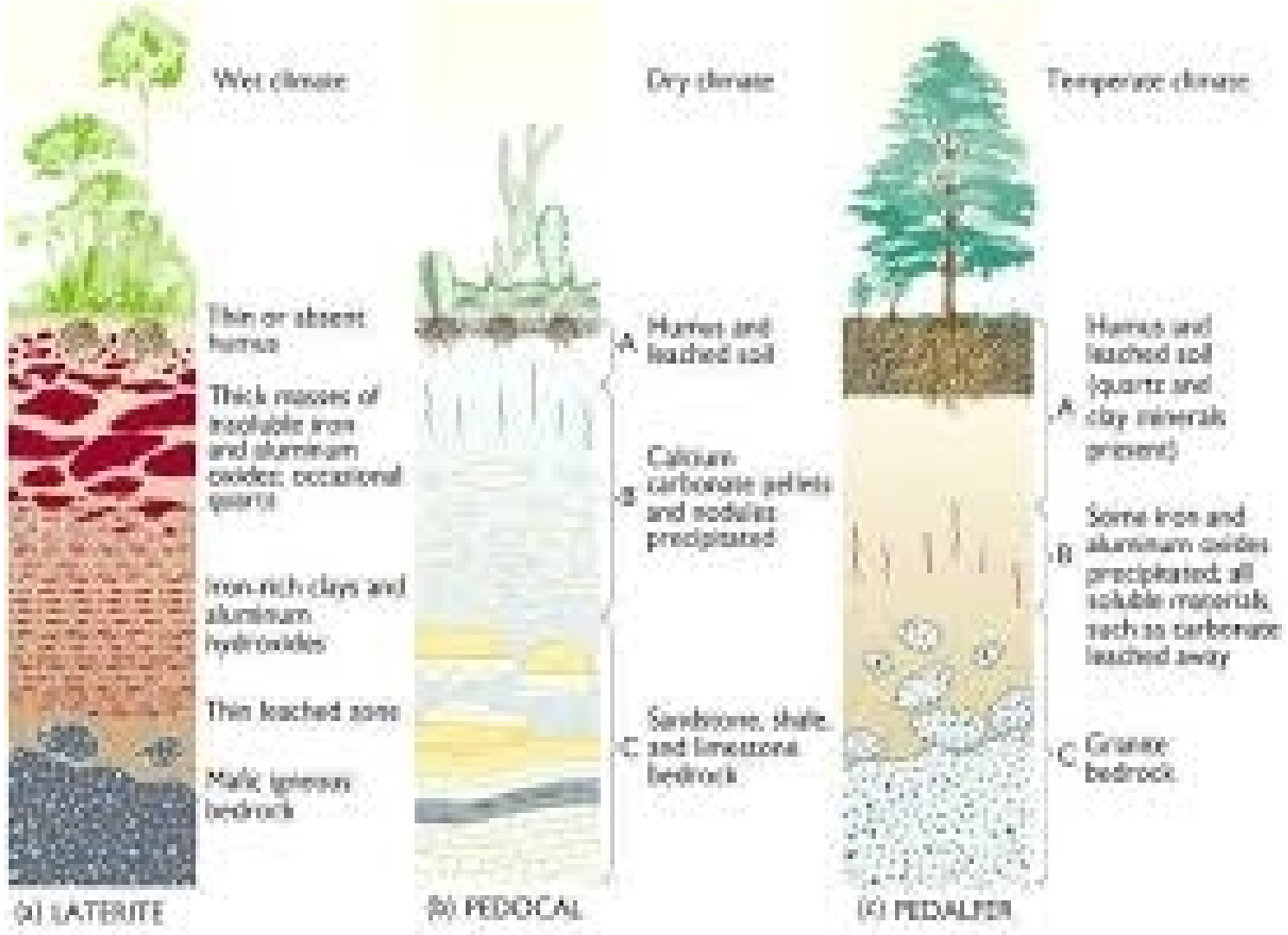
LATERITE

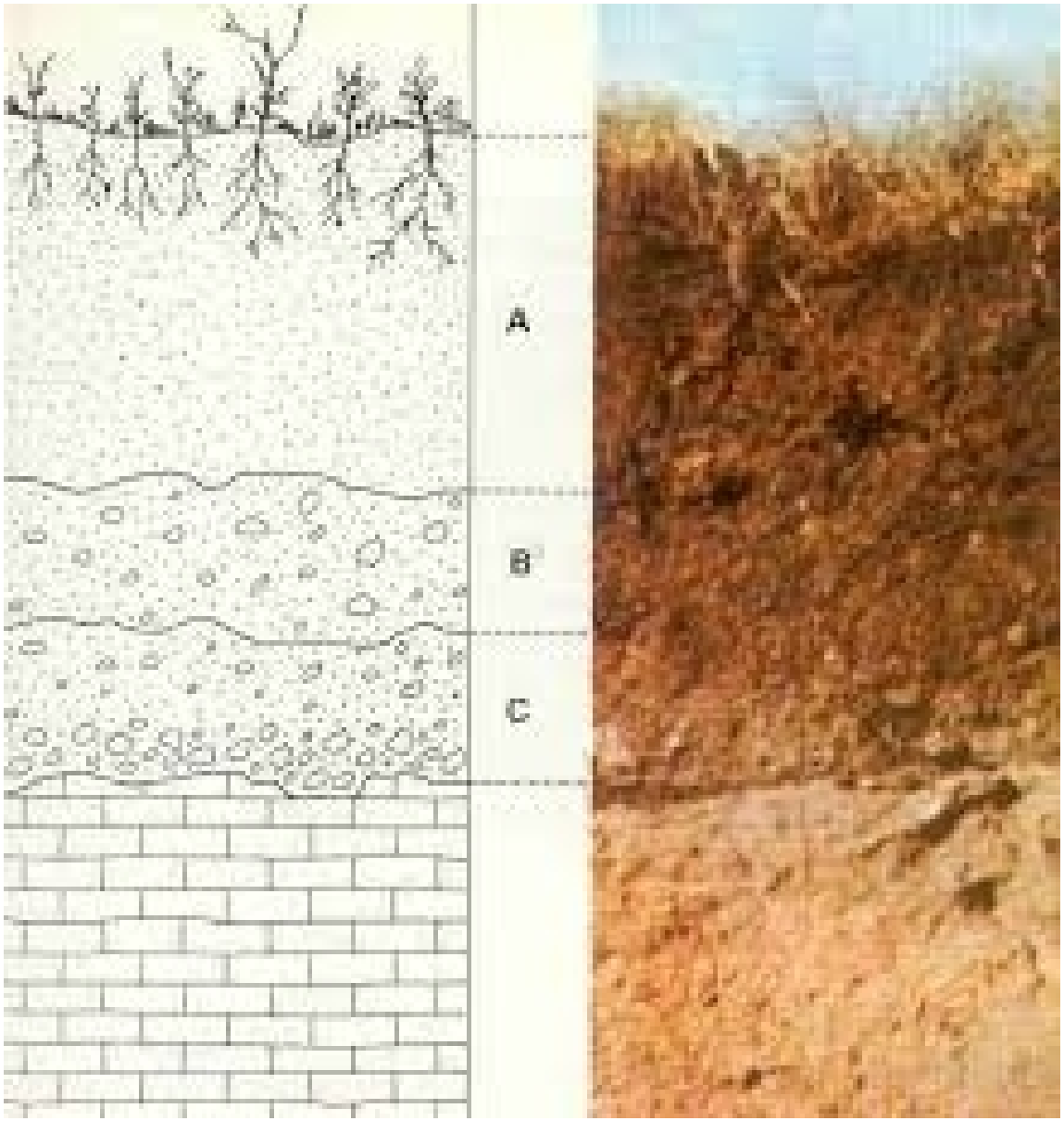
Thin or absent humus

Thick masses of insoluble iron and aluminum oxides; occasional quartz

Thin leached zone

Mafic igneous bedrock


Wet climate
Thin or absent humus
Thick masses of insoluble iron and aluminum oxides; occasional quartz
Iron-rich clays and aluminum hydroxides
Thin leached zone
Mafic igneous bedrock
(a) LATERITE
Dry climate
A Humus and leached soil
B Calcium carbonate pebbles and nodules precipitated
C Sandstone, shale, and limestone bedrock
(b) PEDOCAL
Temperate climate
A Humus and leached soil (quartz and clay minerals present)
B Some iron and aluminum oxides precipitated; all soluble materials, such as carbonate, leached away
C Granite bedrock
(c) PEDALFER


A
B
C

CHARACTERISTICS OF LATERITE

- Typical laterite is dark brownish red in colour, granular structure
- Laterite clay crust is mottled and thick
- Horizon differentiation is not distinct
- Reaction varies from degree of acidic
- High percentage of colloid mainly by hydroxides of iron and Fe and Al, hence does not posses the common properties of clay as swelling, plasticity, shrinkage

- Low organic matter and high sesquioxides decrease negative charge
- Decrease absorption of bases may include absorption of anion as sulphate and nitrate
- The soil is non plastic, non cohesive
- Low in cation exchange capacity
- Low in fertility due to lack of organic matter and dry nature of clay