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# Soil and water Conservation Engineering

Presented By-

**Shubham Kumar Sarangi**

**Asst Professor**

**DEPARTMENT OF AGRICULTURAL ENGINEERING, SoABE  
CENTURION UNIVERSITY OF TECHNOLOGY AND  
MANAGEMENT PARALAKHEMUNDI, ODISHA**

# Wind erosion





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# Wind erosion

**Wind erosion:** It is the process of detachment, transportation and deposition of soil particles by the action of wind.

- **Rajasthan** has severe wind erosion problem.
- Arid and semi arid regions where annual rainfall is less, are more predominant to wind erosion.
- Wind erosion occurs only in dry periods of the year in humid region.



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# Wind erosion types

1. Sweeping drift
2. Active drift

**Sweeping drift:** It commonly refers to relatively gentle wind erosion in which some loose soil's fines get into suspension.

**Active drift:** It refers to more vigorous wind erosion, it involves all the three particle movement process with development of drift banks.



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# Factors affecting wind erosion

1. Climatic factors
2. Top soil condition
3. Vegetation



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# Mechanics of wind erosion

The occurrence of wind erosion could be described under following three different phases. They are

1. Initiation of soil movement
2. Transportation of soil particles
3. Deposition of the soil particles



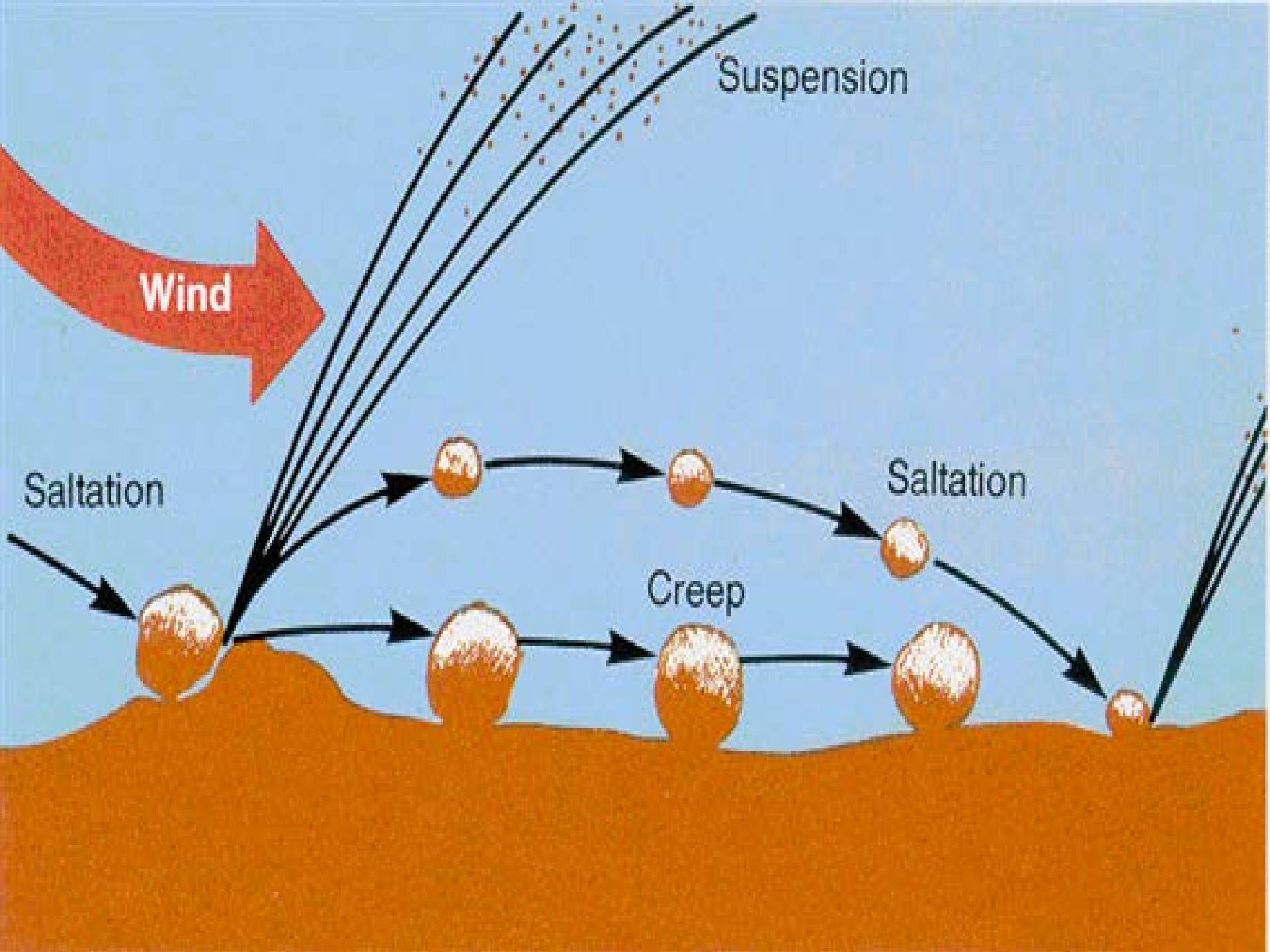
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## Initiation of soil movement:

The movement of soil particles may be described in three distinct forms, depending on the size of soil particles. The three types of particles movements are given below-

1. Suspension
2. Saltation
3. Surface creep



Suspension

Wind

Saltation

Saltation

Creep





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**Transportation of soil particles:** The transportation of soil particles in wind erosion, is directly influenced by the particle size, gradation of particles, wind velocity and distance across eroding area.

- In addition the transportation also gets increase as the gradation of soil particle decreases.



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**Deposition of soil particles:** It mainly depends on the particle's weight and wind velocity, in which particles weight is directly related to gravitational force; has prime importance for deposition.

- The deposition occurs, when gravitational force is greater than resisting force holding the particles in air.
- The deposition can also takes place, when wind velocity gets decrease sufficiently near the ground surface either due to surface roughness or some other natural causes.



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# Wind Erosion Control

- A suitable surface soil texture is the best key to wind erosion protection.
- Properly managed crop residues, carefully timed soil tillage, and accurately placed crop strips and crop barriers can all effectively reduce wind erosion.
- Proper land use and adaptation of adequate moisture conservation practices are the main tools which help in wind erosion control.
- In arid and semiarid regions where serious problem of wind erosion is common, several cultural methods can help to reduce the wind erosion. In the absence of crop residue, soil roughness or soil moisture can reduce the wind erosion effectively.



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Three basic methods can be used to control wind erosion:

- Maintain Vegetative Cover (Vegetative Measures)
- Roughen the Soil Surface by Tillage Practices  
(Tillage Practices or may be called Tillage Measures)
- Mechanical or Structural Measures (Mechanical Measures)



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# Wind Breaks

▶ This is a permanent vegetative measure which helps in the reduction of wind erosion. It is most effective vegetative measure used for controlling severe wind erosion. The term wind break is defined as any type of barrier either mechanical or vegetative used for protecting the areas like building apartments, orchards or farmsteads etc. from blowing winds. The wind break acts as fencing wall around the affected areas, normally constructed by one row or maximum up to two rows across the prevailing wind direction.



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# Shelter Belts

- A shelterbelt is a longer barrier than the wind break, is installed by using more than two rows, usually at right angle to the direction of prevailing winds. The rows of belt can be developed by using shrubs and trees. It is mainly used for the conservation of soil moisture and for the protection of field crops, against severe wind erosion.

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**THANK  
YOU**

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