**Wind as an ecological**  **factor and its importance**

# Wind

 Wind is a moving air and is caused by difference in pressure within our atmosphere.

Air under high pressure moves towards the area of low pressure. Greater the difference in pressure the faster the air flows. Solar wind is the movement of gases or charged a particle from the sun through space and it occurs in outer space. The planetary wind is the out gassing of light chemical elements from a plants atmosphere into space.

Winds are commonly classified by the following things.

1. Their spatial scale.
2. Their speed.
3. The types of forces that causes them iv. The regions in which they occur

 v. Their effect.

The strongest winds on a planet in the solar system occur on Neptune and Saturn

 There are two types of wind that we encounter usually.

i. Squalls. ii.

 Gust.

# Squalls:-

 These are violent gust of wind that occurs. Suddenly Squalls occurs rains snow or sleet. It remains for a second, snow or sleet because they are associated with active weathers.

Basically the squalls are sudden high speed winds. These high speed winds may come in a continuous or they may be discontinuous. There thunder storms which may be continuous or dangerous sometimes. The reason of this is that the squall is related to active weathers it means that it causes the rain, snow and thunderstorm the high speed wind with all these things may be dangerous. If there is a blind rain and lightning due to the squalls then condition may be dangerous. And the sudden increase in the velocity of wind may also cause the damage.

 The time of squalls is usually from 30 minutes to one hour. Sometime the limit of time may fluctuate but usually the squalls are within 3hours.

There is a type of squalls called white squalls. These squalls occurs in the seas. It is like the usual squalls a sudden and violent windstorm but the difference is that there is no black cloud formation during white squalls. In terrestrial environment the squalls are accompanied with the black clouds but in case of white squalls are not formed in tropical and subtropical waters.

# Gusts:-

It is a sudden seconds long high speed wind and after it slackening occurs

 The speed of wind gust is 18mph and when slackening occurs the difference between the initial and final value may be with the difference of 10mph.

The wind gust and normal wind are mixed sometimes. Although the gusts are sudden high speed winds but normal wind is differ from gust are no more than 20 seconds. This is the time limit for the gust. A normal high speed moving wind may be for long duration but gust remains just for seconds. And the most important thing is that the wind speed in wind gusts fallen down quickly. There is everything in a great hurry. The rise of wind speed is also occurred suddenly and fall in wind speed is also occurs suddenly. It means that high speed wind shifts to low speed in some seconds. Mostly the time is 20 seconds and high speed wind is of 16 knots and after this low speed wind is of usually 9 knots.

 Wind gusts are sometimes damaging. The wind exceeding from speed 50-60 knots. Sometimes the speed of wind goes up to 100 mph and during this damage may occur. This 100 mph speed of spreads to miles it may cause lot damage. This wind speed of 40 mph may cause a lot of disturbance in walking and of speed exceeds 60 mph then it will be impossible to walk in this wind speed. Normally the wind speed exceeding from 50 mph may cause a lot of disturbance.

# Wind as an ecological factors

Wind is an important ecological factor. Forests are disturbed and get benefits from the wind. The trees have a great impact on them due to wind but this all depends upon the intensity of wind. If a very high speed wind is moving it may cause breakage of trees and it may also cause the uprooting of the whole tree.

The lodging of whole crop also occurs due to wind and abrasion is also occurred due to the wind deformation in plants is occurred mainly due to the wind the cooling in the environment and desiccation in plants there all are impacts on the plants the dispersed off seeds and fruits is also done by wind mainly the self-pollination and crosspollinations and wind plays major role in both kinds of pollination. The temperature and humidity is also controlled by the wind and it occurs mainly in forests. The precipitation is affected by the wind because all the phenomena like evaporation, transpiration, spatial disturbance of snow are affected by wind. If write then mainly following are the effects.

i. Cooling ii. Deformation iii. Abrasion iv. Desiccation

v. Breakage vi. Lodging vii. Dwarfing viii. Uprooting of plants ix. Forest fires

x. Precipitation

# Cooling:-

 The bound layers on the surface of leaf accumulates heat and due to which high temperature is conducted to the plant. The wind when moves it dissipates the layers of heat and makes them thin due to which the temperature is lowered.

 The moving wind also lowers the temperature of the environment.

 In the environment the wind plays very important role in cooling. Warm and dry condition of weather is not much useful for the environments. Humidity is important for plants and animals. If the condition of weather is dry and hot it may cause desiccation. Wind plays an important role in cooling. The rain is caused due to movement of wind and humidity condition of the weather is created. The air in summers is heated from the surface of the earth and it is devoted due to its low density and then cold air comes. The air may be devoted too much and due to rain the condition of the environment become cool. Due to different movement and phenomenon of wind the rainfall and snowfall is occurred and snowfall is also lower the temperature of the environment. In this way the temperature of the environment is controlled. The plants are usually well grown in humid conditions. The more availability of water makes photosynthesis easier and in this way ore oxygen is produced that is more useful for whole environment. Wind plays its role as an ecological factor to maintain the temperature of the environment

# Deformation:-

 Deformation means the permanent change in the shape of plants due to constant movement of wind in that direction. This occurs when the speed of the wind is also high. When the plants are young they face the movement of air in its direction. After a long time when the plants become matured the shape of the plants is molded in that direction which is called deformed. Examples of the deformation are that some inclined plants which grow in ridges and rocks which are flattened to the ground. Some trees are bent in the direction of air these all are examples of deformation.

 The impact of wind means deformation is in plant growth occur both in woody plants and non-woody plants. It was assumed occurs both in woody and non-woody plants that deformation does not occurs in the non-woody plants but know studies show that the deformation occurs in woody and non-woody plants. The deformation is used to indicate the direction of wind in different areas. And it also gives information about the variation of the wind. But this is not clear that whether the woody and non-woody plants give some indication about the variation of wind.

# Abrasion:-

This occurs in desert area the stones surface is rough due to the constant moving wind and small particles are formed. These particles are strong in nature because they are formed from rocks. When these particles are carried with the fast moving air they cause damages to the new born bends and to delicate and tender leaves surface. Not only leaves are damaged by these phenomena but also the bands of trees and crops in the sandy soils are also damaged badly.

Basically the abrasion is the component of weathering. Weathering is the effect of weather and environmental conditions. Abrasion changes the leaf surface structure. The surface becomes dull and rough due to the abrasion. Due to the roughness of the surface of leaf the gaseous exchange is affected and due to it phenomenon like photosynthesis are affected.

This is more dangerous in the areas where the wind is of high speed because sand particles collide with the stone and makes more solid particles which cause more damages.

# Desiccation:-

The moving wind makes the transpiration rate high. Due to which a great amount of water is lost and plants faces the desiccation. Cushion plants may survive in the desiccation because their leaners are small and flat. Their shoot is smell and their taproots are well developed so they do not face the water shortage.

# Breakage:-

The breakage in plants is also occurred due to the wind breaking depends upon the wind breakage depends upon two things basically first the intensity of wind and second the short of the tree. If the wind is of too much high speed and the stem is weak then the breakage will be occurred and if the stem is strong and if the stem is strong and wind is slow then the no damage will be occurred.

# Lodging:-

Lodging is the laying down of the crops and flattened to the earth due to the fast moving. This phenomenon is occurs in rice, wheat and barley. The reason of occurrence of this phenomenon is that the stems of their crops are usually weak and when the lodging starts the falling stem fells on the other one so the weight becomes double and due to it a lot of crops is fallen down. Wind is the main factor in lodging.

# Dwarfing:-

 For a complete nourishment of cell the cell has all the optimum contents Amount of every major and minor element are present. Water is the major element. It keeps the cell turgid. Turgidity is an important character.

 If the cell grows in an environment which is drying the desiccation will be occupied and cell becomes dwarf. Due to dwarfing of cells the whole plant body will become dwarf

# Falling of fruit:-

 Due to wind the falling of fruit is a serious problem. The farmer’s handworks for whole of the year and their lively hood is dependent on the yield of the crop. When the fruit is ripened the falling of fruit is great loss for the farmer but every year a great loss to the economy of the country. But every year a great loss of fruit falling is almost all countries of world occurs.

Fruit falling occurs mostly in oranges, kinno, guava, mangoes etc. A big part of world’s fruit is lost in this calamity.

# Uproot of plants:-

If wind becomes storm it may damage a lot. It may uproot the plants from the roots and many accidents may be occurred due to it. Uproot of plant due to wind is not very often but it sometime occurs and causes serious damages.

# Forest fires:-

The wind plays an important role in both spreading and starting of fire. Wind can bring the flames of fire into the forest and moving wind may increase the intensity of fire. In this way the wind plays its role in spreading of fire in forest. In forests the plants are very close to each other. Due to close location of plants a fire may cause serious damage because it spreads very fast and becomes very difficult to control.

 Recently some months ago the fire in the Australia causes a great damage. **Precipitation:-**

 Precipitation means all types of moisture coming to the surface of the earth. For the soil fertility precipitation is a necessary factor without the precipitation the water the most important thing for all kinds of crops and for all kinds of trees will not be available properly. In plants the water is important for different processes for example photosynthesis because photosynthesis uses water. And oxygen which is the most important gas in this world will not be available. The supply of proper oxygen to all living organisms is very important for crops the seeds in the initial stages also needs water so the importance of water is so much.

 Wind plays its role in almost all kinds of precipitations. All the types of precipitation for example cyclonic, orographic and convection precipitation are based on the movement of wind. So this shows the importance of wind as on ecological factor.

 The first type is the cyclonic precipitation. In surroundings sometimes circles of moving air are seen. These are circle of warm air and they move with a great speed but move in circles, these are called cyclones. These are usually of warm air. They mostly occur in summers. These cyclones cause rains. The temperature near the earth surface is high and as we move up the temperature falls and environment is cooled. In cyclones the air moves in ascending order. As the air moves up at the upper conditions it is cooled and rain occurs. So wind movement is basic cause of rain in this kind of precipitation. Orographic is the second main type of precipitation. In environments different things are produced by the nature. Seas, mountains, and terrestrial areas are created by the nature. The wind when elevated from different things like mountains when goes up it cause rain. The cause of rain in this type of precipitation is also wind. The third type is the convection precipitation. This is also very important type of the precipitation. It mostly occurs in the summers. In summers the temperature of the environment is high and due to which the temperature of the surface of the earth also becomes very high. Due to high temperature of the surface of the earth the temperature of the air near the surface of the earth also become high due to the heat transfer from the surface of the earth to the air. The density of the air is inversely proportional to the temperature. It means that if temperature of the air is high its density will be low and if temperature is low then the density will be high. So due to high temperature the density of air near the surface of earth will be low as compared to the air above it. Due this overturn will be occurred and air will be projected vertically upward and it will be cooled and due to it rainfall occurs this is occurred due to wind so it shows the ecological importance of the wind.

 Gust cause rainfall and snow fall. The rain is a direct source of precipitation for the surface of the earth and snow when melts it also becomes a good source of precipitation. This also shows the importance of wind in precipitation and its importance as an ecological factor.

# Importance of wind:-

As there are some harmful aspects of wind but there are many beneficial aspects are also present. The plants races are survived due to the pollination and there are two basic types of pollination selfpollination and cross pollination and both these types of pollinations are caused by wind. Fruit and seed disposed are very important phenomenon and both are mainly done by the wind.

As we know that this is the era of technology and today’s world bases on electricity two much. Wind-mills are used. Wind mills are used to produce electricity.

# Wind pollination:-

 Flowers are produced in angiosperm. For the production of flowers the pollination is very important. The pollination is very important and it is called anemophily.

Wind pollination mostly occurs in cold areas where too many plants are present. About 18% of total pollination of the world is done by wind pollination. Pollination is based on capture of pollens are lost therefore those plants produces a lot number of pollens.

 Too much pollen the environment may cause disease in human being. There some problems are present but the wind pollination is very important and necessary.

 It is considered that the wind pollination is not as efficient as the animal pollination is. In animal pollination the pollen grains are stuck to the legs of animals for example in flowers a liquid is produced to get that liquid bees come and pollen grains stick to their legs and when they go to the other flower the pollen grains stuck to the female part of the flower and fertilization occurs in this process the loss of pollen grains as compared to the wind pollination is very much less. But the evidence from the herbs proved that wind pollination in not much less efficient. The efficiency of wind pollination depends upon different factors. Some places are naturally suitable for the wind pollination. At that place the wind pollination has too much efficiency and for the transfer of pollen grains the size of pollen grain must be small and it should be less in weight. Wind pollination is evolved from the animal pollination so to improve the efficiency of wind pollination different adaptations had adopted. For example pollen transport is maximized by having large well exposed others hanging on long filaments as the dispersal is important for wind pollination the capture of pollen grain is also very important. So the capture is enhanced by the brackets and sepals which deflect the air current to the stigma. So the wind pollination is the good source of pollination.

# Seed and fruit dispersal:-

 This is very important phenomenon in the terrestrial plants wind plays important role in the disposal of seeds and fruit of terrestrial plants. The seeds and fruit of such plants develop some adoptions. For example such seeds are light in weight and have hairs on them so they are easily carried to the distance places by the wind. There seeds are usually of small size and very less weight. Due to this kind of disposal their seeds have some adoptions like tumbling, catapult.

 The seeds in plants are produced to produce more plants and this is done to secure the plants races and for their survival. If the seeds are fallen near the roots of plants means under the plants then it is not useful. The seeds are carried are carried away with the wind to the distant places, it has many benefits. A very important benefit is that the plants will be at distance from each other. Due to distance every plant will get the more resources and will grow bitterly but if the plants will be closed to each other there will be competition between them for resources for example light, water etc. and their growth will be less because their need will not be compensated. One other aspect is that in forests there is great chance of the fire. If the plants are closed near to each other the spreading of forest fire will be easy and if they will be separated from each other by long distances then the fire will remain to a few plants. And one another beneficial aspect is that falling of seed due to wind to a distant places may colonize a new area which may be having no trees.

 So all there the benefits of spreading of seeds to large distances. And wind is a main factor among all of them. All other factors are also important like dispersal with the water and other processes are.

But wind dispersal is very important because it may spread the seeds to distant places therefore due to all above aspects the dispersal of seeds through wind is very important for this process.

# Wind mills:-

The area where there is high speed wind, wind mills are constructed in those areas. Wind mills have big fan like structures. High speed wind is used to make the turbines work.

 Wind mills are of great importance. This age needs electricity a lot. Every kind of necessity is somehow related to the industry and industry cannot work without the electricity so to run the life electricity is necessary and wind is playing its role with the help of wind mills.

 Another benefit is that the fossil fuels are used to produce electricity. Fossil fuels are non-renewable source of nature. So they are costly. And burning of fossil fuels also produces pollution. But when the wind mills are used to produce electricity we are saved from pollution and sources are saved too. Because the air is a renewable source of nature.

With the use of wind energy we are securing our fossil fuels which are necessary for our future so a security of energy is produced.

The wind mills are not limited to the industry. They are used on both scales. They are used on both scales. They are used both on industrial level and on domestic level. They may be used in forms like poultry farms and cow farms and in residential areas. In cities in big plazas and is big buildings the wind mills may be used to provide electricity.

 The big thing is that the wind energy is free of cost the only one thirty which is necessary is the pressure of high speed wind. If high speed wind is present then a large number of turbines may work and may produce energy. The other benefits of the wind energy are that it produces jobs for the people. It is a big industry word wide and many people are related to it. Those people are earning their livelihood by the wind mill. The only cost is in the initial stage which is planting of wind mills and after that the wind energy is free. A slight problem occurs when there is fluctuation in the speed of wind. The efficiency of the turbine is reduced and a serious problem occurs. A regular and high speed wind is required for the proper working of wind mills.

 Therefore due to this reason the wind mills are constructed on the highly areas.