

ENVS REPORT (2022-23)

A Report on Project works undertaken as a part of course curriculum on Environmental Studies:

Environmental Studies is all about learning the way we should live and how we can develop sustainable strategies to protect the environment where we live in. It helps individuals to develop an insight of the living and physical milieu and to resolve perplexing environmental issues that touches and affects individual lives. Under stressful environmental circumstances, creation of a model of a clean and healthy environment is perhaps the greatest concern of all generations to come.

Under affiliation to Cooch Behar Panchanan Barma University, A.B.N. Seal College, Cooch Behar is required to follow a well-structured curriculum and syllabus for Environmental Studies (ENVS) and impart the same by arranging for theoretical classes.

All the newly enrolled student from all the branches of the Under Graduate courses has to study Environmental Studies on a mandatory basis. Apart from a theoretical evaluation process, the students have to undertake a project work on certain specified topics of relevance and prepare their individual study reports to satisfy their curriculum requirement. They are duly tutored about the formalities of undertaking a research work on a stipulated area of focus, by the teachers concerned.

Some of such topics of contemporary vitality are mentioned underneath.

Environmental assets--- River/Forest/Grassland/Hill/Mountain etc. • Environmental pollution – Urban/ Rural / Industrial / Agricultural • Study of common Plants/Insect /Birds / Wild life etc. • Study of simple ecosystems: Pond / River / Hill slope, etc. • Municipal Solid Waste management and handling etc.

A project work report is attached beneath for representational purpose.

COOCH BEHAR PANCHANAN BARMA UNIVERSITY



B.A SEMESTER I (CORE COURSE) EXAMINATION 2022-23

(Under Choice Credit System)

ENVIRONMENTAL STUDIES

Project Report On

“Study of Common Plants”

Submitted by

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Roll No- 22BAH-ECON-M-001

SESSION- 2022-2023

Theme :-

Study of Common Plants/Insects/Birds/Wildlife etc.

Title :- Study of Common Plants.

ACKNOWLEDGEMENT

I would like to express my special thanks of gratitude to my Economics teacher "Prof. Bimal Kumar Saha" for his guidance and support in completing my project.

I would also like to thank all of my departmental teachers for the continuous support and encouragement in this regard.

I also thank my fellow classmate for tendering the necessary support in preparation of my project work.

Date : 21/12/22

Arnab Mukhopadhyay.
Signature of the student

BONAFIDE CERTIFICATE

This is to certify that Arnab Mukhopadhyay, a student of 1st semester, Department of Economics, ABN Seal College, Cooch Behar has successfully submitted the project work under theme "Study of Common Plants/Insects/Birds/Wildlife etc" and the project title being "Study of Common Plants." This project work is the record of authentic work which is genuinely carried out by his tireless effort. He has prepared this entire project report under my supervision and guidance.

I wish his all success in his life.

Date:

Bimal K. Saha
Signature of Teacher

DECLARATION

I, Arnab Mukhopadhyay, first semester UG student of the Department of Economics, A.B.N Seal College, Cooch Behar. hereby declare that the AECC-ENVS Project under theme "Study of Common Plants/Insects/Birds/Wildlife etc." and the project title being "Study of Common Plants" is submitted by me for the partial fulfillment of the requirement for AECC-ENVS Project work. The AECC ENVS Project Work comes under the AECC-ENVS Course of 1st semester UG CBCS under the CBPBU, Cooch Behar.

Date: 21/12/22

Place: Cooch Behar.

Arnab Mukhopadhyay.

Signature of the student

STUDY OF COMMON PLANTS

Plants are usually photosynthetic eukaryotes of the kingdom Plantae. Here, I will discuss about some common plants.

Mango : This has become one of our most popular horticultural species with different varieties grown all over the country. The wild mango tree has small tangy fruit and a big seed in comparison to the large pulpy fruit used in horticulture.

The mango tree is an evergreen species and gets small flowers that are pollinated by insects. In the forest, fruit dependent animals such as monkeys, squirrels and fruit eating birds relish its ripe fruit.

A mango is an edible stone fruit produced by the tropical tree Mangifera



Mango

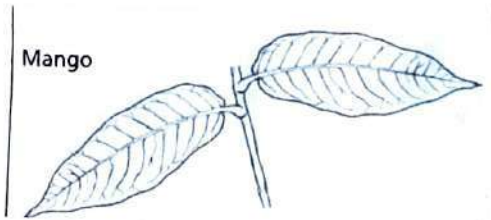
indica. It is believed to

have originated in the region between northwestern Myanmar, Bangladesh and northeastern India. M indica has been cultivated in south and southeast Asia since ancient times resulting in two types of

modern mango cultivars : the "Indian type" and the "Southeast Asian type." Other species in the genus Mangifera also produce edible fruits that are also called "mangoes", the majority of which are found in the Malasian ecoregion.

Worldwide, there are several hundred cultivars of mango. Depending on the cultivar, mango fruit varies in size, shape, sweetness, skin color, and flesh color which may be pale yellow, gold, green, or orange.

Mango is the national fruit of India, Pakistan and the Philippines, while the mango tree is the national tree of Bangladesh.



A raw mango is 84% water, 15% carbohydrates, 1% protein and has negligible fat. The energy value per 100g (3.5 oz) serving of a raw mango is 250 kJ (60 calories). Fresh mango contains only vitamin C and folate in significant amounts of the daily value as 44% and 11% respectively.

Teak: This tree is from the Southwest parts of peninsular India. It is a common tree in deciduous forests. It yields a much sought after timber used for making excellent furniture. During the early British period it was cut down from many forest tracts to build ships. As the stocks were diminishing, the British selected areas which they called Reserved Forests where teak was planted for the Government's use. Teak is grown extensively by the Forest Department

and is a highly priced wood. The teak tree is identified by its large leaves, which grow more than 40 or 50 cms long and 20 cms wide. It has tiny flowers and fruit. In the winter the trees shed all their leaves. In the growing season, which begins in April and extends through the monsoon, teak forests are bright green and shady. Most natural teak forests have various other species of plants and have a large

number of wild animals. Some areas of teak forests that have exceptional populations of wildlife have been included in our National



Teak

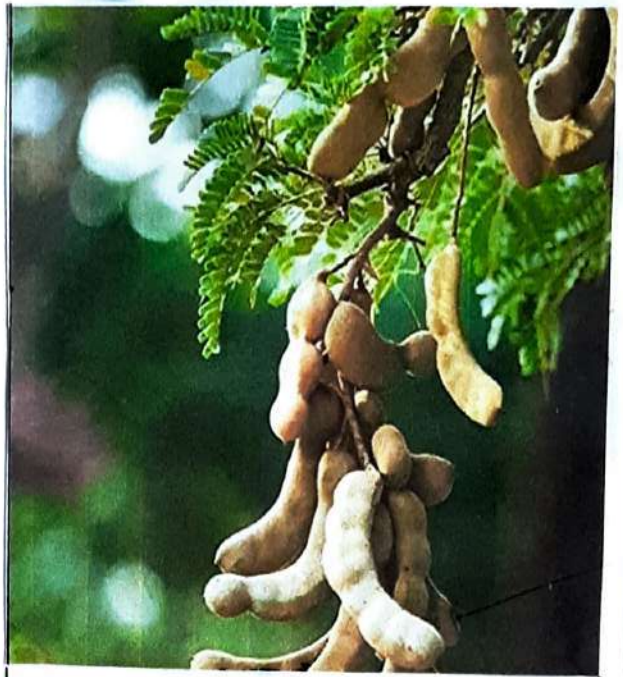
Parks and Wildlife Sanctuaries.

Tamarind: One of the best known Indian trees, it grows to a large size and is known to live for over 200 years. Its familiar fruit is a curved pod with sour pulp and contains a number of squarish seeds. The pulp in the fresh fruit is either green or red. As it ripens, it turns sticky and brown and separates from the skin. The tree is commonly cultivated as a shade tree and for its edible sour fruit which contains high concentrations of Vitamin C. It is used as an additive in food to give a tangy

flavour. It is valued for its timber as well as for fuelwood.

Tamarindus indica is a leguminous tree bearing edible fruit that is probably indigenous to tropical Africa. It belongs to the family Fabaceae.

Throughout Southeast Asia, the fruit of the tamarind is

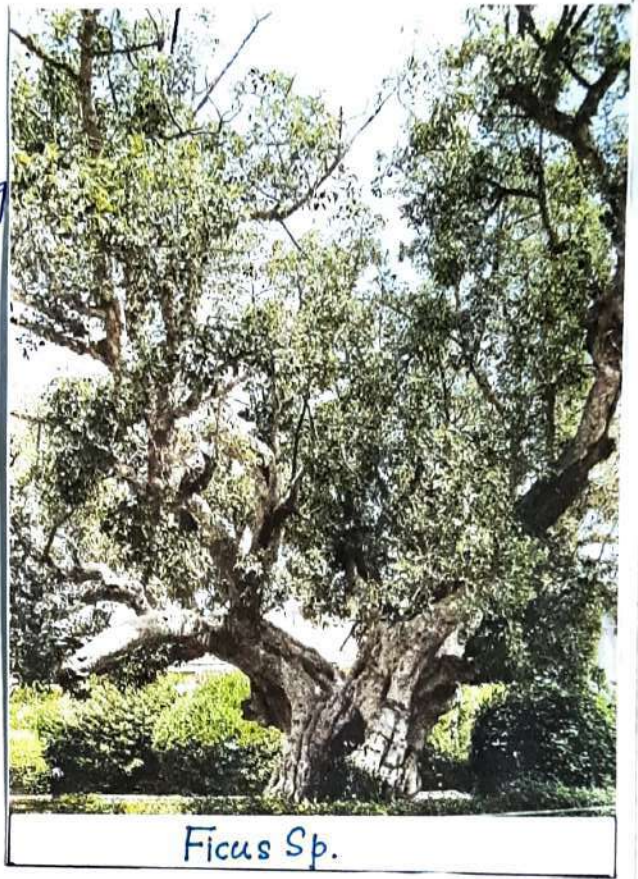


Tamarind

used as a poultice applied to the foreheads of people with fevers. The fruit exhibits laxative effects due to its high quantities of malic acid, tartaric acid and potassium bitartrate. Its use for the relief of constipation has been documented throughout the world.

Ficus sp. : Ficus is a genus of about 850 species of woody trees, shrubs, vines, epiphytes and hemiphytes in the family Moraceae. Peepal, Banyan and many other ficus species form a part of this group of important trees. They are all ecologically of great importance as many different species of insects, birds, mammals live on ficus barriers. The flowers are inside the berries. They are pollinated by a specific wasp which lay it eggs inside the berries

on which the larvae feed and grow. The ficus trees bear berries throughout the year, thus supplying nutritious food to several animal species when other trees have no fruit. Some species of ficus are: Ficus aurea, Ficus benjamina, Ficus benghalensis, Ficus maxima, Ficus hampelas etc.



Ficus Sp.

The wood of fig trees is often soft and the latex precludes its use for many purposes. It was used

to make mummy caskets in Ancient Egypt. Certain fig species (mainly F. cotinifolia, F. insipida and F. padifolia) are traditionally used in Mesoamerica to produce (Nahuatl: āmatl) which is known as papel amate. Mutuba (F. natalensis) is used to produce barkcloth in Uganda. Pou (F. religiosa) leaves' shape inspired one of the standard kbach rachana, decorative items in Cambodian architecture. Indian banyan (F. benghalensis) and the Indian rubber plant, as well as other species, have use in herbalism. The inner bark of an unknown type of wild fig, locally known as urú, was once used by the Moré people of Bolivia to produce a fibrous cloth for clothing.

Coconut: This tall stately palm has a more or less straight trunk with circular markings. Cocos nucifera is a member of the palm tree family (Arecaceae) and the only living species of the genus Cocos. The term "coconut" (or the archaic "cocoanut")

can refer to the whole coconut palm, the seed or the fruit, which botanically is a drupe, not a nut.

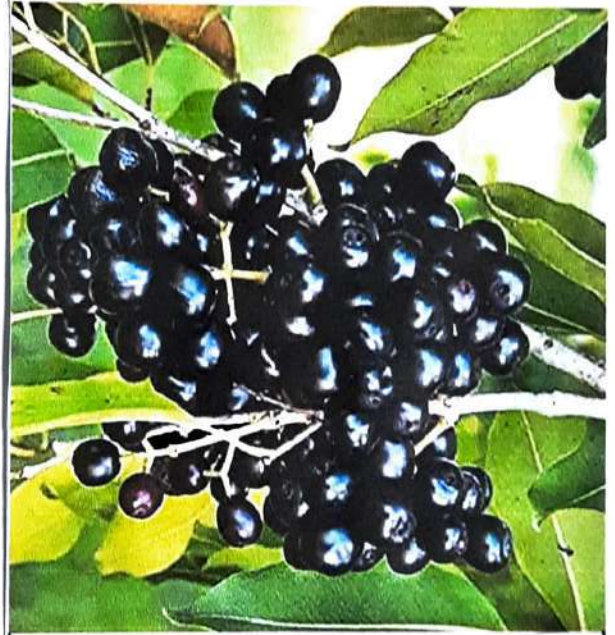
The name comes from the old



Coconut

Portuguese word coco, meaning "head" or "skull", after the three indentations on the coconut shell that resemble facial features. They are ubiquitous in coastal tropical regions and are a cultural icon of the tropics. The coconut tree provides food, fuel, cosmetics, folk medicine and building materials, among many other uses. The inner flesh of the mature seed, as well as the coconut milk extracted from it, form a regular part of the diets of many people in the tropics and subtropics. Coconuts are distinct from other fruits because their endosperm contains a large qty. of clear liquid, called coconut water or coconut juice.

Jambun: Syzygium cumini, commonly known as Malabar Plum, Java Plum, Black Plum, jambun, jaman, jambul or jambolan, is an evergreen tree in the tropical area in the flowering plant family Myrtaceae, and favored for its fruit, timber and ornamental value. It is native to the Indian subcontinent, adjoining regions of southeast Asia, including Myanmar, Sri Lanka and the Andaman Islands. It can reach heights of up to 30 meters (98 ft.) and can live more than 100 years. A rapidly growing plant, it is considered an invasive species in many world regions. The fruit of Syzygium species is described as "drupaceous." The fruit is oblong, ovoid. Unripe fruit looks green. As it matures, its colour changes to pink, then to shining crimson red and finally black color.



Jambun

Jambolan fruits have a sweet or slightly acidic flavour and are eaten raw, and may be made into juice, jelly, sorbet, syrup or fruit salad.

Raw fruit is 83% water, 16% carbohydrates, 1% protein, and contains negligible fat. In a 100 gram reference amount the raw fruit provides 60 calories, a moderate content of vitamin C and no other micronutrients in appreciable amounts.

Neem: Azadirachta indica commonly known as neem, nimtree or Indian Lilac, is a tree in mahogany family Meliaceae. It is one of two species in the genus Azadirachta, and is native to the Indian subcontinent. It is typically grown in tropical and semi-tropical regions. Neem trees also grown on islands and southern Iran.

Neem is a fast growing tree that can reach a height of 15-20 metres (49-66ft), and rarely 35-40m (115-131ft).

Neem leaves are dried in India and placed in cupboards to prevent insects eating the clothes and also in bins where rice is stored.

The tender shoots and flowers of the neem tree are eaten as a vegetable in India. A soup

-like dish called veppampoo charu in Tamil made of the flower of neem is prepared in Tamil Nadu. In Bengal, young neem leaves are fried in oil with tiny pieces of eggplant (brinjal). The dish is called neem began bhaja and is the first item that acts as an appetizer. It is eaten with rice.



Neem

Neem is a key ingredient in non-pesticidal management (NPM), providing a natural alternative to synthetic pesticides. Neem oil has been shown to avert termite attack as ecofriendly and

economical agent.

Neem leaves are used in eco-printing (botanical printing) onto fabric in parts of Asia.

Neem leaves are used as forage for ruminants and rabbits.

Pine: A pine is a conifer tree or shrub in the genus *Pinus* of the family Pinaceae.

Pine trees are evergreen, coniferous resinous trees (or, rarely, shrubs) growing 3-80 meters (10-260 feet) tall, with the majority of species reaching 15-45 m (50-150 ft) tall. The smallest are Siberian dwarf pine and Potosi piñon and the tallest is an 81.8 m (268 ft) tall ponderosa pine located in southern Oregon's Rogue River-Siskiyou National Forest.

Pines are among the most commercially important tree species valued for their timber and wood-pulp throughout the world. The seeds (pine nuts) are generally edible; the young male cones can be cooked and eaten, as can the bark of young twigs. Some species



Pine

have large pine nuts, which are harvested and sold for cooking and baking. They are an essential ingredient of pesto alla genovese.

A tea is made by steeping young, green pine needles in boiling water (known as tallstrunt in Sweden).

In Greece, the wine retsina is flavoured with Aleppo pine resin.

In traditional Chinese medicine, pine resin is used for burns, wounds and dermal complaints.

Pines are monoecious, having the male and female cones on the same tree. The male cones are small, typically 1-5 cm long and only present for a short period (usually in spring, though autumn in a few pines), falling as soon as they have shed their pollen. The female cones take 1.5-3 years (depending on species) to mature after pollination, with actual fertilization delayed one year.

Amla: Phyllanthus emblica, also known as emblic, emblic myrobalan, myrobalan, Indian gooseberry, Malacca tree, or amla, from the Sanskrit (āmalakī), is a deciduous tree of the family Phyllanthaceae. Its native range is tropical and southern Asia. The tree is small to medium



in size, reaching 1-8 m (3ft 3 in - 26 ft 3 in) in height. The branchlets are not glabrous or finely pubescent, 10-20 cm (3.9-7.9 in) long, usually deciduous, the leaves are simple, subsessile and closely set along branchlets, light green, resembling pinnate leaves. The flowers are greenish-yellow. The fruit is nearly spherical, light greenish-yellow, quite smooth and hard on appearance, with six vertical stripes or furrows. The fruit is up to 26 mm (1.0 in) in diameter, and, while fruit of wild plants weigh approximately 5.5g (0.19 oz) cultivated fruits average 28.4 g (1.00 oz) to 56 g (2.0 oz)

The amla fruit is eaten raw or cooked into various dishes, such as dal (a lentil preparation) and 'amle kamurabbah', a sweet dish made by soaking the berries in sugar syrup until they are candied.

It is traditionally consumed after meals.

In the Batak area of Sumatra, Indonesia, the inner bark is used to impart an astringent, bitter taste to the broth of a traditional fish soup known as holat.

In Ayurveda, dried and fresh fruits of the plant are used as a common constituent.

Amla contains high amount of ascorbic acid (vitamin C) and have a bitter taste that may derive from ellagitannins such as emblicanin A (37%), emblicanin B (33%), punigluconin (12%) and pedunculagin (14%). Amla also contains punicafolin and phyllanemblin A, phyllanemblin other polyphenols, such as flavonoids, kaempferol, ellagic acid and gallic acid.

Sal: Shorea robusta the sal tree is a species of tree in the family Dipterocarpaceae. The tree is native to India, Bangladesh and Nepal, Tibet and across the Himalayan regions.

Shorea robusta can grow up to 40 meters (130 feet) tall with a trunk diameter of 2 meters (6.6 feet). The leaves are 10-25 cm long and 5-15 cm broad. In wetter areas, Sal is evergreen; in drier areas it is dry

-season deciduous, shedding most of the leaves from February to April, leafing out again in April and May.

Sal is one of the most important sources of hardwood timber in India, with hard, coarse-grained wood that is light in colour when freshly



Sal

cut but becomes dark brown with exposure. The wood is especially suitable for constructing frames for doors and windows.

The dry leaves of Sal are a major source for the production of leaf plates called as patravali and leaf bowls in Northern and Eastern India, also used as leaf plates to serve food in Karnataka Canara (Dakshina Kannada, Gokarna) regions of India.

Sal seeds and fruit are a source of lamp oil and vegetable fat. The seed oil is extracted from the seeds and used as cooking oil after refining.

Jackfruit: The Jackfruit (*Artocarpus heterophyllus*), also known as jack tree, is a species of tree in the fig, mulberry and breadfruit family (Moraceae). Its origin is in the region between the western ghats of Southern India, all of Bangladesh, Sri Lanka and the rainforests of the Philippines, Indonesia & Malaysia.

The jack tree is well-suited to tropical lowlands, and is widely cultivated throughout tropical regions of the world.

It bears the largest fruit of all trees, reaching as much as 55 kg (120 pounds) in weight, 90 cm (35 inches) in length and 50 cm (20 inches) in diameter.



Jackfruit

The Ripe Jackfruit is naturally sweet, with subtle pineapple- or banana-like flavor. It can be used to make a variety of dishes, including custard, cakes or mixed with shaved ice as *es teler* in Indonesia or *halo-halo* in the Philippines.

The wood of the tree is used for building furniture and house construction in India. In Indonesia, hardwood from the trunk is carved out to form the barmels of drums used in the gamelan, and in the Philippines, its soft wood is made into the body of the *Kutiyapi*, a type of boat lute.

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COOCH BEHAR PANCHANAN BARMA UNIVERSITY
A.B.N. SEAL COLLEGE

B. Sc Semestet 1 (Physics Honours) Examination 2022-2023

(UNDER CHOICE BASED CREDID SYSTEM)

ENVIRONMENTAL STUDIES

PROJECT REPORT ON

“AIR POLLUTION”

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I am grateful to the department of Physics, A.B.N. Seal college for providing me all necessary facilities to carry out my project work. I would like to thank all of my department teachers for their continuous support and encouragement.

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Annabrata Ghosh.

Sign of the student

Maity 19/12/22

Sign of the teacher

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What is Air-Pollution:-

Air-pollution is the contamination of air due to the presence of substances in the atmosphere that are harmful to the health of humans or other living beings, or cause damage to the climate or materials.

Pollutants :- Air pollutants is a material in the air that can have adverse effects on human and the ecosystem. The substance can be solid particles, liquid droplets or gases.

There are two types of pollutants →

i) Primary Pollutants:- These are usually produced by processes such as ash from a volcanic eruption. Other examples include carbon monoxide (CO), gases from motor vehicles exhausts Sulphur dioxide (SO₂), Nitrogen dioxide (NO₂) released from chemical factories.

ii) Secondary Pollutants:- These are not emitted directly. Rather it forms in the air when primary pollutants reacts or interacts. Ground level ozone (O₃) is prominent example of a secondary pollutant.

Some pollutants may be both 'primary' & 'secondary' pollutant at the same time — those are both emitted directly and formed from either primary pollutants.



Types of Sources of Pollutants:- These are mainly 'four' types of air pollutants →

- i) Auto-Mobile Sources:- Such as cars, buses, planes, trucks, trains etc. They mainly increasing the carbon emission rapidly.
- ii) Stationary Sources:- Such as power plants, oil refineries, industrial facilities and various factories. These emits huge amount of sulphur-di-oxide (SO_2).
- iii) Area Sources:- Such as agricultural areas, cities, wood burning fire places etc.
- iv) Natural Sources:- Such as wind-blown dust, wildfires and volcanic eruption.

Causes of Air-Pollution:- The rising number of air pollutants has made breathing fresh-clean air next to impossible. Causes of air pollution have left everyone worried about their health.

- 1) The burning of fossil-fuels:- Most of the air-pollution takes place due to the burning of fossil fuels such as coal, oil to produce energy for electricity or transportation. This also emits other toxic pollutants in the air. Inhaling air induced with pollutants due to the burning of natural gas and fossil fuel reduces heart's ability to pump enough ' O_2 '.



causing one to suffer respiratory illness.

Industrial Emission:

Industrial activities emit several pollutants in the air that affects the air quality more than we can ever imagine. Industrial pollution effects associated with your health, that can irritate your eyes and throat to breathing issues, at times it can even lead to chronic illness.

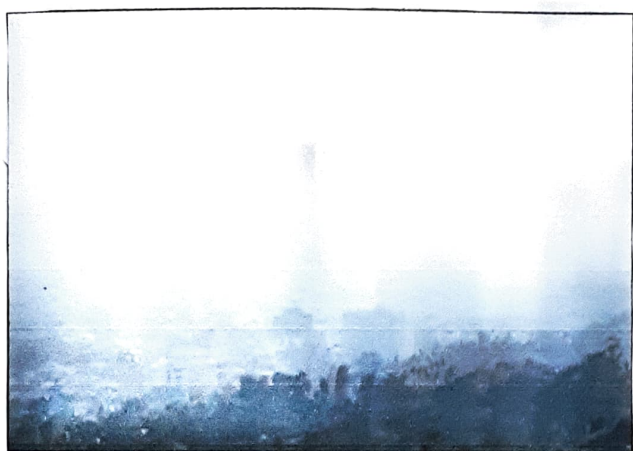
Wildfire: Climate change is not just increasing wildfire but also spiking air pollution. Burning stubble and farm residue is also a major contribution to wild-fire. Smog makes the air hazy and people find it difficult to breathe.

Open burning of Garbage Waste: Open burning of garbage is much more harmful to your health and the environment than one may think. Exposures to open burning of garbage waste can pose serious health risks including cancer, liver, issues, impairment of immune system can also affect the developing nervous system.

Health Effect of Air-Pollution:

People exposed to high enough levels of certain air pollutants may experience →

- 1) Irritation of the eyes, nose & throat.
- 2) Wheezing, coughing, chest tightness and breathing difficulties.



3) Worsening of existing lung and heart problems. Such as asthma.

4) Increased risk of heart attack.

To pollution can cause cancer and damage to the immune, reproductive and respiratory system. In extreme case, it can even cause death.

Effects of Air Pollution in Environment :-

1) Acid-Rain :- It is precipitation containing harmful amounts of nitric and sulphuric acids. These acids are formed primarily by nitrogen oxides and sulphur oxides released into the atmosphere by fossil fuels are burned.

2) Haze :- It is caused by when sunlight encounters tiny pollution particles in the air. Haze obscures the clarity, colour, texture and form of what we see. Some haze ~~are~~ causing pollutants are directly emitted to the atmosphere.

3) On Wild-Life :- Toxic pollutants in the air, or deposited on soils or surface waters, can impact wildlife in many ways. Like humans, animals can experience health problems if they are exposed to sufficient concentrations of air toxics over time.



Crop and Forest Damage: Air pollution can damage crops and trees in a variety of ways. Ground level ozone (O_3) can lead to reductions in agricultural crop and commercial forest yields, and increase of plant susceptibility to disease, pests and other environmental stresses.

Global Climate Change: The Earth's atmosphere contains a delicate balance of naturally occurring gases, that trap some of the sun's heat near Earth's surface. The "Greenhouse-Effect" keeps the Earth's temperature stable. Many scientists believe the global warming could have significant impacts on human health, agriculture, forests, wildlife and coastal areas.

Controlling Air Pollution: In the United States, the 'Clean Air Act' has been a crucial tool for reducing air pollution since its passage in 1970, although fossil fuel interests aided by the industry-friendly lawmakers have frequently attempted to weaken its many provisions. Ensuring that this bedrock environmental law remains intact and properly enforced will always be key to maintaining and improving our air pollution quality.

P.T.O.



But, the best effective way to control air pollution is to speed up our transition to cleaner fuels and industrial processes. By switching over renewable energy sources and replacing more and more of our gasoline-powered cars and trucks with electric versions, we'll be limiting air pollution as it's sources are also curbing the global warming that heightens so many of its worst health impacts.

Reduce Air - Pollution:- The less gasoline we burn,

the better we're doing to reduce the pollution and harmful effects of climate change. Mr. Walke says, "Make good choices about transportation for driving, when you can walk, ride a cycle or take public transportation. You can also investigate your power provider options - you may be able to request that your electricity be supplied by wind or solar power. Buying your food locally can cut down the fossil fuel usage. Most importantly, "support leaders who push for clean air and water and responsible steps on climate change."