

III B.SC PSYCHOLOGY

21CPS5D- ENVIRONMENTAL PSYCHOLOGY

UNIT I (15 HOURS)

INTRODUCTION

Need for the Study of Environmental Psychology -Nature and Meaning of Environmental Psychology- Characteristics of Environmental Psychology- A Brief Overview of the Theories of Environment.

UNIT II (15 HOURS)

ENVIRONMENTAL STRESSES

Natural Disaster - Characteristics of Natural Disaster- Effects of Natural Disasters, Technological Catastrophe, Noise - Defining-Measuring & Perceiving Noise-Important Noise Variables-Sources of Noise-Physiological Effects of Noise on Performance-Noise and Social Behaviour-Commuting-Impedance

UNIT III (15 HOURS)

EFFECTS OF HIGH DENSITY ON HUMANS

Effects of Density- Its Consequences for Affect-Arousal and Illness- Effects of Density on Social Behaviour - Effects of High Density on Task Performance- Conceptualizations of Density- Effects on Humans Eliminating- The Causes and Effects of Crowding - A Look Into the Future.

UNIT IV (15 HOURS)

CHANGING BEHAVIOUR TO SAVE THE ENVIRONMENT

The Common Environment Dilemma: Pollution, Energy conservation, Recycling-Behaviour Problem- Ecological Consumerism – Strategies to Encourage Environmentally Responsible Behaviour

UNIT-V (15 HOURS)

WORK, LEARNING, LEISURE ENVIRONMENT

Work Environment Setting: History of Workplace Design-Ambient Work Environment-Territoriality and Status in the Work Environment-Engineering for Human Efficiency- The Electronic Office -Learning Environment Settings: Classroom- Library- Museum- Leisure Environment.

UNIT I

INTRODUCTION

Need for the Study of Environmental Psychology -Nature and Meaning of Environmental Psychology- Characteristics of Environmental Psychology- A Brief Overview of the Theories of Environment.

ENVIRONMENT

- *The word environment is derived from the French word “Environ” which means surroundings.* An ecosystem refers to all the living and the non-living things present in the environment.
- Environment is a broad spectrum of factors that are vital for human existence such as air, water, oxygen, food, vegetation.

MEANING OF ENVIRONMENTAL PSYCHOLOGY

In such interactions, people change the environment, and their behaviour and experiences are subsequently changed by the environment.

The study of environmental psychology includes theory, research, and practice meant for improving our relationship with the natural environment and making the relationship more humane

DEFINITION

- ❖ According to the Journal of Environmental Psychology, the field can be defined as: *“The scientific study of the transactions and interrelationships between people and their physical surroundings (including built and natural environments, the use and abuse of nature and natural resources, and sustainability-related behaviour).”*
- ❖ Environmental psychology is the study of interactions between individuals and their physical settings.
- ❖ Environmental psychology is an interdisciplinary field of psychology that deals with the interaction of humans, the built-up environment and the natural environment.

NATURE OF ENVIRONMENTAL PSYCHOLOGY

- ❖ An *inter disciplinary approach* that caters to maintaining balance between man and environment.
- ❖ Aims at *designing effective ways of conserving the natural environment* which in return are essential for better life and psychological growth of human beings.
- ❖ Environmental psychology is *oriented towards influencing the design of work of professional* (architects, interior designers, urban planners, etc.) And thereby improving the human environment

- ❖ Environmental psychology examines the influence of the environment on human experiences, behaviour, and well-being, as well as the influence of individuals on the environment, factors influencing environmental behaviour, and *ways to encourage pro-environmental behaviour*
- ❖ Environmental psychology work in almost all environments (urban environment, rural environment, slum environment, work environment and institutional environment) because we humans continually interact with some kind of environment.

NEED FOR THE STUDY OF ENVIRONMENTAL PSYCHOLOGY

- ✚ Environmental psychology offers a *practical understanding of why people act in certain ways in their surroundings*.
- ✚ It can also help *create sustainable solutions and motivate people to act in environmentally friendly* and climate-positive ways.
- ✚ Environmental psychology is also *concerned with people's personal space, sense of ownership over spaces, and how certain environments influence people's* concern for climate change and the planet.
- ✚ In an increasingly urbanised and crowded world, environmental psychology is important to understand how people treat their environments, as well as future decisions they might make about it.
- ✚ Environmental Psychology would help to find answer to the following questions:
 - ✓ Researching how to motivate people to change their behaviour
 - ✓ Understanding why some people live sustainably, while others don't
 - ✓ Understanding why people might not adopt positive behaviour

CHARACTERISTICS OF ENVIRONMENTAL PSYCHOLOGY

The characteristics of environmental psychology are:

1. Interactive Approach:

- This approach deals with how the environment influences behaviour of an individual and vice versa, which factors affect behaviour that can help improve the quality of environment.
- The cognitive development of children is affected by their social, emotional and physical environment. People's support for nature conservation measures may influence environmental conditions such as biodiversity.

2. Interdisciplinary Collaboration:

Interdisciplinary collaboration has mostly occurred in three domains.

- First, environmental psychology has always worked closely with the disciplines of architecture and geography to ensure a correct representation of the physical spatial components of human–environment relationships.
- Second, theoretical and methodological development in environmental psychology has been influenced strongly by social and cognitive psychology.
- Third, when studying and encouraging pro environmental behaviour environmental psychologists have collaborated with environmental scientists, among others, to correctly assess the environmental impact of different behaviours.

3. Problem Focused Approach:

- Environmental psychology deals with the problems faced from bottom to the top level and finds solution to these problems for mutual co-existence.
- These problems may arise between humans and their immediate environment such as neighbourhood, sewage and littering and also their solutions such as sewage management and recycling.

A BRIEF OVERVIEW OF THE THEORIES OF ENVIRONMENT

The historical backdrop of environmental psychology has been firmly impacted by the need to address questions posed by the practical concerns of architects, planners and other professions answerable for the planning, design and management of the environment (Uzzell, 2000a).

These inquiries include:

- ✓ how the environment stimulates behaviour and what occurs with excessive stimulation;
- ✓ how the environment constrains and causes stress,
- ✓ how we would structure maps of the environment in our minds and use them to explore through the environment; what variables are significant in individuals' assessment of the natural and man-made environment
- ✓ what is the impact of the environment or behaviour setting on individuals;
- ✓ what are the actual properties of the environment that encourage some behaviours and debilitate others;

THE THEORIES TO ANSWER THE ABOVE INQUIRIES ARE:

- ❖ Arousal Theory
- ❖ The Environmental Load or Over-Stimulation Approach
- ❖ Under Stimulation Approach
- ❖ Adaptation Level Theory

- ❖ Optimal Stimulation
- ❖ Behaviour Constraint Approach
- ❖ Ecological theory

Arousal theory

- Arousal Theory From a neuro-physiological point of view, arousal is an uplifting of brain action, by the arousal centre of the brain known as reticular formation.
- One impact of ***exposure to environmental stimulation is increased arousal.***
- It could be estimated physiologically by elevated autonomic activity, for example, increment pulse, circulatory strain, breath rate, adrenaline rush and so on.
- It may be measured behaviourally by increased motor activity, or simply as self-reported arousal.
- The increase of arousal level leads people to look for information about their internal states. We attempt to interpret the nature of arousal and the purposes behind it. Is it lovely or horrendous? Is it because of individuals around us, or due to some physical aspects of the environment?
- As indicated by a few theories of aggression, increased arousal will encourage aggression,
- From an environmental behaviour viewpoint, as environment stimulation from crowding, noise, heat or some other source builds arousal, performance will either increase or decrease

The Environmental Load or Over-Stimulation Approach

- The hypothesis is that people have ***a restricted capacity to deal with environmental stimuli.*** The limit is dictated by the measure of information inputs that can be handled by the central nervous system.
- People have a limited ability to deal with information. When the sources of information surpass that limit, individuals will in general disregard a few information sources and dedicate more attention to others

Eg: For instance, while driving during heavy traffic a lot of consideration is paid to the vehicles, trucks, transports, and street signs around us.

- Once in a while the organisms' ability to manage the environment is exhausted or even drained. At the point when this happens, only the main information is taken care of, with any remaining data filtered through.

Under stimulation approach

- This methodology proposes that under stimulation can be just as aversive as overstimulation. This is due to ***repetitive and same living conditions can also be viewed as the consequence of under stimulation.***

- Educational administration of the hyperactive children is principally corresponding to decrease of environmental stimulation.
- Wohlwill (1966) has contended that conditions ought to be portrayed regarding measurements applied to the dimensions of intensity, novelty, complexity, temporal variation, surprisingness, and incongruity, all of which contribute to stimulus load.
- Some relaxation techniques are very useful methods that can empower an overstimulated kid to restore his equilibrium.

Adaptation Level Theory

- Helson developed the adaptation level theory of psychology. This ***theory states that a person's ability of judgment of a stimulus depends on his prior involvement or experiences of how they perceived similar stimuli in the past***

Eg: maybe you avoid cats because you were scratched by one as a child

Optimal Stimulation Level (OSL)

- OSL theory postulates that individual behavior is influenced by the intrinsically motivated desire to accomplish a specific level of stimulation, termed "optimum stimulation level"
- When ***the stimulation derived from the environment is too low, individuals will attempt to increase stimulation. When the stimulation is too high, individuals will attempt to decrease stimulation***
- Due to individual difference, the optimal stimulation level (OSL) vary from person to person. People who have high amount of optimum stimulation level attract by stimulation whereas others avoid stimulation

Behaviour constraint theory

- Behaviour constraint theory examines ***the ways in which we may feel powerless when in environments that are undesirable to us.***
- It suggests that our human behaviour in these situations is learned – that if we find we cannot control stimuli within our environment, we adopt a level of helplessness and accept what we cannot change – or perhaps we just leave the environment entirely.

Eg: Think about sharing a flat with other people. Maybe one of your flatmates is messy – they never clean the kitchen or bathroom, they leave dirty dishes and clothes all over the place, and despite speaking to them about it many times, the flat is still a mess. Behaviour constraint theory suggests you'll either come to just accept the mess, or clean it up yourself. Or possibly find a new place to live

Ecological theory

- Ecological theory says that we co-exist with our environments – and that our behaviours exist because of our environments. In fact, it suggests that there is no greater influence on behaviour than our environment.

Eg: Think about how you might behave at work, or at school, or at a friend's house. Ecological theory suggests that it is the place, even more than your personality, that affects how you behave in each of those environments.

- Behaviour settings and staffing theory are useful instruments to take care of environmental design problems and to improve the working conditions.

UNIT II

ENVIRONMENTAL STRESSES

Natural Disaster - Characteristics of Natural Disaster- Effects of Natural Disasters, Technological Catastrophe, Noise – Defining measuring and Perceiving Noise-Important Noise Variables-Sources of Noise- Physiological Effects of Noise on Performance-Noise and Social Behaviour-Commuting-Impedance

NATURAL DISASTER

- ❖ Natural disaster is “A significant event brought by the natural processes of the Earth that makes widespread destruction to the environment and death toll.”
- ❖ Natural disasters are catastrophic events that result from any of the Earth’s natural phenomena. These can range from floods and tropical storms to tidal waves and earthquakes.

CHARACTERISTICS OF NATURAL DISASTER

- ❖ A natural hazard is ***generally perceived*** before a natural disaster.
For example, the Gujarat Earthquake, which happened on 26th January, 2001 is a natural disaster. The natural hazard is living under the active fault lines present under the territory of Gujarat.
- ❖ Nonetheless, some regular risks can likewise be incited or ***influenced by anthropogenic components***.
For example, avalanches can be set off by deforestation, mining and agrarian exercises.
- ❖ Natural disasters frequently ***cause destruction*** on a massive scale.
- ❖ A natural disaster is a major destructive event ***occurring because of natural processes of the Earth;*** which include floods, typhoons, cyclones, volcanic emissions, quakes, torrents, storms, and other geologic cycles
- ❖ A natural disaster can ***cause death toll or harm property and regularly leave*** some financial repercussions afterward.
- ❖ ***Disturbance is a natural force*** that influences all biological systems. For instance, a wild fire may kill mature trees over a large territory
- ❖ ***Rapidly spreading fire changes the environment conditions*** and furthermore causes extreme contamination by the outflow of particulates and gases like carbon dioxide and nitrogen oxides to the environment
- ❖ Other ***natural agents of disturbance incorporate tropical storms, cyclones, floods, and even glaciation*** (throughout geologic time)

- ❖ A **volcanic eruption or earthquake** can produce at least one or more devastating oceanic waves, or tsunamis
- ❖ The impact and warmth of a volcanic emission can likewise harm environment
- ❖ Natural population outbreaks of herbivores, predators, or microorganisms can likewise bring about extreme harm to natural environments.

EFFECTS OF NATURAL DISASTER

By and large, the components like the population, the environment and physical structures in housing, industry, trade and public administrations are getting damaged as the effects of natural disaster.

The impacts can be classified as direct or indirect losses.

Direct losses are identified with

- ✓ actual harm,
- ✓ increased number of casualties,
- ✓ harm to the foundation of public administrations,
- ✓ harm to buildings, the metropolitan zone, industry, exchange, and
- ✓ disintegration of the environment.

The **indirect loss** can ordinarily be classified into social impacts like

- ✓ the interference of transportation,
- ✓ public administration,
- ✓ the media,
- ✓ the negative picture that an area may secure regarding others; and
- ✓ monetary impacts like interruption of exchange and
- ✓ decrease in production,
- ✓ increased cost of rehabilitation and restoration.

THE VARIOUS EFFECTS OF NATURAL DISASTER ARE:

a) Humanitarian Crises:

- Environmental change and accompanying natural disasters have created an enormous migrant populace, called climate refugees or environmental migrants.
- These individuals are seen to be forced out of their homes by an unexpected catastrophic event

b) Public Health Issues

Health problems are quite possibly the most pressing issues after any natural disaster.

- ✓ It is frequently the situation that facilities for water and latrine cleanliness are damaged or
- ✓ inoperable removal of human waste rapidly turns into a general public health hazard.
- ✓ Without water
- ✓ Unhygienic food
- ✓ More scope for pathogenic microscopic organisms and infection
- ✓ Most of the survivors are thus affected with PTSD.

c) Environmental Problem

- Natural disasters from tsunamis and wildfire can cause wide-ranging and long-term consequences for ecosystems: spreading pollution and waste, or essentially demolishing habitats

d) Infrastructural Damage

- This is Quite possible that most quick and financially wrecking worries, debris from natural disasters is creating harm to both public and private infrastructure. This cause billions of losses to the government.

TECHNOLOGICAL CATASTROPHE/DISASTER

- ❖ **A technological catastrophe is a calamitous occasion that is brought about by either human error in controlling technology or a malfunction of a technological system.**
- ❖ Mishaps or catastrophes can be the aftereffect of natural or man-made disasters.
- ❖ Civil unrest, terror acts and pre-planned clashes are viewed as man-made disasters.
- ❖ Contrary to that, technological disasters include transport mishaps, mishaps in manufacturing units, blasts, chemical substance leak, etc.
- ❖ Disasters brought about by technology include the breakdown of systems, hardware and engineering standards that damage individuals and the climate.
- ❖ Technological disasters include structural collapses, like bridges, mines and structures, as well as modern mishaps, like chemical and atomic bomb explosions.
- ❖ Addressing chronic issues might take some time and it could be difficult to pinpoint who is eventually liable for the cause of a complex disaster and paying for the expenses of restoration.
- ❖ Disasters are bound to happen persistently due to repeated practices that are disregarded and not reported on time.

CHARCATERISTICS OF TECHNOLOGICAL CATASTROPHE

- ❖ A technological disaster is an event happened due to the malfunction of a technological structure or potentially some human error in controlling or taking care of the technology.
- ❖ Technological disasters can be viewed as manmade disasters which means there is an “identifiable cause” characteristic
- ❖ The impacts of a disaster on community people might be long lasting and they can suffer for quite a long time.
- ❖ The threat cannot be envisioned.
- ❖ A technological disaster is abrupt, may happen sudden, and are variable.

- ❖ People are responsible. Casualties or victims of technological disasters will in general feel outrage toward individuals who were answerable and responsible for the accidents that may have been prevented.
- ❖ Community breakdowns and conflicts, disputes within communities may take place
- ❖ **Longer Recovery**—Community members will in general focus on litigation and blame, and less on cleanup and recovery.
- ❖ **Media Exposure**—Media covering a technological disaster can be steady adding to already high levels of stress and anxiety.

DEFINING NOISE

- ❖ Noise is undesirable sound which is thought to be unpleasant, loud and disruptive to hearing.
- ❖ Noise is an undesirable sound. It can be created by numerous sources - man's vocal cord, a running motor, a vibrating loudspeaker, an operating machine tool, etc.

There are two significant characteristics of sound or noise –

- a) frequency and
- b) loudness.
- Sound is the rapidly varying pressure wave going through a medium. When sound travels through air, the atmospheric pressure varies periodically.
- ***The quantity of pressure variance per second is known as the frequency***, and is estimated in Hertz (Hz) which is characterized as cycles per second.
- The higher the frequency, the higher pitched a sound is heard. The sound generated by drums have lower frequencies than those created by a whistle

ENVIRONMENTAL NOISE

- Environmental noise is the accumulation of all noise present in a particular environment.
- The principle sources of environmental noise are motor vehicles, airplanes, trains and industrial sources.

Effects of environmental noise pollution that creates

- ✓ inconvenience, and
- ✓ critical health consequences, like hearing loss and cardiovascular disease
- ✓ intrudes on sleep,
- ✓ upsets communication and

- ✓ disturbs with other human activities.

Suggestion to overcomes:

- intensity reduction,
- land-use arranging strategies,
- noise barriers and sound baffles,
- time of day use regimens,
- vehicle operational controls and
- architectural acoustics design measures

MEASURING AND PERCEIVING NOISE

- ❖ Sound is estimated dependent on the amplitude and frequency of a sound wave.
- ❖ Amplitude measures how powerful the wave is.
- ❖ The energy in a sound wave is estimated in decibels (dB), the measure of loudness, or intensity of a sound; this estimation depicts the amplitude of a sound wave.
- ❖ Decibels are communicated in a logarithmic scale.
- ❖ Then again, pitch depicts the frequency of a sound and is estimated in hertz (Hz)

Measuring noise

To measure noise –

- Noise Dosimeters are regularly utilized in occupational environments.
- Noise monitors are utilized to measure noise in environments and noise pollution, and
- Now smartphone based sound level meter applications (apps) are being utilized to crowdsource and map recreational and community noise
- An audiometer is a gadget that estimates how well an individual can hear certain sounds.

Decibels are not quite the same as other familiar scales of measurement. While numerous standard estimating gadgets, like rulers are linear and ***the decibel scale is logarithmic***. Utilizing the logarithmic decibel scale, if a sound is 80 decibels, and we add another 10 decibels, the sound will be multiple times more serious and turn more loud to our ears

‘A-weighted’ decibels, or ‘dBA’ are frequently utilized when describing sound level suggestions for healthy listening. While the dB scale depends just on sound intensity, the dBA scale depends on intensity and on how the human ear reacts

The cochlea is a snail-moulded organ inside your inward ear that allows you to hear. The cochlea can react to a specific range of frequencies, or pitches of sound. **At the point when sounds contain frequencies are excessively high or excessively low for us to hear—as in ultrasonic and infrasonic sounds—our cochlea does not respond to all.**

Indeed, even little expansions in dBA level can immensely affect your hearing wellbeing.

Sound is bound to harm your hearing in the event if it is:

- ✓ 85 dBA and you are exposed to it for 8 hours.
- ✓ 100 dBA and you are exposed to it for 14 minutes.
- ✓ 110 dBA and you are exposed to it for 2 minutes.

NOISE VARIABLE

- A nuisance or uncontrolled factor that adds variation to a process or product.
- Variables that are difficult or impossible to control at the design and production level, but can be controlled at the analysis level; for example: loads and material variation. A noise variable will have the nominal value as specified by the distribution, that is follow the distribution exactly.

SOURCES OF NOISE

Given below are the significant causes/sources of noise pollution:

- (i) **Industrial Sources:** Progress in technology (industrialization) has given rise to noise pollution. Textile mills, print machines, engineering establishments, metal works and so on contribute vigorously towards noise pollution. In industrial cities such as Kolkata, Ludhiana and Kanpur, generally the industrial zones are not separated from the residential zones of the city particularly on account of small scale industries. These carry out their work from workshops situated on the ground floors in the residential areas and **cause inconvenience, distress and irritation** to the occupants exposed to the noise that is unavoidably produced. The situation is vastly improved in present day planned cities like Chandigarh where the industrial area and the residential area are separated from each another by an adequately wide green belt.
- (ii) **Transport Vehicles:** Automobile revolution in metropolitan places has ended up being a major cause of noise pollution. **Rising traffic** has given rise to traffic jams in congested zones where the continued hooting of horns by anxious drivers pierce the ears of others. **Noise from airplanes** has been a significant issue in large urban areas like Delhi and Mumbai. Air terminals are set up nearby

densely populated areas and the *airplanes fly over residential areas. Heavy trucks, freight car trains, airplanes, motorcycles, mopeds, jeeps*, etc., contribute largely to the noise pollution.

- (iii) **Household:** The household is an industry in itself and is a cause of numerous indoor noises like the *slamming of doors, noise of playing kids, crying of babies, moving of furniture, loud conversations of the residents* and so on. Besides, the music and entertainment system, blender processors, pressure cookers, desert coolers, air conditioners, exhaust fans, vacuum cleaners and washing machines in the house altogether cause noise pollution.
- (iv) **Public Address System:** In India people need just an excuse for using *loud speakers*. The reasons can be a *religious event, birth, demise, marriage, protests, business publicizing*, etc. Public system, in this way, contributes in its own particular manner towards noise pollution.
- (v) **Agricultural Machines:** *Tractors, thrashers, harvesters, tube wells* and so on have all made agribusiness profoundly mechanical and yet exceptionally noisy. Noise level 90 dB to 98 dB because of running of farm machines have been recorded in Punjab.
- (vi) **Defense Equipment:** A great deal of noise pollution is added to the environment by *big guns, tanks, launching of rockets, explosions, activities of military planes and shooting training*.
- (vii) **Miscellaneous Sources:** The *auto repair shops, construction works, blasting, demolishing, stone crushing*, etc., are different causes of noise pollution

PSYCHOLOGICAL EFFECTS OF NOISE ON PERFORMANCE

A large number of studies have shown a link between noise pollution and increased anxiety, depression, high blood pressure, heart disease, and stroke.

Given below are the psychological effects of noise:

- (i) **Hindrance in language learning:** As per a child psychologist from the University of Wisconsin Madison, *noise can go about as an obstruction in the learning abilities of a kid, particularly a language. Steady or constant background noise can prompt diminished capacity of understanding words that the youngster definitely knows, and furthermore of learning new ones.*
- (ii) **Anxiety and depression:** The most well-known mental health disorders are also connected to noise. Various examinations have demonstrated that noise pollution is connected to *uneasiness, wretchedness, hypertension, heart sicknesses and strokes*. Consistent noise can make an individual restless. In 2011, researchers found that individuals who lived close to the air terminal in some European urban cities admitted to be taking 28% more anxiety medications with each 10-decibel

increment in noise. Another examination found that individuals living in and around occupied roads had 25% more chances of slipping into depression than other people who lived on less bustling roads.

- (iii) **Stress Hormone (Cortisol):** Constant or continuous exposure to sound keeps cortisol, the stress hormone, active constantly. With time, this can be really harmful to the body – both physically and mentally. *Steady exposure to noise can cause significant medical issues like respiratory failures and furthermore triggers anxiety.*
- (iv) **Sleep issues:** Noise can disturb our sleep and rest. We may close our eyes but not our ears. *Noise while sleeping can create issue with our wellbeing. Not getting enough sleep may create medical issues.*
- (v) **Everyday life troubles:** Noise can cause some personality changes – *individuals become worse tempered, irritated, fierce and furious due to steady noise.* They cannot focus and think and may end up committing senseless errors or failing to remember things.
- (vi) This creates havoc in regular day today existence as well as **increasing feelings of anxiety, prompting more health issues.**

EFFECTS OF NOISE ON PERFORMANCE

- Noise has diverse negative impacts starting from interference with cognitive performance to harming physical and psychological wellbeing.
- The non-auditory impacts of noise exposure incorporate perceived disturbance, irritation, cognitive impairment, cardiovascular issues and sleep disturbance.
- Environmental Noise Pollution exposure is an issue in numerous occupational and non-occupational environments.
- Noise can influence performance either by impairing data handling or causing changes in strategic response. Specifically, noise builds the degree of general alertness or activation and attention.
- Noise can likewise diminish performance accuracy and working memory performance, but it does not influence performance speed.
- The extent of cognitive and mental functions is depended on diverse, enveloping response time, attention, memory, intelligence and concentration, to give some examples.
- Altered cognitive function prompts human error which leads to mishaps. This can eventually prompt reduced performance and productivity

- Exposure to noise over 85 dBA force prompts numerous unfavourable auditory and non-auditory impacts. The non-auditory impacts of noise exposure depend upon exposure span, kind of work, sexual orientation, age and affectability to noise.
- The following are the physiological signs that are involved:
 - (a) Signals related to the peripheral nervous system, including heartbeat and Electromyogram
 - (b) Signals related to the central nervous system including electroencephalography (EEG)
- Many investigations have utilized EEG signals as an important device for cognitive performance assessment. Cognitive theory proposes that the mind is exceptionally associated with feelings. Fundamental feelings utilize explicit cortical and subcortical frameworks inside the mind and are unique in relation to the cerebrum's electrical and metabolic exercises. Subsequently, EEG is perhaps the best and normal techniques for mind imaging utilized for Brain action preparing identifying with human pressure including noise.
- EEG signals are generally assessed in different recurrence groups to decide their relationship with stresses. These bands incorporate the Alpha (8-12.5 Hz), Theta (4-8 Hz), Delta (1-4 Hz) and Beta (12.5-30 Hz) bands. Humphreys and Reveille recommend that fluctuations in the Alpha and Beta bands, specifically, are a sign of cognitive function.

Alpha (8-12.5 Hz)	Theta (4-8 Hz)	Delta (1-4 Hz)	Beta (12.5-30 Hz)	Cognitive Performance
Increase	-	-	decrease	increased cognitive function
decrease	Increase	Increase		neurological problems

- Marshal et al., have shown a converse relationship in the prefrontal cortex between the Alpha power rhythm in an EEG and suffering from stressful conditions, implying that the *Alpha power rhythm decreases with stress*.
- Choi showed a *positive connection between the Beta power rhythm in an EEG and experiencing distressing conditions in the temporal lobe*.
- Different investigations have shown a decrease in the relative power of the *Alpha band when attention is reduced*.
- Contrasted with other imaging procedures, Electroencephalography has certain preferences which incorporate being non-intrusive, minimal effort, agreeable, protected, versatile, and having high time goal.

- Along these lines, EEG can be an extraordinary device for distinguishing Environmental Noise Pollution stressors in the climate as well as for anticipating the negative impacts of noise exposure.

NOISE AND SOCIAL BEHAVIOUR

- Not only can noise be appeared to detrimentally affect cognitive processes, it has also been found to have a negative impact on social behaviour.
- For the most part, research has shown that increasing degrees of noise are related with
 - ✓ lower levels of social interaction
 - ✓ increased aggressiveness and
 - ✓ lower levels of altruistic behaviour.
- Typically, these sorts of impacts appear to be more checked when there is poorly perceived control over the source of noise.

Noise, Aggression and violence

In metropolitan zones, seem to increase for years to come, the current focus is on finding the connection between noise and aggressive behaviour

- Noise all alone does not really increase aggressiveness, it may improve the probability of an aggressive reaction in somebody who has just been maddened, irritated or in some way prepared to act aggressively.

Shock experiment

- Participants were at first divided into two groups. One group was infuriated by a confederate. The members were then allowed the chance to give electric shocks to someone else under one of three conditions. In the primary condition, members were exposed to uncontrollable noise.
- In the second, they were exposed to noise they could control.
- The third condition was a control (no noise).
- The outcomes showed that overall, angry participants gave higher intense shocks than non-furious participants. However, both furious and non-furious participants gave the low intensity shocks when they were subjected to noise they could handle

COMMUTING

- ❖ Because noise-induced hearing impairment is the result not only of occupational noise exposure but also of total daily noise exposure, it is important to take the non-occupational exposure of individuals (during commuting to and from their jobs, at home, and during

recreational activities) into account. Mass transit is one of the main contributors to non-occupational noise exposure

- ❖ A new methodology to estimate a representative commuting noise exposure was put into practice for the Madrid subway because of all Spanish subway systems it covers the highest percentage of worker journeys (22.6%).
- ❖ The results of the application highlight that, for Madrid subway passengers, *noise exposure level normalized to a nominal eight hours depends strongly on the type of train, the presence of squealing noise, and the public address audio system, ranging from 68.6 dBA to 72.8 dBA.* These values play an important role in a more complete evaluation of a relationship between noise dose and worker health response

IMPEDANCE

- ✚ One of the important physical characteristics relating to the propagation of sound is the acoustic impedance of the medium in which the sound wave travels.
- ✚ Acoustic impedance (Z) is given by the ratio of the wave's acoustic pressure (p) to its volume velocity (U):

$$Z=P/U$$

- ✚ Acoustic impedance is a measure of the ease with which a sound wave propagates through a particular medium

In the context of environmental psychology, *impedance refers to the barriers or obstacles that hinder or prevent individuals from engaging in pro-environmental behaviors* or adopting environmentally friendly attitudes.

These barriers can be psychological, social, or structural and can significantly impact people's willingness and ability to act in environmentally responsible ways.

Here are some examples of impedance in environmental psychology:

- a) **Lack of Awareness:** Many individuals may not be fully aware of the environmental impacts of their actions or the benefits of adopting sustainable behaviors. Without this awareness, they may not feel motivated to change their habits.
- b) **Inconvenience:** If pro-environmental behaviors require extra effort or inconvenience, people may be less likely to adopt them. *For example, recycling may not be readily available or accessible in certain areas, making it less likely for residents to participate.*

- c) **Economic Constraints:** Financial constraints can make it difficult for individuals to choose environmentally friendly options.
- d) **Social Norms:** Social norms and peer pressure can influence behavior. If pro-environmental actions are not seen as socially accepted, individuals may avoid engaging in them.
- e) **Habit and Inertia:** Humans are creatures of habit, and breaking established routines can be challenging. *If people are accustomed to certain behaviors, such as driving alone in their cars rather than carpooling or using public transport, they may resist change.*
- f) **Psychological Distance:** People may feel disconnected from environmental issues that seem distant in time or space. *For example, the impact of climate change might feel remote, making it difficult for some to feel personally responsible or motivated to act.*
- g) **Greenwashing:** Misleading marketing and advertising practices by companies that claim to be environmentally friendly but engage in little or no substantive action can create scepticism and mistrust among consumers, reducing their motivation to support genuinely eco-conscious businesses.

UNIT III

EFFECTS OF HIGH DENSITY ON HUMANS

Effects of Density- Its Consequences for Affect-Arousal and Illness- Effects of Density on Social Behaviour- Effects of High Density on Task Performance- Conceptualizations of Density Effects on Humans -Eliminating The Causes and Effects of Crowding - A Look into the Future.

EFFECTS OF DENSITY ON HUMANS

Overcrowding and its associative effects result from:

1. The high '**social density**' in homes, schools, clinics, camps;
2. The **high 'spatial density'** of the camp, in particular, *congested buildings and roads, and lack of public spaces, including playgrounds and meeting places;*
3. The burden placed on the already insufficient infrastructure and utilities, including roads, water supply, and electricity, and public services, including health and education.

The *social and psychological effects of overcrowding are immediate, long term, cumulative, multiple, mutually reinforcing, direct as well as indirect, and critical.*

Overcrowding is likely to worsen.

Social and psychological effects of overcrowding are experienced among individuals and within relationships at the following levels:

Within households, due to:

- (a) Lack of personal privacy
- (b) Exposure to others' behaviours and personal activities between families and households, since multi-family households are common and space within households is constricted due to physical congestion
- (c) Crowded and overburdened social services, and
- (d) Limited public spaces and buildings for meeting socially

Methodologies Used to Study High Density in Humans Feeling the Effects of Density

- ❖ Of the several methods of describing the spatial distribution of population, the simplest way is *percentage distribution of population over the geographical areas.*
- ❖ Another methodology usually adopted is to list the geographical areas of a given class into *rank order which enables comparison of ranking from census to census.*
- ❖ This provides changes in population trends over time. There are also other methods which are generally used to study population distribution like
 - ✓ calculation of median point,
 - ✓ the mean point or the centre of population,

- ✓ the point of minimum aggregate travel, and
- ✓ the point of maximum population potential

EFFECTS OF DENSITY AND ITS CONSEQUENCES FOR AFFECT-AROUSAL AND ILLNESS

The effects of population density can have consequences for both affect-arousal (emotional responses and physiological arousal) and illness. These consequences can vary depending on the level of density, the specific environmental conditions, and individual factors. Here's how population density can impact affect-arousal and illness:

AFFECT

The effects of long-term high density on various areas can be cited as follows:

a) Goal Blocking:

- Sandstrom found that unwanted social input in crowded situation increased stress, arousal and irritation.
- In an attempt to cope up with the situation, **the person may withdraw from the situation internal disturbance and subsequent failure in attempting goals.**

b) Attribution (mental expectations):

- **The mental expectation about the crowd would bring behavioural changes to the people.**
- Baum et. al. conducted experiments in which he observed how people behaved when they were waiting for a large or small group of crowds.
- When expecting a large group to arrive, the subjects looked less comfortable and felt more crowded.
- The effect was somewhat changed when the experimenter informed the subjects that they can reserve their spaces in beforehand. This study showed that we are less influenced or threatened by crowding if we are ensured that our space would be protected by some formal rules.

c) Cognitive Control:

- **Prior information regarding crowd would help the people to prepare their mindsets accordingly.**
- The subjects who were given prior information about the effects of crowding felt more comfortable and performed better in shopping compared to those who were not given such prior information.

EMOTIONAL AROUSAL

This heightened arousal can result from various factors associated with living in crowded environments. Here are some ways in which high population density can lead to increased arousal:

- a. **Stress and Anxiety:** High population density is often associated with increased stress and anxiety levels. The constant presence of people, congestion, and sensory overload (e.g., noise, crowds) can be stressors that activate the body's stress response, leading to heightened arousal.
- b. **Irritation and Frustration:** Crowded environments can lead to feelings of irritation and frustration, especially when individuals must navigate through crowded streets, public transportation, or long lines. These perceived inconveniences can trigger emotional arousal.
- c. **Security and Safety Concerns:** In densely populated areas, concerns related to personal security and safety can lead to increased physiological arousal. Fear of crime or the perception of unsafe neighbourhoods can trigger anxiety and stress responses.
- d. **Increased negative emotional experience:** High population density can indeed lead to negative emotional experiences for individuals living in densely populated areas. The experience of living in crowded urban environments can be accompanied by a range of negative emotions and stressors. List of such stressor are
 - ❖ Social discomfort
 - ❖ Reduced quality of life
 - ❖ Health complications
 - ❖ Poor social interactions.

ILLNESS

High population density in urban areas can have several implications for public health and contribute to various types of illnesses and health challenges. These health issues can be influenced by factors such as overcrowding, limited access to healthcare resources, environmental factors, and lifestyle behaviours. Here are some of the illnesses and health concerns associated with high population density:

a) Infectious Diseases:

High population density can facilitate the rapid spread of infectious diseases. Close contact and limited personal space increase the risk of transmission of contagious illnesses like the flu, colds, and, in extreme cases, pandemics like COVID-19.

b) Respiratory Illnesses:

Air quality in densely populated areas may suffer due to factors like pollution, overcrowding, and traffic congestion. This can contribute to respiratory issues such as asthma, bronchitis, and other lung diseases.

c) Mental Health Problems:

Living in densely populated environments can be stressful, leading to mental health challenges like anxiety, depression, and stress-related disorders. The constant sensory stimuli and social pressures can affect mental well-being.

d) Overburdened Healthcare Access:

Despite having better access to healthcare facilities in urban areas, high population density can lead to overcrowded hospitals and longer waiting times, potentially affecting the quality and timeliness of healthcare services.

e) Limited personal space

Densed population leads to poor personal space which could bring various health issues due to

- Poor sanitization
- Improper hygiene
- Improper social distance
- Difficulty in insulation
- Contaminated environment

EFFECTS OF DENSITY ON SOCIAL BEHAVIOUR

The effect of density on someone's social behaviour is depends on number of factors like personality, interest and people's background.

- If any individual is incompatible due to various personal characters like intolerance, high aggression, less cohesiveness and low adaptability, then they prefer to withdraw from social gatherings.
- If any individual is compatible with density then they will find that same crowding as recreational .

The following are the major impact of densely populated on social behaviours of humans

- a. **Crowding and Stress:** High population density can lead to crowding, which can be associated with increased levels of stress, anxiety, and irritability
- b. **Aggression and Conflict:** High population density can also lead to increased competition for resources such as food, housing, and jobs. This competition can escalate into aggression and conflicts among individuals or groups.
- c. **Social Isolation:** Paradoxically, high population density can sometimes lead to social isolation. In large cities, for example, people may be surrounded by millions of others but still feel lonely and disconnected

Other effects like

- Lower interpersonal interaction
- Relationship disturbances
- Negative evaluation of friends and family
- Withdrawal from crowd
- Low social contact
- Social avoidance
- Fail to explore
- Decreased sign of immediacy
- Desire to leave

EFFECTS OF HIGH DENSITY ON TASK PERFORMANCE

The impact of density on task performance can be influenced by various factors, including the nature of the task, the physical environment, and the individual's cognitive and emotional responses. Here are some effects of high population density on task performance:

- a) **Distraction and Noise:** In densely populated areas or crowded workspaces, noise levels tend to be higher due to increased human activity. Noise can be a significant distraction, making it difficult for individuals to concentrate on their tasks. This is particularly problematic for tasks that require high levels of focus and attention to detail.
- b) **Reduced Privacy:** High population density often means less personal space, which can lead to reduced privacy. When individuals feel exposed or constantly observed by others, it can lead to self-consciousness and discomfort, affecting their ability to perform tasks comfortably.
- c) **Increased Stress and Anxiety:** Crowded environments can be stressful, and this stress can spill over into task performance. High levels of stress and anxiety can impair cognitive functions like memory, decision-making, and problem-solving.
- d) **Competition for Resources:** In densely populated areas, there may be competition for resources such as office space, equipment, or computer access. This competition can create frustration and hinder task completion, particularly in professional or educational settings.
- e) **Task Interruptions:** In crowded environments, individuals may experience more frequent interruptions from others seeking assistance or information. These interruptions can disrupt workflow and lead to longer task completion times.
- f) **Task Complexity:** Densed population may create over trouble at workplaces and cause human to go through complex situations and competitions to complete a task.

CONCEPTUALIZATIONS OF DENSITY EFFECTS ON HUMAN

There are various physical and human factors affecting the density of the population.

❖ **population density is the average number of individuals per unit of geographical area.**

Some of the factors that affect the density of a population are discussed below.

Physical Factors

The physical factors affecting population density are as follows:

1. Relief and landforms: Crowding Lowland plains, flat river valleys and deltas and volcanic areas with fertile soil tend to have high population densities. Mountainous areas with steep slopes and poor quality soil tend to have low population densities.

2. Weather and climate: *Areas which are very dry, very cold or very wet tend to have sparse population whereas areas which have a moderate climate with evenly distributed rainfall or monsoon type climates have denser populations.*

3. Soil type and quality: Areas which have *rich, fertile soils* tend to have higher population densities than areas which have poor quality soils. *Good quality soils may be found in low lying areas, in volcanic areas and in areas which have a high natural humus content. Poor quality soils may be found in areas with steep slopes, areas with very high rainfall* throughout the year which tends to leach nutrients from the soil, and areas experiencing soil degradation through human management, i.e. over-grazing/deforestation.

4. Water supply: Water supply is essential for human survival and development and because of this areas which have *sufficient water (but not too much)* tend to have denser populations than areas which are dry or suffer from regular drought or areas which have excessive rainfall or which may be prone to flooding.

5. Vegetation: Some types of vegetation make the development of settlement more likely, e.g. grasslands. *Areas with particularly dense rainforest, coniferous forests* or those with little vegetation tend to have sparse populations.

6. Raw materials/natural resources: *Areas with a wealth of natural resources such as oil, coal or minerals* may have higher population densities than areas which do not have access to raw materials or natural resources. However, it is important to remember that natural resources may be found in otherwise harsh environments and that they may be traded and exported/used in areas other than where they are extracted.

7. Natural threats: These may affect population density as people may try to avoid areas where pests, threatening animals and diseases are particular risks.

Human Factors

The human factors affecting population density are as follows:

- 1. Agriculture:** Areas with well-developed farming methods are often densely populated.
- 2. Secondary industry:** Those areas in which manufacturing has developed tend to be densely populated. It is worth noting that even in old industrial areas in which manufacturing has declined or even stopped, population densities may remain high.
- 3. Accessibility:** Areas with well-developed transport infrastructure and links through road, rail, shipping, canals and air are likely to be more densely populated than areas which are poorly connected.
- 4. Political decisions:** Government policy can have a significant impact upon population density. This can occur if governments decide to provide boost to previously underdeveloped areas. If governments decide not to invest in an area, it may also result in a large number of people leaving which can lead to reduced population density.
- 5. Conflict:** Wars and conflicts can lead to significant movements of population and a simultaneous decrease in density in some areas while in other areas it may increase.

ELIMINATING THE CAUSES AND EFFECTS OF CROWDING: LOOK TO THE FUTURE

Crowded living conditions increase the risk of the spread of infectious diseases, such as respiratory infections, meningococcal disease, rheumatic fever and tuberculosis. The better planning of the house and the surrounding living environment can reduce crowding, and access to functioning health hardware, such as hot water, showers and clothes washing facilities, can reduce the health impacts of crowding.

The cause and effect of crowding can be eliminated in future in the following ways:

- a) **The City: Perceiving and Experiencing the City:** Crowding the city, build their own image of it, and the mental maps of the city, through the things they see, remember, the messages and signage they perceive and, in general, through the elements and signs of the urban landscape.
- b) **Effects of Urban Life on the City Dweller:** Urban are the heart of technological development and economic growth of many nations, while at the same time they serve as a breeding ground for
 - poverty,
 - inequality,
 - environmental
 - hazards, and communicable diseases.

Most urban poor live in slums that are unregulated, have congested conditions, are overcrowded, are positioned near open sewers, and restricted to geographically dangerous areas such as hillsides, riverbanks, and water basins subject to landslides, flooding, or industrial hazards.

All of these factors lead to the spread of communicable and noncommunicable diseases, pollution, poor nutrition, road traffic, and so on.

c) Stress

Stress is your body's reaction to a challenge or demand. In short bursts, stress can be positive, such as when it helps you avoid danger or meet a deadline.

But when stress lasts for a long time, it may harm your health. Stress is a feeling of emotional or physical tension. It can come from any event or thought that makes you feel

d) Coping

Coping skills help you tolerate, minimize, and deal with stressful situations in life. Managing your stress well can help you feel better physically and psychologically and it can enhance your ability to perform your best. There are two different types of coping strategies:

e) **Problem-based coping** is helpful when you need to change your situation, perhaps by removing a stressful thing from your life.

f) **Emotion-based coping** is helpful when you need to take care of your feelings.

This refers to a situation when you either don't want to change your situation or when circumstances are out of your control. For example, if you are grieving the loss of a loved one, it'd be important to take care of your feelings in a healthy way (since you can't change the circumstance).

g) Affiliative Behaviour and Performance

An affiliative behaviour is often defined as friendly and peaceful acts exchanged among individuals. Affiliative behaviours occur across a wide variety of taxa, but are particularly common among birds and mammals, and are often found within the category of social interaction.

h) Crime

Effective environments relating to criminal behaviour can be explained on three levels:

Macro level: It refers to general features of the larger scale of environment, or society.

Medium level: It refers to environmental characteristics on a city level.

Micro level: It refers to the situation and circumstances of a particular location in a particular environment.

i) Long-term Behavioural Effects on Health

A little stress every now and then is not something to be concerned about. Ongoing, chronic stress, however, can cause or exacerbate many serious health problems, including:

- Mental health problems, such as depression, anxiety, and personality disorders
- Cardiovascular disease, including heart disease, high blood pressure,
- abnormal heart rhythms, heart attacks, and stroke

- Obesity and other eating disorders
- Menstrual problems
- Skin and hair problems, such as acne, psoriasis, and eczema, and permanent hair loss
- Gastrointestinal problems, such as GERD, gastritis, ulcerative colitis, and irritable colon.

It is obvious that long term physical stress would affect a person even behaviourally

UNIT IV

CHANGING BEHAVIOUR TO SAVE THE ENVIRONMENT

The Common Environment Dilemma: Pollution, Energy conservation, Recycling-Behaviour Problem- Ecological Consumerism – Strategies to Encourage Environmentally Responsible Behaviour

COMMON ENVIRONMENT DILEMMA

The common environment dilemma is the Environmental degradation which defined as any change or disturbance to the environment through depletion of resources such as air, water and soil; the destruction of ecosystems; habitat destruction; the extinction of wildlife; and pollution.

The following are the major causes of environmental degradation or dilemma:

a) Land Degradation

It is the basic form of environmental degradation. A rupture in the environmental surroundings provide a suitable environment for various weeds to grow and take control over nature and eliminate the local greenery.

b) Pollution

Pollution is harmful to the environment whether it is air, water, land or noise.

- *Air pollution* pollutes the air that we breathe, which causes respiratory issues.
- *Water pollution* degrades the quality of water that we use for drinking purposes.
- *Land pollution* degrades earth's surface as a result of human activities.
- *Noise pollution* damage of ears when continuous exposure to sounds.

c) Overpopulation

Increase in population puts a strain on natural resources resulting in the degradation of our environment. Better and advanced medical facilities have resulted in decrease in mortality rate and an increased lifespan.

d) Landfills

Landfills are caused due to the large amount of waste that gets generated by households, industries, factories and hospitals. Resulting in destroying the beauty of the place.

e) Deforestation

The process of slashing down trees in order to clear space for construction of homes and industries is known as deforestation. Urban sprawl and overpopulation are considered as the major causes for deforestation.

f) Natural Causes

Avalanches, quakes, tidal waves, storms, and wildfires can totally crush flora and fauna to the point where they can no longer survive in those areas.

POLLUTION

- ❖ Pollution is defined as the contamination of the environment by foreign or toxic substances and excess forms of energy that are harmful for the environment.
- ❖ The substance or energy that constitutes a particular kind of pollution is known as the pollutant. Pollutants can be in the form of solid, gas, liquid or energy.

Types of Pollution

Following are the different kinds of pollution:

1. Air Pollution
2. Water Pollution
3. Soil Pollution
4. Noise pollution
5. Other types of Pollution like light pollution, Thermal Pollution, Radioactive Pollution

TYPES OF POLLUTION	DEFINITION	CAUSES	EFFECTS
Air Pollution	Air Pollution refers to the contamination of the atmosphere by harmful gases, particulate matter and chemicals.	1) Burning of fossil fuels in power plants and vehicles 2) Agricultural activities like aerial spraying of insecticides, slash and burn system 3) Industrial release of carbon monoxide and other chemicals 4) Methane from waste in landfills	1. Respiratory diseases like chronic bronchitis, emphysema, asthma etc. 2. Health issues in children impairing brain development 3. Global warming 4. Acid Rain 5. Depletion of Ozone layer
Water pollution	The contamination of water sources beyond permissible limits is called water pollution. It includes the contamination of both surface water and groundwater	1) Domestic Sewage- Untreated sewage water that contains soaps, chemicals, food waste, human waste 2) Industrial effluents: . Untreated wastewater from these factories is high on microorganisms. 3) Agricultural waste: Runoff of	1. Destruction of marine life and aquatic ecosystem 2. Degradation of water quality and Scarcity of fresh drinking water 3. Waterborne diseases like Cholera, Typhoid etc 4. Biomagnification

		fertilizers, pesticides and manure 4) Spillage of Petroleum products: Accident spillover of petroleum in sea water.	
Soil pollution	Soil pollution refers to the contamination and consequent degradation of land. Presence of pollutants or contaminants that disrupt the balance of nutrients in the soil is a growing concern.	<ol style="list-style-type: none"> 1. Overuse of fertilisers and herbicides in agriculture 2. Dumping of industrial waste and harmful chemicals 3. Improper domestic waste management system 4. Run off of municipal sewage water 5. Improper irrigation management leading to poor soil quality 	<ol style="list-style-type: none"> 1) Degradation of fertile soil 2) Inferior agricultural produce quality 3) Health issues as a result of Biomagnification 4) Destruction of soil ecosystem
Noise pollution	Noise pollution is the presence of unwanted and excessive sound that harms human beings and animals. Noise has the potential to disrupt essential activities like sleeping, reducing one's quality of life.	<ol style="list-style-type: none"> 1. Noise from factories 2. Noise from transportation systems 3. Events and Functions 4. Construction activities 	<ol style="list-style-type: none"> 1. Mental problem like Anxiety, Irritation 2. Partial or Complete Hearing Impairment 3. Affect animals' ability to communicate, attract their mate etc

Other Types of Pollution

- ❖ **Radioactive pollution** manifested itself in the nuclear disasters in Chernobyl, Fukushima etc. It has long-term implications for the health of human beings and affects geographically distant communities too.
- ❖ **Thermal pollution** happens when the temperature of a water body rises manifold as a result of human intervention.
- ❖ **Light Pollution** is the excessive presence of light rays, usually around cities. It hampers the ability of migratory birds to travel at night.

CONTROL MEASURES TO ENVIROENMENTAL DILEMMA

- The atmosphere has several built-in self-cleaning processes such as dispersion, gravitational settling, flocculation, absorption, rain-washout, etc to cleanse the atmosphere.

However, control of contaminants at their source level is a desirable and effective method through preventive or control technologies as follows:

ENERGY CONSERVATION

Energy conservation is the effort to reduce wasteful energy consumption by using fewer energy services.

This can be done by using energy more effectively (using less energy for continuous service) or changing one's behaviour to use less service (for example, by driving less)

Techniques for energy conservation

- ❖ Installing CFL lights
- ❖ Lowering room temperature
- ❖ Fixing proper insulation
- ❖ Using maximum day lights
- ❖ Using energy efficient appliances
- ❖ Drive less, walk more and carpooling
- ❖ Switch off appliances when not in use
- ❖ Planting saplings
- ❖ Use bicycles instead of other vehicles.

These benefits contribute to the protection and preservation of the environment in several ways:

- a) **Reduced Greenhouse Gas Emissions:** One of the most significant environmental benefits of energy conservation particularly carbon dioxide (CO₂). This helps mitigate climate change and its associated impacts, such as rising global temperatures and sea-level rise.
- b) **Improved Air Quality:** By using energy more efficiently and reducing SO₂ and NO_x usage, air quality is improved, leading to better public health and helps to avoid smog, acid rain, and respiratory diseases.
- c) **Less Habitat Destruction:** Energy conservation reduces the demand for non-renewable resources, helping to protect natural habitats, ecosystems, and biodiversity.
- d) **Resource Conservation:** Energy conservation is closely tied to resource conservation. Reduced energy consumption means lower demand for raw materials like coal, oil, and natural gas, which are often extracted from ecologically sensitive areas.
- e) **Reduced Light Pollution:** Energy conservation practices, such as using energy-efficient lighting and reducing unnecessary outdoor lighting, can help reduce light pollution. This is important for preserving the natural nighttime environment and protecting nocturnal ecosystems.
- f) **Lower Land Use Impact:** Energy-efficient building designs and practices can reduce the need for additional construction and land use. This helps preserve natural spaces and ecosystems.

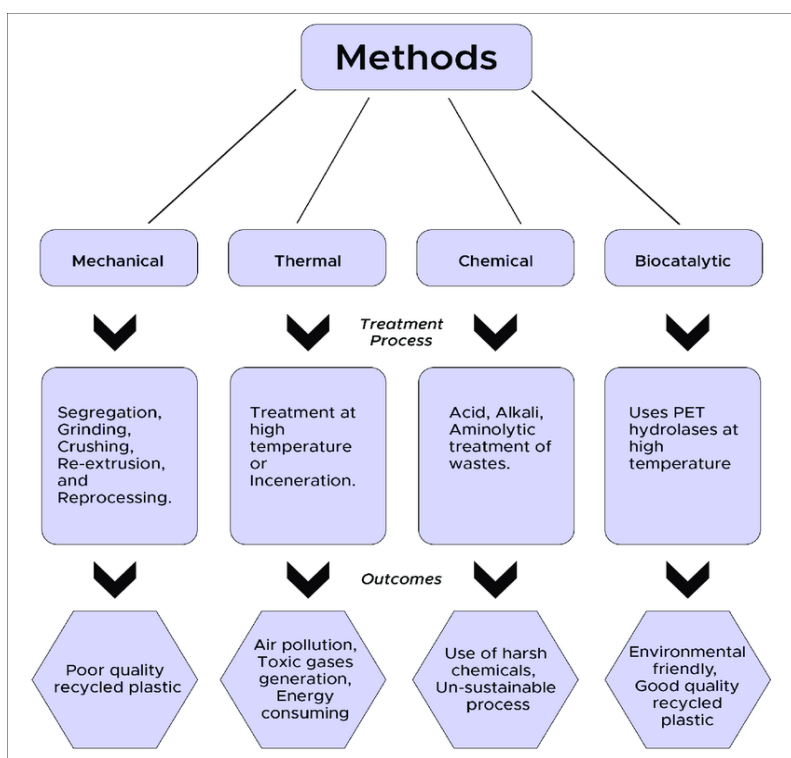
- g) **Resource Efficiency:** Energy conservation often involves using energy-efficient appliances and technologies, which can result in less waste generation. Products that last longer and require fewer replacements reduce the environmental impact of manufacturing and disposal.
- h) **Sustainable Transportation:** Energy conservation practices in transportation, such as carpooling, public transit use, and fuel-efficient vehicles, reduce emissions and air pollution, as well as the environmental impact of road construction and maintenance.
- i) **Enhanced Pro-Environmental Behaviour:** Energy conservation encourages a mindset of responsible resource use and environmental Behaviour. It fosters a culture of sustainability, which can lead to broader adoption of eco-friendly practices.

RECYCLING

- ❖ Recycling is the process of converting waste materials into new materials and objects. This concept often includes the recovery of energy from waste materials.
- ❖ Recycling is a key component of modern waste reduction and is the third component of the "Reduce, Reuse, and Recycle" waste hierarchy.
- ❖ Recyclable materials include many kinds of glass, paper, cardboard, metal, plastic, tires, textiles, batteries, and electronics. The composting and other reuse of biodegradable waste—such as food and garden waste—is also a form of recycling

The Recycling Process:

1. **Collection:** Recycling begins with the collection of recyclable materials. Commonly recycled items include paper, cardboard, glass, plastics, metals (such as aluminum and steel), and electronics. Collection methods can vary and may involve curbside pickup, drop-off centers, or specialized recycling programs.
2. **Sorting and Processing:** Once collected, recyclables are transported to recycling facilities where they undergo sorting and processing. This step involves separating materials into different categories and removing contaminants (non-recyclable items). Advanced technologies, such as conveyor belts, magnets, and optical scanners, are often used to automate this process.
3. **Cleaning and Preparation:** Some recyclables, like paper and cardboard, need to be cleaned and prepared for recycling. This can include removing ink, adhesives, or contaminants from paper products.
4. **Conversion:** Recyclables are then converted into raw materials or new products through various processes.



METHODS OF RECYLING

Benefits of Recycling:

- a) **Conservation of Resources:** Recycling reduces the need for extracting, refining, and processing raw materials, which conserves natural resources like timber, minerals, and oil.
- b) **Energy Savings:** Recycling typically requires less energy than producing new materials from scratch. For example, recycling aluminum saves up to 95% of the energy required to make aluminum from bauxite ore.
- c) **Reduction of Waste:** Recycling reducing the environmental impact of waste disposal and the associated pollution risks.
- d) **Lower Greenhouse Gas Emissions:** By reducing the energy and emissions associated with the extraction and production of new materials, recycling helps lower greenhouse gas emissions and combat climate change.
- e) **Conservation of Habitat:** Recycling reduces the need for logging, mining, and other activities that can harm natural habitats and ecosystems.
- f) **Job Creation:** The recycling industry provides employment opportunities in collection, sorting, processing, and manufacturing, contributing to local economies.
- g) **Promotion of Sustainability:** Recycling promotes a more sustainable and circular economy, where resources are reused and repurposed, reducing waste and environmental impacts.
- h) **Reduction of Pollution:** Recycling reduces the pollution associated with resource extraction, manufacturing, and waste disposal, leading to cleaner air, water, and soil.
- i) **Promotion of Environmental Awareness:** Recycling raises awareness about resource conservation and environmental issues, encouraging responsible consumption and waste reduction.

ENVIRONMENTAL BEHAVIOUR

The term 'pro environmental behaviour' refers to the conscientious willingness and action to minimize negative impacts for our natural environment.

Another term that has also been use is "environmental concern" (EC) that refers to broad range of attitudes towards the natural environment.

BEHAVIOURAL PROBLEMS

Changing behaviour is a more difficult and complicated process, and different research have tried to explore in more depth about the relevant behavioural shifting factors.

There have been several attempts to develop a complete and meaningful framework of factors influencing environmental behaviour

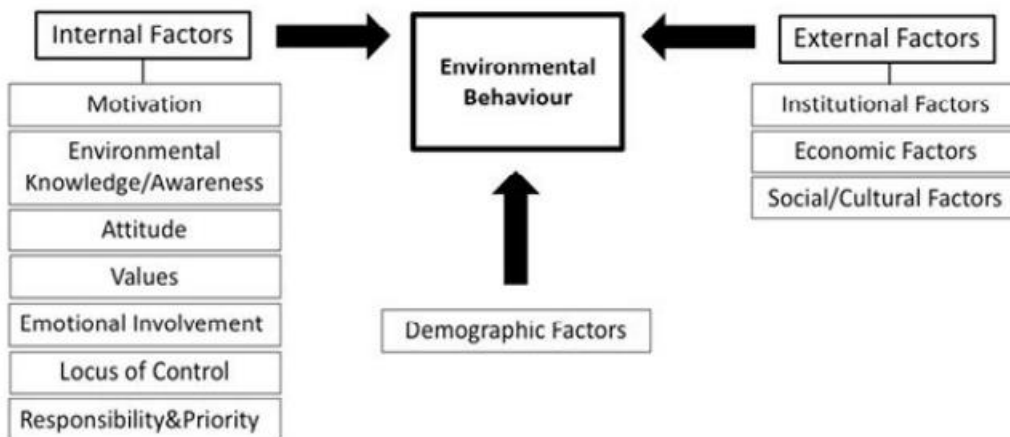


Figure 11.3 Model by Kollmuss, A., & Agyeman, J. (2002).

The above internal and external factors are which influencing a person's pro environmental behaviour .

Internal factors:

- a) **Motives** can be divided into primary and selective motives. In an environmental context, primary motives are usually oppressed by secondary motives.
An example of a secondary motive is that a person could prefer driving the car than taking public transportation because the benefit perceived of travelling alone in their own private vehicle is more relaxed (selective) than becoming climate-friendly (primary).
- b) **Environmental knowledge and awareness** are not a guarantee for pro-environmental behaviour. However, it is assumed that in order to act consciously, people need to have a basic understanding.
- c) **Attitudes** are characterized by positive or negative thoughts to act responsibility
- d) **Values**, are closely linked to attitudes and are mostly responsible for our intrinsic motivation. People usually adapt, modify or change their values from their immediate surrounding due to their experiences. So, pro environmental discussions with family and friends might form pro-environmental behaviour, sensitivity and subsequently, environmental awareness.
- e) **Emotional environmental involvement** refers to the emotional link between a person and the environment.
- f) **Locus of control** is the conviction of a person to what extent his or her actions can bring a change. People with a stronger external locus of control in comparison to their internal locus of control are less confident about their own change potential and expect others to deal with it.
- g) **Responsibilities and priorities** are evaluated based on attitudes, values and control beliefs.

External factors:

- a) **Institutional factors** are responsible for providing a suitable infrastructure for a positive behavioural adaptation. If an environmentally aware person is not given the chance and tools to act accordingly to their attitude, then pro-environmental behaviour will not happen.
For example, if there are no trash cans in the park and streets, then it is likely that people will litter in the park streets.
- b) **Economic factors** have a strong influence as lower priced alternatives are mostly preferred but when some companies started the pay-per-bag policy, then it resulted in waste reduction behaviour.
- c) Lastly, **social and cultural factors** also play an important role in environmental behaviour. It is suggested that in countries where natural resources are rare and the population is dense, people tend to act more climate friendly.

Demographic factors: Demographic variables such as age, income, gender play a role in determining the environmental behaviour as higher education is believed to foster pro-environmental behaviour.

THEORY OF PLANNED BEHAVIOUR

Many researchers have tried to explain the gap between attitude and behaviour, but the theory of planned action offered by Ajzen and Fishbein (1980) argues that attitudes do not determine behaviour directly, rather they influence behavioural intentions which then helps to shape our actions.

- ❖ Intentions are shaped by three determinants that are
 - ✓ attitudes,
 - ✓ subjective norms, and
 - ✓ perceived behavioural control.

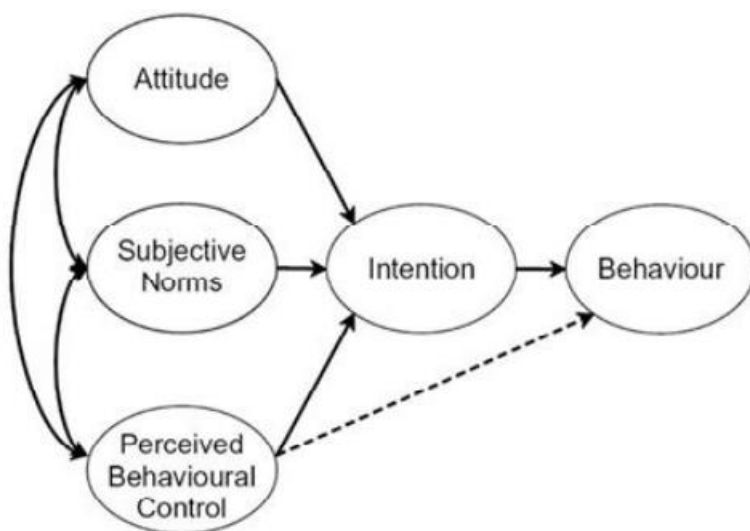


Figure 11.4 Theory of Planned Behaviour

(PBC) is **self-motivation**. This determinant refers to the perception of the acceptance or difficulty of performing the behaviour. The PBC has shown that people's behaviour is strongly influenced by their confidence and belief to implement it.

❖ **Attitude refers to the degree to likeness** which a person has a favourable or unfavourable assessment of the behaviour.

❖ **Subjective norms are beliefs** regarding whether significant others think an individual should engage in the behaviour or not. People can be influenced by their emotions and by their values.

❖ **Perceived behavioural control**

Behaviour is not directly determined by attitudes but influenced by intentions which do affect our behaviour. Although humans want to consciously change their behaviour, but they mostly lack discipline to repetitively practice the new behaviour pattern in order to form a new habit.

To explain this gap between attitude and behaviour Rajecki (1982) determined four exemplary reasons for the discrepancy between environmental attitude and the corresponding actions:

(1) Direct vs. indirect experience: *Direct experience means that whether the effect is seen immediately and has a stronger impact on a person's behaviour than an indirect experience.* An improving environmental change cannot be experienced instantly during a pro-environmental action which widens the gap between attitude and behaviour.

(2) Normative influence: Environmental behaviour is also *formed by social norms and customs.* For individuals who are part of a culture where they live an unsustainable lifestyle might result and contribute negatively to the environment.

(3) Temporal discrepancy: *Attitudes might change over time* so when the collection of behaviour data and attitude data lie far apart in time, results can become inconsistent.

(4) Attitude-behaviour measurement: Often the measured attitude is broader in scope than measured actions, which leads to larger discrepancies in results.

ECOLOGICAL CONSUMERISM

- ❖ Ecological consumerism is when a consumer demands or chooses products that are less harmful to the environment. It is a social behavior that promotes the use of eco-friendly (or green) products.
- ❖ Green consumerism or ecological consumerism is not just about buying eco-friendly products; it can be practicing recycling, conserving, or using public transportation instead of driving.

Here are some key aspects and principles of ecological consumerism:

PRINCIPLE	REASON	METHODOLOGY/BENEFITS
Product Selection	Choose products and services that are environmentally friendly, energy-efficient,	Selecting products made from sustainable materials, with minimal packaging, and those that have been certified by recognized environmental labels and standards
Energy Efficiency	Energy-efficient appliances, vehicles, and technologies	Reduce energy consumption, lower greenhouse gas emissions, and save on energy costs.
Waste Reduction	Reducing waste is a fundamental aspect	Practices such as recycling, composting, reusing items, and avoiding single-use plastics and disposable products.
Reduce and Reuse	To avoid dumping of new wastages	Recycle and try to reuse anything before buying new onw.

Local and Organic Foods	Buying locally produced and organic foods is a common practice	Local economies, reduces transportation-related emissions, and encourages farming methods that are less reliant on synthetic chemicals
Minimalism	Individuals prioritize experiences and quality over quantity	Reducing the overall consumption of goods and living a simpler, less materialistic life
Green Energy Choices	To reduce fossil fuels	Opting for renewable energy sources, such as solar or wind power, for homes
Advocacy and Activism	Engage in advocacy and activism to promote environmental and social causes	Supporting environmental organizations, participating in campaigns, or advocating for policies that promote sustainability
Education and Awareness	Staying informed about environmental issues, eco-friendly products, and sustainable practices is essential for ecological consumers.	Empower individuals to make informed choices and spread the message of sustainability
Avoid Single-Use Plastics	Minimize your use of single-use plastics, such as plastic bags, straws, and disposable containers	Opt for reusable alternatives like cloth bags and stainless-steel straws
Reduce Food Waste	To reduce the biowaste	Practice reducing food waste by planning meals, buying only what you need, and using leftovers creatively
Conserve Energy and Water:	To conserve energy and pollution	Implement energy-saving measures in your home, such as sealing gaps in doors and windows, using programmable thermostats, and turning off lights and appliances when not in use. Conserve water by fixing leaks and using water-efficient fixtures.
Choose Transportation Wisely	To reduce pollution	Consider eco-friendly transportation options, such as walking, biking, carpooling, and using public transit.

STRATEGIES TO ENCOURAGE ENVIRONMENTALLY RESPONSIBLE BEHAVIOUR

Encouraging environmentally responsible behavior or Pro Environmental Behaviour (PEB) is essential for addressing environmental challenges and promoting sustainability. Various strategies can be employed by governments, organizations, and individuals to promote eco-friendly actions and choices. Here are some effective strategies:

a) Education and Awareness:

Educate people about the consequences of unsustainable behaviors and the benefits of environmentally responsible actions through public campaigns, educational programs, and informational materials.

b) Provide Information:

Offer easily accessible information on sustainable practices, such as energy conservation, waste reduction, and eco-friendly products. Use labels and certifications (e.g., ENERGY STAR, Organic, Fair Trade) to help consumers make informed choices.

c) Incentives and Rewards:

Provide incentives for environmentally responsible behaviors, such as tax incentives for renewable energy installations, or rewards for recycling. Offer discounts or promotions for eco-friendly products and services.

d) Regulations and Policies:

Enact and enforce regulations and policies that promote sustainable practices, such as emissions limits, waste reduction targets, and environmental standards.

Implement policies to discourage environmentally harmful behaviors, through fine and ban items

e) Financial Incentives:

Offer financial incentives, such as subsidies or grants, to support green initiatives like renewable energy projects or sustainable agriculture.

Establish pricing mechanisms (e.g., pay-as-you-throw waste programs) to encourage resource conservation.

f) Public Transportation and Infrastructure:

Develop bike lanes, pedestrian-friendly pathways, and carpooling initiatives to reduce reliance on single-occupancy vehicles and use public transport.

g) Community Engagement:

Create community-based programs and events that promote environmentally responsible behaviors, such as neighborhood cleanups, tree planting, and recycling drives.

Establish community gardens and shared composting facilities.

h) Green Certifications and Labels:

Promote eco-labeling and certification programs that identify environmentally friendly products and services.

Encourage businesses to obtain and display green certifications.

i) Corporate Sustainability Practices:

Promote corporate social responsibility and transparency in reporting environmental efforts.

Incorporate Sustainability into Education:

Integrate environmental education into school curricula, teaching children about the importance of environmental stewardship and sustainable practices.

j) Technology and Innovation:

Invest in research and development to create innovative technologies and solutions that promote environmental sustainability.

Foster the adoption of clean and green technologies in various sectors, including energy, transportation, and agriculture.

k) Behavioral Nudges:

Use behavioral psychology principles to encourage sustainable choices. For example, use social norms and positive reinforcement to promote recycling or energy conservation.

Provide feedback and information on energy and resource usage to encourage conservation.

l) Collaboration and Partnerships:

Collaborate with NGOs, businesses, and community organizations to create and support environmental initiatives.

Foster partnerships between government agencies and private-sector organizations to address environmental challenges..

m) Celebrate Green Milestones:

Recognize and celebrate achievements and milestones related to sustainability and environmentally responsible behavior.

Use success stories to inspire and motivate others to take action.