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Re-Focusing Human Relationship with Environment: Development of TOPHI Model and Expedition towards Sustainable Development

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Abstract

Earth is our Mother
We are Mother's Children
Mother Earth Needs our Love and Care

Significant of the Study: The above maxim makes it evident that human and environment are very closely related and an important part of each other. As human need to interact with environment to obtain our food, water, fuel, medicine, building materials and many others things, thus, protecting the environment is essential to our health, quality of life and ultimately for survival. Humans have been interacting with the environment since, people first walked the earth. Humans have been cutting down forests to clear land to grow crops and building residents. Later on, with introduction of industrialization during 18th century in the UK and slowly spreading in Europe and America and then across the world. Such industrialization indicates technological intervention in organizations related to agriculture, animal husbandry and agriculture related industries. Much of massive production stated taking place and subsequently, the production of wastes as sewage, agricultural run-off, industrial chemicals etc. also started which leads to pollution.

Aim of the Study: The present paper proposes the TOPHI Model to draw a holistic picture of relationship between human and environment. The model focuses upon how each parameter are related itself to human existence with mother nature. The model also tries to provide both positive and negative perspective of these relationship. Finally, the paper also tries to lighten the pathway of sustainable development describing its need for ensure better future. The paper not only provide a comprehensive framework covering all the possible elements of nature and human but also hopes to serve as a base for future study.

Key Points: Environment, Human, TOPHI Model, Relationship, Parameter, Sustainable Development

I. HUMAN AND ENVIRONMENT RELATIONSHIP- HISTORICAL PROGRESSION

Literally, the very word 'Environment' comes from the French word *'Environner'*, which means 'to surround' and 'to encircle'. Thus, die word environment is used to describe everything that surrounds us. In simple word, Environment is the totality of the biotic and a-biotic factors that surrounds ourselves. Therefore, Environment is thus the aggregate of all conditions that support living things where, humans are the most interactive parts of environment. Today the study of relationship between human and environment has always been a focal theme for many disciplines. It has become one of the most interdisciplinary discussed topics due to ever changing nature of human activities. Such activities lead to change in social arena, economic arena, technological arena and ultimately its huge impact upon environment.

A. Human Interaction with Environment Through Ages

In order to analyze Human Environment Interaction, it is important to be aware of specific characteristics of human social system. The type of society strongly influences people attitude towards human nature, their behavior and therefore their impact on environment. Important characteristics of the human social systems are population size, organization, values, technologies, wealth, education, knowledge and many more. People modify the environment for their purpose and obtain benefits from it. Such benefits include water, timber, food, energy, land for farming and building houses etc. Using such resources human affect the environment in lot of ways (Lill. A & Graber. S, 2006).

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Therefore, the relationship between man and the environment has been established since the early periods. Human beings live in the kingdom of nature and interact with it constantly. The influence of nature in the form of the air man breathes, the water man drinks, the food man eats and the flows of energy and information. Any change in the environment cannot only result in devastating effects, but can also pose a threat to the human race. The relationship between man and his immediate environment is practically to man's benefit, ignoring the effect such activities may cause to the environment. Over the last four countries, human activities have transformed the Earth chemistry, water; soil and air, alter the face of the Earth itself, and change the earth's climate. These changes have led to massive environmental degradation whose impact is being felt on the health of the people living within the immediate environment. However, because of the permanent interaction between man and his environment, our health is to considerable extent determined by the environmental quality. As a consequence, environment and health are closely related. The environment in which we live, work and relax is determining for our health and well-being. Physical, as well as chemical and micro (biological) factors in the environment can have repercussions on our health, both physically and mentally (Bashar, A.G.P & Zamare, 2017).

Thus, understanding our changing relationship with the environment is, therefore, at the core of historical understanding. It involves grappling with questions of how humans have lived, how they have treated the earth, and how their power over the earth has grown. Understanding the changing relationship between humans and the environment in the world's past may be a first step towards finding a less damaging relationship in the future (World History for Us All)

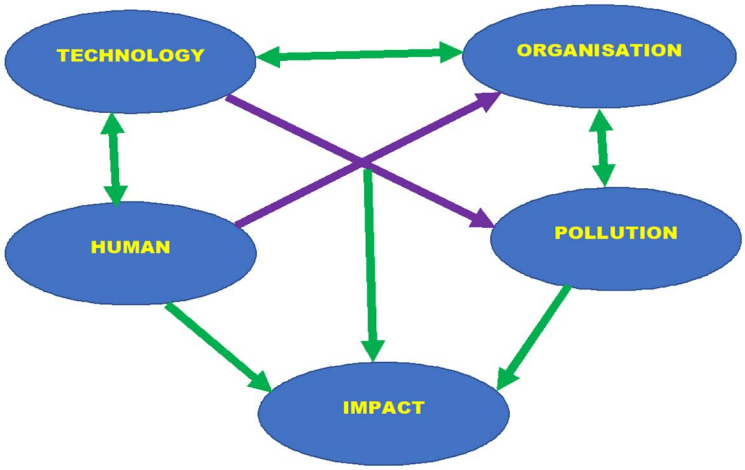
Hence, in order to answer the above questions and to understand these, vary interchangeable relationship of human and environment, a model has been developed to analyse the intimacy of the relationship. The proposed model known as TOPHI Model, comprises of five parameters. This parameter forms the assessment criteria and provides a scientific angle and space in the research context.

B. The TOPHI Model: Model on Human-Environment Relationship

Within the past decades, research has been increasingly drawn towards understanding whether there is a link between the changing human-nature relationship and its impact on people's health. Our understanding of the human-nature relationship and its underlying mechanisms could be further understood from different factorial perspective (Seymour. V, 18th November, 2016). Therefore, the TOPHI Model is designed to assess the relationship between human and environment and its overall impact. The assessment is done based upon five factors as Technology, Organization, Human, Pollution and their Impact on both environment and human life style. The model indicates how single factor can influence the other factors and in process forms the holistic approach termed as TOPHI model. Additionally, the model also explores, how each countries technological and organizational development affects the level of pollution and how the eventually impact factor become changeable in nature.

Below, the model associates itself with five factors. Each of the first 4 factors are influencing each other to form the impact. Whereas, human runs the organization with the help of technology, for large scale production of goods and services. Likewise, these production in the process leads to pollution of different kinds. Thus, each four factors leading to the 5th factor called Impact or the end result of the relationship.

Fig: 1.1 - The TOPHI Model



Source: Dr. Satabdi Roy Choudhury, 6th May, 2021

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C. Factors of TOPHI Model

The factors of TOPHI Model can be described as: -

1) *Technology:* The word technology comes from the two Greek words, transliterated 'techne' and 'logos'. Techne means art, skills, craft or the manner by which a thing can be achieved and Logos means a word, a saying or an expression by which an inward thought is expressed. Thus, literally technology means a skill to convey an idea. But now a days the term technology signifies the knowledge of tools, machines, techniques, crafts, systems and methods to solve a problem (Roy Choudhury. S & Burman. A, June, 2014).

Today, with rapid development of technology and its wide application range in our daily life, technology has become an inseparable part. With the coming of technology, the human race has been introduced with new form of communication, education and thinking ability, which is more informative and collaborative. Technology has generated tremendous support to medical science and surgery, which in turn leads to higher birth and lesser death ratio. In the social sector commercial technology as security surveillance system, storage solution etc., are serving admirably. Even the modern telecommunications and transport networks are essential and invaluable in meeting social needs. Though, technology is playing a crucial role for the existence of human kind, yet its importance and value remained controversial till today. Instead, of simply the key to a promising future, technology seems more like a double-edged sword that needs to be handled with care (Chen. J, 2020).

Evolution of Industrialization, not only paves the way for new technologies but also introduced immense power to the mankind. This leads to the transition in the western society and slowly around the globe. This industrialization has used up many natural resources and in turn it proves to be very detrimental as their increases various diseases as Cholera, Typhoid¸ Cancer, Ebola, Plague, Spanish Flu and recently born Corona virus. More over eutrophication and destruction of eco-system which is negatively affecting the food chain and depletion of ozone layer due higher concentration of greenhouse gases etc., are major impact of technological advancement.

Electromagnetic Radiations (EMR) due to the introduction of Smart phones and Internet wires and side by side the placement of towers within the city and village area are impacting the environment negatively. The EMR, which are emitting from these mobile towers are interfering with the biological habitats. It is affecting birds and bees, an indication that doesn't augur well for other species. The report has been prepared by an expert committee that was constituted on August 30, 2010, by the ministry in response to a question in the Lok Sabha on the ill-effects of mobile towers on birds. This report buttresses the finding of an inter-ministerial committee, comprising officials from the Department of Telecommunication, Indian Council for Medical Research, Department of Biotechnology that was released earlier this year.

The committee that was supposed to review all the studies done so far, Indian and international, recommended that EMR should be treated as a pollutant and that more studies on humans and especially wildlife need to be carried out in India (Misra. S.S, 2021).

Electronic Waste from most of the multi-national companies specifically from IT companies has lot of contribution in such waste. These wates consists of heavy metals like cadmium, lead, copper, and chromium that can contaminate the environment. Even the overused or discarded computer monitors, printers, scanners, keyboards, mice, cables, circuit boards, lamps, clocks, flashlight, calculators, phones, answering machines, digital/video cameras, radios, VCRs, DVD players, MP3 and CD players etc., also consists of electronic waste which are never disposed properly into recycling centres (Lopes. S, 2021).

Vehicle Emission due to transport logistic are impacting the environment negatively. Transport and the road traffic in particular produce fine particles that pollute the outside air. These particles are not only dangerous and carcinogenic to humans, but they are also toxic to ecosystems. Exposure to fine particles PM2.5 and to the particles PM10 reduces the human life expectancy and affect the new born. Some respiratory and cardiovascular diseases are due to air pollution. Likewise, greenhouse gases (CO2, CH4, N2O, O3, halocarbons, SF3) emitted by the means of transportation are harmful to nature. These pollutants due to road infrastructure in urban areas diminish the air quality and pollute the water reserves of the planet (MAP Transport, 2018).

Plastic Waste are the accumulation of plastic objects and particles, for example plastic bags, bottles etc. Plastic pollution has become one of the most pressing environmental issues, as rapidly increasing production of disposable plastic products overwhelms the world's ability to deal with them. Plastic pollution is most visible in developing Asian and African nations, where garbage collection systems are often inefficient or non-existent. But the developed world, especially in countries with low recycling rates, also has trouble properly collecting discarded plastics. Plastic trash has become so ubiquitous it has prompted efforts to write a global treaty negotiated by the United Nations (Parker. L, 2019).

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2) *Organisation:* An organisation is an entity such as an institution or an association comprising one or more people having a particular purpose. There are various types of organisation and each organisation has a leader or group of authority who are involved into an action to reach to a certain goal (Oxford Learner's Dictionary, 2021).

Every organisation is surround by environment. In other words, each organisation has to work within a framework of certain environmental factors. Thus, organisation and environment have a continuous interaction. In the society, organisations are mainly divided into Three Sectors of a Nation's Economy. The Primary Sector consisting of Farming, Fishing, Animal Husbandry and Extraction of Raw Material. The Secondary Sector consists of finished products as Manufacturing, Utilities as, Electricity and Gas and Construction Activities. Finally, the Tertiary Sector under which comes the Retail Industries, Financial Houses, Telecommunication Sectors, Hospitality, Educational Institutes, Health Sectors, Mass Media, Real Estate, NGO's etc. These tertiary sectors or the service sector of the economy are mainly sub-divided into profit and non-profit organisation. All these above sectors are more or less have the direct or the indirect impact on the environment. For example, service industries have significant indirect environment effects on an economy-wide basis even when their direct emissions are negligible. When an average annual goods and services are purchased by an average consumer, the amount spent on manufactured goods is about 25 % greater than that spent on services, but the environmental effects associated with manufacturing sector are about two to three times that of service (Rosenblum. J, Horvath. A & Hendrickson. C, 2000).

Primary Organisations are the first sector of economy for any country which is making direct contact and use of natural resources. The primary sector mainly consists of

Agriculture, which plays a crucial role in the development of a country. Agriculture is the key source of food, income and employment specifically in rural areas around the globe. At present, agriculture above and beyond farming includes forestry, dairy, fruit cultivation, poultry, beekeeping, mushroom, arbitrary, etc. Thus, agriculture could be referred to as the production, processing, promotion, and distribution of agricultural products (Dane. K, 2020). In spite, of these positive activities, agriculture also contributes to a large number of environmental issues, that causes natural degradation, deforestation, biodiversity loss, irrigation related as dams etc. Intensive agriculture also increases the risk of salination, alkalization and water logging in some irrigated areas.

Animal Husbandry and Dairying is basically the practice of breeding, farming and care of farm animals such as cattle, dogs, sheep, hen, goats, pigs and horses etc., for additional production of eggs, milk, wools, animal meat for humans. But such additional productions are having huge repercussions on the ecosystem and biodiversity of the planet. The conversion of forests livestock ranches is one of the major causes of deforestation. Raising livestock generates 14.5 per cent of global greenhouse gas emissions that are very bad for the environment (Brown. S, 2019).

Mining is the extraction of raw material specifically non-renewable resources from the Earth. The extraction includes petroleum, natural gas, coal, minerals and metals such as cooper, aluminium, silver gold, iron etc. In other words, the objects which are not plant based are all the products of mining. The cemented area we are walking on, the laptop screen we are reading at are all the products of modern-day mining. Yet, this mining sector is plagued with several environmental and health-and -safety related problems. Mining leads to releases much amount of dust, methane and greenhouse gases and sulphur dioxide due to blasting operation involved. The movement of underground rock sometimes leads to sever accidents due to land slide. One of the burning examples of environmental damage due to mining is caused by Kudremukh Iron Ore Company Limited (KIOCL), it has caused large scale destruction of the hills, pollution of ground water and severely affected the Kudermukh National Park (Mehta P. S, 2002).

Secondary Organisations This sector mostly takes raw materials from the primary sector and creates finished goods via heavy machineries which require factories. The secondary sector mainly consists of:

Manufacturing Industries are considered as the backbone of development for any country. It has helped modernising the agricultural sector by providing simple machines as tractors, front-end loaders, backhoe etc. Even manufacturing industries have reduced the over dependency of people upon agriculture and also provided new employment opportunities. These industries has not only helped to modernize the agriculture but also it has revolutionized the societies existence. Today, the branch of manufacture and trade based on the fabrication, processing, or preparation of products from raw materials and commodities. This includes all foods, chemicals, textiles, machines, and equipment. This includes all refined metals and minerals derived from extracted ores. This includes all lumber, wood, and pulp products. Therefore, this sector in a way brings down the regional disparities and enhances the path for foreign investment due export and import activities (Sustainable Development Indicator Group, 1996)

However, though manufacturing industries has brought radical change within the society, yet the sector has also become the cause of environmental disaster. As the manufacturing units are growing bigger and bigger and slowly becoming full scale operational, the level of pollutants is also increasing day by day. Industrial pollution takes on many faces. It contaminates several sources of

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drinking water, releases unwanted toxins into the air and reduces the quality of soil all over the world. Despite the efforts of governments, the world over to reduce the amount of pollution that these factories pump into the atmosphere, there is still so much major impacts that industrial pollution has caused to the environment. Such impacts are-

- A huge portion of climate change or global warming can be attributed to our reliance on industrial activities over the years. Toxic materials and gases are burned and released into the atmosphere, such as carbon dioxide and methane.
- The toxic gases that factories release into the air, combined with those added by automobiles on the road, has increased risk of developing chronic respiratory disease, lung cancer, heart disease and many other illnesses, diseases and conditions.
- Factories are also a major contributing factor to water pollution across the globe. The illegal dumping of contaminated water, gases, chemicals, heavy metals or radioactive materials into major waterways causes damage to marine life.
- Chemicals and toxic materials can destroy the fertility of the soil, decrease the productivity of crops and even lead to the contamination of foods that we may eventually consume.

(Source: field.org.uk, 2018)

Construction Industry is an important part of the country's economy. Construction is an important sector that contributes greatly to the economic growth of a nation. The construction industry has laid down the physical and technological foundations upon which modern civilization has developed. It also creates investment opportunities across various related sectors and vital to the achievement of national socio-economic objectives. It envelops a very large canvas of human activities, from huts to skyscrapers, from cart routes to super-express highways, from culverts to multi-span multilane flyovers, from village shops to supermarkets and large industrial complexes, refineries and fertilizer's plants, from observation posts in the high Himalayas to off-shore drilling platforms in deep seas (TechnoFunc, 2020).

Infrastructure is vital for the development of nations and it is because of this that the construction industry is ever-growing. After all, more growth often means more business. The increase, however, comes at a price. There are many societal impacts of construction. Methods, materials, and operations all contribute to the environmental impact of construction. Construction projects worsen climate change. The sector accounts for 25 to 40 percent of the world's total carbon emissions. In addition, the environmental impact of construction can also affect wildlife. Roads in rainforests can cut off migration routes. Dams can divert water from freshwater habitats. Spills from oil platforms can kill marine organisms and leave the shoreline polluted (Afable. M. V, 10th January, 2019).

Tertiary Organisation mainly consists of service houses of the economy as per the theory. They don't produce any end products or use raw materials but produces intangible goods. This sector includes the provision of services used by final consumers. Such services include transportation, distribution, entertainment, retailing, hospitality, medical facilities, hotels and restaurants, pest control etc. The main focus is on customers and there usage rather then transforming the goods into physical form.

Hospitality Segment is the broad category of the service field which includes, food, lodging, drinking, theme parks, event planning, restaurants, bars, casino hotels, resorts, recreational rooms, tour operators, travel guides, fashion shows etc. This part of the service sector is the largest and fastest growing in terms of providing employment and as a source of foreign income. Under this sector tourism and hotel industry are the key sub sectors-

(a)Tourism Industry is one of the major sources of government income as it boosts the local tourist places of the country. It is also, one of the valuable sources of national and local employment. The tourism industry's revenue helps the government build the necessary infrastructure like bridges and rail-lines, which furthers the development of those regions. The tourism sector also helps preserve the rich art, history and cultural aspects of a country. The people visiting from different parts of the world are educated about important tourist locations' as well as their cultural and historical significance. This, in turn, spreads awareness about the need to protect them for future generations (Berlin School of Business, 2021).

Though, tourism industry is one of the major sources of country's development, yet there is also substantial negative impact upon the environment. Tourism puts enormous stress on local land use, which can lead to soil erosion, increased pollution and loss of natural habitat due to regular visit of tourists. These effects can gradually destroy the environmental resources on which tourism itself depends (The World Counts, 2021).

(b)Hotel Industry is the heart of the tourism industry, that is both are the two sides of the same coin. It one of the fastest growing economy of these time. The hotel industry alone is a multi-billion dollar and growing enterprise. The hotel industry is diverse enough for people to work in different areas of interest and still be employed within the hotel industry. Hotels mainly provides types of accommodations for several days along with various types of meals and drinks, basic housekeeping services etc (Rajak. H, 2021).

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Financial Segment make up the influential sector of the economy. It is a broad range of activities which include banking, investing and insurance. This segment is leading the world in terms of earnings and equity market capitalization (Catalano, T.J, 2021). The financial segment is complemental to payment systems.

This payment system is typically based on transaction through currencies consists of both paper and hard material coins, whose manufacturing process leads to the direct negative impact upon the environment. The manufacturing processes release huge amount of nitrogen dioxide, sulphur dioxide and carbon dioxide into the atmosphere. These releases contribute to acid rain and addition to greenhouses gases (Kempner. D, 2016).

Healthcare Segment, the health care industry plays an important role in the health of people and the economy as a whole. We need healthcare professionals to enforce policies that will run the system effectively. With the increasing levels of stress and psychosomatic illnesses, we need healthcare professionals never like before. Other challenges necessitate the need for qualified healthcare professionals to lead and manage hospitals.

The world needs more healthcare professionals. And the healthcare profession has the potential of greatly rewarding the individual based on the quality of services he or she offers. A health officer can have the opportunity to impact a town or nation positively (Referral md, 2021).

Therefore, healthcare is a large economic sector and employer in many countries. There is a pressing need to understand the health impact upon environmental footprint. As the investment in health care increases around the world, there is considerable potential for increasing harm health from pollution.

Treatment and disposal of healthcare waste may pose to health risks indirectly through the release of pathogens and toxic pollutants into the environment. Further, disposal of heavy metal content in particular lead, mercury and cadmium can spread toxic metals in the environment (Lanzen. M & et al., 2020).

Entertainment Segment is one of the most important part of the tertiary sector. This segment provides huge employment opportunity starting from street dancers to highest paid celebrities. Thus, supporting the country's economy as a lot of tax is collected from the industry.

Though entertainment provides a lot of fun and believe it or not this industry has a huge impact on environment. People in the name of fun and in order to experience their desire, travel many far of places leading to increase in carbon footprints, leading to increase of global warming. Many times, the film location decided by the crews disturbs the wild life and as well as lives of many local tribal peoples (Joint Ventures, 2019).

3) *Pollution:* Environmental pollution is the current biggest challenge facing the world. Urbanization and industrialization along with economic development have led to increase in energy consumption and waste discharges. The global environmental pollution, including greenhouse gas emissions and acid deposition, as well as water pollution and waste management is considered as international public health problems, which should be investigated from multiple perspectives including social, economic, legislation, and environmental engineering systems, as well as lifestyle habits helping health promotion and strengthening environmental systems to resist contamination (Kelishadi. R, 2012). There are many forms of pollution and each form has its own way of impacting the environment and living organism.

a) *Air Pollution:* Presence of certain substance in the atmosphere that are harmful to human and other living beings, can cause damage to everyday life style. Air pollution is a mixture of solid particles and gases in the air. Car emissions, chemicals from factories, dust, pollen and mold spores may be suspended as particles. Ozone, a gas, is a major part of air pollution in cities. When ozone forms air pollution, it's also called smog. Some air pollutants are poisonous. Inhaling them can increase the chance you'll have health problems. People with heart or lung disease, older adults and children are at greater risk from air pollution. Air pollution isn't just outside - the air inside buildings can also be polluted and affect your health (Medline Plus, 2021)

b) *Water Pollution:* Water pollution occurs when harmful substances—often chemicals or microorganisms—contaminate a stream, river, lake, ocean, aquifer, or other body of water, degrading water quality and rendering it toxic to humans or the environment. Examples include wastewater (also called effluent) discharged legally or illegally by a manufacturer, oil refinery, or wastewater treatment facility, as well as contamination from leaking septic systems, chemical and oil spills, and illegal dumping. Further there is used water, which, comes from our sinks, showers, and toilets and from commercial, industrial, and agricultural activities (as metals, solvents, and toxic sludge). The term also includes stormwater runoff, which occurs when rainfall carries road salts, oil, grease, chemicals, and debris from impermeable surfaces into our waterways (Denchak. M, 14th May, 2018).

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c) *Land Pollution:* The deposition of solid or liquid waste materials on land or underground in a manner that can contaminate the soil and groundwater, threaten public health, and cause unsightly conditions and nuisances. The waste materials that cause land pollution are broadly classified as municipal solid waste (MSW, also called municipal refuse), construction and demolition (C&D) waste or debris, and hazardous waste. MSW includes non-hazardous garbage, rubbish, and trash from homes, institutions (e.g., schools), commercial establishments, and industrial facilities. Garbage contains moist and decomposable (biodegradable) food wastes (e.g., meat and vegetable scraps); rubbish comprises mostly dry materials such as paper, glass, textiles, and plastic objects; and trash includes bulky waste materials and objects that are not collected routinely for disposal (e.g., discarded mattresses, appliances, pieces of furniture). C&D waste (or debris) includes wood and metal objects, wallboard, concrete rubble, asphalt, and other inert materials produced when structures are built, renovated, or demolished. Hazardous wastes include harmful and dangerous substances generated primarily as liquids but also as solids, sludges, or gases by various chemical manufacturing companies, petroleum refineries, paper mills, smelters, machine shops, dry cleaners, automobile repair shops, and many other industries or commercial facilities. (Nathanson, J.A, 2021).

d) *Noise and Light Pollution:* Light and noise pollutions are two types of pollution which may not see as, immediately to be harmful for existence of living beings. Noise pollution is created in forms of driving cars, blowing horns, playing loud music during festivals, operating machines of construction activities etc. Noise pollution leads to increase stress, cardiovascular disease, sleeplessness, promotes mental illness. Light pollution occurs due to artificial lighting that harms the ecosystem. Bright street lights, household security lights, bill board lights, lights from sky high malls etc., which leaking into the dark night sky are main cause of light pollution. Such pollution is causing sleeplessness, increased occurrence of skin cancer, invitation to migratory insects.

(Source: University of Wisconsin-Eau Claire, 2021)

4) *Human:* Human activity has had an effect on the environment for thousands of years, from the time of our very earliest ancestors. Since Homo sapiens first walked the earth, we have been modifying the environment around us through agriculture, travel and eventually through urbanization and commercial network (Kent State, 2018). Hence, humans impact the physical environment in many ways: -

a) *Overpopulation:* Human population has been affecting the environment for hundred of years. The term overpopulation is used to describe a situation in which the world or area has a population so large that the people there are suffering as a result. In other words, the population exceeds the region or planet's carrying capacity--the number of people, other living organisms, or crops that can be supported without environmental degradation. Their suffering may include a shortage of food, limited access to healthcare and other public services, overcrowding, and high unemployment (Leblanc. R, 2021).

b) *Deforestation:* Deforestation is the clearing, destroying or removal of trees through deliberate, natural or by accidental means. In order to feed the growing human population notable advances are meet in the name of agriculture, keeping live stocks (domesticated animals and birds), fields for grazing and which contributed a lot towards depleting native grasses and soil erosion. Deforestation has also led to destruction of wild life habitats, increased greenhouse gases and loss of moisture in the atmosphere (Pachamama Alliance, 2021).

c) *Global Climate Disruption:* The largest single threat to the ecology and bio-diversity of the planet in the decades to come will be global climate change. More people necessitate more demand for oil, coal, gas, and other energy sources extracted from below the Earth's surface that spew carbon dioxide (CO_2) into the atmosphere when burned, trapping warm air inside like a greenhouse. Most fossil fuel consumption comes from developed countries (Kent State, 2018).

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Table 1.1 Overview of Elements of the Factors of TOPHI Model

Factors of TOPHI Model	Elements of Each Factor
Technology	1. Industrialisation 2. Electromagnetic Radiations 3. Electronic waste 4. Vehicle Emission 5. Plastic Waste
Organisation	1. Primary Sector- (a) Agriculture (b) Animal Husbandry & Dairying (c) Mining 2. Secondary Sector- (a) Manufacturing Industry (b) Construction Industry 3. Tertiary Sector- (a) Hospitality Segment-Tourism Industry and Hotel Industry (b) Financial Segment (c) Healthcare Segment (d) Entertainment Segment
Pollution	1. Air Pollution 2. Water pollution 3. Land pollution 4. Noise pollution 5. Light pollution
Human	1. Overpopulation 2. Deforestation 3. Global Climate Disruption
Impact	Outcome of each element, both positive and negative impacts are described below

(Author's Compilation)

IMPACT In respect of the above complex relation as explained between human and environment, provides both negative and positive impact upon our planet earth. Therefore, in order to understand the depth of this relation, below the table representing both negative and positive outcome and its impact.

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Table: 1.2 Representing the Positive Impacts of Human Relation with Environment

Factors of TOPHI Model	Positive Outcomes
Technology	1. Enhanced new form of communication. 2. Advance transition of society due to industrialisation. 3. Easy transportation of raw materials and easy travelling.
Organisation	1. Provided a backbone to human society through its three sectors as primary, secondary and tertiary. 2. Generation of huge employment opportunity in each sector. 3. Development of modern civilisation.
Pollution	1. Turing the existing carbon into precious jewels as processed in Beijing. 2. Turning smog into diamonds as created by Dutch artist Dan Roosegaared. 3. Invention of Air Carbon which is like plastic but better, can be melted and formed into different shapes which are bio degradable as well. *(Source: World Economic Forum, 2021)*
Human	1. Protection of endangered species through establishing wild life parks. 2. Projects are introduced to clean various rivers, lakes and seas, for example Swach Ganga Mission by Indian Government. 3. Recycling waste products and growing plants and vegetables.
Impact	It can be concluded that individuals and collective actions can make a big difference in the environment where we all live in. We human can encourage healthy living through our activities which has long term benefits leading to bigger and significant impact.

(Author's Compilation)

Table: 1.3 Representing the Negative Impacts of Human Relation with Environment

Factors of TOPHI Model	Negative Outcome
Technology	1. Eutrophication and destruction of eco-system. 2. Loss of Biological Habitat. 3. Huge disposal of plastic waste into water bodies.
Organisation	1. Depletion of fossil fuels and other raw materials. 2. Increasing global warming. 3. Huge waste disposal to sea, leading to death of marine life.
Pollution	1. Increased health problems like asthma, skin cancer, skin irritation, eye burning etc. 2. Contamination of different water bodies and ground water due to over use of fertilizers. 3. Too much grazing leading to erosion of top soil.
Human	1. Overpopulation. 2. Building urban or concrete jungles. 3. Deforestation and ozone depletion.
Impact	There is no denying that our natural habitat that is planet earth has been seriously wounded and, in many cases, irreparably damaged by our actions. Thus, it has to considered to fix which is broken.

(Author's Compilation)

D. Can Ever be Fixed Which is Broken: A Path way to Sustainable Development

The explanation of TOPHI model makes it evident that human health is directly linked to the state of biodiversity and climate change. Improving human-environment relation and mitigating against future health disasters require simultaneously addressing these causative factors in an integrated fashion. The existing pandemic that is evolution of Coronavirus SARS-CoV-2 (COVID 19) is the burning example of a zoonotic diseases which is actually came as a cost to our broken relationship with environment. Top experts says that we must heal our broken relationship with nature to prevent humanity and our planet earth in long run. We must curb the high-risk trade, consumption of wildlife, halt deforestation and land conversion as well as manage food production (Corbett.J, 2020).

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Thus, it is critical to generate knowledge to bring about changes that emphasizes a shift away from current development trajectories characterised by biodiversity loss and ecosystem degradation, unsustainable production and consumption patterns, pollution and climate change (Relief Web, 2021).

Therefore, to frame the relation between human and environment, the call for sustainable development is imperative. In very simple term, the word sustainable development is an idea, where it is expected that human society must live and meet their need without compromising the ability of future generations to meet their own need. The 30 years journey of Four World Summits from Stockholm to Nairobi to Rio and to Johannesburg has put world on notice that sustainable development is not an option but it is an imperative decision which have to be taken.

Goals of Sustainable Development: -

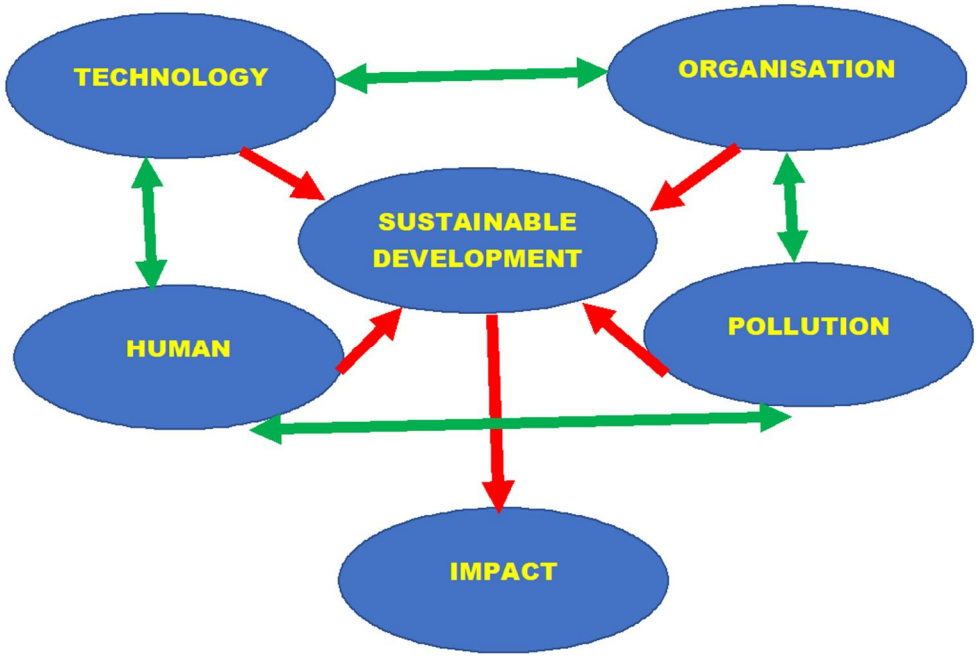
1) End of poverty and hunger
2) Better standard of education and healthcare, particularly pertaining to better water quality and better sanitation.
3) Economic growth, promoting jobs and stronger economies.
4) Sustainability to include health of land, air and water.

(Source: Shah. M.M, 2008)

From the above justification of sustainable development to reduce deforestation and build a shared prosperity for today's population and to continue to meet the future generation a long-term planning is necessary. Thus, UN Environment challenge in 2030 Agenda is to develop and enhance integrated approaches to sustainable development-approaches that will demonstrate how improving the health of the environment will bring social and economic benefits. Aiming at reducing environment risks and increasing the resilience of societies and the environment as a whole. So, fostering the environmental dimension of sustainable development is the need of the hour (UN Environment Programme, 2021).

Hence, if we connect our present model that is TOPHI MODEL with sustainable development, it may serve as awareness of legislation protection of health of people from pollution and other harmful activities of business

Fig: 1.2 – Sustainable Dimension of TOPHI MODEL



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The figure 1.2 depicts the sustainable dimension of the TOPHI Model. According to the above diagram (1.2) if we start going into deeper process to evaluate each factors of the present model in the framework of sustainable development, then it can lead to a new reflection of the planet earth. Through it is not able to manage environment crisis until we change our attitude, our consumption pattern, our manufacturing and marketing practices and get into technological world that is less intensive in its use of materials and energy. It is now accepted worldwide that there has to be development that is rather sustainable than the one adversely effecting and destroying the environment (Monga. M, 2018)

Therefore, let us elaborate the above discussion to make it clearer on how sustainable form of development impact society then untenable form of development. Below the table 1.4 describe the how sustainable development is necessary to maintain the planet earth.

Table: 1.4 Sustainable Development vs Untenable Development as per TOPHI Model

Factors of TOPHI Model	Untenable Development	Sustainable Development
Technology	1. Eutrophication 2. Loss of Biological Habitat 3. Disposal of Plastic Waste	1. Installing Tertiary Treatment Systems to reduce nitrogen and phosphorus present in run-off plants. 2. Management of human consumption on resources. 3. Improving waste management system 4. Ban on plastic bags
Organisation	1. Depletion of Fossil Fuel 2. Global Warming	1. Focusing on self-renewing sources like sun-light. 2. Decarbonization of all aspects of economy.
Pollution	1. Health Issues	1. Afforestation 2. Minimizing the pollution at it root point. 3. Water treatment.
Human	1. Overpopulation 2. Huge Concrete Buildings	1. Proper Implementation of government child policy norms. 2. Proper implementation of community health programme. 3. Construction of parks, protecting forests and farm-lands.
Impact	Sustainable development thus, can protect us from more frequent and severe consequences which likely to become if we follow these untenable from of development.	

(Author's Compilation)

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Born on 8th September 1988, is a Freelance Writer form Assam, India. She started her educational journey form Kendriya Vidyalaya, Kapili, Assam and completed her Graduation from St. Edmund's College, Shillong, Meghalaya. She is Credited with MBA degree in HR Major and Marketing Minor from EIILM, Sikkim. She holds the PhD from Assam Central University, Silchar (2018) with specific focus upon the Well-Being activities of the Indian Power Sector Enterprises for their employees and as well as their subjective opinion regarding these measures. Dr. Satabdi has more than 26,000 reads as per Research Gate, of her 14 International Publication out of which 2 Papers are presented one during UNESCO Conference at Thailand, 2014 and another during Ramthakur College at Tripura, 2020. She has also been the part of Academic Module with Acumen Academy as-

Academic Module with Acumen Academy

Name of the Module	Area of the Module	Duration of the Module
Adaptive Leadership	Kajol Gaon, District-Chirang, Assam	10th June to 13th July,2020
Martin Luther King's Letter from Birmingham Jail	Social Challenge Against Race, Activism and Extremism	4 Days

Awards Received

Awards	Organisations
Best Paper Award, 2016	EPRA International Journal
The Real Super Women, 2020	Forever Star India Award
Education Icon Award, 2020	Brand Opus India
Young Researcher Award, 2020	Institute of Scholars (InSc), Bangaluru
Global Women Inspiration Award, 2021	I Can Foundation, Jaipur

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Second born of Dr Narendra Nath Saha and Mrs Anindita Saha, Nilotpal did his elementary to high schooling in Indo Bangla border district Karimganj . Later He came to Silchar for higher education and pursued BCom and MCom From Assam University Silchar. He has also completed Post graduation Diploma in Marketing Management and Earned Doctorate of Philosophy from Same institute.

He has also passed Post Graduate Diploma in International Business Operations from Indira Gandhi National Open University and qualified NET. As a lifelong learner he has successfully completed several short term courses from different national and International organizations.

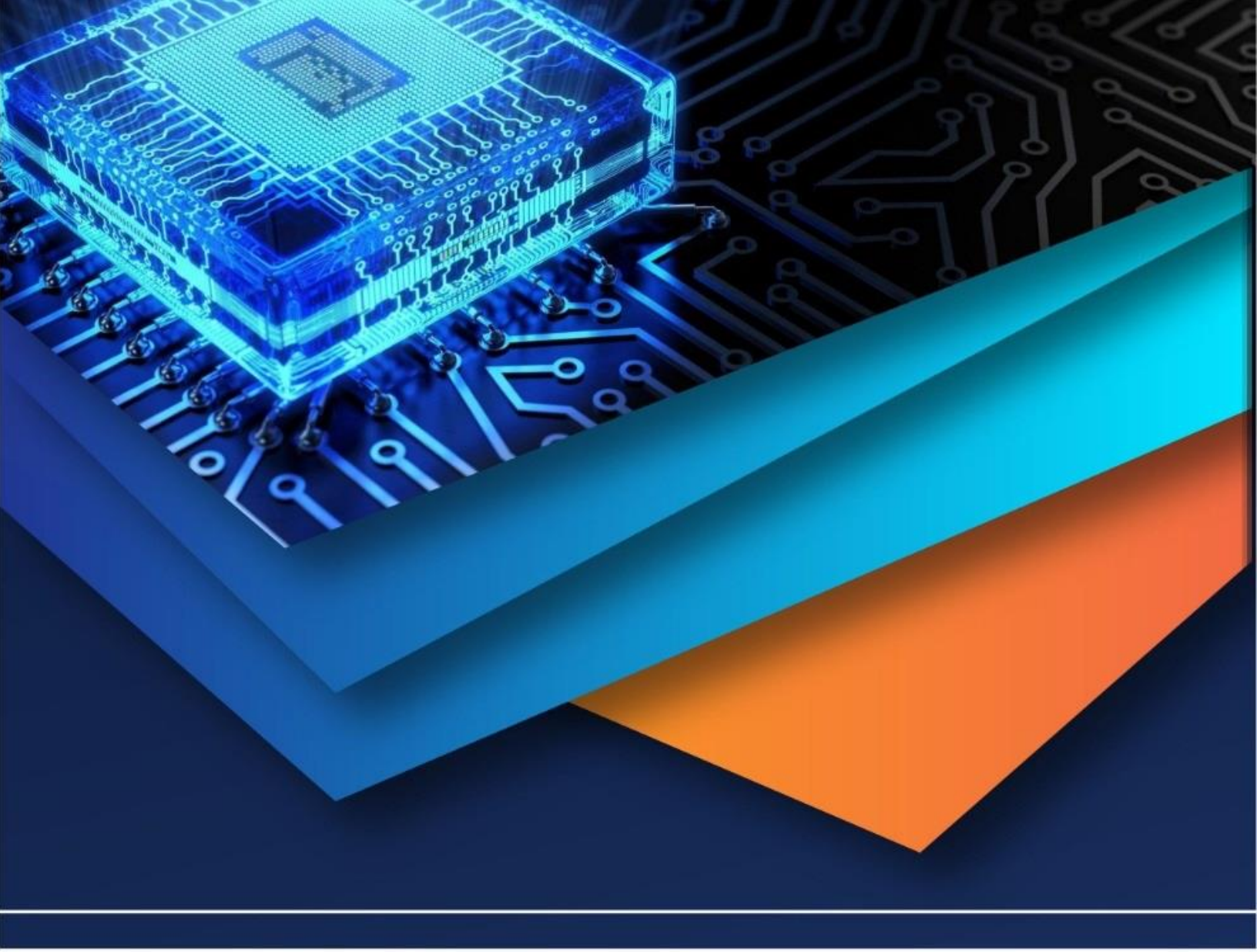
He successfully participated in different Co-curricular activities like debate, quiz and science seminars as a student. And actively took part in NCC and NSS along with his studies. He was also interested in adventure sports and martial arts.

He started his teaching career from Northeastern Higher secondary School, Silchar. He later joined Don Bosco College, Tura where he served as Lecturer for a brief period of time. He then joined ICFAI University Meghalaya as a Teacher Associate for Marketing Management. After that he joined as Assistant Professor to Commerce College Kokrajhar where he is serving till date. Further time to time he has served as a visiting faculty to Assam University Silchar, Rural Self Employment Institutes (RSETI), and Kokrajhar District Industries and Commerce Centre. He is also an Empanelled resource person of Securities and Exchanges Board of India (SEBI) for extending financial education to masses.

As a researcher he has completed one Minor Research Project under UGC and published 8 papers in reputed Journals and edited Books. He has also presented several research papers in National and International Seminars.

In his leisure time he extends his volunteer services to Indian Red Cross Society; and creates positive awareness towards first-aid and voluntary blood donation. As a nature enthusiast he actively takes part in tree plantations and biological surveys.

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