ENVIRONMENTAL SCIENCE MATERIAL IN TELUGU pdf

1: Natural science - Wikipedia

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Pollution started from prehistoric times , when man created the first fires. According to a article in the journal Science, " soot " found on ceilings of prehistoric caves provides ample evidence of the high levels of pollution that was associated with inadequate ventilation of open fires. Core samples of glaciers in Greenland indicate increases in pollution associated with Greek, Roman, and Chinese metal production. The Industrial Revolution brought an infusion of untreated chemicals and wastes into local streams that served as the water supply. King Edward I of England banned the burning of sea-coal by proclamation in London in , after its smoke became a problem; [6] [7] the fuel was so common in England that this earliest of names for it was acquired because it could be carted away from some shores by the wheelbarrow. It was the industrial revolution that gave birth to environmental pollution as we know it today. London also recorded one of the earlier extreme cases of water quality problems with the Great Stink on the Thames of , which led to construction of the London sewerage system soon afterward. Pollution issues escalated as population growth far exceeded viability of neighborhoods to handle their waste problem. Reformers began to demand sewer systems and clean water. August Bebel recalled conditions before a modern sewer system was built in the late s: There were no public toilets in the streets or squares. Visitors, especially women, often became desperate when nature called. In the public buildings the sanitary facilities were unbelievably primitive As a metropolis, Berlin did not emerge from a state of barbarism into civilization until after A British expert in concluded that Berlin represented "the most complete application of science, order and method of public life," adding "it is a marvel of civic administration, the most modern and most perfectly organized city that there is. Chicago and Cincinnati were the first two American cities to enact laws ensuring cleaner air in Pollution became a major issue in the United States in the early twentieth century, as progressive reformers took issue with air pollution caused by coal burning, water pollution caused by bad sanitation, and street pollution caused by the 3 million horses who worked in American cities in , generating large quantities of urine and manure. As historian Martin Melosi notes, The generation that first saw automobiles replacing the horses saw cars as "miracles of cleanliness. Extreme smog events were experienced by the cities of Los Angeles and Donora, Pennsylvania in the late s, serving as another public reminder. Awareness of atmospheric pollution spread widely after World War II, with fears triggered by reports of radioactive fallout from atomic warfare and testing. National news stories in the late sâ€”especially the long-term dioxin contamination at Love Canal starting in and uncontrolled dumping in Valley of the Drums â€”led to the Superfund legislation of The development of nuclear science introduced radioactive contamination , which can remain lethally radioactive for hundreds of thousands of years. Lake Karachay â€”named by the Worldwatch Institute as the "most polluted spot" on earthâ€”served as a disposal site for the Soviet Union throughout the s and s. Chelyabinsk , Russia, is considered the "Most polluted place on the planet". The toll on the worst-affected populations and the growth since then in understanding about the critical threat to human health posed by radioactivity has also been a prohibitive complication associated with nuclear power. Though extreme care is practiced in that industry, the potential for disaster suggested by incidents such as those at Three Mile Island and Chernobyl pose a lingering specter of public mistrust. Worldwide publicity has been intense on those disasters. The borderless nature of atmosphere and oceans inevitably resulted in the implication of pollution on a planetary level with the issue of global warming. Though their effects remain somewhat less well understood owing to a lack of experimental data, they have been detected in various ecological habitats far removed from industrial activity such as the Arctic, demonstrating diffusion and bioaccumulation after only a relatively brief period of widespread use. A much more recently discovered problem is the Great Pacific Garbage Patch , a huge concentration of plastics, chemical sludge and other debris which has been collected into a large area of the Pacific Ocean by the North

Pacific Gyre. This is a less well known pollution problem than the others described above, but nonetheless has multiple and serious consequences such as increasing wildlife mortality, the spread of invasive species and human ingestion of toxic chemicals. Organizations such as 5 Gyres have researched the pollution and, along with artists like Marina DeBris , are working toward publicizing the issue. Pollution introduced by light at night is becoming a global problem, more severe in urban centres, but nonetheless contaminating also large territories, far away from towns. Blue drain and yellow fish symbol used by the UK Environment Agency to raise awareness of the ecological impacts of contaminating surface drainage. The major forms of pollution are listed below along with the particular contaminant relevant to each of them: Common gaseous pollutants include carbon monoxide , sulfur dioxide , chlorofluorocarbons CFCs and nitrogen oxides produced by industry and motor vehicles. Photochemical ozone and smog are created as nitrogen oxides and hydrocarbons react to sunlight. Particulate matter , or fine dust is characterized by their micrometre size PM10 to PM2. Radioactive contamination , resulting from 20th century activities in atomic physics , such as nuclear power generation and nuclear weapons research, manufacture and deployment. See alpha emitters and actinides in the environment. Thermal pollution , is a temperature change in natural water bodies caused by human influence, such as use of water as coolant in a power plant. Water pollution , by the discharge of wastewater from commercial and industrial waste intentionally or through spills into surface waters ; discharges of untreated domestic sewage , and chemical contaminants, such as chlorine , from treated sewage; release of waste and contaminants into surface runoff flowing to surface waters including urban runoff and agricultural runoff, which may contain chemical fertilizers and pesticides ; also including human feces from open defecation - still a major problem in many developing countries ; groundwater pollution from waste disposal and leaching into the ground, including from pit latrines and septic tanks ; eutrophication and littering. Pollutant A pollutant is a waste material that pollutes air, water, or soil. Three factors determine the severity of a pollutant: Cost of pollution Pollution has a cost. A manufacturing activity that causes air pollution is an example of a negative externality in production. Because responsibility or consequence for self-directed action lies partly outside the self, an element of externalization is involved. If there are external benefits, such as in public safety , less of the good may be produced than would be the case if the producer were to receive payment for the external benefits to others. However, goods and services that involve negative externalities in production, such as those that produce pollution, tend to be over-produced and underpriced since the externality is not being priced into the market. Sometimes firms choose, or are forced by regulation, to reduce the amount of pollution that they are producing. The associated costs of doing this are called abatement costs, or marginal abatement costs if measured by each additional unit. This utility comes from the consumption of goods and services that create pollution. Therefore, it is important that policymakers attempt to balance these indirect benefits with the costs of pollution in order to achieve an efficient outcome. It is possible to use environmental economics to determine which level of pollution is deemed the social optimum. At this point the damage of one extra unit of pollution to society, the marginal cost of pollution, is exactly equal to the marginal benefit of consuming one more unit of the good or service. If the social costs of pollution are higher than the private costs incurred by the firm, then the true supply curve will be higher. The point at which the social marginal cost and market demand intersect gives the socially optimal level of pollution. At this point, the quantity will be lower and the price will be higher in comparison to the free market equilibrium. Some examples include tariffs , a carbon tax and cap and trade systems. Sources and causes Play media Air pollution produced by ships may alter clouds, affecting global temperatures. Air pollution comes from both natural and human-made anthropogenic sources. However, globally human-made pollutants from combustion, construction, mining, agriculture and warfare are increasingly significant in the air pollution equation. Principal stationary pollution sources include chemical plants , coal-fired power plants , oil refineries , [38] petrochemical plants, nuclear waste disposal activity, incinerators, large livestock farms dairy cows, pigs, poultry, etc. Agricultural air pollution comes from contemporary practices which include clear felling and burning of natural vegetation as well as spraying of pesticides and herbicides [39] About million metric tons of hazardous wastes are generated each year. Humans have ways to cut greenhouse gas emissions and avoid the consequences of global warming, a major climate report concluded. In a series of press reports culminating

in a book called Fateful Harvest unveiled a widespread practice of recycling industrial byproducts into fertilizer, resulting in the contamination of the soil with various metals. Ordinary municipal landfills are the source of many chemical substances entering the soil environment and often groundwater , emanating from the wide variety of refuse accepted, especially substances illegally discarded there, or from pre landfills that may have been subject to little control in the U. There have also been some unusual releases of polychlorinated dibenzodioxins , commonly called dioxins for simplicity, such as TCDD. For example, hurricanes often involve water contamination from sewage, and petrochemical spills from ruptured boats or automobiles. Larger scale and environmental damage is not uncommon when coastal oil rigs or refineries are involved. Some sources of pollution, such as nuclear power plants or oil tankers , can produce widespread and potentially hazardous releases when accidents occur. In the case of noise pollution the dominant source class is the motor vehicle , producing about ninety percent of all unwanted noise worldwide. Ozone pollution can cause respiratory disease , cardiovascular disease , throat inflammation, chest pain, and congestion. Water pollution causes approximately 14, deaths per day, mostly due to contamination of drinking water by untreated sewage in developing countries. An estimated million Indians have no access to a proper toilet, [52] [53] Over ten million people in India fell ill with waterborne illnesses in , and 1, people died, most of them children. Noise pollution induces hearing loss , high blood pressure , stress , and sleep disturbance. Mercury has been linked to developmental deficits in children and neurologic symptoms. Older people are majorly exposed to diseases induced by air pollution. Those with heart or lung disorders are at additional risk. Children and infants are also at serious risk. Lead and other heavy metals have been shown to cause neurological problems. Chemical and radioactive substances can cause cancer and as well as birth defects. An October study by the Lancet Commission on Pollution and Health found that global pollution, specifically toxic air, water, soils and workplaces, kill nine million people annually, which is triple the number of deaths caused by AIDS, tuberculosis and malaria combined, and 15 times higher than deaths caused by wars and other forms of human violence. There are a number of effects of this: Biomagnification describes situations where toxins such as heavy metals may pass through trophic levels , becoming exponentially more concentrated in the process. The emission of greenhouse gases leads to global warming which affects ecosystems in many ways. Invasive species can out compete native species and reduce biodiversity. Invasive plants can contribute debris and biomolecules allelopathy that can alter soil and chemical compositions of an environment, often reducing native species competitiveness. Nitrogen oxides are removed from the air by rain and fertilise land which can change the species composition of ecosystems. Smog and haze can reduce the amount of sunlight received by plants to carry out photosynthesis and leads to the production of tropospheric ozone which damages plants. Soil can become infertile and unsuitable for plants. This will affect other organisms in the food web. Sulfur dioxide and nitrogen oxides can cause acid rain which lowers the pH value of soil. Organic pollution of watercourses can deplete oxygen levels and reduce species diversity. This web site includes links to databases, bibliographies, tutorials, and other scientific and consumer-oriented resources. Worker productivity A number of studies show that pollution has an adverse effect on the productivity of both indoor and outdoor workers. Pollution control A litter trap catches floating waste in the Yarra River , east-central Victoria , Australia Air pollution control system, known as a Thermal oxidizer , decomposes hazard gases from industrial air streams at a factory in the United States of America. Pollution control is a term used in environmental management. It means the control of emissions and effluents into air, water or soil.

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2: Environmental science - Wikipedia

I CORE MODULE SYLLABUS FOR ENVIRONMENTAL STUDIES FOR UNDER GRADUATE COURSES OF ALL BRANCHES OF HIGHER EDUCATION Vision The importance of environmental science and.

Atmospheric sciences can include studies of meteorology , greenhouse gas phenomena, atmospheric dispersion modeling of airborne contaminants, [6] [7] sound propagation phenomena related to noise pollution , and even light pollution. Taking the example of the global warming phenomena, physicists create computer models of atmospheric circulation and infra-red radiation transmission, chemists examine the inventory of atmospheric chemicals and their reactions, biologists analyze the plant and animal contributions to carbon dioxide fluxes, and specialists such as meteorologists and oceanographers add additional breadth in understanding the atmospheric dynamics. Ecology Biodiversity of a coral reef. Corals adapt and modify their environment by forming calcium carbonate skeletons. This provides growing conditions for future generations and forms a habitat for many other species. Ecology is the study of the interactions between organisms and their environment. Ecologists might investigate the relationship between a population of organisms and some physical characteristic of their environment, such as concentration of a chemical; or they might investigate the interaction between two populations of different organisms through some symbiotic or competitive relationship. For example, an interdisciplinary analysis of an ecological system which is being impacted by one or more stressors might include several related environmental science fields. In an estuarine setting where a proposed industrial development could impact certain species by water and air pollution , biologists would describe the flora and fauna, chemists would analyze the transport of water pollutants to the marsh, physicists would calculate air pollution emissions and geologists would assist in understanding the marsh soils and bay muds. Environmental chemistry Environmental chemistry is the study of chemical alterations in the environment. Principal areas of study include soil contamination and water pollution. The topics of analysis include chemical degradation in the environment, multi-phase transport of chemicals for example, evaporation of a solvent containing lake to yield solvent as an air pollutant , and chemical effects upon biota. As an example study, consider the case of a leaking solvent tank which has entered the habitat soil of an endangered species of amphibian. As a method to resolve or understand the extent of soil contamination and subsurface transport of solvent, a computer model would be implemented. Chemists would then characterize the molecular bonding of the solvent to the specific soil type, and biologists would study the impacts upon soil arthropods , plants, and ultimately pond-dwelling organisms that are the food of the endangered amphibian. In some classification systems this can also include hydrology , including oceanography. As an example study of soils erosion , calculations would be made of surface runoff by soil scientists. Fluvial geomorphologists would assist in examining sediment transport in overland flow. Physicists would contribute by assessing the changes in light transmission in the receiving waters. Biologists would analyze subsequent impacts to aquatic flora and fauna from increases in water turbidity. Open-pit coal mining at Garzweiler , Germany Regulations driving the studies[edit] Environmental science examines the effects of humans on nature Glen Canyon Dam in the U. Numerous state laws have echoed these mandates, applying the principles to local-scale actions. The upshot has been an explosion of documentation and study of environmental consequences before the fact of development actions. One can examine the specifics of environmental science by reading examples of Environmental Impact Statements prepared under NEPA such as: In England and Wales the Environment Agency EA , [8] formed in , is a public body for protecting and improving the environment and enforces the regulations listed on the communities and local government site. The agency was set up under the Environment Act as an independent body and works closely with UK Government to enforce the regulations.

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3: Environmental Studies Study Materials - ES Class Notes PDF Download

These are important Environmental science in Telugu. Which are very useful for APPSC and TSPSC examinations.

Earth science also known as geoscience , is an all-embracing term for the sciences related to the planet Earth , including geology , geophysics , hydrology , meteorology , physical geography , oceanography , and soil science. Although mining and precious stones have been human interests throughout the history of civilization, the development of the related sciences of economic geology and mineralogy did not occur until the 18th century. The study of the earth, particularly palaeontology , blossomed in the 19th century. The growth of other disciplines, such as geophysics , in the 20th century led to the development of the theory of plate tectonics in the s, which has had a similar effect on the Earth sciences as the theory of evolution had on biology. Earth sciences today are closely linked to petroleum and mineral resources , climate research and to environmental assessment and remediation. Atmospheric sciences Though sometimes considered in conjunction with the earth sciences, due to the independent development of its concepts, techniques and practices and also the fact of it having a wide range of sub disciplines under its wing, the atmospheric sciences is also considered a separate branch of natural science. This field studies the characteristics of different layers of the atmosphere from ground level to the edge of the time. The timescale of study also varies from days to centuries. Sometimes the field also includes the study of climatic patterns on planets other than earth. Oceanography The serious study of oceans began in the early to midth century. As a field of natural science, it is relatively young but stand-alone programs offer specializations in the subject. Though some controversies remain as to the categorization of the field under earth sciences, interdisciplinary sciences or as a separate field in its own right, most modern workers in the field agree that it has matured to a state that it has its own paradigms and practices. As such a big family of related studies spanning every aspect of the oceans is now classified under this field. Interdisciplinary studies[edit] The distinctions between the natural science disciplines are not always sharp, and they share a number of cross-discipline fields. Physics plays a significant role in the other natural sciences, as represented by astrophysics , geophysics , chemical physics and biophysics. Likewise chemistry is represented by such fields as biochemistry , chemical biology , geochemistry and astrochemistry. A particular example of a scientific discipline that draws upon multiple natural sciences is environmental science. This field studies the interactions of physical, chemical, geological, and biological components of the environment , with a particular regard to the effect of human activities and the impact on biodiversity and sustainability. This science also draws upon expertise from other fields such as economics, law and social sciences. A comparable discipline is oceanography , as it draws upon a similar breadth of scientific disciplines. Oceanography is sub-categorized into more specialized cross-disciplines, such as physical oceanography and marine biology. As the marine ecosystem is very large and diverse, marine biology is further divided into many subfields, including specializations in particular species. There are also a subset of cross-disciplinary fields which, by the nature of the problems that they address, have strong currents that run counter to specialization. In some fields of integrative application, specialists in more than one field are a key part of most dialog. Such integrative fields, for example, include nanoscience , astrobiology , and complex system informatics. Materials science The materials paradigm represented as a tetrahedron Materials science is a relatively new, interdisciplinary field which deals with the study of matter and its properties; as well as the discovery and design of new materials. Originally developed through the field of metallurgy , the study of the properties of materials and solids has now expanded into all materials. The field covers the chemistry, physics and engineering applications of materials including metals, ceramics, artificial polymers, and many others. The core of the field deals with relating structure of material with it properties. It is at the forefront of research in science and engineering. It is an important part of forensic engineering the investigation of materials, products, structures or components that fail or do not operate or function as intended, causing personal injury or damage to property and failure analysis , the latter being the key to understanding, for example, the cause of various aviation accidents. Many of the most pressing scientific problems that are faced today are due to the limitations of the materials that are available and, as a result,

breakthroughs in this field are likely to have a significant impact on the future of technology. The basis of materials science involves studying the structure of materials, and relating them to their properties. Once a materials scientist knows about this structure-property correlation, they can then go on to study the relative performance of a material in a certain application. The major determinants of the structure of a material and thus of its properties are its constituent chemical elements and the way in which it has been processed into its final form. Natural philosophy and History of science Some scholars trace the origins of natural science as far back as pre-literate human societies, where understanding the natural world was necessary for survival. Water turned into wood, which turned into fire when it burned. The ashes left by fire were earth. Plato rejected inquiry into natural philosophy as against religion, while his student, Aristotle, created a body of work on the natural world that influenced generations of scholars. While Aristotle considered natural philosophy more seriously than his predecessors, he approached it as a theoretical branch of science. Unlike Aristotle who based his physics on verbal argument, Philoponus instead relied on observation, and argued for observation rather than resorting into verbal argument. Robert Kilwardby wrote On the Order of the Sciences in the 13th century that classed medicine as a mechanical science, along with agriculture, hunting and theater while defining natural science as the science that deals with bodies in motion. The scientific revolution, which began to take hold in the 17th century, represented a sharp break from Aristotelian modes of inquiry. Data was collected and repeatable measurements made in experiments. Antoine Lavoisier , a French chemist, refuted the phlogiston theory , which posited that things burned by releasing "phlogiston" into the air. This growth in natural history was led by Carl Linnaeus , whose taxonomy of the natural world is still in use. Linnaeus in the s introduced scientific names for all his species. By the 19th century, the study of science had come into the purview of professionals and institutions. In so doing, it gradually acquired the more modern name of natural science. Modern natural science â€”present [edit] According to a famous textbook Thermodynamics and the Free Energy of Chemical Substances by the American chemist Gilbert N. Lewis and the American physical chemist Merle Randall , [75] the natural sciences contain three great branches: Aside from the logical and mathematical sciences, there are three great branches of natural science which stand apart by reason of the variety of far reaching deductions drawn from a small number of primary postulates â€” they are mechanics , electrodynamics , and thermodynamics.

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4: Pollution - Wikipedia

The interdisciplinary study of environmental problems, within the framework of established physical and biological principles, i.e. oriented toward a scientific approach. The integrated study of factors that influence the environment and environmental systems, especially the interaction of the physical, chemical, and biological components of.

Read this article to learn about the meaning, objectives, guiding principles, scope, importance and need of environmental studies: Environment literally means Surrounding in which we are living. Environment includes all those things on which we are directly or indirectly dependent for our survival, whether it is living component like animals, plants or non living component like soil, air water. Ecology is that part of environmental studies in which we study about organisms, plants and animals and their relationship or interdependence on other living and non living environment. It deals with the study of flow of energy and materials in the environment. It deals with the study of nature and its function. It deals with the exchange of various materials between the biotic and abiotic components of environment. Meaning Of Environmental Studies: Environmental studies are the scientific study of the environmental system and the status of its inherent or induced changes on organisms. It includes not only the study of physical and biological characters of the environment but also the social and cultural factors and the impact of man on environment. Objectives and Guiding Principles of Environmental Studies: It should build a bridge between biology and technology. Scope and Importance of Environmental Studies: The disciplines included in environmental education are environmental sciences, environmental engineering and environmental management. It deals with the scientific study of environmental system air, water, soil and land , the inherent or induced changes on organisms and the environmental damages incurred as a result of human interaction with the environment. It deals with the study of technical processes involved in the protection of environment from the potentially deleterious effects of human activity and improving the environmental quality for the health and well beings of humans. It promotes due regard for physical, social and economic environment of the enterprise or projects. It encourages planned investment at the start of the production chain rather than forced investment in cleaning up at the end. It generally covers the areas as environment and enterprise objectives, scope, and structure of the environment, interaction of nature, society and the enterprise, environment impact assessment, economics of pollution, prevention, environmental management standards etc. To clarify modern environmental concept like how to conserve biodiversity. To know the more sustainable way of living. To use natural resources more efficiently. To know the behaviour of organism under natural conditions. To know the interrelationship between organisms in populations and communities. To aware and educate people regarding environmental issues and problems at local, national and international levels. Need of Public Awareness about Environment: It is not only the duty of government but also the people to take active role for protecting the environment, so protecting our environment is economically more viable than cleaning it up once, it is damaged. The role of mass media such as newspapers, radio, television, etc is also very important to make people aware regarding environment.

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9: Osmania University

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