

CHEMICAL CONTAMINANTS OF ENVIRONMENT AND ITS EFFECT ON HEALTH

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The chemical has wide range in the environment which has contaminate our earth's land, water and air. This chemical also shows impact environment and human health. Among this containments many comes from the industry and commercial area like roads, parking, oil and chemical spills and storm drains like non point sources. The waste water treatment plants and sewage system also produces chemical containments in the environment. In the ecosystem food chain some containment entered by breakdown and accumulating. The containment accumulated by fish or any other wildlife has been eaten by human and thus it enters into the food chain system. The environmental pollution refers to unwanted or undesirable change in the chemical, physical and biological characters of water, air and soil. It has harmful for living organisms. The noise, heat or light are the chemical substance or energy form of pollution. A contaminate are enters into the body of human by four main route like inhalation, injection, ingestion and absorbed by the skin and eyes. A contaminate substance occurs by absorption via respiratory tract, and it absorbed into blood stream and distributed into throughout of body. The chemicals inhaled into the body in the form of vapors, mists, fumes, fine dust and as aerosols. The symptoms of this chemicals occur through inhalation include eyes, nose and throat irritation. It also shows the symptoms like coughing, headache, dizziness, difficulty in breathing, confusion and collapse.

The mixture of many chemical species occurs in air borne particulate so it is not single particle of pollutant. It has solid core with liquid coating shows the complex mixture of aerosols contain liquid small drops and dry solid fragments and solid mixture. It has different in size, shape and chemical composition. It found in earth's crust from, organic compounds, element of carbon, inorganic ion and metallic compounds. The air quality regulatory the air borne particle defined by his diameter. In the environment

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many pollutants has affect on human health and also cause different environmental problems like global warming, climate change and acid rain formation. The common surface water and ground water pollutants on lands are organic matter, bacteria, industrial waste, hydrocarbons, agrochemicals, pesticides and household products. The pollutants on the earth occur everywhere it can found in water that we drinks, it occur in air that we breathe and it also found in the food that we can it, these pollutant takes toll on our health. In the year 2015 pollution estimated about nine millions deaths worldwide , the malaria, tuberculosis and AIDS like diseases combined together but pollution has shows three time more deaths. This type of dangerous effect of chemicals condiments occur on the human health.

Keywords: Contaminate, Acid rain, Pollutant, Particulate matter and Food chain etc.

I. INTRODUCTION

The environment has composition of atmosphere, land and water, it refers to the surrounding within which human exists. On the earth living organisms like plants, animals and microorganisms has occurred. The combination organism and relationship with physical, chemical and cultural condition influence on the human health and well-beings. The environment consist different spheres in which biosphere is very important sphere. This biosphere consist harbors the living organisms. In the sphere the living organisms interacts each other and with non biotic factor of environment like soil, water and air. Today the industrialization and globalization process has shown effect on environment and living life. The environment contaminated by different pollutants it shows impacts on health and environment.

The introduction of pollution direct or indirect of substance or energy into environment it defined in literature. The harmful and deleterious effect is result of pollution living organisms also hazards on health of human by environment activity. The presence of elevated concentration of substances in environment and nature for the organism has contamination results. The exposure of chemicals and other factors shows the potential health effect. The other factor consist properties of chemical, its dose and concentration, way and time of exposure, individual susceptibility and other result of mixture with another chemicals. The chemical which is naturally occur or found higher than naturally present its presence increase pollutants of chemical known as chemical pollution. In chemical pollution the chemical used by man for various activities it has man-made and it containment to the environment. The chemical pollution caused containments has organic or inorganic by the nature. The chemical pollutants are not degradable easily in nature because it used by crossing its limits of use. In the growth of agriculture production farmer used insecticides, herbicides and pesticides it is not easily degradable so they show harmful effect on nature and human health. The chlorinated solvents use in dry cleaning process and much industrial process, it also shows the chemical contamination of environment. The nature of chemical its structure and contamination classified into natural occurring and man-made classification. The organic compound contains carbon and carbon-hydrogen bonds and an inorganic compound not contains carbons. The chemical brings benefits to society it releases during in lifecycle and cause harmful effect on ecosystem and human health. The chemical pollution has one of planetary boundary in which humanity safety operate. In the world more than 350,000 chemicals and its mixture registered for production and its uses. In which 50,000 chemicals are noteworthy finding that identities many chemicals remain publically unknown. In 2020 the world has used more pesticide up to 3.5 million tones than the estimated range. The increase of amount due to its crop production benefits but it causes serious effect because of its biological magnification and persistent nature. The non degradable pesticide pollute directly or indirectly soil, air and water also all ecosystem and produce health effect in living things. The pesticides used in world having different types it show impact on ecosystem. In the world more than one thousands pesticides used for ensure food it not destroyed by different pests. Every pesticide has its toxicological properties and effect. In environment five thousands ubiquitous occur and about one lakhs forty thousand new chemical synthesized from the year 1950. In the agriculture pesticides or other mixture of substance has used for the protection of crops from different pests, weeds and vector borne diseases control like malaria schistosomiasis and dengue fever. The pesticides has classified according

to the type of pests like insects having insecticides, for the plants has herbicides, for the rat and mice pest used rodenticides, for the prevent of bacteria used bactericides and for the fungi fungicides and for larvae larvicides. The substance or mixture of substance used for preventing, destroying any pests, vectors of human or animal disease, unwanted animals and plants species cause harmful effect interfere with production, storage, processing and transporting of food, agricultural commodities, wood and its products, animal feed stuffs and substance used for control of arachnids, insects and other pest of animal bodies control known as pest according to the Food and Agriculture Organization. The world has used two million tones pesticides today in which it content herbicides 47.5%, insecticides 29.5% and fungicides 17.5% and other pesticides 5.5%. The pesticides show effect on human health it produces cancer of brain, breasts, prostate, testis and ovaries. It also shows effect on reproductive system includes birth, continuous abortion, sterility and fertility like issues. The pesticide contained carcinogenic substances it causes cancer. Every cancer has characterized by the abnormal growth of cells and it divides without control and spread surrounding tissue. The cancer rarely caused by single exposure event but cause due to repeated contact or by ingestion through eyes, skin and lungs. The low dose of carcinogenic substance also causes the cancer. The pesticide has shows the some immediate exposure such as irritation of nose, throat and skin also cause burning, stinging and itching. It also shows rashes and blisters on the skin, the nausea, diarrhea and dizziness also occur commonly. The people which having asthma shows very serves reaction to the some pesticides like carbonate pesticides, organophosphate and pyrethrum. The protection from the pesticides control the this type of health in human.

II. OBJECTIVES

1. To study the chemical potential of environmental contaminate
2. To study the role chemical contaminate in the environment pollution
3. To focus on chemical contaminate impacts on the human health
4. To aware young generation about effect of different types of pollution in our life

III. ANALYSIS AND RESULT

The chemical injection occur when the handling the chemical contaminated items like plastic, pipettes, broken glass, needles and razor blades. The body tissue and organs has damaged due to the directly chemical injected into blood stream. It also exposure through ingestion occur by absorption of chemical in digestive tract. The process of direct ingestion occur due to accidently eating or drinking of chemical it is likely occur. It mostly receive chemicals exposure occur indirect ingestion ways. The chemical containments also absorb by food and drink it also absorb in the form of vapor and dust in air it exposure after enter in body. The food or drink stored in refrigerator with chemicals also exposure. The laboratory worker who handles chemical without wearing gloves the ingestion occurs in them. The people who not practice with good personal hygiene like hand washing before eat and drink in laboratory. The chemical exposure at every place affects as chronic exposure it not manifest itself until year later. The ingestion chemical exposure shows the symptoms like strange test in mouth, vomiting, stomach discomfort, general ill feeling and swallowing problems.

The chemicals also absorbed by the eye and skins also results chemical exposure, it results the chemical splash to unprotected eyes and skins. The chemical absorbed any organ enters into blood stream and causes other damages. The chemicals exposure by eyes shows effects like itchy, burring sensations, discomfort, blurred vision and blindness. The protection of eyes from chemical exposure has been done by the wearing the safety glasses in laboratory and chemicals hazards places. The splash goggles with face shield have batter way for the protection of eyes and mouth. The environment contains different containments which has shows effect on health the some important chemical containments are as follows.

1. Airborne particulate matter: The mixture of many chemical species occurs in air borne particulate so it is not single particle of pollutant. It has solid core with liquid coating shows the complex mixture of aerosols contain liquid small drops and dry solid fragments and solid mixture. It has different in size, shape and chemical composition. It found in earth's crust from, organic compounds, element of carbon, inorganic ion and metallic compounds. The air quality regulatory the air borne particle defined by his diameter. In the environment many pollutants has affect on human health and also cause different environmental problems like global warming, climate change and acid rain formation. The particles induce adverse health effect which has ten microns or less is inhaled by the lungs. The particles having 2.5 microns or less in diameters are emitted in atmosphere by chemical reaction of gases like nitrogen oxide, sulfur oxide and some organic compounds. The organic compound emits from natural resource such as trees and vegetation, the man-made source produce it form vehicles exhaust, industrial process and from indoor sources like mold spore, pollen grains, dusts, cockroaches and mites. The indoor activity of human also produces air born particles like smoking of tobacco, coking and burning woods, candles and incense. The particles form indoor shows complex reaction of gases pollutant emitted from household cleaning products like air fresheners. A tiny solid piece of matter has given the general name as particle. The road dust, fire dust, plants and soil particles are the natural resources. The oil burners, candles burning, wood stoves, tobacco smoke, vehicles exhaust and power plants dust are the man-made resources. The mechanical force dust like grinding dust and household dust like small insect's parts, fibrous binding materials, and pollen and mold spore as source of particles.

The contaminants direct inhaled into lungs by nose and mouth are known as inhalation process. This air borne contaminants includes vapors, gas, fumes, dust and mists. The chemical enter into the body by this common route of inhalation. It has controlled using mask and using protective equipment it given protection from air borne contaminants. In the process of absorption the hazardous chemicals are absorbed directly by contacting with skin and eyes, it contains particulates, gases, liquid and vapors. The using of selected gowns, safety glasses and gloves with face shields used for prevents of absorption through skin and eyes. The contaminants enter through mouth into body in ingestion process. It is like dusts, chemical particle and mists inhaled by mouth and also containment by objects like cigarettes, food and hands it has comes contact with mouth. The effect of health ranges from none at all to very serious. In allergic sings nasal discharge, runny eyes, cough, rashes, throat infection, breathing difficulty and headache, the allergic reaction serve occur death also.

The health effects can range from none at all to very serious. The allergic symptoms and signs include nasal discharge, difficulty breathing, coughing, runny eyes,

throat irritation, rashes, and headaches. In severe allergic reactions, death can occur. The asthmatic episodes may occur in some people with asthma. The permanent lung damage occurs by coal dust, asbestos fibers and silica like particles. This also shows the chronic shortness of breath, fatigue and coughing, it inhaled in high doses. In the activity of painting and building renovation the lead dust enters into the body it cause blood pressure, reproductive problems, decrease hearing and also cause death. The chronic obstructive pulmonary disease, emphysema and cancer caused due to tobacco smoke because it has contain numerous toxic material in particulate form.

The product ingested prevents by good hygiene practices, the eating and smoking banned in harmful chemical handling area. The sharp object contaminated with chemicals the injection also occur by misuse of syringe needles, by accident and through broken glass. The injection prevention has done by caution use of any sharp object. The glassware, potentially sharp objects, syringe needle about it we has know proper storage, about handling and disposal prevent injection. The protective cloths and wearing of gloves also reduce possibility of injection.

- 2. Arsenic:** The wall water, soil and rocks are the natural elements of arsenic, the paint pigment, wood preservative, use of metal alloys and human activity show the arsenic contacts. It also present in pencils and school bags of students it has danger to health because it produces the cancer diseases. The dark skin, corns, and warts on palms also on soles of feet these symptoms cause by arsenic. It also affected babies before after they born, it also affect on nervous system, cardiovascular system, respiratory system, immune system and endocrine system. The arsenic also affects the body organs like skin, prostate, bladder, kidney and liver. The children eat more food than body weight it get higher dose of arsenic by hid diet than the adults. The eating of rice cereal the baby comes in contact of arsenic because rice takes arsenic by growing more easily than the other crops. The food and drug administration recommends babied feeding variety of cereals and limit amount of rice cereal for babies eat.
- 3. Benzene:** The aromatic hydrocarbon C_6H_6 has known as benzene, in liquid form it is clear, colorless and flammable. The liquid benzene evaporates easily in room temperature into air and dissolved in water. The air, water and soil in environment also contain the benzene, it also occurs naturally in product of decomposition of some food. In the body half benzene person inhales than exhaled and rest temporarily stored in body's bone marrow and fat. The bone marrow and liver break down benzene into metabolites in some chemical process. The metabolites like hydroquinone are toxic than benzene, it eliminated from body after two days. The benzene has carcinogenic cause's cancer also damage neurological system and harm to the immunity system. The long term exposure causes the nerve damage due to benzene fumes.
- 4. Xylene and Formaldehyde:** It is short term of high level benzene it related with aromatic hydrocarbons like toluene and xylene, it causes nausea, headaches, dizziness and unconsciousness. The immune system also harmed by the excessive exposure of benzene. At the room temperature level the colorless gas formaldehyde has also given notable smell because it is volatile organic compound. It is found in the many household products. The formaldehyde is volatile organic compound also known as methylene oxide, oxomethene oxide and formalin. When it comes in contact the eyes can irritate, with nose and

throat, it also shows symptoms like headache, dizziness and fatigue. It also causes the serious disease like cancer.

- 5. Volatile organic compounds:** The man made material carpets has made by the synthetic martial, wool and other natural materials. The carpets have two parts cushion for support and noise reduction and other carpet itself. The synthetic carpets are tufted and made by machines it stitches and loop yarn and attach to a backing. The polyester and nylon has made yarn, the backed yarn attached to another backing with latex products. The second backing of yarn help the carpet more stable, the some carpets has emits the volatile organic compound. This volatile organic compound effect on health like nausea, headaches, breathing difficulty and irritate eyes with nose and throat. It also causes allergies due to dust the woodstove ashes, wall to wall carpeting increases children's inhalation exposure. The dry cleaners use for cloths and fabrics cleaning it not disposed so move to ground to air and breathed in body it can produce harmful affect to health, it also increase risk of cancer. It also affects pregnant women and small babies. It affect on central nervous system and immune system.

The volatile organic compound contains carbon and also evaporates gas at room temperature. The benzene, methylene, hexane, chlorides, styrene, perchloroethylene and toluene like some examples of volatile organic compound. The household products like cleansers, wax, glues, cosmetics, paints, varnishes, kerosene, gasoline, pesticides and cigarette smokes contains the volatile organic compound. The new carpets draperies, gum used wood products and backing certain finishes, vinyl type flooring and wall covering releases the volatile organic compound into the air. This volatile organic compound causes irritation to the eyes, nose, and throat, the headaches, nausea, and nerve

- 6. Mercury:** The mercury is natural element found in three different forms in the nature. It found as metallic or element form it used in thermometers, switches, jewelry, batteries, dental filling and in the cosmetics, it also found household items also. It occur inorganic form in cosmetics and different consumer products. The third form is organic it occur in food like containment fishes and shellfish.

The breathing of metallic mercury vapors affects on lungs, brain, kidney and nervous system. The contacted person shows the symptoms like difficulty in breathing, coughing, vomiting, chest pains, nausea, diarrhea and fever. The symptom has includes short term memory loss and irritability, loss of weight, headache and loss of appetite, the time and amount of dose shows the effect on health.

- 7. Ozone:** The ozone has a noticeable smell and colorless gas found naturally in atmosphere. It creates smog in environment and produce air pollution. In the atmosphere it protect from the effect of harmful sun rays. But the lower level towards the earth it is form breathing problem it damage lung and irritate the throats. The ozone effect shows wheezing, congestion, coughing, shortness of breath, chest pain, bronchitis, heart diseases and emphysema in human. The children are more breath so highly affected.
- 8. Polychlorinated biphenyls:** In the 1980 this compound used in building material and electric equipments. The paint, glue, lighting ballasts, fluorescent, transformers and capacitors, caulk contains the polychlorinated biphenyls. After this period it is banned in

some countries, the exposure of polychlorinated biphenyls shows effect on health. The polychlorinated biphenyls produce cancer, because it classified as carcinogens, it is interconnected means it affected one system of body but significantly affect to other system and lead to many serious health problems. The immunity system has critical fights infections, the disease produced has suppressed the immunity system and it loads other health problems. It leads early babies born and decreased birth weights. It also affect on thyroid hormone level in human, this hormone are critical for normal growth and development.

- 9. Glyphosate and pesticides:** It is chemical compound which targets the weed and important in fruit and vegetable production and nuts. It is also resistant to crop like soybean and corns, it also manage noxious weeds. It breakdown in environment it reduce erosion of soil and integrated pest management, it has used in liquid concentrate, solid and ready to use as liquid form. Its container likes round up which control the weeds of agricultural and non agricultural field. It has control droplet application system, ground spraying, aerial spraying, shielded and hood sprayer and wiper applications. The chronic health effect not occur in the week and months, it taken many months and years time after exposure of pesticide to link with health impacts. It includes cancer of tumors, brain and nervous system, it damage liver, kidney and lungs like organs and defects infertility and other reproductive system related problem. In endocrine disruptors it shows blocking of hormones, sterility and developmental problems.
- 10. Carbamates and Organophosphates:** It is known as nerve gas it attack on nervous system and brain, it interfere nerve signal transmission. The symptoms of these attacks are nausea, dizziness, vomiting, headache, diarrhea, chest pains and confusion. The symptoms include convulsions in serve of poisoning incidents like breathing difficulty, involuntary urination, coma and death. In each year this pesticide has affected by acute poisoning to the thousands of people in the world.
- 11. Soil Fumigants:** The soil fumigants pesticide apply to the soil in gas form it has toxic for bacteria, fungi, nematodes, insects and plants in the soil. It moved again from soil in to the air and expose people working near it. In commonly chorpocrin, metam sodium, metam potassium and 1, 3 dichloropropene soil fumigants are used. The soil fumigants exposure shows symptoms like irritation of skin and eyes and also lung infection. The all chorpocrin, metam sodium, metam potassium and 1, 3 dichloropropene soils are cancer causing chemicals and also show harmful effect on reproductive system.
- 12. Pyrethroids:** It is the synthetic chemical but shows the similar structure of botanical compounds insecticides. It has toxic for the nervous system. The involuntary twisting, itching of skin, vomiting, headache, tremors, salivation, fatigue and stinging like posing symptoms are seen in pyrethroid. In the body hormones and hormone balance interfere by substance known as endocrine disruptor. In growth and reproductive function they regulate necessary different functions. It reduces semen quality with decreasing fertility and genital malformations, testicular and prostate cancer. The appearance of the cysts in ovaries, uterus anomalies, decreased fertility, breast cancer, early abortion, diabetes and obesity has effect of these pesticides. The Parkinson's disease, thyroid, brain degenerative diseases, disorder of brain development and neurological disorder also occur by the pesticide effect.

13. Combined effects: It is also one of worried issue related to exposure of pesticides, it affects the individual chemical enhanced when combined with other substances, and it is also called as cocktail effect. The cocktail effect of exposure chemicals and facts has no anyone known consistent low level exposure such chemical mixtures. Paul Muller in 1939 discovered the effective insecticide dichloro-diphenyl-trichloroethane (DDT). It is very effective and rapidly used in allover world as

The exposed cocktail effect of chemicals and the fact is that nobody knows what impact this consistent low level exposure to such a mixture of chemicals is having on us. In the year 1939, Paul Müller discovered the effective insecticide Dichloro-Diphenyl-Trichloroethane (DDT) was discovered, which has become extremely effective and rapidly used as the insecticide in the world. It has banned after 12 year in many countries due to its biological effects. The use of history of pesticide by human date back forms 2500 B.C.E. for the crop protection. The dust of sulfur in Sumeria has first human pesticide use 4,500 years ago. The toxic chemicals like mercury, lead and arsenic has used in 15th centaury applied for killing pest of crops. The nicotine sulfate used as pesticide which has extracted from tobacco leaves in 17th century. In 19th centaury natural pesticides like pyrethrum which derived from chrysanthemum and rotenone has used it derived from roots of tropical vegetables. The book 'Silent Spring' written by Rachel Carson focuses on biological magnification and open eyes of world about effect of pesticides.

IV. CONCLUSION

The environment having different types of containments, it found in water which we can drink, it found in food which can we eat and it also found in the air which we can breathe everywhere in environment it found and they are taking toll on our health. In the year 2015 pollution estimated about nine millions deaths worldwide, the malaria, tuberculosis and AIDS diseases when combined for its death number then three times deaths occur due to the pollution. This type of effect has been shown by the chemical containments on human health. The mercury show effect on new born and unborn baby, the mercury also accumulated by sea foods and other fishes, it causes disability and vision and hearing loss. The World Health Organization highlights ten chemical it has cause considerable threats on human health. The neurological problem caused by chemicals which treatment is lacking is epically concerning. In world about 783 million not get pure drinking water about 2.5 billion people has not have adequate sanitation facilities so it also causes the different diseases. The sulfur dioxide nitrogen oxide, carbon monoxide and chemical vapors causes' air pollution. It also participated in chemical reaction when it present in atmosphere creates acid rain and smog. In the building the second hand smog has pollute air, the air pollution also occur from green house gases like ozone, carbon dioxide and sulfur dioxide. The green house gases have warmed the planet by its effect. The noise pollution produces the stress, related illness, blood pressure, hearing loss and speech interference. The noise pollution may also contribute to hundreds of thousands of deaths per year by increasing the rates of coronary heart disease. The air pollution has shows seven million premature deaths annually. In environment agriculture land also turned unfertilized lands due to the agriculture pollution. The land filled by plastic articles caused plastic pollution. These all types of pollution occurs by the different

types of chemical effect in the environment it also show harmful effect on human health and increase the deaths from different serious diseases.

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