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CHEMICAL	DESCRIPTION	COMMON APPEARANCE	HEALTH/ ENVIRONMENTAL IMPACT
Arsenic	Arsenic (As), is an element that occur naturally and is widely spread in the Earth's crust. It is broadly distributed in diverse forms in nature because it can occur as an organic or inorganic compound and can exist in many oxidation states. It is found in environmental matrices like soil, air, water and food.	Food contamination. (Rice) Drinking and Ground water level contamination in mining areas, Soil contamination Natural crust occurs in the earth's crust. High concentrations with other precious or industrial metals, like gold and tungsten. Industrial release to the environment. In pesticides & agricultural chemicals. Additive to poultry feed concentration is enhanced by anthropogenic activities such as mining of mineral ores and industrial effluents	Reduce blood cells production, Breaks up red blood cells. Enlarge the liver (causing chronic hepatitis or hepatic cirrhosis), Colours the skin (melanosis, hyperkeratosis, desquamation and eventually carcinoma, Produces tingling and loss of sensation in the limbs, and cause brain damage. Long-term exposure to inorganic arsenic in drinking water can caused Blackfoot disease. gangrene. Blood vessel disease in the limbs in several other countries. Soluble inorganic arsenic can have immediate toxic effects. Acute gastrointestinal symptoms Disturbances of the blood and circulation Damage to the nervous system, hallucinations, psychosis and eventually death.

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			palpitations, fatigue, headache, dizziness, insomnia, weakness, nightmares, numbness and anaemia Elevated blood pressure, heart attacks and circulatory disease. Diabetes, infertility, stroke and cancers, of the skin, lungs, bladder, kidneys and long-term neurological effects. In the lungs, asthmatic bronchitis Affects lungs, liver, muscles, eyes, vessels are affected. Organ dysfunction. Liver enlargement. Spleen enlargement. Fluid in the abdomen
Bisphenol A (BPA)	Bisphenol-A, 4, 4′-dihydroxy-2, 2-diphenylpropane, is a synthetic organic compound obtained from the condensation of	Water effluent, air, dust and food Rivers, sediments, dumpsites and drinking water in Nigeria (Disinfecting well waters with hypochlorite caused presence of BPA in drinking water)	Interferes with the functioning of endocrine systems. increased incidence and prevalence of some metabolic disorders

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	acetone and phenol1 and a high volume industrial chemical. Bisphenol-A (BPA) belongs to category 1 of Endocrine Disruptive Chemicals (EDCs) that is acutely toxic to living organisms	Plastic (bottled water plastics but also a structural component in Polycarbonate plastic used for consumer and industrial products. bottled water plastics but also a structural component in Polycarbonate plastic used for consumer and industrial products. Thermal papers	
Cadmium			
Glyphosate	Glyphosate (IUPAC name: N-(phosphonomethyl)glycine) is a broad-spectrum systemic herbicide and crop desiccant. It is an organophosphorus compound, specifically a phosphonate, which	Glyphosate is one of the most widely used herbicides with applications in agriculture, forestry, industrial weed control, lawn, garden, and aquatic environments. Sites with the largest glyphosate use include soybeans, field corn, pasture and hay. Glyphosate is generally used in spraying applications against emerged annual, perennial and biennial weeds in all crops. It can be used on soil but mainly on	One of the world's most widely used glyphosate-based herbicides, Roundup, can trigger loss of biodiversity, making ecosystems more vulnerable to pollution and climate change. Glyphosate also seems to exert a significant toxic effect on neurotransmission and to induce oxidative stress, neuroinflammation and mitochondrial dysfunction, processes that lead to neuronal death due to autophagy, necrosis, or apoptosis, as well as the appearance of behavioral and motor disorders.

	acts by inhibiting the plant enzyme 5-enolpyruvylshikimate-3-phosphate synthase (EPSP). It is used to kill weeds, especially annual broadleaf weeds and grasses that compete with crops.	existing vegetation before planting fruit crops, ornamental plants, trees, nursery plants etc. It can also be sprayed on crops before the harvest to dry the leaves of cereals and oilseeds Many farmers use glyphosate products in their fields and orchards. They spray it on crops like corn and soybeans that are genetically engineered to withstand glyphosate, also known as GMOs. They also spray it on non-GMO crops like wheat, barley, oats, and beans, to dry out the crops so they can harvest them sooner. It gets into foods early in the food chain, before raw food is harvested and before it's processed.	New research from the UC Berkeley School of Public Health shows that childhood exposure to the world's most widely used weed killer, glyphosate, is linked to liver inflammation and metabolic disorder in early adulthood, which could lead to liver cancer, diabetes, and cardiovascular disease later in life.
Lead		food chain Automobiles in the country, which still burn leaded gasoline. burning of garbage (containing domestic and industrial refuse, wood, paper products, plastics, discarded tires, battery casings, agricultural wastes, etc.) in open	risk factor for chronic kidney disease adversely affect the male reproductive system Reports have shown an association between impaired sperm motility and cadmium and/or lead concentrations in sperm or seminal fluid. The cardiovascular effects of lead have been associated with increased blood pressure (BP) and

		air (a common method of waste management), the use of wood fuel for cooking, and factories	hypertension. Studies in general populations have identified a positive association of lead exposure with coronary artery disease CAD and stroke mortality, and peripheral arterial disease. Renal diseases
Microplastics	Microplastics are fragments of any type of plastic less than 5 mm (0.20 in) in length, according to the U.S. National Oceanic and Atmospheric Administration (NOAA)[1][2] and the European Chemicals Agency.[3] They cause pollution by entering natural ecosystems from a variety of sources,	Water sampled from boreholes in Lagos was found to have an "abundant" amount of the tiny particles, which have unknown health effects. The tiny particles and flakes, produced when plastic is disposed of improperly and breaks down, seep into the environment where they can be ingested by animals and humans. Recently, researchers detected microplastics in human blood for the first time. The main source of microplastics can be defined as tires, synthetic textiles, marine coatings, road markings, personal care products, plastic pellets, and city dust.	Based on the latest global estimate of microplastics, there are 93–236 thousand tons of microplastics floating on the ocean surface, which corresponds to 51 trillion particles. 79% of global plastic waste is stacked in landfills, which makes soil a large microplastic sink. Plastic products are usually manufactured by using new resources basically petroleum-based materials. However, they lost their value during their life cycles due to leakage along the entire value chain such as pellet loss, loss during transportation, and storage of plastic waste and littering as well as combined sewage overflow and poorly designed products, which lead to loss into our environment easily and difficult to recover. This leads to contamination of the environment, affecting wildlife and human well-being. A small

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	including cosmetics, clothing, food packaging, and industrial PROCESSES.	Moreover, the majority of microplastics come from household activity with a percentage of 77% and 23% from industrials application.	proportion is recycled for remanufacturing with remainder utilized for energy recovery.
Neonicotinoids	Neonicotinoids (sometimes shortened to neonics /ˈniːoʊnɪks/) are a class of neuro-active insecticides chemically similar to nicotine. The neonicotinoid family includes acetamiprid, clothianidin, dinotefuran, imidacloprid, nitenpyram, nithiazine, thiacloprid and thiamethoxam. A new report has revealed that about	they affect the central nervous system of insects, neonicotinoids kill or deleteriously affect a wide variety of both target and non-target insects. They are often applied to seeds before planting as a prophylactic treatment against herbivorous insects. Neonicotinoids are water-soluble, so when the seed sprouts and grows, the developing plant absorbs the pesticide into its tissues as it takes in water. Neonicotinoids can also be applied to the soil directly. Once absorbed, neonicotinoids become present throughout the plant, including in its leaves, flowers, nectar, and pollen.	Negative impacts due to neonicotinoids have been documented for earth- worms, soil microorganisms, predatory beetles, bees, and parasitic wasps. In particular, neonicotinoids were associated with mass poisoning events of honeybees and were shown to have serious negative effects on honeybee and bumblebee tness when consumed. Neonics also pose a threat to human health. It's not only the birds and bees that can be harmed by neonics, but even people need to be careful! Potential health effects of NEOs, such as neurological toxicity and diabetes to non-targeted mammals

	40 per cent of all pesticides in use in Nigeria are dangerous substances that have been banned or heavily restricted in European markets.		
Organotins	Organotins are those compounds containing at least one tin-carbon bond.	Organotins find uses in the applications such as biocides preservative for cotton and polyester textiles, as biocides for the protection against odour in sports textile, stabilizer or catalyst in PVC, polyurethane and polyester foams. PVC used as a binder for prints sometimes contain organotin stabilizer. Organotin compounds are also used as anti-microbial finishing preventing the bacterial degradation of sweat and the corresponding odour. Polysiloxane softeners which are used to improve grip in polyester fabrics may contain low amount of organotin stabilizers.	Organotin compounds are environmental pollutants and particularly harmful to the aquatic environment. Organotins are very toxic to marine and freshwater organisms even at very low concentrations. Seafood is the primary source of human exposure to organotin compounds, and the most common harmful effect is immunological impairment in mammals. The use of organotin compounds in products should not be permitted because it is deleterious, skin irritant and easily absorbed through the skin
Phthalates	Phthalates or phthalate esters, are	Some phthalates are used to help dissolve other materials. Phthalates are in	Phthalates are easily released into the environment. In general, they do not persist due to rapid

	esters of phthalic acid. They are mainly used as plasticizers, i.e., substances added to plastics to increase their flexibility, transparency, durability, and longevity. They are used primarily to soften polyvinyl chloride (PVC).	hundreds of products, such as vinyl flooring, lubricating oils, and personal-care products (soaps, shampoos, hair sprays). Phthalates see use as plasticisers in various other polymers, with applications centred around coatings such as lacquers, varnishes, and paints. The addition of phthalates imparts some flexibility to these materials, reducing their tendency to chip. Phthalates derived from alcohols with between 1-4 carbon atoms are used as plasticisers for cellulose-type plastics, such as cellulose acetate, nitrocellulose and cellulose acetate butyrate, with commonly encountered applications including nail polish. Most phthalates are also compatible with alkyds and acrylic resins, which are used in both oil and emulsion based paints. Studies have shown high levels of phthalates in water samples from three different locations In Lagos State, Nigeria.	biodegradation, photodegradation, and anaerobic degradation. Outdoor air concentrations are higher in urban and suburban areas than in rural and remote AREAS. They also pose no acute toxicity. Because of their volatility, DEP and DMP are present in higher concentrations in air in comparison with the heavier and less volatile DEHP. Higher air temperatures result in higher concentrations of phthalates in the air. PVC flooring leads to higher concentrations of BBP and DEHP, which are more prevalent in dust. A study in the peer-reviewed journal Environmental Pollution published October 12, 2021 found that high phthalate levels are weakly correlated with a greater risk of dying from any cause and with a stronger correlation to dying from heart problems, but the calculated hazard ratios were below 2 in both cases. Phthalates enter the bloodstream and disrupt sex hormone production, interfering with sexual development in infants and sexual behaviour in adults. Levels of phthalates have been dose-dependently linked to reduced anogenital distance decreased sexual desire and satisfaction in women, and malformed genital development in rats.

			Phthalates act by mimicking the female hormone estrogen, which in turn inhibits production of the male hormone testosterone. As such, phthalates are considered to be endocrine disruptors—a substance that interferes with the normal hormonal mechanisms that allow a biological organism to interact with its environment, and has sparked demands to ban or restrict its use in baby toys
Polycyclic Aromatic Hydrocarbons (PAHs)	A polycyclic aromatic hydrocarbon (PAH) is a class of organic compounds that is composed of multiple aromatic rings. The simplest representative is naphthalene, having two aromatic rings and the three-ring compounds anthracene and phenanthrene. PAHs are uncharged, non-	A survey showed that a considerable number of reports exist on the presence of PAHs in Nigerian soil, water and sediments. Information on the presence of PAHs in the country's air- shed exists but in very limited number. The sources of PAHs are ubiquitous and their concentrations in the country's environment are above the permissible limit set for the pollutant by European Union, the United Kingdom, China and the World Health Organization in most instances. The presence of PAHs in the ambient air of oil producing communities is therefore expected. Ana et al. reported that the	Most PAHs are insoluble in water, which limits their mobility in the environment, although PAHs sorb to fine-grained organic-rich sediments. They are therefore predominantly in solid state, bound to particulate air pollution, soils, or sediments. In solid state, these compounds are less accessible for biological uptake or degradation, increasing their persistence in the environment. PAHs typically disperse from urban and suburban non-point sources through road runoff, sewage, and atmospheric circulation and subsequent deposition of particulate air pollution Cancer is a primary human health risk of exposure to PAHs. Exposure to PAHs has also been linked with cardiovascular disease and poor fetal

	polar and planar. Many are colorless. Many of them are found in coal and in oil deposits, and are also produced by the incomplete combustion of organic matter—for example, in engines and incinerators or when biomass burns in forest fires.	ambient air levels of PAHs in some oil producing communities in Eleme Local Government Area were very much higher than those of non-oil producing communities. The average concentration of PAHs for the oil producing communities which house oil wells, refinery, fertilizer and petrochemical plants was reported to be 7.2 μg/m3 while that of non oil producing communities was 0.17 ng/m3. Benzo (a) pyrene, Benzo (k)fluoranthene, pyrene and indeno[1,2,3-cd] pyrene which are carcinogenic were reported to be predominant in the air samples analyzed. Apart from the oil and gas industry activities, ambient air PAHs are also impacted by open burning of municipal and medical wastes as well as biomass burning of all sorts. Adesina et al. studied the presence of alkyl-naphthalene in the stack gas and ambient air in the neighbourhood of a medical waste incinerator and reported low concentrations of alkyl-naphthalene. Continuous exposure to low doses of the	development, reduced immune function, and poorer neurological development, including lower IQ.

		pollutant over an extended period could however trigger a chronic disease condition. In another report by Adesina et al., the presence of dibenzo(a,h)anthracene, indeno[1,2,3-cd] pyrene, Benzo(a) pyrene, benzo[a]anthracene, chrysene, benzo[b] fluoranthene, and benzo[k]fluoranthene around a municipal dumpsite in the neighbourhood of Afe- Babalola University, Nigeria was established. Dibenzo(a,h)anthracene was reported to have the highest concentration of about 0.72 μg/m3. The presence of PAHs in the smoke of biomass used for domestic cooking has also been observed. The commonly used biomass materials in Nigeria include firewood, sawdust, charcoal, palm kernel shell etc. Olabemiwo and Ogunsola reported the presence of Acenaphthene, Fluorene, Phenanthrene, Anthracene, Fluoranthene, Pyrene, Benzo(a)anthracene, Chrysene, Benzo(b)Fluorene and Benzo(k)fluoranthene in wood charcoal and palm kernel shell although in varying concentrations	

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		Industrial clusters and vehicular emissions also play vital role in the contamination of ambient air by PAHs. The average concentrations of PAHs in the ambient air around some industrial complexes in Lagos and Ogun States Nigeria were 92.8 ng/m3 and 107.72 ng/m3, respectively.	
Triclosan			
Chemicals in products (CiP)			
Endocrine-disrupting chemicals (EDCs)			
Environmentally Persistent Pharmaceutical Pollutants (EPPPs)			

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Hazardous substances within the life cycle of electrical and electronic products (HSLEEP)			
Highly hazardous pesticides (HHPs)		A report, product of studies conducted in Kano, Oyo, Ebonyi and Benue States, noted "40% of all the pesticide products registered in Nigeria have been withdrawn from the European market or are heavily restricted". The 40 per cent represents 57 active ingredients in 402 products that are still in use in Nigeria. Many of those belong to the group of Highly Hazardous Pesticides (HHPs) that are especially dangerous for human health, animals and the environment. The report said 25 registered products in Nigeria have been proven carcinogenic, while 63 to be mutagenic, and 47 are endocrine-disrupting chemicals. Also, 262 products show neurotoxicity and 224 show clear effects on reproduction.	"2 of these pesticides were found to be carcinogens and 2 are mutagens, 5 are known endocrine disruptor compounds (EDCs), 11 are proven neurotoxins and 12 are proven to affect the human reproductive system," the report made available to participants showed.

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		The report stated that 65 per cent of the active ingredients (26 out of 40) used by farmers in Nigeria as sampled in the field study belong to the group of Highly Hazardous Pesticides (HHPs).	
Lead in paint			
Nanotechnology and manufactured nanomaterials			
Per- and polyfluoroalkyl substances (PFASs) and the transition to safer alternatives			

CENTRE FOR HUMAN RIGHTS AND CLIMATE CHANGE RESEARCH

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LEGAL AND POLICY CONCERNS ON CHEMICALS

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RECOMMENDATIONS ON LEGAL AND POLICY INTERVENTION

GENERAL RECOMMENDATIONS

It has become clear that having multi international coordinated action among governing bodies and Secretariat is key to successfully dealing with chemical pollution and the threat it poses in the future. In that light coordination under UNEA is imperative since UNEA is still the highest environmental decision making body. UNEP can serve as a clearing house without jeopardizing the mandate of other Secretariat and governing bodies. More coordination from United Nations Environment Programme (UNEP), the Secretariat of the Basel, Rotterdam and Stockholm will ensure a holistic approach to planning and and action will lead to more effective and sustainable action.

Lead and are of most significant public health importance in Nigeria.

There should be a refocusing on treating chronic diseases caused by environmental toxic burden. Research and regulatory bodies should provide unique exposure information to scientists, physicians, and health officials to help prevent diseases due to some environmental chemicals. The recognition and inclusion of heavy metals assays in the diagnosis of metabolic disorders will definitely improve management.

i. Conducting follow-up study on health hazards of all kinds of people, evaluate the population metal exposure and the severity of health damage related, and analyze its trend;
ii. Concern about the human disease and death impact due to metal exposure, collect and screen the information of population disease and death closely related to metal exposure, and study the link and dose-response relationship between organ damage and metal exposure;
iii. Establishing human health hazard monitoring and early warning network of metal exposure in the framework of environmental public health monitoring;

iv. Implementing prevention and intervention research on population health hazards of environmental metal exposure to reduce the risk of population metal exposure and health injury related. The few studies undertaken so far to estimate the impact of heavy metals on these health changes in Nigeria in spite of the rising trend speak loud of the information gap and challenge to researchers;

RECOMMENDATIONS FOR DEALING WITH NEONICOTINOIDS

Prevent pests from entering your home or garden.

Consider non-chemical methods for controlling pests.

Select the product that best fits your needs.

Follow label directions exactly when mixing and applying pesticides.

Store and dispose of pesticides properly.

Minimize environmental impacts from pesticide use.

RECOMMENDATIONS FOR DEALING WITH PHTHALATES

Do not use plastic containers in microwaves. To minimize exposure to phthalates, avoid vinyl toys, perfumed shampoo and lotion. Choose fragrance-free products whenever possible.

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RECOMMENDATIONS FOR DEALING WITH ORGANOTINS

Environmentally friendly alternative should be used instead eg. Sea-nine antifoulant: an environmentally acceptable alternative to organotins

RECOMMENDATIONS FOR DEALING WITH PAHs

Reduce or stop use of cigarettes, cigars, or vape devices

Limit consumption of roasted or toasted foods (cereals, grains, etc.)

Limit grilled and smoked foods

Choose leaner cuts of meat to reduce the amount of fat dripping and burning

Raise the grill grate higher over the flames to reduce the amount of charring

Remove blackened portions from meat and fish

Regarding PAHs removal from contaminated soil or groundwater, there is a wide variety of different techniques that can be applied, such as soil washing with surfactants, chemical oxidation, and biological and thermal treatments

RECOMMENDATIONS FOR DEALING WITH MICROPLASTICS

Reduce your use of single-use plastics.

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Support legislation to curb plastic production and waste.

Recycle properly.

Participate in a beach or river cleanup.

Avoid products containing microbeads.

Spread the word.

Buy a water filter, and stop using bottled water.

Buy non-synthetic eco-friendly clothes.

Get a laundry ball.

Air dry, do not use the dryer.

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Use public transport, and favor rail infrastructure.

Reduce your meat and fish consumption.

Use active carbon filter on your tap water

Using paper bag instead of plastic bag.

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ACTION THAT CAN BE UPSCALED

1. Urge the Federal Government to ban the use of Bisphenol – A plastics in the production of bottle water
2. Mandate the Committee on Healthcare Services to liaise with relevant agencies and companies producing bottled water to work out Modalities on how to effectively put an embargo on the use of BPA plastics in the Country. To this end, the Minister spelt out the Terms of References as follows:

• To Carry out comprehensive investigations on the safety or otherwise of the use of BPA plastics in the production of packaging materials for food, beverages and most especially bottled water in the country ,considering the permissible level ,environmental and other necessary factors
• Advise the Federal Government on the resolution of the House of Rep. to ban the use of Bisphenol –A (BPA) plastics in the production of bottled water in the country
• Undertake any other necessary activities and co – opt any other relevant MDAs that may be necessary for the achievement of the Mandate.

Glyphosate is banned in organic farming. But that doesn't eliminate it entirely. In the World Health Organization report, one-third of organic oat products tested had traces of glyphosate.