The National Field Research Centre for Environmental Conservation
About innovative Environmental Research

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Sultanate of Oman
Diwan of Royal Court

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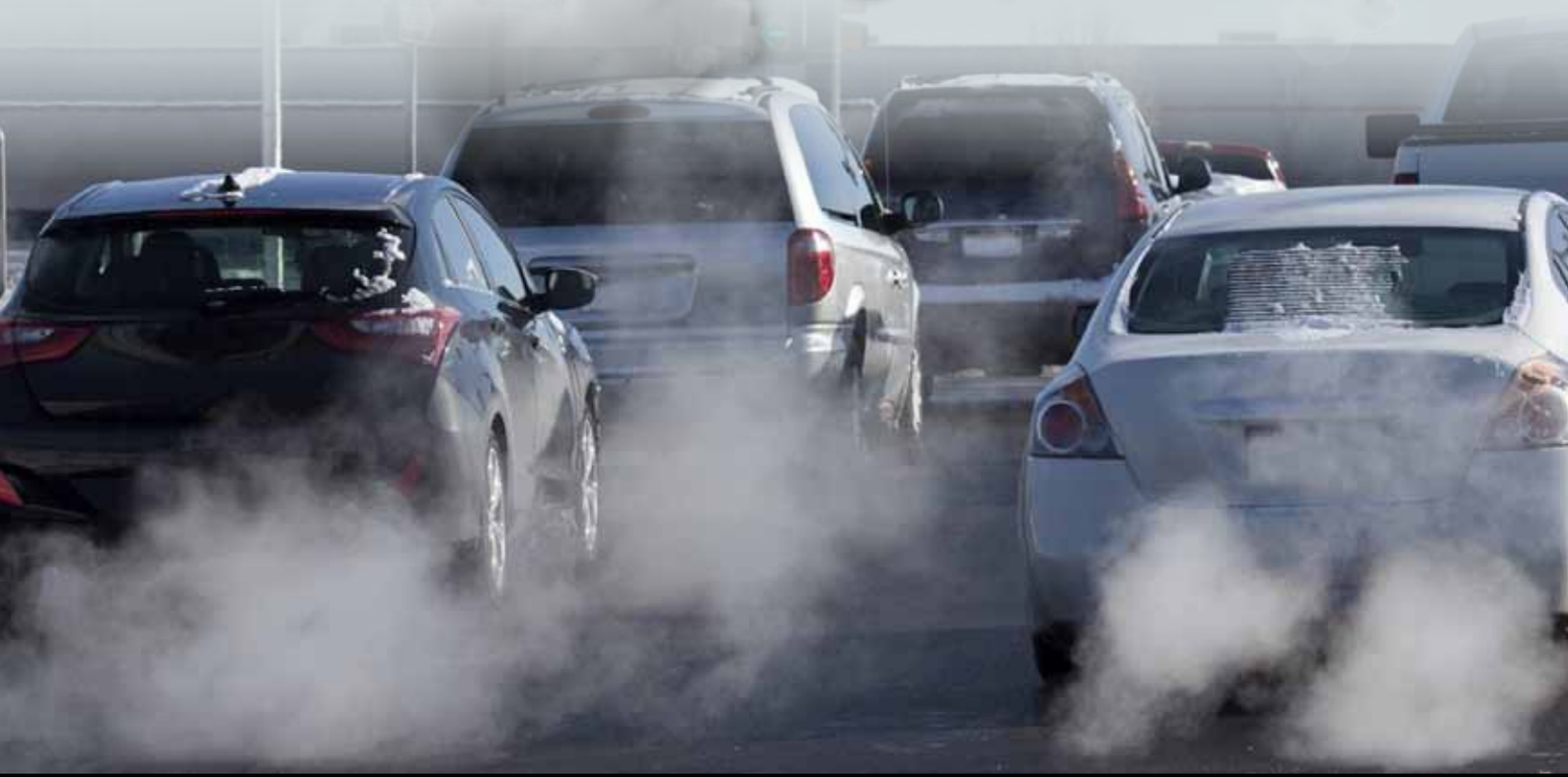
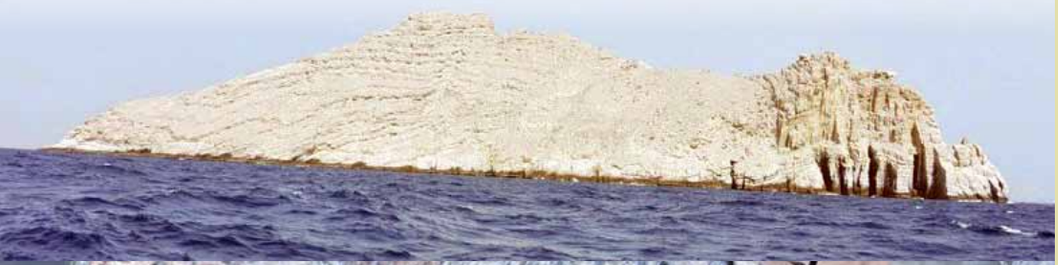
Vehicle Exhaust

is a globaly environmental phenomenon that sounds the alarm



Oman ranks 1st at KSA Award for Environmental Management in the Islamic World

The Sultanate of Oman, represented by the Marine Science and Fisheries Centre (MSFC) of the Ministry of Agriculture and Fisheries ranked first at the Saudi Arabia Award for Environmental Management in the Islamic World (KSAAEM) 2018 / 2019, at the category of "Best Practice in Environment and Sustainable Development Projects or Activities", for the project " The Age Groups and Breeding of the Coccinellidae in the Northwest Coast of the Sea of Oman". The prizes will be awarded at the opening ceremony of the 8th Islamic Conference of Environment Ministers at ISESCO headquarters in Rabat on 23- October 2019. KSAAEM aims to consolidate the broad notion of environmental management in the Islamic world, stimulate interest in sustainable development, and identify and disseminate outstanding efforts and successful practices in environmental management among Member States. KSAAEM is also an important pillar in promoting and raising awareness of issues of joint international environmental action, encouraging both institutions and individuals to ensure an eco-friendly future for the Islamic world and whole the world.



Follow-up on biodiversity
Wildlife in the islands of Musandam

Specialists in Environment and Climate Affairs Administration in Musandam, represented by Nature Conservation Dept, conduct a field visit to Um Al-Tair which is rich in natural resources and considered a safe haven for migratory birds to take shelter to for nesting and laying eggs and then migrating to complete their journey. Some call Umm al-Tair the island of "eggs", a metaphor for the large number of eggs and nesting birds that visit the island in specific seasons annually.

The visit came to learn about the nature of biodiversity and to identify the Tern birds' population that head to this island annually to breed in the period from June to August every year; as the Terns populations nest in small craters under natural plants adapted to the climatic conditions of this island.

The island of Um Al-Tair, also, is visited by Socotra Cormorant, Egret and Eagle population. These periodic visits by the specialists from Climate Affairs Adminsteration`s Nature Conservation contribute to know about the birds; in terms of size and subspecies.

point of view

The Environmental Initiatives

Dr. Dawood Sulaiman Al Balushy
Editor-in-Chief

The environmental initiatives launched by a variety of governmental and private establishments and institutions and civil society organizations reflect the extent to which these entities recognize the significant of their vital role in the observation of the Omani environment and natural resources and enhancing environment knowledge and awareness at local communities; in order to achieve the principles of sustainable development.

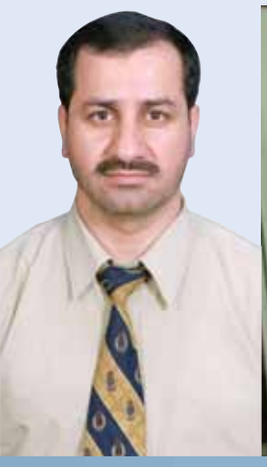
These environmental initiatives open the window to the Omani youth to contribute to serving Oman and the environment through building environmental technologies and creating scientific solutions, and establish for positive attitudes of environment observation at our children. Among these promising initiatives, for example, are; "Green Innovation Eco-Thon" that is launched by Namaa Group in cooperation with the Environment Society of Oman (ESO), "Green School" launched by ESO in cooperation with the Ministry of Education, "Green Wadis" by the National Field Research Centre for Environmental Conservation at Diwan of Royal Court (NFRCEC) in cooperation with higher education institutions, public and private establishments and local communities, "Ashjar" (Trees) by the Ministry of Environment and Climate Affairs, "Protected Areas Awareness Campaign" by the Office for Conservation of the Environment, "Environmental Academy" by be`ah, "Estedamaha" (Sustainability) by PDO, and many other voluntary environmental initiatives.

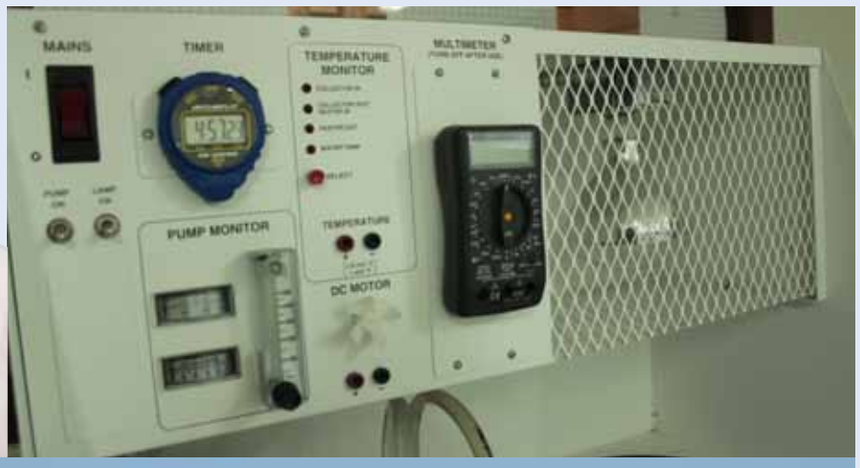
The pleasing thing at these initiatives is that they give all members of local communities the opportunity to create innovative scientific solutions for many environmental issues. This community participation resulted in new projects in power and environment investments and stressed on the good morals that contribute to the observation of Oman`s unique biodiversity.

We are hoping that these community environmental initiatives will continue to be the shield protecting environment and the pulse of the Omani youth in environmental voluntary work; We hope there will be an assessment of the impact of these initiatives; to ensure future sustainability.

says Associate Proffessor at Sohar University

Oman is one of the Most Environmentally Friendly Countries





By: Rashid al Baluchi

Dr. Hussein Kazm, an Associate Professor at Sohar University highlights at this interview the environmental situation in the Sultanate of Oman, climate change, renewable energy, environment observation among many other points. He starts with simplifying the definition of the environmental pollution saying: "it is generally known as "an intercalation of gas, solid or liquid substances into the environment that is changed in a way that it becomes not suitable more for man, plants or animals.

The changes in the environment will lead to climate change (temperature, humidity, snowfall rate, wind speed and direction) which is known as a change in climate in a particular area, because of many varied causes, such as volcanoes, intensity of solar radiation or the fall of meteorites, and the human activities that were added, recently, to the list of causes".

Climate Change

According to Dr. Hussein, the effects of climate change on the planet and man is very serious; as it causes the death of more than 150 thousand people annually. It is expected that about 20% of wild species will become extinct by 2050 because of climate changes. But what we suffer now due to climate change can't be compared to what will be suffered in the future.

Dr. Hussein attributed the scientific causes of climate change to the fact that the atmosphere contains greenhouse gases (Carbon dioxide, methane, sulfur fluoride, etc) in certain ratios that control the temperature of the Earth; any change to these ratios results in global warming and climate change.

Oman`s Environmental Situation

Speaking on the situation in Oman, Dr. Hussein said: compared to other countries, it can be said that the environmental situation in Oman is good; due to the great efforts and cooperation between the competent authorities and local communities. But, we have to acknowledge that industrialization in last two decades increased pollution rates; so, there should be more regulations, rules and laws to control industrial pollution, and we should adopt a "Carbon Law" applicable to the big factories.

Answering a question on the technology and fighting pollution, he said: the technological developments began to put environment observation into consider. Now, many brands of appliances adopt carbon footprint while more and more countries began to recycle waste into bio-fuel to reduce dependence on fossil fuel as it produces carbon dioxide. Furthermore, governments all around the world optimize the renewable energy, solar energy, and wind power.

The sultanate of Oman is blessed with many types of renewable energy; as the solar capacity reaches its peak of 950 watts/ one sqm in a long daytime with clear sky. the wind power is a promising one; especially in the governorates of al Sharqiyah South, al Sharqiyah North, al Dakheliyah and Dhofar. Also, plant and animal residues can be used in producing bio-fuel; the geothermal power can be used in heating purposes and generating electricity. Furthermore, the wave power, especially at the coasts of the governorates of al Sharqiyah North, al Sharqiyah South and Dhofar, can be optimized. Commenting on Oman`s outlook in terms of environment observation, he said: Oman is one of the most environmentally friendly countries; but because of population growth and industrialization, there are higher rates of pollution. So, there should be applicable laws and regulations radiation ratio, and taxes to be imposed on the industrial activities with radiation levels higher than the allowed. On the other hand, we have to adopt the renewable energy which will contribute to environment observation and support national economy through exporting non-renewable energy, such as oil and gas.

Environment conservation is the responsibility of everyone; the members of local communities have to depend more on renewable energy to have their needs of power, and the government should invest more in the renewable energy and reduce dependency on fossil fuel. The other two pillars are drafting laws and regulations and wide-spreading awareness.

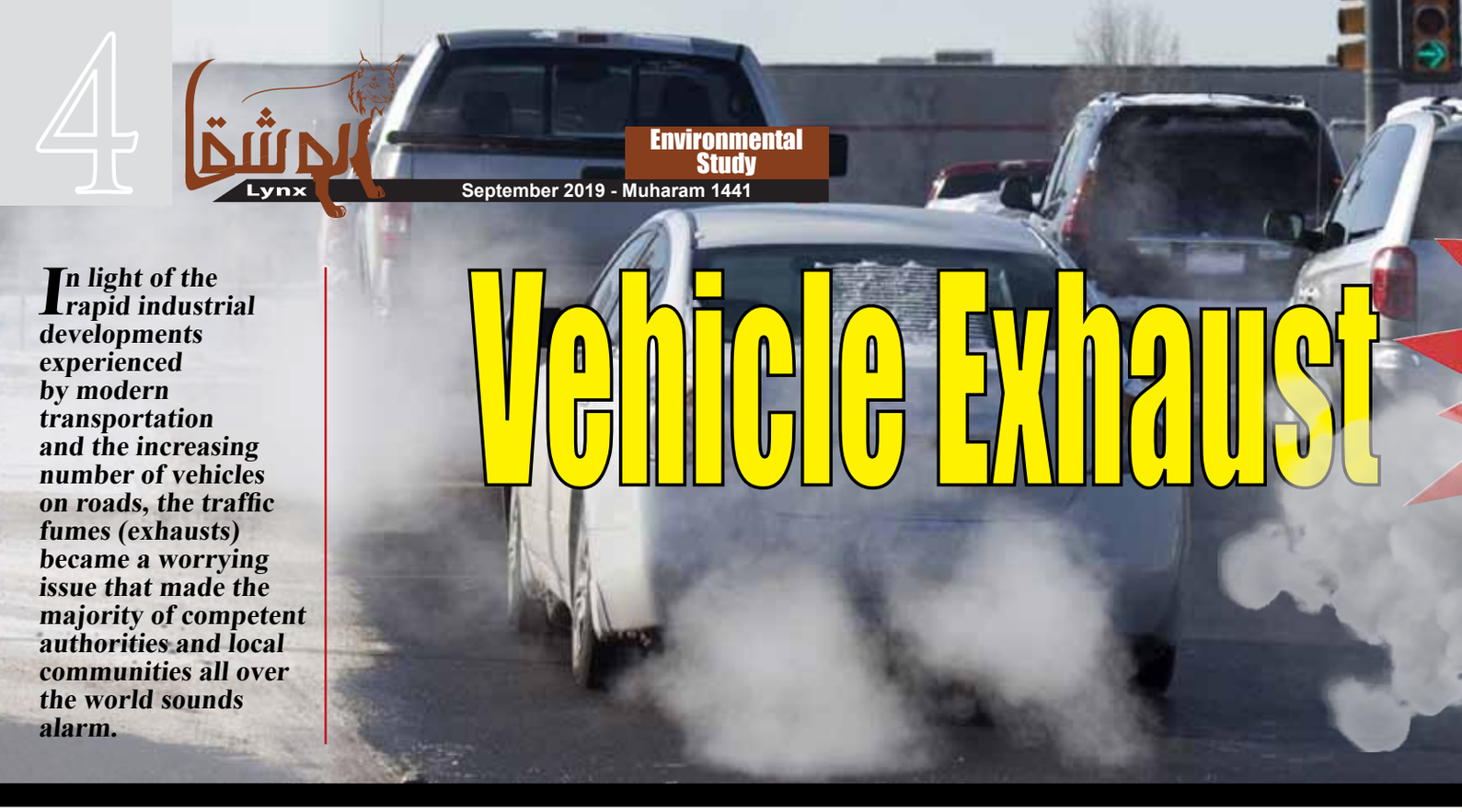
Scientific Research

Pointing to the scientific research journey he has started with Sohar University 18 years ago and the Renewable Energy Lab that ranked 1st globally in solar power by The World Energy Council on 2014, Dr. Hussein said that the 18-m lab that is equipped with large number of equipment and tools funded by The Research Council, including seven systems as the follow: fixed-independent solar system, movable solar system, solar system connected to grid, solar-wind power system, 7 solar thermal system, Meteorological system, and control system.

■ Solar energy in Oman reaches the peak «950 watts/ sqm» during long day and clear sky

■ Going towards renewable energy to attinuate climate change and develop the energy sector

"The total cost of the lab is RO 46,550. We conduct many experiments to measure the productivity of the solar cells and systems and the wind power generator to reach the maximum capacity; Solar Irradiance (TSI, DNI, DHI AND GHI); temperature (for environment and of winds and solar cells and system); relative humidity; atmospheric pressure; wind speed and direction, electrical values (current, voltage, power); and dust effects", concludes Dr. Hussein.



Vehicle Exhaust

In light of the rapid industrial developments experienced by modern transportation and the increasing number of vehicles on roads, the traffic fumes (exhausts) became a worrying issue that made the majority of competent authorities and local communities all over the world sounds alarm.

- **Environmental pollution caused by vehicle exhaust is an issue of global concern**
- **Vehicle exhaust imposes severe risks to human health, livestock and plants**
- **Local communities should be educated on vehicle exhaust risks**

The global efforts in this phenomenon excreted by researchers and specialists are directed to exploring the extent of risks and damages resulted from exhausts that were highlighted by the World Health Organization (WHO) which said in recent reports that air pollution resulted from traffic fumes causes the death of nearly 7 million people worldwide every year; including more than 2 million in the Western Pacific Region, one million in Africa, 500 thousand in Eastern Mediterranean, 500 thousand in Europe, and more than 300 thousand in the Americas. The leading-to-death diseases caused by air pollution were different in terms of being the direct cause of death as the follow: Pneumonia (21%), brain attack (20%), Ischemic heart disease (34%), Chronic obstructive pulmonary (19%), and lung cancer (7%).

Findings of Scientific Studies

According to a study conducted by Massachusetts Institute of Technology (MIT) in 2013, there were 53 thousand premature deaths annually in USA due vehicle emissions. Another study by MIT revealed that that vapors caused by traffic cause the death of 5000 people annually in UK. The Agence Francaise de Sécurité Sanitaire Environnementale (AFSSE) said that vehicle emissions attribute to 33% of air pollutants and cause the death of 6500 - 9500 people annually in France.

A recent study by German researchers revealed that vehicle exhaust gases have a significant impact on children›s health. «The risk of asthma and allergies is several times higher in children living in homes close to busy roads,» said Dr. Michael Kapisch, a specialist in Pediatrics at the Regensburg City Hospital in southern Germany. The researchers based their study on data collected from about 2,500 newborn babies and children of different age groups under 18.

A Swedish study by a group of researchers at Umeå University pointed out that people living in areas with a lot of vehicle exhaust gases are more likely to develop Alzheimer›s compared to ones living in areas with clean air.

Vehicle Exhaust Components

The findings of a study conducted by the Jordanian Ministry of Energy and Mineral Resources, in cooperation with a number of establishments concerned with studying pollutants, the most dangerous gases and pollutants resulted from vehicle exhaust are: Nitrogen oxides caused by the combustion of fuels that converts nitrogen and oxygen into nitrogen monoxide and Nitrogen dioxide that in case of high level of concentration affects the lungs.

Nitrogen forms 78% of air while the rest of components are the nitrogen oxide emitted from the soil into air. There are another components containing nitrogen that are emitted as a result of human activities, such as nitrogen monoxide, nitrogen dioxide, dinitrogen trioxide, nitrogen tetroxide and dinitrogen pentoxide which are pollutant gases.

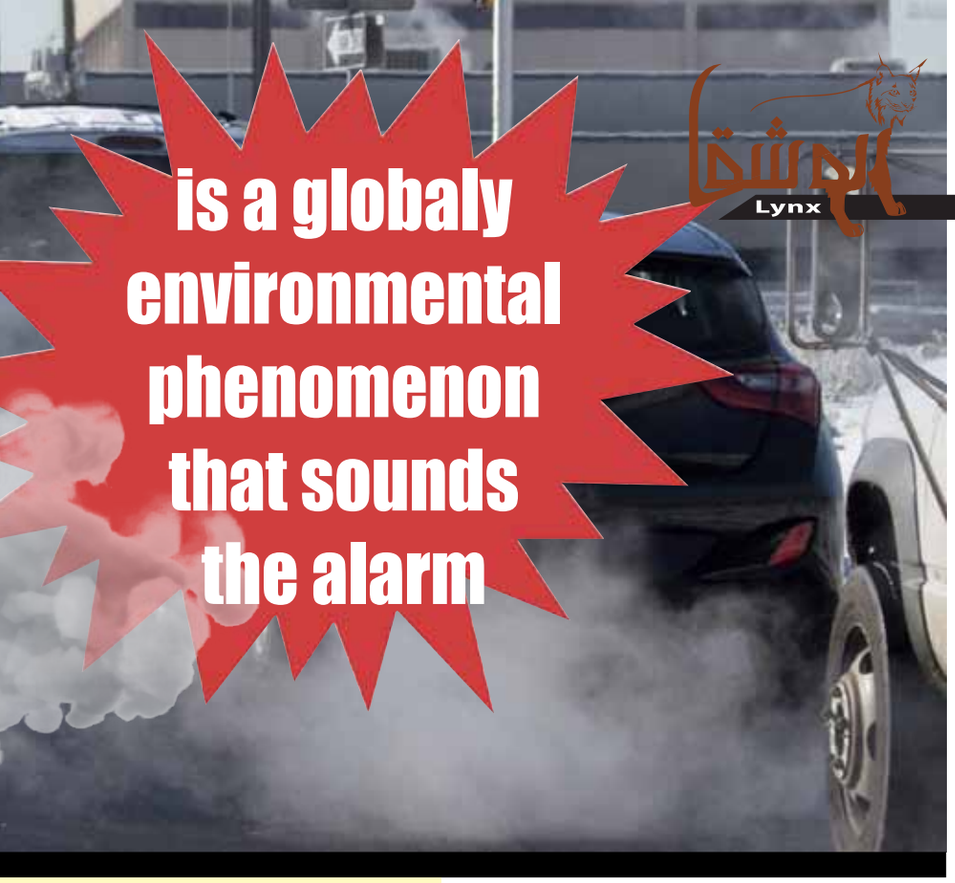
As a result of the fuel composition, the diesel engine produces 222 pounds of nitrogen per 1,000 gallons while the gasoline engine 113 pounds per 1000 gallons of fuel. The nitrogen in the atmosphere arises mainly from combustion of various hydrocarbon fuels in engines.

Carbon monoxide which is a toxic gas resulted from internal combustion. It is a deadly gas as the exposure to a high concentration leads to death; the feeling of exhaustion and headache, and slow response during driving. The concentration of carbon monoxide is higher in tunnels, garages and heavy traffic. Carbon monoxide is a colorless, odorless, and tasteless flammable gas that is slightly less dense than air. It is considered one of the biggest air pollutants; as it represents 50% of the total volume of air pollutants.

The above-mentioned study revealed that each vehicle produces 3.2kg of carbon monoxide per day; with concentration level up to 12.85 ppm in downtown, where a 99.98% of this amount of carbon monoxide is emitted from the exhauster itself. Furthermore, vehicle exhausts contains lead which is a toxic heavy metal and can cause neurological damage.

Vehicles in Oman

According to data released by the National



is a globaly environmental phenomenon that sounds the alarm

Vehicle Exhaust Impacts

- Air pollution causes, globally, the death of around 7m people annually
- Many health risks to humans, including the damage of the respiratory system
- Direct impact on environment, plants and fisheries
- Nitrogen oxides, carbon dioxide emitted from vehicles contribute to global warming
- The interaction of nitrogen oxide and hydrocarbons with sunlight damages the ozone layer

● Periodical maintenance of vehicles is one of big steps forward attenuating exhaust effects on environment

Centre for Statistics and Information (NCSI), the number of vehicle travelling in the Sultanate of Oman increased in 2019 (to May 30th) to 1,516,943; representing a 3.7% increase compared to 2018. By the end of May 2019, there were 1500 - 3000cc 804,272 vehicles; 3001 - 4500cc 340,957 vehicles; 4500+ cc 11 vehicles; and 0 - 1499 cc 121,810 vehicles.

Commenting on the risks of vehicle exhausts, Salim al Alawi, a certified traffic expert and the founder of Al Amanah Centre for Traffic Safety Services, said: Oman`s Traffic Law prohibited driving a vehicle emitting heavy smoke, or unpleasant odors that harm health; although of that, there are a few number of vehicles violating this rule. The issue is not limited to the smoke emission cause, as this involves health effects on humans, whether from direct inhalation or from food contamination that accumulates on fruits, such as palm and fruits due to the accumulation lead atoms emitted from vehicle exhaust.

"The damages and harms from vehicle exhaust are caused by the combustion of vehicle fuel, such as gasoline or diesel which causes carbon emissions and evaporation during vehicle movement, such as carbon monoxide, nitrogen oxides that are resulted from the incomplete combustion of hydrocarbons. When the smoke emitted by vehicle exhaust is unusual, it is an indication that there is a defect in the engine of the vehicle; this emission is more harmful to humans and the environment. The harmful toxins emitted by vehicles add another increase in air temperature to the summer days. The environmental pollution caused by volatile gases from vehicle exhausts has become an issue of concern to the world, so that some countries have banned the use of vehicles in big cities. There are some cities where people suffer from lack of breath, so they are wearing protective masks. In Oman, we have to not wait until we find ourselves in the same situation", concludes Al Alawi.

Nasir al Amri, a Mechanical Engineering specialist at a private establishment said: the combustion of fuel in vehicles produces a lot of harmful gases, especially solid ones. These residues have a direct impact on the natural environment. Furthermore, the increase in population means more vehicles all over the world, especially in crowded cities. "The impact of the exhausts emitted from vehicles that have been manufactured for more than ten years is bigger; as the percentage of errors in the operating values of the internal combustion system becomes higher; and thus toxic gases become more harmful to the environment. Nitrogen oxide and carbon dioxide are dangerous components emitted from vehicle exhaust, leading to global warming and the interaction of nitrogen oxide and hydrocarbons with sunlight causes severe damage to the ozone", said Al Amri.

Steps to Attinate Pollution

Many studies recommended a number of procedures to attenuate vehicle exhausts; to reduce harm and damage resulted, as the follow:

1- Periodical maintenance and changing broken down parts on time.

2- Observing speed limits allowed lowers combustion of fuel; as higher speed produces more toxic gases released into the air.

3- Avoiding traffic as possible.

4- Increasing landscape, plants and trees in cities.

5- Using hybrid or electric vehicles.

6- Extending public transport networks and promoting people to use them.

Raise awareness

Regarding the importance of spreading the awareness of vehicle exhaust damage, Shaker al Azzawia vehicle machinery Engineer said: everyone in society should feel the danger of vehicle exhaust and preserve the environment. All governmental and private organizations and the civil societies should participate in wide-spreading environmental and cultural awareness to keep society safe and observe the environment. The emission of vehicle exhausts is higher in the old vehicles. There should be regulations and laws to attenuate the risks of vehicles exhaust.

Be`ah and PDO Sign Non-hazardous Waste Management Agreement

Petroleum Development Oman (PDO) signed agreement with Oman Environmental Services Holding Company (be`ah) for non-hazardous waste managment with cost of 17m RO including a number of green initiatives. The seven-year agreement be'ah managing non-hazardous waste and waste yards in PDO's concession area. It will provide service containers with different capacities to separate organic, plastic, paper and other waste. In addition, providing regular maintenance and cleaning of the containers.

The agreement contributes to reducing the amount of waste transferred to the engineered landfill sites for final disposal where quantities of organic waste will be converted into fertilizers while other types, such as construction waste, will be used to clean up and close landfill sites in the concession area.

The agreement was signed by PDO Managing Director Raoul Restucci and be'ah CEO Eng. Tariq bin Ali Al Amri at a special ceremony held in PDO's Knowledge World venue in Muscat.

Restucci said: "We made great effort to reduce our environmental footprint while boosting In-Country Value and this agreement is another step in the right direction. Last year, we recycled more than 1,600 tons of non-hazardous waste including wood, plastic, metal and cartons and we look forward to further expanding this programme through our partnership with Be'ah".

Al Amri sid: "This agreement enhances further co-operation in sustainability and conservation. It supports the environmental strategies that PDO has been following throughout the years; as the integrated efforts between institutions ensure efficient implementation of strategic goals, which will certainly drive our country's economic development. This agreement is a first step towards a more detailed plan to recover economic value from waste by recycling it or converting it to energy".

Kuwait

EPA Cleans al Shuwaikh Beach

Kuwait Environment Public Authority (EPA) organized in cooperation with Senegal embassy a drive for cleaning al Shuwiakh beach under the activities of the campaign "It worth Protecting". Attended by Sheikh Abdullah al Ahmad, DG of EPA and H.E.M. Abdou Lahad Mbacke, Ambassador of Senegal to Kuwait Ambassador and with cooperation of diving team of Almabarah environmental volunteer and EPA and embassy staff.

Bahrain

Bahrain`s National emergency Plan to Combat Oil Spills Reviewed

HEDr.Mohamad Mubarak bin Daina, CEO of Bahrain`s Supreme Council for Environment presided over the recently-held meeting of the team assigned to updating the National emergency Plan to Combat Oil Spills. praising the efforts of updating the plan, Dr Daina highlighted the importance of briefing the competent authorities on duties and responsabilities assigned. Furthermore, he asserted on the neccessity of carrying out theoritical and practical excercises according to plan updates in cooperation with the National Committee for Disaster Management.

Qatar

S`hail aims to consreve Endangered Animals, Plants

The Qatari Ministry of Municipality and Environment (MME), represented by Environment Affairs, partipated at Katara International Hunting and Falcons Exhibition S`hail held at Cultural Village Foundation- Katara. MME showcased the efforts done for breeding population of the endangered Houbara Bustards in captivity, to be released again in the wild as a way of controlled propagation.

UAE

Aerial Survey Project Contributes to Biodiversity Observation

Within its strategy for supporting environment, agriculture and livestock sustainability and food security, the UAE Ministry of Climate Change and Environment (MCCE) completed phase one of its research project on the applications of remote sensing and drone-based aerial survey for the agricultural areas at Dubai and northern emirates to collect detailed data and information.

Saudi Arabia

MEWA Strenghthens Capabilities in Fighting Livestock Epidemics, Risks

The Saudi Ministry of Environment, Water and Agriculture (MEWA) lanuched a twining project between Animal Resources Risk Assessment Division and The Centre for Veterinary Epidemilogy and Risk Analyasis, in Italy, under the supervision of World Organisation for Animal Health (WOAH). The three-year project aims at enhancing the skills of MEWA staff in implementing the findings of epidemiological and risk management studies on animal and public health and food safety; including GIS.

Under Climate Change... Most Aggressive Spiders Survive

It seems that the deep impacts of climate change shall not stop surprising us; as a recent study published at the Canadian scientific journal "Nature Ecology and Evolution" and conducted by a team of scientists at McMaster University, Canada, on *"Anelosimus studiosus"* spiders showed that climate change have impacts on this species of spiders that were observed to be more violent, aggressive and vicious when they are subject to extreme weather conditions. Led by Jonathan Pruitt, Prof of Evolutionary Biology at MacMaster University, the research team tracked and examined colonies along the Atlantic coast in USA and Mexico that were hit by tropical cyclones and extreme weather conditions in the period from May to November 2018, to understand the impacts of extreme weather conditions on organisms.

Plastic Gravels ... A New form of Pollution

In a latest indicator to the extent of plastic pollution, a British team of researchers discovered a new type of pollution resulting from plastic hidden in the form of rocky gravels.

According to a recent research, to be published in next Dec. issue of "Science of the Total Environment", plastic pollution was traced in a new form similar to natural gravel stones.

A few days earlier, some oceanographers announced tracing particles inside ice samples collected from Arctic, and that ten thousand plastic microscopic particles fall from the sky. This type of pollution reached to the remote areas in the South Pole. As these plastic particles look, largely, like gravel stones, they are similar to the Plasticine found in Hawaii melted into sand and shells under fire burning.

With this invention ... plastic waste is coming up for sale soon

The French "Earth Wake Association" developed a new version of "Chrysails" machine that recycles plastic waste into power; as an effort to address the environmental challenges of plastic pollution.

The French newspaper "vingt minutes" reported that Chrysails turns plastic waste into fuel. The waste is inserted into giant steel robot, heated to more than 400 ° C. This process is called pyrolysis where plastic molecules are broken into oil and petroleum.

Chrysalis produces 650 g of diesel, 180g of gasoline, 100g of gas and 7g of residue from each 1kg of plastic. François Danel, Administrator of Earth Wake says: We can put plastic bags, bottle caps, basins, bottles of detergent or shampoo, and all that of polyethylene and polypropylene, in Chrysalis.

. «The new version that will be presented in coming days in Nice is three times larger and above all, its processing capacity is much more important, ensures François Danel. We can now put up to 60kg of plastic per batch, against 1 or 2kg with the previous prototype Presented to the public in September 2018 in Antibes, Chrysalis attracted big attention and interest. Thanks to the funds the association received, Chrysalis has been developed a lot since it was first invented in 2015 by Eng.Christopher Costes.

Environmental Vocabulary

The Mine

Eng. Khalifa Badawi Al Higgi
almitc@yahoo.com

Natural environments may lose some important elements, as their direct role in human life has become non-existent or semi-existent. The link between the two parties was cut due to the multiplicity of unnatural resources that forced into human life and interact with hisbenefits. While the wild trees were his food, medicine and hotbed, then transformed to elements that mean nothing to him except a beautiful view or a shadow that might be replaced by something else alternative. A tree that we have not been drunk by its benefits since childhood, how can we realize its importance when growing up!!. An equation needs to be balanced.

This perennial tree has been disappeared from many areas of the Sultanate and remained in other areas resisting human abandonment. He›s abandonmentbecause of its needless to human now. With itshighness, it still imposes its shade to those who are interrupted by the heat of the sun and exhausted by the harsh weather. It rises up to 12 meters high. Its resistance to sun heat, salinity, drought and floodsavoids it to the risk of extinction. Composite leaves similar to Acacia (but larger) overhanging from itssoft branches, and are flowered with rounded yellow flowers that are good meal for bee nectar probably similar to those of the Acacia. Its fruit comes in the form of a horn lined with rounded seeds of up to 15 seeds, and falls after maturity in blackcolour before the seeds are separated from their homes in the horn fruit.

The Wadies are its favorite placesand may not befound in sandyand desert areas unless they are cultivated. Its presence in populated areas is linked to its direct and indirect benefits. Humans were used its strong wood in carpentry and boat industrybecauseof its strength and resistance to white ants. Also the wood characterized by flammable speed, so it is very suitable for coal and firewood. From a medical point of view, its pharmacy is rich in prescriptions, whether leaf extracts in treatments for respiratory diseases or its roots in stomach diseases, dental pain and skin diseases.This is jest examples.

It has a presence in the Arab world under several names, such as: Assanat Al Arabi, orAttalh. In Oman, it became famous by another name, whenever this name passed through who had lived with it from a childhood, he immediately recalled Al Qarattree (Acacia nilotica) and interrupted by its good memories. Such these memories were using its products widely in leather tanning industry. Qarat tree associated deeply with this industry. These generations may not realize what this tree and other treescontain benefits to the nature and human beings, so it is very essential to re-establish its importance and apply it in practice by intensifying its cultivation on a large scale.Then it will reveal its most future vision in the field of industrywithout any touch of the modesty of the environment and its virginity.This tree is a rich mine with environmental treasures, as much as go through as much is revealed its identity andgives more.

Renewable Energy

Marwa Al Mukhaini

Energy that is not exhausted when used and renewed naturally during human life .

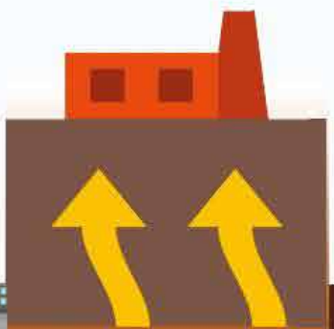
Examples include :

Biofuel

It is one of the renewable energy sources derived from living organisms such as: plants and animals. It is a clean energy source that is not polluting the environment . It is extracted from plants such as corn, soybeans, cotton seeds, sesame, as well as from animal manure and wastewater .

Hydro power (Hydroelectric)

Is a clean, renewable and reliable energy source which converts kinetic energy from falling water from dams and waterfalls into electricity .

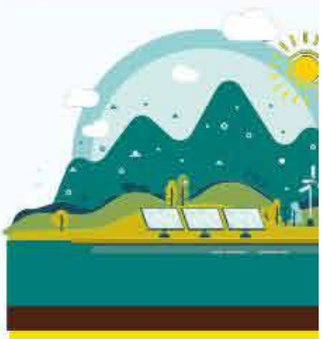


Geothermal Energy

The inside, or core, of the Earth is very hot. This heat sometimes breaks through to the surface of the Earth through volcanoes. When we use heat from the Earth to generate energy it's called geothermal energy .

Wind power (Electromechanics)

Is an elecrtical energy generated from the kinetic energy of the wind using a huge turbines .
It is renewable and environmental friendlly .



Solar Energy

The primary source of all energy on the Earth is from the sun. Solar energy is power generated directly from sunlight. It can be used for heat energy or converted into electric energy .