



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



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Diwan of Royal Court

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Issue 55



Used Vehicle oil

From Imminent
Danger to Promising
Economic
Opportunities

The Sultanate Celebrates the World Environment Day



The Sultanate, represented by the Ministry of Environment and Climate Affairs, celebrates the World Environment Day, which falls on the fifth of June every year. This year celebration comes under the slogan «It Is Time of Nature».

The World Environment Day is considered the most famous day for environmental work in the world since its inception in 1972 with the participation of most of the countries and governments of the world. This year celebration is highlighting (Biodiversity) as a main topic. Being one of the important topics for discussion by countries around the world, biodiversity worth to be highlighted and discussed, to make a real and positive change in the efforts

to conserve the environment, to invent modern methods in this regard and to develop more environmentally friendly models in the midst of the industrial revolution and the industrial progress witnessed by the world. The Sultanate is considered as one of wide geographical diversity countries, as well as it is unique in its biological diversity. This is due to its mountain ranges, wadies, plains, deserts, rocky hills and long and diverse coastlines. In addition to its distinguished geographical location, which makes it an ideal habitat for many plants, animals and birds. The elements of wildlife are considered as a real national wealth that must be preserved from human threats and

encroachments, as it represents a legacy of the Sultanate in addition to its importance for promoting tourism attraction.

Any change in natural environments will be accompanied by an irreplaceable loss and severe shortage of scarce natural resources. Now, these natural resources face several challenges including overgrazing, cutting trees, soil erosion, desertification, drought, land degradation, and other challenges. Therefore, there is an urgent need for preserving natural resources and protecting the rare wildlife, in order to achieve the goals of sustainable development in all economic, agricultural and industrial aspects.

World Ocean Day Celebration

The Sultanate, represented by the Ministry of Agriculture and Fisheries, Omani Environment Society, Oman Post Company, Oman Environment Holding Company «be»ah and Oman Sailing Project, joined the World Countries in the celebration of the World Oceans Day, which falls on June 8 of each year, under the slogan «Innovation for Sustainable Oceans». The celebration aims to

remind everyone of the importance of the oceans role in our daily life. Oceans serve as lungs for our planet. They produce most of the oxygen we breathe. That is why its very important to inform the public about the effects of human activities on the oceans, create a global movement that brings people's interest in them, and unite the peoples of the world in a project for sustainable ocean

management at the global level. The Ministry of Agriculture and Fisheries affirmed the importance of the individuals and institutions role in joining hands for preserving and protecting seas and oceans in innovative and environmentally friendly ways. It is worth noting that the oceans contain more than 200,000 specific species of marine life, but the actual numbers may be in millions.

point of view



When Such Time Comes ?

Dr. Dawood Sulaiman Al Balushi
Editor-in-Chief

The slogan for the celebration of World Environment Day for this year, which falls on the fifth of June of each year, has sparked widespread controversy in the global environmental circles, as the United Nations adopted «It Is Time of Nature» as slogan for this year's celebration under the theme «Biodiversity», which confirms that the time has come for all countries of the world to look positively and deeply into the importance of biodiversity and to comprehend that this diversity is the basis of life.

Any damage to the biodiversity it leads to a global imbalance in the environment, which leads to environmental, natural and biological disasters at the global level.

However, many environmental lovers believe that the time has not come only now, but rather that it has come long ago and that the call to preserve the environment at the present time is not the right time to be aware of the importance of biodiversity in daily life.

Environmental lovers say that it is rather the time for holding the human conscience accountable for its wrong behavior in dealing with biodiversity. It is time for confronting the results of human behavior and changes done to environmental, natural and biological systems. It is time for monitoring the haunting global transgressions that have claimed so many lives so far and caused the loss of many natural habitats, caused the extinction of rare animals and plants, caused the degradation of forests, caused the deterioration of vegetation, desertification.

It is time for confronting the spread various sorts of pollutants around the world and the spread of serious diseases and epidemics as a result of the behavior of the biological research institutions and factories, which led to genetic transformations in the composition of living organisms, viruses and bacteria.

The United Nations Organization stresses that biodiversity is the foundation that supports all life on Earth and below the surface of water. It affects every aspect of human health and provides fresh air, water, nutritious food, and pharmaceutical sources and through scientific understanding, it can provide resistance to natural diseases, and mitigation to climate change effects.

Effecting, altering or removing of one component of this system, affects the entire system of life and can lead to frightening negative consequences.

If biodiversity is so important in preserving the world's systems of life, is it time to be aware of its importance, or is it now time to address the damage caused by the failure to conserve biodiversity? The alarm has been ringing from a long time ago saying (when the time comes).

If biodiversity is so important in preserving the world's systems of life, is it the time (now) for paying attention to its importance, or is it (now) the time to address the damage caused by the failure to reserve biodiversity? The alarm has been ringing from a long time ago saying (when such time comes?).

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By: Fatima Al Zidjali

Plant treatment is a biological process that uses many types of plants to exclude pollutants existing in the soil and groundwater, transport them, reduce them or eliminate them. As well, plant is used to remove some pollutants, whether organic or inorganic from polluted places such as agricultural soil and water. This is one of the important ways, because it is simple and inexpensive and does not lead to environmental damage, as the plant is planted in polluted places and it absorbs large quantities of materials into its biomass, such as roots, stem and leaves.



Plant Treatment

Removes Pollutants from the Soil and Groundwater



Removal of Pollutants

Aquatic environment and soil pollutants can be removed in several ways. Plants secrete materials from their roots that break down pollutants. Harmful chemicals can enter the roots and are transported to the vegetative system then they can easily be removed from the site. Other harmful materials can simply be stored in the plant and these plants are later collected, dried and disposed of in a special storage site. Example of Plants treatment is what happened after the disaster of the nuclear reactor of Chernobyl in northern Ukraine. Sunflower plants efficiently removed radioactive cesium from neighboring lakes, where Sunflower plants were placed to float on the surface of the water. Then they were installed by the sponge. Later they were collected and dried.

Also, a well-known example is the use of poplar trees to volatilize Trichlorine and Ethylene. In other studies, alfalfa plants and Juniper trees (Alalan) were used to remove petroleum and hydrocarbon materials from soil and groundwater. Moreover, successful experiments were performed on Parrot Feather plant and Algae to dispose of ammunition and explosives waste. plants are treated and recycled to extract some materials that can be used in various industries. This method is useful for obtaining important minerals for industry such as copper and tin. The ability of plants to grow and absorb heavy metals or organic materials varies, so more effective plants are used after being extensively studied.

Studies and research indicate that there are many plants that can be used in this area such as fast-growing wild herbal plants that have a large biomass as well as some types of weeds and seasonal crop plants and sunflower. Aquatic plants also play a big role through their ability to grow in fresh water, and thus they easily perform biological treatment and purify water from pollutants, especially the rivers in major industrial cities.

These plants - as mentioned above - transport, minimize or destroy pollutants whether in soil or in water. They may also act as a filter for rainwater carrying harmful elements during its way returning to fresh water. Such plants, always grow near polluted sites to protect the environment and therefore, they have been frequently used for treatment of fresh water.

The term «plant treatment» is derived from «Python», the Greek word that has been translated into plant and «Ramidium», which is translated into treatment. This technology is widely used because when compared with other treatments, it is found less destructive to the soil, its price is generally reasonable. Another advantage is that it adds aesthetic to the deteriorating soil, and makes beautiful plants increase.

Mechanisms of Plant Treatment

There are a number of mechanisms for plant treatment that can be explained as follows:

1- Plants secrete natural materials through their roots which stimulate bacterial microorganisms to feed and play their natural role in getting rid of bio-contaminated materials or so-called degradation.

2- Plants secrete materials that stabilize (or scale) polluted substances and transfer them from liquid to solid state to prevent them from passing into the groundwater.

3- Some plants keep polluted materials in their leaves and in some of their cells away from the places that may harm them. These is considered as wonders performed by these living organisms which are able to create a system of careful treatment. In most cases this system is very useful for keeping away minerals that are harmful to the human body such as arsenic.

4- The plants treat river water through a type of filtering, They may also be used to treat groundwater when it is removed from the ground.

5- The plants draw water that contains organic pollutants, purify the water and extracts the pollutants. Then release pollutants to the air through their leaves.

6- Plant tissue performs metabolism and destruction of pollutants by secreting special chemicals.

7- Trees also perform an indirect special treatment by controlling the movement of the groundwater as they act as natural tubes taking water through their roots, treat it while keeping the pollutants in their crust. By time they peel themselves and the places where pollutants are kept fall to the ground. So, water is completely purified. It is a process that treats large quantities of water from 30 to 350 gallons per day.

Used Vehicle

From Imminent Danger to Promising

Muscat, June 2020

According to statistics issued by the National Center for Statistics and Information, the number of vehicles traveling on the roads of the Sultanate is increasing periodically. This number reaches to 1,555,514 vehicles as at the end of March 2020. This big number of vehicles produces huge quantities of lubricating oil, currently reached up to 30,000 tons annually. This poses a risk to humans and the environment if they are disposed of in improper ways.

Multiple Risks

The risks of used oils are numerous, pose both direct and indirect risks on human health and the integrity of agricultural lands and water. Used oils need long years to decompose. One gallon of used oil can pollute a million gallons of water. Used oil also kills the microorganisms existing in the soil. It covers the leaves of trees with an oil layer, which impedes the growth process and leads to the death of plants and consequently to destruction of the soil. As well, it may reach wells and sources of Aflaj to cause the death of all forms of aquatic life, as these oils prevent oxygen from reaching such organisms, that is in addition to increasing the activity of the anaerobic bacteria that cause water poisoning and make wells and Aflaj invalid.

In the event that the used vehicle oil reaches the marine environment, it causes the death of birds that live on the water surface which dive in order to obtain food. It also leads to the death of fish and marine creatures, as the effect of used vehicle oil extends to the beaches and thus affects the general view and marine tourism.

The additives in the lubricating oils can be toxic to plants and animals, as engine oil accumulates a group of dangerous pollutants when used in engines and transmissions. Such pollutants include lead, cadmium, chromium, arsenic, dioxin, gasoline, and polycyclic aromatics. These pollutants work when disposing of in ways that are not safe to cause direct and indirect damage to the environment and its components.

Benefits of Vehicle Oils

Motor vehicle oil is one of the types of lubricants that protect and maintain the engines. The oils are divided into two basic parts. The first is mineral lubricants, which are the most used oils currently and are obtained from refining crude oil. Sometimes several types of mineral oils are mixed to obtain different viscosity degrees. The other part is synthetic lubricants made from a mixture of chemicals and oils.

Lubricating oils are used to reduce friction between the moving parts of the engines and also to clean the suspended impurities, prevent corrosion of the internal parts, improve performance, reduce heat caused by

● Thirty thousand tons of vehicle oil and lubricants are produced annually in the Sultanate

● Disposal of used vehicle oil in improper ways poses big risks to humans and the environment

combustion inside, cool the engine, and reduce the risks of oxidation that may occur inside the engine due to the presence of oxygen as one of the necessary factors for combustion.

The engine oil consists of base oil and a host of other additives such as anticorrosive, antioxidant, detergent, rustproof, friction-reducing materials and viscosity improvers.

Current Situation

By tracking the issue of used oils and their impact on the environment, (Lynx) observed that there are determined efforts to get rid of these oils in a safe manner, and to make them give an added economic value at the same time. As there are several local companies that buy these oils and recycle them to extract a reused-base oil in the modern oil industry. That is why we find that 60% of the burned oils are used while 40% of them go to the landfill designated for hazardous waste in Sohar.

The used oil market witnesses strong competition between companies operating in this field because of the availability



oil

Economic Opportunities



● The recycling of used oils aims to reduce the waste rate and ensure environmental protection in addition to its economic benefits

● (Bee'ah) is developing an integrated system to provide best practices in the collection and disposal of used vehicle oil



Guidelines

- To create awareness of the risks of used vehicle oil to humans and the environment through all sectors of society.
- To prevent the used oils to reach agricultural lands, groundwater, dams water, Aflaj, beaches and seas.
- To use purification devices in the case of using used oils as an energy source in factories.
- To maximize the role of investment in recycling used oils and applying modern technologies.
- Activating the role of scientific research in reducing the cost of recycling used oils and extracting more effective and useful materials from recycled products.

of technologies used in recycling and because of the fertile environment of investment for this industry. This, in turn, makes environment avoids pollution from such oils and their derivatives.

We hope that the investment efforts will be doubled to maximize the benefit from recycling the used oils and reduce the waste percentage. With the existence of wrong individual practices in the process of getting rid of the burnt oils, and the water for vehicles washing which is saturated with these oils, however the current situation heralds a bright and prosperous future that protects the environment from dangers of used oil and doubles the economic benefits from its recycling.

Continuous Oil Change

The efficiency of vehicle engine oil decreases over time and becomes unable to protect the engine components with the required efficiency, which is inconsistent with the primary purpose of its use. Thus it is necessary to change it to protect the engine from damage. The period during which the engine oil must be replaced varies depending on the type and quality

of the oil and the materials added to it plus the mileage, which sometimes start from 3 thousand kilometers or more. This makes the quantity of used oil due to such replacements, very large.

Recycling

Recycling of oils is the process of collecting used oils and passing them through several manufacturing stages that include filtering, hydrogenation and mixing to extract materials that can be reused after separated from non-useful materials.

The process of recycling vehicle oils aims to reduce the rate of waste and ensure that it does not reach agricultural land, ground water and surface water. Recycled oils are used to provide energy for several industries such as cement and iron factories. These factories are required to have special purifiers to remove airborne toxic pollutants, as the process of burning oil to generate Electrical energy without the presence of purification devices leads to air pollution, because oils contain toxic substances and heavy metal compounds that affect human health and nature. The used vehicle oil is also used in heating, in addition to that it can be used as fuel, and it can also be recycled to be oil for vehicles one more time.

The benefits of recycling oils are not limited to protecting the environment, but it also brings economic returns for individuals and the country, as the institutions that generate these oils in the Sultanate are currently collecting and selling them to the institutions that recycle them.

Bee'ah Efforts

For its part, Oman Environment Services Holding Company «Bee'ah» emphasized that lubricating oils have different uses in many industries, and the company is currently focusing on the oils used to lubricate car engines, explaining that the quantities produced from vehicle lubricants are currently up to 30,000 tons annually.

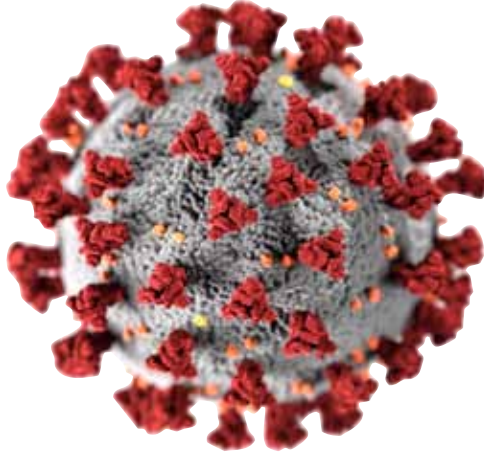
Bee'ah is currently developing an integrated system through which it aims to build efficiencies from small and medium companies to provide best practices in the collection and disposal of lubricant oils, as the company supports the principle of circular economy that aims to bridge the gap between industrial production and natural environmental systems that human beings depend on at the end of day.

On the methods of getting rid of used vehicle oil, Bee'ah clarified that there are two methods that are similar to the principle of circular economy, namely: the treatment of used vehicles oil to extract the base oil that can be reused in producing oils used in several fields such as construction or manufacturing and others, as well as recovering of the calorific value from it through its use as a fuel in a closed system that prevents the release of hazardous emissions into the environment.

Bee'ah indicated that it is looking for innovative ideas to take advantage of vehicle oils to build a sustainable local market, as the company undertakes to prepare and implement the strategy of the Sultanate's government to manage and allocate a waste sector in the Sultanate, and to make it enter into a new stage by applying waste management best practices to meet the challenges of maintaining the environment and the proper disposal of waste through scientific methods, by creating an effective partnership between the public sector, private sector and civil society, and through adopting educational plans to aiming to limit and reduce waste production.

Conservation and Protection Efforts Continue in Innovative Ways in Light of the Outbreak of Coronavirus

Environment Society of Oman has created an aiming digital content to share with the community. The initiative includes graphics, videos, brochures, educational materials, and other activities that can be implemented remotely by using modern technologies. The initiative team works tirelessly to harness all possible ways for the continuation of its activities and services and to reduce implications of the outbreak of the emerging Coronavirus on conservation and protection efforts and in line with its commitment to preserving the Sultanate's natural heritage. Her Highness, Tania bint Shabib Al Saeed, President of the Omani Environment Society, said: «On behalf of the Society's family, I extend my thanks and appreciation to those who endeavor to provide the necessary support to us at different times, in light of these unprecedented challenges. We will continue to adapt to changes to reduce the impact of the Coronavirus's Outbreak.»



Her Highness added that despite the difficult times we live in today, we are still committed to our endeavor to preserve one of the most important Omani riches, namely the natural heritage of Oman, without losing sight of our priorities in preserving the health and safety of society and our employees. Despite the challenges imposed by this situation, such as social separation and limitation on carrying out the planned activities, whether that are our research activities, community outreach activities, members activities, or fundraising events, the society team does its best to work remotely to fulfill the association's obligations for this year. We will continue to join hands and stand together with our partners to mitigate the effects of the pandemic. «Today, we are re-planning research trips and searching for new and innovative ways to communicate with society through various and new initiatives that will allow our members the opportunity to participate in these new initiatives remotely,» added she.

Saudi Arabia

First Facility for Recycling of Construction and Demolition Waste in Riyadh

The Saudi Investment Company for Recycling «SIRC» - one of the companies owned by the Public Investment Fund - has revealed that it has reached the final stages of building the first construction waste recycling and demolition facility in Riyadh and that the facility will start operating at the end of July this year, to be followed by a series of facilities that will be implemented later. The start-up of this facility is considered as the first step towards implementing the comprehensive strategy for the waste management sector in Riyadh to achieve a set of strategic goals for recycling, most notably of which is to shift 60% of construction and demolition waste away from landfills by 2035 and move towards the circular economy model. The construction and demolishing waste recycling facility is the first to be developed and built according to the Memorandum of Understanding signed last year between the National Center for Waste Management, the Riyadh Municipality, and «SIRC» company, to start the activities of integrated waste management and waste recycling in Riyadh. The new facility is located in Al-Khair scheme north of Riyadh, and was built on an area of 1.3 million square meters at the land allocated by the Riyadh Municipality. As soon as it operates, the facility will process about 600 tons of construction and demolition waste in Riyadh per hour, and achieve recycling rates in excess of 90%. This facility will be used to build advanced technology, and provide it with innovative mobile equipment, which can be moved between future recycling sites, and retrofitted to deal with various absorptive capacities according to local needs.

Qatar

70% of the Local Plant Species to be Preserved in the Genetic Bank of Seeds

The Ministry of Municipal and Environmental Affairs, represented by the Department of Genetic Resources at the Agricultural Research Directorate and through the Genetic Bank for Seeds, seeks to collect the largest number of seed samples, especially the highly efficient seeds; for use in breeding programs for agricultural

and forage crops. Aisha Dasmal Al-Kuwari, head of the Genetic Resources Department at the Agricultural Research Directorate of the Ministry of Municipal and Environment Affairs, says that plant genetic resources are considered as one of the national wealth of strategic and economic value owned by countries.

Kuwait

The Convening of the Fifth Meeting of the Environmental Committee in the National Assembly

The fifth meeting of the Environmental Committee was held in the National Assembly in the presence of His Excellency Sheikh Abdullah Al-Ahmad Al-Hamoud Al-Subah, the Director General of the Environment Public Authority, Chairman of the Board of Directors and the Deputy Director General for Technical Affairs

Dr. Abdullah Al-Zaidan through video communication. During the meeting, various environmental issues were discussed, especially those related to Jon - al Kuwait, the city of Subah Al-Ahmad, and the Jleeb Al-Shuyoukh area, to reach the best temporary and permanent environmental solutions.

UAE

Ministry of Climate Change and Environment organizes a Forum for Developing Marine Environment Research

The Ministry of Climate Change and Environment organized the first National (Biharana - Our Seas) Forum, which aims to create a national platform for the State experts specializing in the field of marine sciences to exchange scientific knowledge and develop marine environment research in the country in line with the global trends and

innovations, as well as to enhance the State's position in international forums in this field. The forum came out with a number of recommendations related to the future research in the field of marine environment, including standardization of standards and procedures for analyzing fisheries and marine habitats and the quality of marine water properties.

Bahrain

Bahrain celebrates the World Environment Day

The Kingdom of Bahrain joins the world this year celebration of the World Environment Day, which falls on the fifth of June under the theme: "biodiversity", amidst local pioneering accomplishments and globally activated initiatives in preserving the environment,

wild life, marine life, and optimal exploitation of natural resources, in order to support the sustainable development process during this prosperous era. of His Majesty King Hamad bin Isa Al Khalifa, the King of the country, - may God protect and preserve him - .

» The United Nations Launches a New Climate Initiative on the World Environment Day

The United Nations Climate Change Secretariat launched a new initiative to combat climate change, in conjunction with World Environment Day. The German news agency stated that the initiative's slogan came under the title «Race to Zero», and the campaign aims to stop greenhouse gas emissions such as carbon dioxide by 2050 at the latest. According to the United Nations, nearly a thousand companies, 458 cities, 24 States and regions, 500 universities and 36 major investors have already committed to cut emissions to zero by 2050. Rolls-Royce, Nestle and international fashion stores Inditex and more than 120 countries among the companies that announced their commitment announced their commitment to become climate-neutral by the year 2050. Earlier, the President of the upcoming World Climate Conference, British Energy Minister Alok Sharma, said that the world's economies should be rebuilt in a more sustainable and clean way after the Corona pandemic.



» Human Activity Causes Extinction of Wild Animals



A recent American study revealed that human activity on places with a very rich wild life made hundreds of wild animals on the verge of extinction. The study said that a group of human activities such as deforestation and overhunting, pushed about 500 mammals, birds, reptiles and amphibians to the edge of extinction. The study confirmed the existence of evidence that the world is witnessing the sixth wave of mass extinction. : «We have entered into the sixth wave of mass extinction and that the extinction crisis is very bad and what we will do between the next fifty years is what will determine the future of humanity», said Professor Gerardo Ceballos of the Mexican National University in Mexico City, stressing that regional environmental systems are facing collapse.

» The World loses 10 Million Hectares of Forest Every Year

A new UN report recorded an improvement in the world's loss of forest areas, which previously lost about 16 million hectares (39.5 billion acres) each year, but since 2015 it has lost about 10 million hectares (24.7 billion acres) only. This situation, while improving, still calls for more rapid action to protect forest biological diversity. The report issued by the Food and Agriculture Organization (FAO) on May 22, on the occasion of the International Day for Biological Diversity, highlighted the importance of forest preservation. Although forests occupy only 31% of the land area, they incubate most of the planet's biological diversity, as they contain 60 thousand tree species, 80% of amphibians, 75% of bird species and 68% of mammal species in the world. «Deforestation and forest degradation are continuing at alarming rates, which contribute significantly to the loss of biological diversity.» said FAO Director-General Kyoichi Saito in the introduction of the report.



Environmental Vocabulary

Medicine Dining

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The mountain environment is home to a lot of biodiversity because of its environmental privacy and the abundance of life factors for wildlife, such as food, drink, protection and distance from human communities. Their diversity is not only for plants, wildlife, etc., but also to birds that have the freedom to move to large distances to choose the right environment and their preferred place. What makes some bird species love mountains and settle them away from human gatherings, doesn't that invite us to meditate and think!?

This bird has very strong audio-visual senses, which it uses as sensors that help it to be very careful, especially from humans. It is very active in the morning as well as at the end of the day. It prefers to run than flying, perhaps because of its full body that weighs about 450 g and its length up to 34 cm, but it does not hesitate to fly when is faced by danger. When it spread its wings to the sky, and touch the air makes sounds like bird whistling. This bird does not like to be alone but lives in small groups that communicate with each other by releasing loud and disturbing sounds. Most of its body is covered with gray brown feathers that help it camouflage due to proximity to the color of the rocks. Its tail is short and the red color dominates its legs and beak. The black lines above the male's eye have earned it a better beauty than the female, so they can be distinguished. This beautiful bird is environmentally friendly as it feeds on harmful insects in agricultural crops.

During March and April, the female lays about 20 eggs hidden in a hole between rocks and covers them with herbs and tree remains, and then hatches after about twenty-five days during which the male is guarding them. After hatching, the colour of the Chicks is completely brown, where it is difficult to recognize them on the rocks because all carry the same colour. Two weeks later they can start a new life and rely on them self to eat and fly until they reach the end of life cycle for about ten years.

One of the qualities that makes this bird has a special advantage is its small eggs that dotted with brown and red, which contains a high nutritional value that exceeds chicken eggs almost four times. In addition, It is free of allergens, and is suitable for children, the elderly and patients due to its easy digestion and contains high percentages of vitamins, antioxidants and minerals. This is make it qualified to be suitable for the treatment of many diseases.

The partridge (locally: Shaneh) is classified as endangered. Its demand from humans and animals continues to increase. The Arabian partridge that settles the Hajar Mountains and the Dhofar mountains is an important icon to this environment. We are afraid to wake up one day and find this bird only in the virtual world if the protection and awareness programs do not expand to save and preserve it.

Personal Hygiene

I wash my hands frequently



I brush my teeth twice a day



I cover my nose when sneezing



I keep my place clean

