



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

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Sultanate of Oman
Diwan of Royal Court

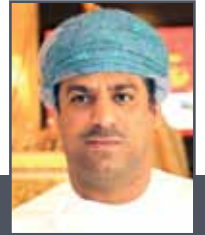
Issue 33

Rogue Plant

won the first place in
Globe program



high fertilization capability
and saline absorption
of water and soil



point of view

Glaring Environment

Dr. Dawood Sulaiman Al Balushi
Editor-in-Chief

Our beloved country Oman has made massive achievements in the area of environmental protection. This has been bright side of this country ever since the beginning of the Blessed Renaissance led by His Majesty Sultan Qaboos bin Said. His Majesty, the Sultan has given environment extraordinary importance since very early days. His Majesty, the Sultan, has made environment one of the most important axis of this modern state, with all its geographical, cultural, political, social and developmental components.

This month we are celebrating National Day on July 23. We feel proud of all the achievements we have made in the area of environment and which has taken us among the top ranking countries in the area. The Sultanate of Oman is the first Arab country to set up a Council for Conservation of Environment and Prevention of Pollution in 1979 under the chairmanship of His Majesty himself. The Sultanate was also the first Arab country to establish a Ministry of Environment in 1984 as an initiative taken by His Majesty. This is because he started giving environment priority before any Arab country could even think about. The Sultan Qaboos Prize for Environmental Preservation was also set up for which His Majesty himself made donations to UNESCO during its visit in 1989. In addition to his, the Sultan gave a monetary prize in 2008 to the Human and Environmental Affairs Sector of the Secretariat General of the Gulf Cooperation Council. He also took special interest in establishment of natural reserves in the country. He issued royal decrees for legislations and laws to protect and preserve Omani environment. Oman ratified international environmental conventions and treaties also, and dedicated two years 2001 and 2002 for environment of Oman. There are also focus on ground environmental research, development of Omani human resources for the environment, and implementation of many projects, programs and activities to ensure the sustainable environmental development of the Sultanate.

When we talk about all these environmental achievements, we either feel proud of whatever we had done in the area in the Sultanate under the direct supervision of His Majesty the Sultan, or we remind ourselves how to protect these environmental achievements and take it forward. This is repetition of the call to inculcate the positive values of preserving Omani ecosystem and protection of its natural resources among our people and in all segments of our society. This is important to guarantee its survival for generations to come.

Whatever, achievements we have made in the area of environmental protection became possible only because of the bright ideas of the leader of our country and his interest in the local and international environmental issues.



(UNEP)

The Sultanate one of the most rich countries in biodiversity

AIROBI: The United Nations Environment Programme (UNEP) has described the Sultanate as a “unique world of imagination and nature” because of its rich elements of beauty. Oman is endowed with a rich natural bounty, it said, referring to the country’s mountain ranges, valleys, plains, slopes and rocky hills. The coastal areas are home to green turtles, red sharks, dolphins, whales and predatory birds such as the Egyptian eagle and the golden eagle. The Sultanate has 99 endangered species of mammals, such as The Orxx, The Arabian Leopard, the Arabian Tahr, the Red Fox, the Gazalle and the Rabbits that live in the valleys and the mountains. Also in the province of Dhofar are rodents, wolves, blue lizards, water snakes, Arab frogs and bats living in caves. said the report.



The reserves of Ras al Hadd, Ras al Jinz and Masirah Island are considered one of the largest where green turtles nest, it said. It has 30 sq km of coral reefs, making it a fertile ground for plants and millions of migratory sea birds. The UNEP said the Sultanate has rich desert landscapes ranging from the golden sand dunes in the east, Jeddah al Harasis in the centre and the desert of Empty Quarter in the far south — a habitat for predators such as lynx, sand foxes and cats. Dhofar is one of the most-visited tourist destinations in the peninsula, it said, citing its natural scenery and its wide range of tropical fruits. The report said the Sultanate is home to 1,212 species of plants. In the past ten years, it has developed the Oman Botanic Garden, the largest database documented in the Arabian Peninsula, including 1,407 documented species.

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▶ **Lead to anxiety, tension
and mood swings**

Prepared by Saeed Al-Rashdi:

Noise

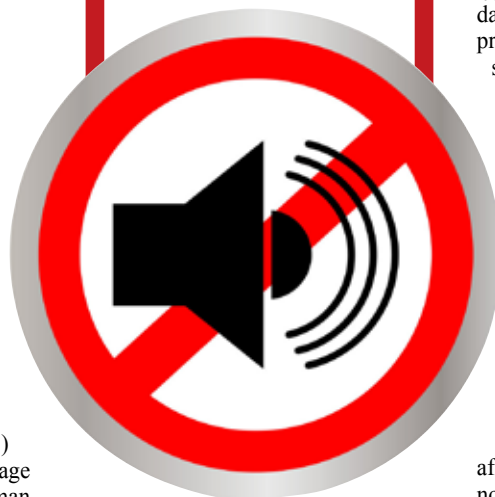
One of the most dangerous types of environmental pollution in modern times



■ **Noise is one of the most dangerous types of environmental pollution on human health and most prevalent in the current era, because the spread made it a matter of ordinary and insignificant does not pay attention mechanism, where noise pollution entered with the modern human civilization greatly and because of the entry of many devices and technologies that made life easier to human.**

Definition
Noise is defined as a group of heterogeneous interlocking sounds, exceeding their normal range to become harmless to the ear and to human health in general. The noise is measured by the unit of sound intensity measurement (dB) and for approximation of the image to the decibel units. In the human rest period the intensity of the sound must be less than 25 decibels, while the intensity of the dialogue between two people is within 60 decibels and up to 70 decibels in the case of traffic

Studies confirm that 60% of young people are at risk of hearing loss at an early age



congestion and a household vacuum cleaner. It may also reach 90 dB in the case of a hair dryer while up to 120 dB in the case of jet aircraft. In general, a person's ability to concentrate is less than 65 decibels, but if it exceeds 85, it is considered bad for human health, while the pain threshold starts at 140 decibels.

Environmental Acoustics

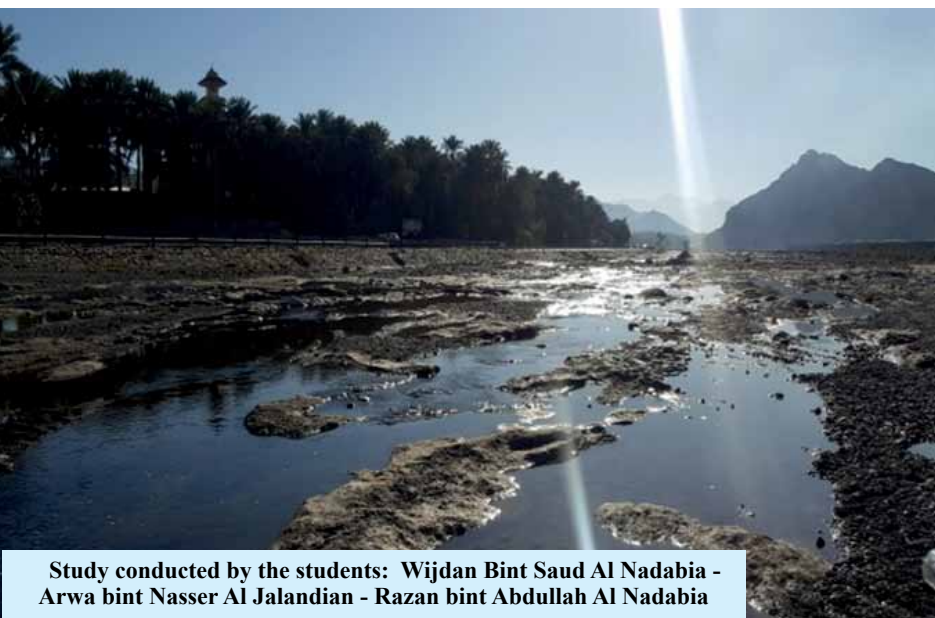
There is a science called environmental acoustics that controls noise pollution around humans. In the recent period, this type of pollution is one of the most dangerous types of pollution to the prevalence of frequent and multiple seizures, where scientific reports indicate that 60% of young people at risk of hearing loss at an early age, and studies have noted the high complaints of tinnitus and damage to internal ear tissue (cochlea) This usually occurs after exposure to an intensity of 85 active continuously, as indicated by the National Institute of Health in the United States. In general, the small blood vessels within the human body begin to contract after three seconds of exposure to noise for the flow of hormones such as (adrenaline and cortisol) and decrease the amount of water inside and need to 5 minutes to return to normal after the cessation of the external effect. The World Health

Organization (WHO) reports that there is a link between continuous exposure to a sound intensity of more than 70 decibels in 1999, which is closely related to high blood pressure. The presence of such hormones continuously in the human body leads to anxiety, tension and mood swings. In France, a study of psychiatric patients confirmed that 20 percent of them were victims of noise pollution. The findings coincided with a study in the United States of a group of schoolchildren living near Los Angeles airport where they found they were suffering from higher blood pressure and slower solving mathematical issues.

Solutions

As part of the solutions, some environmental organizations pointed to the need to take into account the issue of noise pollution in the process of urban planning, for example land distribution on areas interspersed with gardens to break the noise and distance schools and hospitals from airports and railways and busy streets and reduce the use of car horns in the evening and the construction of airports outside the cities gatherings With residential aircraft use less noise possible. At the individual and family level, choosing a home location, using soundproofing, and allocating certain days to the family to enjoy calm and restore balance is required.

Omani scientific study opens way for its environmental benefit



Study conducted by the students: Wijdan Bint Saud Al Nadabia - Arwa bint Nasser Al Jalandian - Razan bint Abdullah Al Nadabia

Rogue Plant

won the first place in Globe program high fertilization capability and saline absorption of water and soil

- **A group of Omani students carried out a scientific study of the effectiveness of the use of rogue (reeds) in fertilisation of plants. The study has tracked the effect of reeds on water and soil on which it grows. The study achieved the first place in the Globe international environment program. The study proved effectiveness of plant in fertilization of plants, and its positive ability to absorb salinity from water and soil. The study recommends benefitting from the Rogue plants for fertilization of plants, and to explore other possible environmental use of it.**



Reasons:
Rogue (reed or jungle) is the genus of a herb, belonging to the *Nigella* species. Its scientific name is *Phragmites australis*, which has been widely seen in the wadis of wilayat Samail, particularly in the area where water stays for a long time. Previous studies have shown that the spread of this plant to this level was an environmental problem, because of its ability to absorb water. Its spread was considered to cause weakness in the ground water resources. In view of the spread of this plant and its ability to absorb organic materials from soil, the study focussed on research about the effectiveness of its use in plant fertilization to increase growth rates, which in the future could become beneficial for the society and the environment. The researchers in their previous studies focussed on the environmental uses of the Rough (jungle) plant for the treatment and purification of sewage water, in addition to its use in feeding the animal such as sheep and cows. It contains 35% dry material, 12% raw

protein, 31% raw fiber, 1.2% fat.

Application:
This study was applied in wilayat Samail, where the Rough plant was dried and grinded to be used as fertilizer for tomato plants. The growth rates of tomato for which Rough fertilizer was used compared with the tomato plants for which usual organic fertilizer was used through land cover protocol. The water and soil protocol was also used to measure the properties of conductivity, salinity and acidity of the samples of water and soil from two different locations, one near the growth of the Rogue and the other away from it, and compare them.

The research was based on three main questions: How effective is the use of Rough or reed in plant fertilization? How are water characteristics affected by the growth of the Rogue compared with water in a distant location from it? How are the characteristics of the soil on which the Rogue grows compared to soil far away from it? Some relevant sources were also determined for the study



such as collecting information from the schools' educational resources centre, like encyclopedias and internet to access some articles as well as the protocols of the GLOBE program.

Tools and Approach:

The equipments and tools suitable for the work were identified. They were pH meter, salinity and conductivity measurement, metric bar, ruler, sensitive balance, distilled water, cups, moving tool, transparency tube, thermometer, GPS, paper, pen). This is in addition to collection of samples by using appropriate protocol activities (ground layer, water, soil) by cutting, drying, grinding and preparing them for fertilization. Then the tomato plants were planted on the same type of soil and irrigation was done with the same amount of water. These plants are divided into four sections, a section which was fertilised by Rough, the second which is fertilized with organic fertilizer, the third is mixed with the Rough and organic fertilizer and fourth without fertilizer, followed by observation of growth and recording of the data during three weeks as well as study of the characteristics of water, including its conductivity, transparency, Salinity and acidity on two places. One closer to the area where Rough plant grows and the other which is far from it. Similarly, the characteristics of soil including conductivity, salinity and acidity were studied where the Rough plants grow and soil is far from it.

Data collection:

Samples were taken from the study sites at the appropriate time and according to the specifications decided by the team. The working papers were designed, the growth data of the tomato plant was recorded every two days and the water was irrigated in equal quantities each time. Similarly, the data was collected and were organised in charts and were entered in the website www.GLOBE.gov. The data regarding the first question were collected by measuring the growth of the stem of the tomato plants grown according to the type of fertilization which was provided. The samples of tomato plant of the same species were selected and planted in the same soil type, given water in the same amount and divided into four sections according to the types of fertilisation. They are fertilization by Rough only, fertilization with organic fertilizers, fertilization by Rough mixed with organic fertilizers and without fertilization. Then the growth of all plants was measured and the ratio of growth of sample plants was assessed as well as data was collected about the characteristics of water including transparency, temperature, conductivity, salinity and acidity in two position in the wadi. One of them far from the area where Rough plant is found and the other is closer to the area where Rough plant is found. Then data is collected about the general properties, conductivity, salinity, acidity at two sites on the wadi, one of them is far from the presence of the Rough and the other from the soil on which the Rough grows on the wadi, and then comparing these data of the two places.

Results:

1. The results of the study indicated the effectiveness of the use of Rogue in fertilizing plants. The plant fertilized with Rogue recorded more growth rates during three weeks. It had a growth rate of 14.5 cm in three weeks, compared with a growth rate of 11 cm of tomato plant for which organic fertilizer was used. Then comes the plants for which Rogue and compost were used together. It had a growth of 10.2 cm. The plants which were not fertilised had the average ratio of growth of 5.5cms.

2. Results about water characteristics showed higher salinity, conductivity and acidity in the water sample at a wadi which was free of Rough plants. Here, water transparency was 110 cm below the sample near the Rogue.

3. The results about the soil characteristics at two different locations showed that wadis which did not have Rough plant had more salinity, conductivity and acidity. This is lower in the areas where Rough plants are found. It showed that the contribution of Rough in absorbing salinity, conductivity and acidity is seen in the ratio of acidity of the soil. These properties are found more in the land which is far from the Rough plants.

4. The ability of the Rough plant to absorb elements from soil and water gives a clear indication of the rich amount of elements which enters the structure of this plant. This encourages more investments and its use in the appropriate environmental purposes.

Recommendations:

These conclusions lead us to further research and investigation into the possibility of using the Rough plant for fertilisation of different types of plants.

It seeking new areas for the use of Rogue plants in other environmental uses.

We need to design appropriate equipments for drying and grinding process of the Rough plants, in addition to more innovations which will expand the overall utilization of this plant.

Sultanate celebrates World Day to Combat Desertification

The Sultanate of Oman celebrated World Day to Combat Desertification, observed every year on June 17, under the auspices of His Excellency Najib Bin Ali Al Rawas, Undersecretary of the Ministry of Environment and Climate Affairs. The theme of this year's celebration was «Land has real value.» It included a number of activities including lectures about the United Nations' Convention to Combat Desertification and the economic value of frankincense. A film «Desertification in the Sultanate of Oman» was also launched at the occasion. The activities were aimed at promoting wise investment of land for economic gain, avoiding unsustainable land use and agriculture, and excessive consumption of biological resources. Desertification is one of the most dangerous phenomena exposing the



planet to degradation and change in its ecosystem by loss of vegetation and biodiversity due to drought and unmanaged human activities, which in turn have a negative impact on the environment and human life on this planet. Therefore, it is important to give priority to fight desertification by implementing preventive

measures for lands which have not yet degraded or only slightly degraded. Therefore, degraded areas should not be neglected at all. Social participation is essential to combat desertification and drought. Special information and monitoring systems should be developed in the areas prone to desertification and drought.

The economic and social aspects of these ecosystems should take care. The Sultanate has given special attention to the phenomenon of desertification within the framework of its strategic vision regarding environmental conservation, preservation of nature, conservation of natural resources, arable and cultivable land and rational use of limited water resources. The protection of the quality of land and its sustainable management is wise investment of economic growth through which the earth's ecological and economic potential can be balanced. Land investment generates an economic return which requires participation of its users as producers and consumers by supporting the use of sustainable management techniques and consumption of organic products to encourage their production.

Qatar

Central Bank moving towards issuing green bonds

Dr R Sitaraman, chief executive officer of the Doha Bank (QCB), announced the efforts made by the Qatar Central Bank to issue green bonds and to increase cooperation with Qatar Development Bank for economic diversification through green financing activities as well as to support sustainable investment and creating incentives for financial and industrial companies to promote this type of financing. He made the announcement on the sidelines of the 20th World Climate and Climate Change Conference held in New Delhi. As part of its social responsibility, Doha Bank Group has embraced fair, open, efficient and consistent business practices to mitigate the impact of climate change and promote sustainable development.

Bahrain

Educational programs for summer festival visitors

The Supreme Council for the Environment of the Kingdom of Bahrain participated in the 10th Bahrain Summer Festival, which was launched by the Culture and Antiquities Authority to achieve all that is required to spread awareness and interest in the environment and nature of land and sea. It was also to showcase the real commitment of citizens and residents in protecting them in healthy environment. The council was present in the festival with a number of educational, awareness and entertainment programmes. The Environment Council participated in the activities of the camps situated near the Arrad Fort in Muharraq. It has offered a variety of competitions and environmental games which were combining entertainment and motivation of children to preserve the land and marine environment. There were three workshop organised everyday to educate children and young people about famous animals and organisms living in the Kingdom of Bahrain

Saudi Arabia

200 million \$ to support organic agriculture

The Ministry of Environment, Water and Agriculture in Saudi Arabia announced the Executive Action Plan for the Organic Agriculture Policy approved by the Council of Ministers recently. Ahmed Al-Ayda, Undersecretary of Agriculture, said an amount of 750 million Saudi Riyals (\$ 200 million) was allocated for the plan to develop mechanism which was approved by the council of economic and development affairs to be in line with the initiatives of the national transformation program. This would be a qualitative leap, and will be a link between what has been achieved in organic agriculture in Saudi Arabia over the years, and its long term development in future.

KUWAIT

Scientific Centre stops plastic of single use

During the world Environment Day, the Scientific Centre of the Kuwait Foundation for the Advancement of Sciences (KFAS) announced that it will get rid of plastic materials such as plastic bags and plastic bottles. The Scientific Centre has said that over the years it has faced many challenges and has made huge efforts in saving animals including those threatened with plastic pollution on the beaches of Kuwait. There are many examples of this, including water turtles which are unable to distinguish between plastic bags and jellyfish, which are food for them.

UAE

launches eco-tourism project

The Ministry of Climate Change and the Environment of the UAE has launched a large-scale project to develop ecotourism in the country, as reported by the Gulf Times newspaper. The project is aimed at attracting tourists to 43 nature reserves, which account for 14 percent of the total area of the UAE. These reserves include desert areas, as well as forests off the shallow waters on the coast. As part of the project, a portal and mobile application will be developed containing all information about reserves in the UAE. Advertising campaigns will also be launched abroad by diplomatic missions and the UAE airlines.



Innovation increases efficiency of solar batteries

Scientists at the Moscow Institute of Physical Technologies have concluded that organic molecules may form the basis for increasing the efficiency of solar batteries. Solar batteries typically use polycrystalline silicon. However, scientists are developing alternative engineering solutions using organic compounds and polymers with photovoltaic specifications. A group of Russian scientists, with the participation of an international team of experts, have discovered a method to increase the efficiency of organic solar batteries by adding fluorine atoms to polymer, improving its photovoltaic properties. The team published an article explaining the method in *Journal of Materials Chemistry*. Innovative technology has raised the efficiency of some models of photovoltaic converters (solar batteries) from 3.7 percent to 10.2 percent.



Environmental Vocabulary

Confident its step

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Its aesthetic qualities were well known and sung by the eloquent, and filled the poems of poets. Is this because of its beautiful shape, or slim body, or beauty of eyes, and the short length of ears! Was and remains a hearty table in the boards of literature, which was mentioned by manuscripts and books. The proverbial racket for women in beauty, the must lucky of which be described like its beauty. Both are lovable in human beings, their charm is in effect to the hearts. It is created to be beautiful, however why it lives deadly!

It lives in a vast space of sand, feeds from its grass, and breathes from its queer. The desert and the sands of its vast home, earning from them high running speed, and agility in the movement. Naturally, it does not jump like the Arabian gazelle, but runs in high speed from the occurrence of danger. From its hebetate derived its name, and from its beauty carved its qualities. It is called Sand Gazelle, and others described it as a Rim Gazelle. Each name derived according to different point of views. Rim Gazelle (Sand Gazelle) weighs about 25 kilograms and is larger than the Arabian Gazelle. It has a short tail, and two short ears. The male features two horns that are not found in the female. The length of the horn reaches 26 cm and is decorated with 24 circular rings. The desert gave it a light colour that distinguishes it from the Arabian Gazelle that has a darker colour. Its black eyes surround with white spots like an eyeliner that gave it exquisite and breathtaking beauty.

A female Rim Gazelle gives birth to a twin after a pregnancy of six months. Rim Gazelles live in large groups of up to 100 heads, giving it a lot of opportunity for mating and reproduce. Despite its existence in Oman, the Arabian Gulf, Iraq, Jordan and Syria, the people's love on it has helped to decrease its number. Many factors have decimated the Sand Gazelle, such as lack of food due to lack of rain, and the high demand for it by humans and predators. It is a delicious meal in the mouths of them. As a result, the Omani desert became dry from it with a little exception and has lost an important component at a glance.

In order not to lose its species, some authorities are breeding them in captives, where they are in satisfactory numbers, but these numbers are not enough to be released into the wilderness. If so, they may face the same condition in the absence of protection. The situation requires to breed and protect them as an urgent case. Rim Gazelle or Sand Gazelle its nature hebetate in an open space with a wide range of air in which it moves freely with a confident step, without noise or bustle. Place, animal and human are triple twin in the womb of the environment, sharing a life and destiny.

Create a shield to protect birds from the noise of a high-speed train

The high-speed railway began operating on Sunday in Guangdong Province without affecting the lives of tens of thousands of birds near the track. The 357-kilometer-long railway links Jiangmen and Zhanjiang in Guangdong, only 800 meters from the home of more than 30,000 heron birds in the Shenghui district of Jiangmen. To avoid disturbing the birds, a vaulted shield was placed to cover a 2036-meter section near the birds' habitat, which consists of several islands covered with banyan trees.



Hybrid laboratory embryos to save white rhino

Scientists have created hybrid embryos from the sperm of near-extinct white rhinoceroses in the laboratory, hoping they can ultimately help save the species. Northern white rhinoceros are the most endangered mammals on earth, leaving only a mother and daughter living in Kenya's Bijita Reserve. The researchers collected about 300 milliliters of semen from the last four male rhinoceros before they died, saying they were large in quantity but very low in quality. After using some of that amount to carry out in vitro fertilization of eggs taken from their closest relatives, the Southern White Rhino, researchers hope to use the same technique to synthesize a pure white single-horn embryo using female eggs. The embryo can then be implanted into an alternative mother. «We hope the birth of the first (northern white) single within three years,» said Thomas Hildebrand of the Leibniz Institute for Animal and Wildlife Research in Germany.

Discover coldest place on earth

A recent study by scientists from the National Centre for Snow and Ice Data at the University of Colorado found that the coldest place on earth was colder than previously thought. The researchers discovered small wadis near the upper part of Antarctica's ice sheet, where temperatures reach almost 100 degrees Celsius below zero in the winter. The results could change researchers' understanding of how the earth's surface is exposed to low temperatures. The researchers used satellite data between 2004 and 2016 to reach a temperature of 100 degrees below zero, as the eastern plateau of the Antarctic region is a barren area with no surface weather measuring instruments available. The researchers found that small wadis in the Antarctic ice sheet has lowest temperatures.



Cleaning the beaches

By: Iftikhar Al Badawi



Students were surprised when they saw piles of trash on the beach.



Then they decided to launch a cleaning campaign for the beach So that they can enjoy playing and relaxing on the beach



God has given us beautiful beaches which is delight for the eyes of the beholder. They must be preserved and one should not throw trash on it. This is because it is likely to be driven by the waves into the sea and harm the marine life of coral reefs and other organisms. Particularly, when the plastic bags accumulate on the beaches, it makes difficult for the small turtles to reach to the sea. If these plastic bags reaches to sea, turtles eat them thinking that they are jellyfish

