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**SEA POLLUTION CAUSED BY THE ROTATION OF AIR POLLUTANTS IN  
COASTAL AREAS OF PERSIAN GULF**

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**ABSTRACT**

Coastal areas due to its special position are as the source of oil and gas resources as well as the source of sea water that are used in refinery and petrochemical processes, and these areas are the sources of different types of pollutants, such as gas, air and soil in the bed and the marine environment. These pollutants include hydrocarbons, NOX, SOX and sometimes include other useless pollutant gases that sometimes enter to the sea through municipal and industrial wastewater and sometimes through contaminated air, and raining "pollutant acidic raining". The spread of these pollutants in coastal areas are different with the local non-coastal areas due to local sea breeze and land. The interaction of synoptic winds and local breezes in the non-coastal areas is different. The interaction of synoptic winds and local breezes are effective in its spread. The sea breeze can turn pollutants that are the source of water pollution in the air is guided into the sea and cause pollution of the sea. Time of pollution differs from the time of spread. Earth's rotation and acceleration of its Creolist affect on the movement and location of the sea pollution.

On the other hand the increase in population, growing urbanization, the development of industrial activities and changing consumption patterns makes millions yearly industrial waste produced in the country and out of the cycle. The waste then through a network of domestic and industrial sewage and sometimes through the waste gas pollutants from smoke large industrial plants in coastal cities, as well as smoke from combustion of

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waste materials and air pollution as well as pollution of cars and combustion engines can pollute air and water through rainfall, And on the other hand the impact of such pollutants in the air can be seen in the architecture of the south coast port cities. In this article, we have tried to study the pollution of the Persian Gulf through airborne pollutants, descriptive and analytic is used in this research to examine the causes of marine pollution of Persian Gulf through the air pollutants. The necessity to study due to the lives of people and animals in the Persian Gulf is an inevitable.

**Keyword: pollution of the sea, turning pollutants, air, architecture, coastal areas**

## INTRODUCTION

Coastal habitats, due to the large land and marine ecosystems in the interface between the two, are influenced by the environment. Therefore, as one of the areas considered sensitive. Industrial activities, agriculture and urban wastewater and air pollutants are among the factors affecting the quality of coastal habitations in the world. Therefore, compared to other parts of the coastal areas most affected by the risks of pollution and the pollutants are carried include assessing the quality of these habitats is important to enjoy. The air pollution caused by contaminants in the coastal strip of three important aspects Freshwater pollution of rivers go to the sea and the sea pollution comes from rainfall And pollutants in the river bed and banks of sea plays of the soil contamination that creates a variety of carcinogens and skin diseases as well as the contamination of human and animal

life that live in this environment is the canvas. (Blanchet *et al.* 2008)

Due to its coastal location and source of oil and gas resources of the sea water used in refinery and petrochemical processes, the role of different types of gas pollutants. These pollutants include hydrocarbons, NOX, SOX and sometimes include other pollutant gases in the complex is unusable. Elevated Fellers or ground, depending on the direction of emission of these pollutants and burn them (Which in turn generate new pollutants) to high altitudes are designed and used. ". The spread of these pollutants in coastal areas are different with the local non-coastal areas due to local sea breeze and land. The interaction of synoptic winds and local breezes in the non-coastal areas is different. The interaction of synoptic winds and local breezes are effective in its spread. The sea breeze can turn pollutants that are the source of water pollution in the air is

guided into the sea and cause pollution of the sea. Time of pollution differs from the time of spread. Earth's rotation and acceleration of its Creolist have effect on the movement and location of the sea pollution. Industrial development and rapid population growth due to increased supplies and thus increasing the solid waste of the topics the recent crisis has created enormous human societies. Especially the collection and disposal of these materials in most developing countries is not advanced enough so that overproduction waste (waste) is significant for human problems. So that statistics show an average daily production of 3.5 million tons of waste in the world that can be a source of abundance is beneficial or harmful (Omrani, 2005: 14).

On the other hand it should be kept in mind that the weather conditions along with other environmental factors are the most important factors in the formation and development of cities and urban survival. In fact, cities, urban elements and their functions that are affected by weather before the generation of megalopolises and big cities almost one-sided and cities have effects on climate also and climate change have created micro-climate in a way that is specific to a territory called "micro Klima city", and

the study entitled "The climate of the city" has been raised and the environment and climate in the coastal villages and towns south of architecture has a great impact (Dennis J.Gayle, 2007).

### **The Necessity for Research**

The marine environment as it is made up of different elements is vulnerable against the external substances that come to the sea intentionally or unintentionally. Near the coast of biodiversity is more significant because it has been enriched foods that are dumped into the sea by rivers that these materials are not the results of human activities. The area of Persian Gulf is 237, 473 square kilometers, and it is the third largest in the world after the Mexico Gulf and St. Hudson Gulf. Persian Gulf joins to the Strait of Hormuz and the Sea of Oman, the East Indian Ocean, the Arabian Sea, and the West River delta Arvand River, the Tigris and Euphrates rivers that link and join the Karun River. Iran, Oman, Iraq, Saudi Arabia, Kuwait, United Arab Emirates, Qatar, and Bahrain are around the Persian Gulf. The southern coast of the Persian Gulf are totally in the political geography of Iran because of oil and gas resources in the Persian Gulf and its beaches, the waterway at the international level is regarded as the important and strategic region. In the past,

people used that only to fish or for communication. Today, according to its touristic view residents of other cities travel there, and it is used in winter. Physical and chemical tests conducted on water samples from different parts of the sea show that in general the Persian Gulf sea water is choler sodic with relatively stable combination over the years and different regions. Evaluation of microbiological contamination of sea water in different parts show that the water is pollutant due to the large oil and gas refineries, industries related petroleum, domestic, industrial, agricultural waste, and pollutants in the air are the important factors in the contamination of coastal beach Sea and the Persian Gulf. The pollution in the Persian Gulf coast in recent years has increased due to the pollutants from large oil and gas refineries, industries related petroleum, domestic, industrial, agricultural waste, and pollutants in the air such as greenhouse and toxic gases of the smoke from factories, workshops, motor vehicle combustion and smoke from vehicles. Harmful effects of environmental deterioration in the Persian Gulf shouldn't be ignored, as the Persian Gulf coast has important oil capabilities. Iran's southern coasts where

are separated by the Zagros mountains from the Central Plateau are hot and humid climate. This area includes a narrow strip of the northern coast of the Persian Gulf and Oman Sea from the Arvand River in the south to gulf goiter in the southeastern Sistan-Baluchistan province, which is called "gates of hell" due to the hot weather. The feature of this area is hot and humid summers and mild winters, except for limited palm groves and fields, the region is generally devoid of vegetation. In these areas, the maximum temperature in summer is 35 to 40 ° C and a maximum relative humidity is 70 percent, in these areas, difference in the temperature of land surface and sea level rise the breeze of sea and the land, and other characteristics of this area is the high intensity of sunlight in the humid climate of the region that causes the boldness and eye injuries, as the cloudy and milky sky, high brightness light due to the sunshine hurt the eyes and in clear air and wasteland, the reflected light of ground is maximum, Bandar Abbas, Jask, Abadan and Ahvaz, are the cities of climate. These areas are different in the heat and humidity and rainfall because of the distance from the sea. For example, there is more regular rainfall on the coast of Persian Gulf and Oman Sea that are affected by the monsoon of the Indian

Ocean, irregular rainfall and frequent droughts are the features of this region. Throughout the coastal region, especially on the side of Iran, a large number of people live by fishing. The beaches attract tourists from different parts of the sea. But due to severe pollution which is spreading, the countries of the Persian Gulf (Iran, Oman, Iraq, Saudi Arabia, Kuwait, United Arab Emirates, Qatar and Bahrain) are hardly able to utilize the resources of the sea that each of these resources are helpful for development. Then, according to the mentioned cases, studying about this issue is necessary, as the pollutants in the coastal areas create a movement and the pollution is growing, daily (Hashemi, Seyyed Yousuf, 2011: 105).

### **RESEARCH METHOD**

Since the coastal strip of Persian Gulf includes 30 cities and islands in the south of Iran in its Bank, and because the air pollutants through the crowd, large deposits of oil and gas and petrochemical industries and factories, machine tools and other places are larger than the other places, according to the climate condition such as: reducing the temperature, protecting the building against sunlight by creating maximum air flow and use of natural ventilation, we can do this research by analytic-descriptive method,

analyzing the air pollutants, coastal pollution, and their effect on the construction of the coastal cities; and we can also analyze the factors of the air pollution and their effect on the coastal areas of Persian Gulf. The available documents, library studies, and the documents of organizations and related offices are used in this research.

### **The Studied Area in Research**

Persian Gulf is a waterway along the Oman Sea and between Iran and Arabian Peninsula. The watery zone with an area of over 237,473 square kilometers that the total area of the northern coast is located in coast of Iran. Persian Gulf in the south of Iran preserve the environmental condition of the southern regions. There are the big cities with 220 sources of pollution in the coastal areas of Persian Gulf, and Iran with the most volume of industries is damaged by the pollutants, and it has the large volume of gas and oil resources. The main factor of the importance of Persian Gulf is the existence of gas and oil resources in the bed of coasts, as it is called "the resource of oil in the world". Persian Gulf is the 3 channel of transiting oil in Iran, Iraq, Kuwait, Saudi Arabia, and UAE; so it is regarded as the important and strategic region. About 30 percent of oil in the world is supplied by Persian Gulf that

this amount sometimes decrease or increase. The produced oil in Persian Gulf should be transmitted by this path and Strait of Hormuz to the world. Persian Gulf in terms of oil resources compared to the rest of the world has many advantages, such as ease of extraction, low cost production, surplus production capacity, and high quality of crude oil, ease of transportation, the production of new oil wells and the possibility of discovery of large resources in the region. According to the recent estimates, Persian Gulf has 730 billion barrels oil and more than 70 trillion cubic meters natural gas. Also, there are important ports around the Persian Gulf such as Bandar Abbas, Bushehr, Bandar Lengeh, Kish and Bandar Mahshahr Khorramshahr in Iran and Sharjah, Dubai and Abu Dhabi in the United Arab Emirates and the port of Basra and Faw Arabic in Iraq (Consulting Engineers Herampi, 2006, 214).

### **Important Factors of Pollution in the Persian Gulf Coasts**

A variety of environmental factors affect the Persian Gulf that each of them can somehow cause erosion, and finally, the possibility of exploitation of sea resources away from the public or make costly to do so. Some of these factors are related and lead to steps which ultimately

could interfere with the objectives and interests of the countries in this area and prevent to implement them. According to the head of the environment in coastal cities, entering 100 percent of sewage to the sea without treatment cause to the accumulation of sewage and pollution in ecosystems and the uncontrolled growth of algae and consequently the reduction of oxygen and therefore it will be the death of plants and animals. This despite the fact that nature can defend itself against a certain level of contamination. But when human activity increases the rate of infection and a special loading ports on the beach as well as huge oil and gas refineries and related facilities in the Persian Gulf as the most polluted beach is known and at the same time prevent the natural cleansing process, and the environmental disaster begins. As the largest investor in the oil industry, generates Tangzshouroun that environmental degradation caused by the accumulation of millions of tons of sulfur condemned in the Persian Gulf. In addition to these differences, the peripheral countries of the Gulf face as a more important issue that is pollution that eight countries contribute to its existence. Pollutions of Persian Gulf include oil, pesticides, agricultural pesticides, heavy metals and sewage

pollution of the sea in the Persian Gulf, Iran contributes to this pollution much lower than in neighboring countries, and about 12%, but with the closure of the Persian Gulf, all the pollutants remain.

### **6 Factors of the Marine Pollutions**

1. Pollution by land based sources, sewage, waste of factories, domestic and heavy industries,
2. Pollution by drilling in the sea during drilling the oil and gas wells
3. Pollution by Dumping of toxic wastes and discharge of atomic---
4. Pollution from tanker ships,
5. Pollution of the atmosphere, and pollutants in the air
6. Drilling and exploration in the deep sea bed (National Conference of Environmental Health, Hamadan. 2011).

In this study according to the title of research, most of the pollutants and their effects on coastal areas of Iran are considered. So that the important factors of the climate effects and weather cycles and pollution should be evaluated:

The effects of pollutants that are in the atmosphere on the coastal areas of the Persian Gulf through the airflow:

A) Sea breeze, drought: coastal areas and the sea winds often represents the change of direction from day to night. Breeze of drought is wind that blows from land to sea during the night that is due to the cooling of the Earth's and heat loss during the night that the earth gets cold sooner than water. Therefore, the warm earth gets cold sooner than the water, and the air of the land also gets colder and heavier. Finally, the airflow starts from the land to sea. So, in terms of air pollution if a power plant or factory and motor vehicles are established in the coastal areas, their stack emission due to the breeze during the day can spread over the surface and sometimes create the smoke at ground surface. On the other hand, during the night due to the loss of heat radiation from the Earth's night pollution formed is gradually. So the construction of industries should be prevented in the thermal inversion, which there is stable air masses.

If the sides of the sea if breeze brings pollutants into the city, factories and industries are dangerous such as coastal areas of Bushehr and Chabahar that is completely obvious.

B) Mountain breeze - the sea: this kind of winds is in mountainous regions close to the beach. During the daily warming the

marine areas get relatively "higher than the mountains, the warm air of sea in the sunshine climb to the slope of the mountains. Such a move from the air to the bottom of the sea, is called sea breeze. The air areas during the night on the mountain slopes due to contact with the slope surface (surface air) faster than the surrounding air and particularly "air cooled sea, and the air flows along the slopes of the mountains to the sea, which is called mountain Breeze. Mountain breeze of the sea breeze is more severe and topography of strong mountain breeze may affect quality. In terms of air pollution, inversion in the sea with Steep Mountain, especially at sea, where cold air accumulates be mild or severe intensity is formed unless the winds blow. If the possibility of accumulation of pollutants in the bottom of the sea to the mountain breeze, the slope of the mountain and the sea Breeze, especially on slopes facing the sun, where the pollutants are almost "200 meters of the sun rising behind them is scattered. Because it is the hottest range of air movement. (Watson, Donald 1388,28).

C- The status of building: The characteristics of the grounds of near the chimney and the establishment of chimney of factories and other industries, as well as non-uniform height of

buildings to the height and location of the chimney on the side action (mass) smoke affect the production of mechanical turbulence. The chimney is in a position behind a hill or buildings may outputs of chimney (pollutants) move downward and may smoke to rise above the chimney. If the speed of flue gas is equal to or less than the speed of air, the pollutants are carried down to the back of the chimney. In general, to prevent the accumulation of pollutants in the downstream near the chimney height should be equal to or greater than 2.5 times the height of surrounding buildings. This is due to the high volume of construction in the Persian Gulf coastal areas and high traffic of vehicles is noteworthy because the influx of buildings and road along the coast could have a significant impact on air pollution (ibid, 31).

#### **Confusion or atmospheric turbulence and dispersion of smoke in the air and beaches:**

1- Thermal turbulence (vertical movement of air): This type of vertical flows caused by the warming of the earth's surface caused sometimes by passing air mass is relatively "cold on land or sea can be seen warming. The boiling clouds of shifting the vertical height of the cloud is formed in the latent

heat is released and this energy creates small-scale upward and downward movements; in hot and dry areas, humidity of the atmosphere may not be enough to form clouds. Aircraft may be affected by thermal agitation in which case the region of the atmosphere known as bubbling or bumpy. In some areas of the desert, its effects may cause to sand storms or dust.

2 - Mechanical turbulence or friction this type of atmospheric turbulence is created in the airflow on the surface ruggedness such as buildings, trees, hills, etc.

#### **Distribution of smoke and columns of smoke:**

Depending on atmospheric conditions and the behavior of the plume of smoke can be seen to 6 as follows.

1. Looping movement: The column of smoke in the case adiabatic occurs (Super-adiabatic). The movement of the plume of smoke can be usually seen "on sunny days with clear air and when the wind speed is low to the ground. In large-scale, wind can be seen as a thermal vines that these kinds of winds of the plume of smoke flow for a short time on the surface of ground and causes to increase the pollution near the surface around the chimney in real time and temporary.

2- Coning movement: This type of column is formed less than the adiabatic plume of smoke in the near neutral conditions. The speed of wind is moderate to severe and the sky is covered by clouds at night or day. Major portion of pollutants of the chimney reach the earth before reaching the surface from a relatively "round.

3- Fanning movement: It is created in the stable atmosphere, when surface inversion occurs. Stability of atmosphere due to surface inversion prevents the vertical mixing of air, but the horizontal mixing occurs. The tall chimneys weather conditions is significant because the concentrations of pollutants at ground level are minimal in this case. Plume of smoke can be seen in parallel with the ground. Smoke may often occur in high in the early morning and night and in all seasons.

4- Lofting movement: If the inversion occurs in the lower part of the plume of smoke and fumes downstream mixing of pollutants are dispersed upward. In such circumstances, the tip top inversion acts as a barrier to the movement of pollutants to the surface of the earth. This type of movement is the most desirable for the dispersion of smoke. Because it prevents the movement and accumulation of pollutants into the ground.

5- Fumigation: This occurs when a stable layer of air at the top of chimney, as well as a layer of underneath air is unstable. Unstable layer of air causes the emission of mixed and pushed to the ground, resulting in a mass. Usually "This condition lasts about 30 minutes. Peristaltic is more common in summer.

6- Trapping movement: When there is an inversion layer down and a layer above the plume of smoke, this condition happens. In such circumstances pollutants spread is related to instability that is between two layers of inversion. This inversion of remission may occur in a few days. This mode (held) is one of the worst forms plume of smoke (Hashemi, Seyed Yousuf 2011, 89).

#### **Characteristics of Pollutants:**

The prevalence and severity of air pollution depends on the type and amount of pollutants, these pollutants are solid, liquid and gas, and may be caused by radioactive materials or a contamination of pollutants. The reaction of pollutants in the air can increase or decrease the amount of air pollution which in turn depends on the characteristics and nature of the pollutants. The effects of air pollution into the atmosphere and the way their spread. The source of this pollution can be point, line, area or

continuous and instantaneous. Spread pollutants from their source depends on the type of pollutants released into the atmosphere.

#### **Factors affecting the operation of air pollutants damage due to water vapor on the shores of the Persian Gulf:**

1. Moisture: moisture greatly contribute to corrosion. For example, the presence of sulfur dioxide and particles by increasing moisture in the atmosphere increases the rate of corrosion.
2. Temperature: By influencing the speed of chemical reactions helps to destruction.
3. Sunlight: it causes to the photochemical reactions and produces products such as ozone and causes to damage the materials.
4. Air flow: the wind plays an important role in the spread of pollution from industry and an important factor in the deterioration of surfaces that are in contact with pollutants. The presence of pollutants with high speed winding increases the effects of abrasion, which may continue due to long distances.

#### **Acid rain pollutants from the air and sea pollution in the coast of the Persian Gulf:**

One of the implications of air pollution is acid rain. Acid rains are from sulfur dioxide emissions and nitrogen oxide that is created by the exhaust of cars and factories. These gases react in the

atmosphere with water vapor and acids like sulfuric acid and nitric acid form. One of the serious problems of the human environment in many parts of the world today is involved, is acid rain. Phenomena such as acidic fog and acid snow which descends from heaven. Rain gets acidic when PH level of the water is less than 5.6. The PH value represents the chemical equilibrium between carbon dioxide and the resulting solution of bicarbonate ( $\text{HCO}_3$ ) in pure water. Acid rain causes to harmful effects and acid in the air has a direct effects on the human's health. Also, it has negative effects on vegetation. Acid rain creates below gases below that are harmful to coastal life of humans, animals, and plants:

1- CO: reducing oxygen in the blood due to carbon monoxide affect "on the brain and the respiratory system and heart surgery.

2- Hydrocarbons: Hydrocarbons particularly methane hydrocarbons naturally present in air. Its source 'in the air is natural gas, coal, oil field and fire.

3- Ozone: ozone like sulfur dioxide irritates the respiratory tract. About  $\frac{3}{4}$  of inhaled ozone is destructed in upper respiratory system. Because it quickly reacts with organic materials. Ozone actually destroy the pulmonary macrophages, and causes thickening of

the pulmonary arteries, emphysema and heart disease.

4- Sulfur dioxide and nitrogen: About the effects of sulfur dioxide on human health below hygienic indicators can be used:

- Mortality rate higher than expected
- Incidence of diseases such as chronic bronchitis, emphysema, lung cancer, respiratory and digestive problems, eye and cardiovascular disease, the severity of symptoms of some illnesses such as runny nose, asthma, chronic lung disease and promote infection in some diseases like pneumonia

- Charges in various activities such as the reduction in the volume of pulmonary respiratory, respiratory tract resistance, blood gas exchange ratio, increasing respiratory activity

The origin of the gases and fine particles include fuel combustion from motor vehicles, power plants, industrial processes, particles from combustion heaters, etc., in the coastal areas. The origin of the coarse particles is generally "work of polishing and grinding operations are objects and storms (Herampi Consulting Engineers, 2006).

#### **Effective factors in the acidity of rain:**

Water never completely pure and has been added to the industrial development of the impurities. Natural impurities of

rain are mainly due to sea salts and gases and fumes caused by human activity are involved in the process of clouds. Forest fires are also factors that play a role in the acidity of rainwater. Biological processes, volcanic and human activities spread the atmospheric pollutants locally, regionally and globally in to the space.

#### **Air pollutants pollute the environment through raining by three ways:**

- Through air pollution, dumping of waste open air, especially in summer, and the dominance of anaerobic conditions at the bottom of this material result gases such as CO, SH<sub>2</sub>, CH<sub>4</sub>, 2 CO and more. In many materials, burning of waste or spontaneous fires cause gases such as CO, CO<sub>2</sub>, smoke particles in the air. Also, the combustion of plastic and chemical materials can produce in addition to the abovegases, result to produce a toxic chlorinated gas.
- Through polluted water: water is the main condition for survival in the world, the rate of population growth, improve of health and industrial developments in the world's increasingly limited water resources, that cause to pollution of water in the coast and sea by Alkaline and acidic rainfall. So, the water pollutants caused by the following:

A) Leakage to the groundwater and drinking water and raining on the beaches and the rivers

B) The spread of Alkaline and acidic materials in the soil of coast and washing it through water in beach

- Through soil pollution: acid rain through the rainfall on the coast and the land inject the large amounts of acidic pollutants in the air to the soil that these materials are completely harmful to plants and trees as well as human health and cause to the environmental crisis (the Ahrampoush. Farsad, M. Dehghani, 2005, 117).

#### **The ecological effects of acid rain pollutants on the environment of Persian Gulf coasts:**

The first kind of pollutants such as NO and SO<sub>2</sub> don't make the rain acidic, but these pollutants can be changed in to the second type of pollutants such as H<sub>2</sub>SO<sub>4</sub> and HNO<sub>3</sub> in some hours or some days that both can dissolve in water and are considered as the strong acids. In fact, all acidic powers in acid rain are due to these acids.

#### **The impact on aquatic ecosystems**

Acidic Gulfs are made of high concentration of hydrogen ions due to leaching of rocks. Acid and high concentrations of aluminum are the main cause of decrease in population of

fish. The combination of biological acidic Gulf is strongly changed and the proliferation of fish in waters containing high acid strength decreases. When PH is much lower than 5, some species survive and reproduce; in the last decades, environmental pollution has been a major challenge in the coastal areas.

Since 60 percent of the world's oil reserves are in the Persian Gulf, the construction of oil platforms and refineries complexes and around the Persian Gulf and in the oil, chemicals and wastewater into water pollution are important factors. One of the important factors in pollution of the Persian Gulf happened during the Iran-Iraq war, about 5.8 million barrels of oil released in water, firing the large volume of crude oil wells released the oil in the sea. Annually, Passing more than 10,000 vessels through Persian Gulf and Oman Sea that 75 percent of them related to transport of crude oil and petroleum products, and then, discharge waste such as water of engine washing, wastewater, ship ballast water, and several factors cause to pollution in the region that have significant effects on the environment. According to studies conducted annually about 1.5 million tons of oil into the Persian Gulf, and for this reason the International Maritime Organization

(IMO) declared this area as a special marine area in 2007. According to statistics, the level of pollution is more than the international average in the area (Shahbazi 52. 2008).

#### **The effects on plants and forests:**

One of the factors that negatively affect the environment of the Persian Gulf and the western cities is Arabic dust. Every year in the dry season "dust storm" blows from Iraq - Kuwait and Saudi Arabia to the north of the northern coast of the Persian Gulf and West Iran. This dust is harmful and may even sometimes close Tehran's life and business. Dust causes to flight of birds and animals and the type of life is damaged in the coast of Persian Gulf. The impact of acid rain on forest and agricultural products can hardly be determined. However, laboratory studies indicate that crops grown in acid rain show a different behavior. Some products have increased and some have decreased. Air pollution has bad effects on trees. Soil acidification destroy the foodstuffs. Acid rain falls in the forest, ozone and other oxidizing of air that the trees are exposed to them could adversely affect the trees and vegetation, and adverse effects when associated with drought, high temperatures, disease, etc., may dry the trees. High-altitude forests are the most affected by acid rain. Acid in fog and

dew are stronger because in fog and dew, water to dilute the acid is less. Deciduous trees that are damaged by acid rain, gradually lose their leaves from the top down and the majority of the dried leaves will not be renewed in the next spring (ibid, 129).

**Some of the important effects of acid rain that are noted by Fomaro in 1997:**

1. Harmful for humans: shortness of breath, bronchitis, pneumonia, influenza and the common cold
2. Deforestation: the shedding of leaves, roots degradation by bacteria, reduction of growth, reducing the levels of productivity, loss of life.
3. Dangerous for the Gulfs: death of hundreds of species
4. Accelerate the corrosion of materials: corrosion of vehicles and monuments

Most important organ that controls the gas absorption by plants is the amount of opening and closing of stomata. When the aperture is closed to a high rate, absorption is maximum, and vice versa. Consequently, the conditions that increase the gas absorption (e.g. CO<sub>2</sub> for photosynthesis) makes the plant susceptible to absorb some of the pollutants. A condition which causes to open the plant stomata as light intensity, especially during the morning hours, high

relative humidity, sufficient moisture for root and temperature.

**The effects of pollutants on animals:**

Severe weight loss, reducing body resistance, loss of appetite, and paralysis and etc. fluoride in acid rain is accumulated in long-term in the bodies of animals and continues in bone calcification. Spot on dent of animal is symptom of chronic fluorosis. On the other hand, this rain is harmful for fish and cause to immigrate of fish that are caught. Humans and animals, particularly gallinaceous that use this fish are at risk of various diseases (Qadiri Masoum, 2012, 87).

**Architecture coastal cities of "Persian Gulf" and the impact of pollutants on coastal buildings:**

Architects of southern areas of Iran after centuries practicing have found bitter experience how to recognize that type should be fit to live in different seasons strong and consistent climate, the best and most cost-effective and at the same time is the most resistant building materials against rain and scorching sun and torrential stifling humidity resistant.

Studying these issues, in fact, are the big part of successful tests in the Persian Gulf coastal people who have been there for thousands of years and we found that foundation of Iranian architectural

traditions in the Persian Gulf is compatible with the eternal history of the inhabitants of these areas; indigenous architects and tribal peoples over the centuries transferred great art traditions from generation to generation and these buildings have stronger and steadier materials. Not to interrupt the continuity of traditional architecture all at once instead continue in the way of more important and more beautiful local architecture and ethnic (Mahmud Mahdi, 2003, 52).

Powerful countrymen in the Persian Gulf region have found for centuries before the destruction of the natural (and exhausting warm air, rain and torrential monsoon moisture around too destructive) that for survival and supremacy of the problems must bring all appropriate climate and to counteract the devastating effects of these factors. Windward that is the most evolved invention of the architects in traditional areas is made as the most reliable means of hot air superiority and exclusive to these areas. Large buildings with multiple floors and large rooms and high ceilings with large windows and a small covered porch in the deep and hidden columns of the main characteristics of the traditional architecture of the Persian Gulf that by the combination of other factors led to

survival in these buildings, and viewers will wonder why the scorching rays of the sun does not shine during the heat wave directly "into the room and the location of dwellers of these buildings. We have found that the porch and deep columns are built in the Persian Gulf region "to avoid excessive sun exposure that this method is not common in other areas of Iran. Thick wall construction and major materials are made of gangue plaster that are covered that are covered with thick mortar plaster, and the most important use of thick walls in these areas is to prevent the infiltration of extreme heat and torrential rains. Because the intensity of the sun in the summer starts from 8 am onwards we can easily understand that local architects based on the philosophy and reason to build houses on four sides of its high-volume, long-term and large rooms have made the attempt, due to the humidity and heat, basement is not built in this buildings.

The height of the ceilings is more than 5 meters high on top of the mesh when the input window of the window there is a plaster mold decorated with beautiful geometric patterns; and one of the most valuable properties of such windows is cool airflow into the building. All buildings in the Persian Gulf have one or more deflector that much of the grueling

summer heat and cool the building is habitable. Usually the "wind in forms and different sizes are based upon the latest class or different classes. There is a bath in the big buildings apart from specific storage water, Sewage from the upper classes and mouth covered by duct leading to the first floor and out of the corner of the building and sprit to the sewer well. The entrance and the ports of interior rooms are generally "made of wood and often" carved wood doors and generally "a C or mesquite that are resistant to heat and humidity. In fact, the use of painted wood and netted areas of southern Iran is one of the major factors for beauty of buildings in the traditional architecture of the South (Babaei, F., 2010, 86.92).

#### **Architectural design in the hot and humid climate:**

Climatic architecture and sustainable architecture is a way to maintain or to minimize the cost to maintain favorable conditions and comfort of the interior of the building. Maintain thermal comfort, the temperature balance between the body and the environment caused by the climate is hot and humid climate design goals are the following:

- Reduce indoor air temperature
- protect the building from sunlight to create maximum ghosting

- protect buildings against flooding and heavy rains

- Use the air stream to create natural ventilation.

Shading and airflow are important factors in forming the urban fabric and structure of the building in this area. Creating a semi-dense in urban context, the relatively openrural context, the expansion of towns and coastal villages along the coast and the sea are characteristics of the urban fabric of the area (Babaei, F., 2010, 84).

#### **How air pollutants are involved in the destruction and destroy of buildings in the Persian Gulf:**

Oxides of sulfur and oxides of nitrogen in the air are gaseous pollutants which enter the air from fixed and mobile sources can be combined with humid of air, as well as sulfuric acid, nitric acid and residential are physically damaged monuments including bleaching, metal corrosion, dissolving marble, cement and other building materials combined with limestone and it is washed with calcium sulfate causes to beach and degradation of historic buildings. To prevent damage to historical buildings and other structures, these pollutants should be controlled in fixed and mobile sources. This control includes binary combustion, installation of control systems and

replacing fuels with low-sulfur fuels in mobile sources and combustion of fossil fuels, removing the sulfur from the fuel and replacing other energy sources is fixed.

**The mechanisms of destruction of buildings in the Persian Gulf through several factors:**

- 1 Scratch and abrasion on the outer body building
2. Cleaning of solid particles or liquid particles deposited on the surface of buildings according to building material
3. The chemical reaction with the material directly, for example, "Call SO<sub>2</sub> marble stone because it is white. Or hydrogen sulfide can be dark red or acid mists that will scratch and wear of metal surfaces.
4. Chemical reaction indirectly, for example by mass absorbed SO<sub>2</sub> is converted to sulfuric acid, which causes the loss of the leather.
5. Corrosion: Moisture in air pollutants in the atmospheric reactions accelerate corrosion of metals.

**Recommendations and Strategies**

In many countries, some requirements have accomplished to decrease the air pollution in the environment, while the scientists study the harmful effects of air pollution on plants, animals, the human life; the legislators have approved the

laws to control the decrease the pollutants, and teachers in schools and universities explain the effects of air pollution for the young. The first step for solving the air pollution problem is evaluation. The scholars analyze the air pollution and determine the standards for measuring the type and amount of dangerous pollutants. Next, some limitations should be determined. Then, we can start some steps to decrease the air pollution. Setting some legislations for some materials that spread in the air by the human activities, complete this aim. Many countries have some limitations for the spread of the pollutants of car and industries. This is accomplished by the organizations that monitor the environment. In United Nations, the plan of space management executes the patterns of biology in the world. In critical days, avoid to traffic in crowd regions. Try to use the public transportation in the interurban trips, especially in the cities near the coasts. Therefore, following points are offered in order to prevent the increase of the pollutants in the coasts.

- Identification of risk factors and the impact of pollutants on the fluctuation and development Architecture
- Land, body wall, and volume component in the development process

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should be capable of maintaining the exterior view of the old city buildings have against pollutants.

- The house of seeds and volumes of historical periods and the transfer of pollutants into the outer layers of applications and services

- The management of the oil and gas industry and related industries to reduce pollution refinery combustion industries close to beaches

- And a shift away from the shores of the Persian Gulf pollutant industries

- Lack of temporary storage of industrial solid waste and fire them due to high humidity coastal cities

- Optimization of the production process, improve data devices and the use of modern technology and materials to minimize waste volume reduction and recovery industry.

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- Optimization of the production process, improve data devices and the use of modern technology and materials to minimize waste volume reduction and recovery industry.

-Requiring industrial units to create the environment and environmental certification standard

-The use of environmental laws and penalties for polluting cars and factories and workshops, both pollutants in coastal cities

- Monitoring and control of vehicles and workshop and pollutant industries in the region

- The establishment of environmental management in coastal cities.

## REFERENCES

1. Hashemi, Seyed Yousuf, 2011, a set of environmental conditions, Sanei Shahmirzadi, printing, (pp. 6, 12, 13, 102 and 105)

2. Research and Development Design Consulting Engineers coast 20 kilometers from Bandar Abbas Herampi February 2006

3. Ahrampoush, M. Farsad M, Dehqani, Tafti A., Mozaian, M., 2005, system of collection, transport and disposal of industrial waste in the industrial city of Yazd, the Eighth National Conference of Environmental Health, Tehran.

4. Shahbazi, 2008, review of waste management in the industrial town of Sirjan, Master Thesis Environmental Management, University of Bandar Abbas, p.151.

5. Qadiri, M., M. Heidari, 2012, examined the shores of Persian Gulf countries in tourism, the first international conference on sustainable

tourism Persian Gulf coast, opportunities and threats.

6. Mohammad Mehdi Mahmoudi - DPLG PhD in Architecture from the University of Toulouse, France UPA, associate professor of landscape architecture and technology trends Faculty of Architecture, School of Architecture, College of Fine Arts, Tehran University

7. Babaei, F., "set the environment and building facilities", the publication of the first edition mutation 2010(pp. 4 and 13 V86-84).

8. Apostolopoulos, Y, Dennis J. Gayle, 2007, island tourism and sustainable development: Caribbean, pacific, and Mediterranean experiences.

9s. Blancas, F. J, & etc, Goal programming synthetic indicators: An application for sustainable tourism in Andalusian coastal counties, Ecological Economics 69 (2010)