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THE IMPACT OF OIL SPILLS ON THE ENVIRONMENT AND LIVING ORGANISMS-REVIEW ARTICLE

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Abstract:
Oil spills affect the environment and living organisms, primarily through suffocation and toxicity. The severity of the damage generally depends on the amount and form of the spilt oil, environmental conditions, and allergic reactions. This article discusses the effects of oil spills and how interactions between oil systems and living organisms can lead to superior spill cleanup. Environmental impacts, whether environmental problems or potentially catastrophic ecological impacts, can become excessive in the long run, causing major disasters for ecosystems and people living near contaminated areas, causing their loss.

Keywords: Oil spills, Environmental pollutant, Living organisms

Article evaluation issues: The damage caused by oil pollution affects all kinds of human activities, marine and terrestrial life, birds, and plants, ultimately affecting millions of living creatures of all species and types. It leads to extinction and extinction. It increases in size and has a negative impact on the environment.
Purpose article assessment: The most common causes of oil spills are oil handling and unloading, loading and cleaning of oil tankers, oil pipeline interruptions, maritime transport, or oil leaks from oil facilities, refineries, and terminal damage to an oil tanker caused by. Therefore, the causes of these accidents can be studied to find appropriate measures to reduce it.
Practical technology: Some gas is separated in the oil field, then fed to the gas plant to separate the condensate produced by the gas's condensation as a natural fuel, and then the oil is sent to the decantation tank, where mechanical impurities are separated and neutralized. Effects of air pollution that can harm living organisms include people, animals, food crops, climate change, ozone layer depletion and the destruction of habitats and urban environments, the most important of which is acid rain.

1-INTRODUCTION:

The nature and impact of an oil spill depends on many factors, these factors include the amount and type of oil spilled the behavior of the oil in the environment, and the location of the spill with respect to environmental conditions, physical characteristics and timing, especially seasonal and weather conditions. It is necessary to choose the most appropriate approach to the cleaning task and the effectiveness of its implementation (1). Stretch ability results depend on the rate at which contaminants are diluted or dispersed by natural pretreatments, the size of the impact zone is determined when sensitive environmental objects are exposed to high concentrations of petroleum or its toxic components over long or short periods of time. The susceptibility and susceptibility of organisms to petroleum contaminants is considered to be hazardous or adaptive (2). Currently, natural recovery methods can repair damage by removing oil through a properly performed homogenization process and can often be facilitated by carefully implemented standardization measures (3). There are several mechanisms of damage caused by oil spills. Petroleum affects the environment through suffocation, which can affect physiological properties as well as chemical toxicity that can have fatal or near-fatal consequences or cause changes in the properties of the earth because there is depend on water for survival, when most of the water is covered in oil, life on the surrounding land cannot thrive(4). Petroleum hydrocarbons are toxic and kill many living things, this toxicity can manifest itself in several ways. For example, some fish may be bothered by droopy arms, frayed fins, changes in heart rate or breathing rate, or poor imitation, but other small marine animals, especially sea turtles, may mistake spilled oil for food and eat it. It can be extremely dangerous or even deadly (3)

1-1 The impact of oil spills on the ecosystems:

Oil spills have devastating effects on the environment and all living things, spills can increase for a variety of reasons, but the main reason is human error. , equipment failures, natural disasters, deliberate sabotage(5). Human error is one of the most common causes of oil spills and can cause injuries during drilling, transportation and storage. Equipment failures, such as pipe breaks and tank leaks, can lead to natural disasters such as hurricanes and earthquakes, while deliberate acts of sabotage, such as terrorist attacks and sabotage, impact the environment (6). Oil spills affect marine and terrestrial ecosystems because oil spilled into the water covers the surface of the water, blocking sunlight from reaching marine plants and animals(7). This leads to a reduction in the photosynthesis process, causing organ damage and disrupting the food chain(8). There are several strategies for responding to oil spills, including containment, cleanup, on-site incineration and the use of dispersants(9). Containment involves the use of physical barriers such as cordons to prevent the spread of oil. Skimmers use a special system to remove effluents from the water layer(10). In situ combustion involves ignition of the oil and is effective in rapidly removing large quantities of oil dispersants. Chemicals are used that break down the oil, allowing it to spread through the water column. Each approach has advantages and disadvantages, and the answer will depend on the specific loss situation in each loss area(4). Preventing oil spills is important to reduce the impact on the environment because the key elements to preventing oil spills are techniques such as leak detection, double-walled conveyors, maintenance and training to prevent future oil spills using a comprehensive prevention, intervention approach and clean environment (11).

Oil spills are dangerous precisely because of their composition and environmental impact. Unlike heavy crude oil, crude oil has less sulfur and characteristic impurities, making it easier to process and transport. This section describes the risks of oil spills and why oil spills are particularly dangerous according to(6), including the effects of oil spills on marine life. Destructive effects on marine life, when oil coats a bird's feathers, it makes it difficult for it to fly or it can drown. Fish and marine animals can also suffocate due to clogged gills(12). Oil pollution can also cause long-term damage to the reproductive structures of marine animals, leading to a decline in their numbers. In terms of human health effects, oil pollution has a direct and serious impact on human health as it can cause respiratory diseases, dermatitis, and other health problems(13). People who work in the oil industry or live near refineries are at high risk of exposure to these pollutants, which can lead to negative effects. Spilled oil is difficult to remove easily because its composition allows it to penetrate deep into the environment and is difficult to remove. Furthermore, oil contamination can remain in the environment for many years and cause long-term damage(14). One of the most important prevention methods is to prevent spills by strengthening refinery safety protocols, increasing the number of proposals submitted by oil companies, and encouraging response plans that are considered comprehensive sanitary response plans the necessary precautions to avoid it in surrounding areas and adjacent groups to ensure direct access to the source(15).

Oil spills also have a significant economic impact, with oil spill response costs, loss of fishing and tourism revenues, and damage to property and infrastructure being among the greatest economic impacts of a significant oil spill (8). Oil spill response costs are high and vary depending on the size and area of the oil spill. Therefore, preventing and preparing for oil spills is essential to reducing the economic impact. In some cases, oil spill response costs can reach billions of dollars. For example, the Deepwater Horizon oil spill in the Gulf of Mexico in 2010 cost more than $65 billion in damages. Oil spill response costs include equipment, rigid panel construction, land, water, and groundwater cleanup costs (9,16). Damage to property and infrastructure can take years to repair. Therefore, it is important to take precautions to prevent oil spills and prepare for their consequences. Prevention and preparedness are essential to reducing the economic impact of oil spills(17). Measures to prevent oil spills include the use of double-hulled tankers and advanced safety technology. Preparation includes developing a quick and appropriate response plan to an oil spill(11). Unique Oil Spill Response and Cleanup Technologies a combination of mechanical, chemical, and plant-based methods can be effective in containing and cleaning up oil spills. According to (13), environmentally friendly and cost-effective technologies should be prioritized while ensuring the safety of the affected population, flora and fauna. Mechanical cleaning uses equipment to remove oil from water, such as booms, scrapers, and vacuum trucks. Booms are floating barriers used to contain oil and prevent it from spreading(18). A skimmer is a boat with a system for extracting oil from water. Vacuum machines are used to pump oil offshore, and while these methods are effective in removing large amounts of oil, they can be labor-intensive and expensive (19).

Dispersants are compounds that, when sprayed onto oil, break down the oil into small droplets that are easily dispersed in water. However, the use of dispersants can have negative effects on marine life and the surrounding area, so bioremediation, which uses microorganisms to break down the oil, is considered a better method although this method is environmentally friendly and economical, it may take some time for the microorganisms to completely destroy the oil. It is best to remove oil from the shore and surrounding area before it penetrates the sand and rocks(20).

1-2 Several innovative solutions have been proposed to solve the oil spill problem.

A. Remote sensing technology. One of the most notable trends in oil spill response is the use of remote sensing technology(14). Generation includes the use of satellites, aircraft, and drones to detect and inspect oil spills. The facts collected can be used to create a map of the affected area (20). This will help responders better understand the extent of the spill and plan their response accordingly. Remote sensing technology has proven highly effective in detecting and monitoring oil spills and has been used in several major spills, including the 2010 Deepwater Horizon incident(21).

B. Bioremediation: This is a method in which microorganisms break down oil into harmless byproducts has been used during several oil spills, most notably the 1989 Exxon Valdez disaster. Organic remediation is an effective way to reduce

the effects of oil spills, but it is not always practical success of bioremediation depends on many factors(22). This includes the type of oil spilled, water temperature, and nutrients available to microorganisms(14).

C- Chemical dispersants: Used to separate oil into small droplets and easily disperse them to specific points in the water column. This generation has been used during several major oil spills, including Deepwater Horizon in 2010 although chemical dispersants are effective in reducing the impact of oil spills on surrounding areas, they can also have negative effects(23).

D- Localized combustion. This method burns oil on the surface of the water although this method is effective for quickly removing large amounts of oil, it can also have a negative impact on the environment(24) .Electromechanical treatment removal of oil from the water surface using equipment such as booms and skimmers, this method is very effective at removing large amounts of oil, but it can also be labor intensive and expensive(25).

Prioritize cleaner, more sustainable ways to prevent oil spills and protect the environment. Although there is no single solution to this complex problem, many promising options exist, including investments in renewable energy, solar, wind, and hydropower (14, 15). These types of energy are not only clean and sustainable, they also have the potential to create new jobs and boost economic prosperity. By switching to renewable energy sources, we can reduce carbon emissions and protect the planet for future generations (26). Petroleum regulators are stepping up the most stringent measures to stop oil spills, especially in oil-producing countries, by conducting regular inspections of oil platforms and pipelines and increasing penalties for oil spills and other environmental violations. , reduce the risk of oil spills and protect natural resource. It is important to develop new bioremediation methods that use bacteria and various organisms to degrade oils and other pollutants. This technology may be more effective and less harmful to the environment than traditional disinfection methods (27,28).

2- CONCLUSION:

The environmental impact of oil spills is significant and devastating, affecting not only human lifestyles but also the earth and its natural ecosystem, including humans. Oil spills can cause long-term damage to surrounding areas, and recovery can take years. The damage caused by oil spills to plants, animals, people, and water can be severe. When oil enters the ocean, it forms a thick layer on the ocean floor that can suffocate marine animals, and damage to the reproductive organs from the chemicals in the oil can affect the ability of marine organisms to reproduce, which can lead to infertility. It is the root cause of the disease. and poor performance. Oil spills can also damage the food chain, with long-term effects leading to a reduction in biodiversity in the affected area. Damage from oil spills can take years to repair, and some ecosystems may never fully recover. Therefore, early intervention is necessary to prevent long-term damage from oil spills, as early intervention reduces the amount of oil entering surrounding areas and the ground. Advances in technology have improved equipment for dealing with large spills, such as booms and skimmers that can collect oil and remove it from the water layer. Drones and satellites can also help detect and locate oil spills, allowing for early intervention as prevention is one of the ways to reduce the impact of oil spills on surrounding areas. Regularly upgrading and inspecting petroleum equipment and pipelines can help prevent leaks and spills. We need to take a proactive approach to preventing oil spills, using safer technologies such as double-hulled tankers and remote control valves to protect the environment and preserve it for future generations.

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