

# PLANNING AND MANAGEMENT TO PREVENT THE ENTRY OF DUST ON CLIMATE

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## Abstract

Dust phenomenon a few years into one of the most important environmental issues is considered. Dust particles suspended in the air dust that important component of air pollution. Because of the dust from the western border and south West of the country reaches the level of air pollution to several times the limit And therefore increased the number of patients visiting the health centers and the state of the weather conditions is critical. The dust particles and dust in the air if the region fails to contain this crisis with the various forms of environmental damage will be irreversible force it. Any dust and mist in the area because of the phenomenon known as Western trends - Oriental greatest impact on their country. Baathist regime in the war for chemical rocket takes advantage of the same atmospheric phenomenon And our areas of chemistry, and now the same thing is happening in another way. The main source of dust phenomena mainly "located in neighboring countries. These countries include Iraq, Syria and Saudi Arabia. Drought, land degradation caused by the outbreak of regional wars, the construction of dams on the rivers, the inappropriate growth and reducing vegetation cover, the main reasons for the formation of dust phenomenon in recent years. To solve this problem by the governments involved, including Mulching solutions have been proposed, But recent studies have found that this has no effect on reducing the phenomenon of desertification is Because studies show that the origin of sand dust but sedimentary origin and their wetland. So one of the ways to fight for the restoration of wetlands dried up in neighboring Iran.

Key words: dust, neighboring countries Iran, Management and Planning

## Introduction and Statement of Problem

Iran and its western neighbors in the world's arid and semi arid belt uate And more than two-thirds of the arid and semi-arid area is Located, Average annual rainfall in half the average annual rainfall in the world. Iran is subject to the occurrence of the phenomenon of dust in local, regional and global. West regions of the country because of geography and climate and proximity to the deserts of neighboring countries such as Iraq, Syria and Saudi Arabia are exposed to dust systems.

Dust particles with a diameter less than 5 microns are defined as a result of wind erosion and desertification and can be transported very long distances and transferred.

From 4 decades ago, the phenomenon of dust in large areas of the world, including southern West Asia, Central Asia, South West North America, North Africa and the global dust belt is said to be seen in abundance.

Specific areas of desert and desert dust is a natural process caused by strong winds on the surface of the soil, causing soil particles suspended in the atmosphere near the Earth's surface. In recent years, the influence of natural factors such as persistent drought, reduced rainfall and relative humidity as well as the intensification of environmental factors such as excessive use of water resources in desert areas, the loss of marshes and wetlands and lakes deserts of East Iraq war has drained and southern areas Iran and thinning or complete loss of vegetation in these regions. As a result of severe dust events that are known as fine dust, In parts of western, southwestern and central Iran, and could in the short term negative effects on the environment, economy and health of the residents of the 17 provinces of the country, especially border cities like Ahvaz, Iran, Kurdistan, Kermanshah and on leave. In fact, periods of drought and of phenomena appear particular climate on the one hand and a sudden increase in population and

improper exploitation of resources on the other hand Bvkhak aggravated erosion and desertification in the country have been created.



### Research Methodology

The research method for library and field and the study of books, scientific journals and databases, see the Department of Environment and Ecology as well as interviews with officials and experts from Iran, has been collecting the required information.

### Findings

Development and the formation of dust storms

For the development or modification dust storms, rainfall is considered a vital element. Because surface water, vegetation, rock weathering processes and capabilities of human settlements in an area affected is significant. Even small amounts of moisture, highly erodible limits. Dust storms occur when total annual rainfall is significantly lower than normal rainfall. Experiments show that the origin of the dust is mostly marshland to deserts. In the past, wetlands and river bed sediment in their dust But today, because of the unstable dam and the destruction of dams in the river wet Mykrvklymahay this dust into the sky and is likely to exacerbate the effects of global warming and climate phenomena at a level very wide spread.

### The origin of dust in Iran

The main source of dust in Iran in recent years, the north wind. The wind is active from May to September each year, the Middle East and north through the mountains of Turkey and northern Iraq, to the deserts of Iraq and Syria flows And continues to the Gulf and to the open sea. A few years in the south western parts of the province, especially in the summer, has faced severe dust phenomenon. Khuzestan province since 1380 is faced with the phenomenon of dust in earnest. In 1381, 10 times in 1382, 11 times in 1383, 9 times in 1384, 12 times; in turn

1385.19, 1386.31 In turn, in 1387, 55 times in 1388.30 turn this phenomenon has occurred in the province. The maximum concentration of dust particles and pollutants in different years in the province have been different. So that on several occasions during the past 3 years the level of dust to 9360 micro-grams per cubic meters (36 times the limit). In 1390 so far, the maximum concentration of 3825 micrograms of dust is Maximum occurrence of this phenomenon in the province 84 hours and a minimum of 36 hours. In the other affected provinces in 1390 so far can be traced to the following: Kurdistan 3687 micrograms, Lorestan 1460 micrograms, Ilam 5173 micrograms, Kermanshah 5399 micrograms, East Azarbaijan 1,000 mcg, West Azerbaijan 1903 micrograms, Tehran 799 micrograms, Arak, 595 micrograms, Zanjan 3643 micrograms, Bushehr 339 micrograms, Kohgiluyeh-Boyer Ahmad 300 micrograms, Qazvin 625 micrograms to 690 micrograms of dust and Karaj affected.

### **When the formation of dust storms**

Dust storms mainly in spring and summer and autumn and winter occur with less frequency Also, most of these events are when the afternoon to sunset, which is dangerous to human health and the environment In addition to the adverse impact on the agricultural sector to increase the damage to agricultural crops and garden and instability there. Although we have recently seen an increase in terms of dust in Iran But can not be calculated precisely how much dust that the origin of domestic or foreign origin of their size. But what is not in doubt is that the fine dusts are mainly domestic origin. The internal sources include wetlands, agricultural lands in dry areas, plow, extensive excavation and road construction activities and overgrazing.

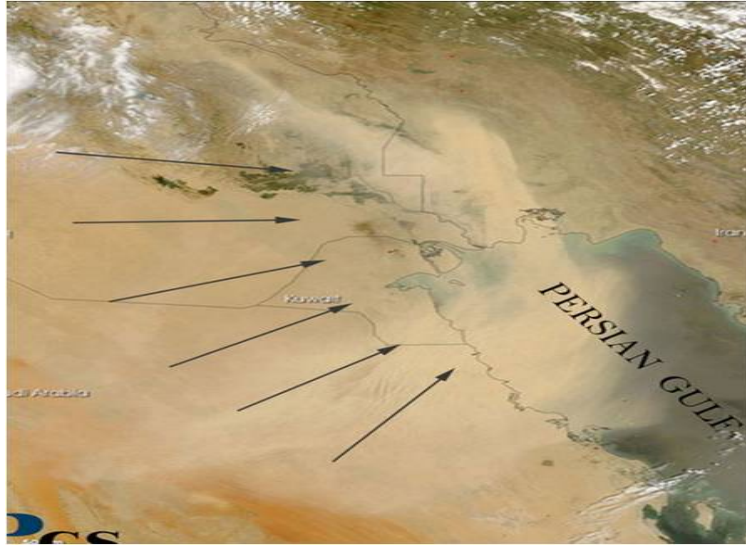
### **Associations dust emissions in Iran**

#### **A. Internal centers**

One of the centers of production and dissemination of dust in the interior, seasonal local wind effect 120 days in the provinces of South East Iran (including Sistan and Baluchestan Province) And the foothills of the mountains of the province of South Khorasan, Khorasan and two large desert in Iran (border provinces of Kerman and Yazd) and desert lands in the South and South West. As well as construction activities in the city (construction, grading, excavation and embankment), including local sources of dust emissions are in urban areas. West of the country of origin Ryzgrdhay drying over eighty percent Azim marshes and wetlands on the border of Iran and Iraq Hvralthvyz-h During the past 40 years due to the construction of more than 32 large dams on the major rivers Tigris and Euphrates by Turkey and Iraq to one-tenth the size of the wetlands of the normal value and an increase in desert areas of southern Iraq have been reduced.

#### **B. Foreign Associations**

In general, Iran is the main source of dust north wind. The wind that is active from May to September, is in the north of the Middle East And through the mountains of Turkey and northern Iraq, as Chanterelle in the deserts of Iraq and Syria to the Persian Gulf and the open water flows and moves. From 1385 until now, new overseas sources of most of the West and Southwest of the country most affected by the frequency and intensity have They are the source of Iraq and East Syria, although other areas such as parts of Jordan, Kuwait and northern Saudi Arabia also involved in the creation of dust on Iran.



### **General factors affecting the phenomenon of dust**

- Basic characteristics of atmospheric conditions and climate change
- Low rainfall and drought
- Control of surface water
- Excessive diversion of rivers and water resources
- Status of land and land use change
- Seed and soil type
- Lack of vegetation
- The moisture content of the soil
- Severe winds than on soft, dry desert soil
- Upside air and dust particles suspended vertical
- Transfer of particles by currents in the upper atmosphere to distant sites

### **The effect of dust on climate change**

#### **A: The impact of atmospheric dust**

- Changes in air temperature due to the influence of the absorption and scattering of solar radiation
- The impact on climate due to the influence of oceanic production
- The effect on cloud formation, precipitation and drought due to the influence of temperature and concentration density nucleoli

#### **(B) the impact on the biosphere**

Changes in ground cover because of their involvement in temperature and rainfall  
 Increase the number of plankton in the oceans (nutrients to the oceans)

The cycle of food and land and sea ecosystems, biochemical cycles

Transfer toxins, radioactive substances war, disease spores

### **The effects of dust on health**

Small wind surfing are two reasons for health problematic:

Size: soil particles in a cloud of fine powder with cloud transition become smaller until they were so small that our lungs are no longer able to easily repel them.

Portable power: the ability of organisms such as dust spores, fungi, bacteria, and viruses they carry. Generally dust will lead to climate change on a global scale and local, biological cycles, humans and the environment Mineral aerosols from dust on rainfall, affect cloud formation and properties and prevents the penetration of sunlight and reduce agricultural production Dust causing a negative effect on the production of cold water fish, reduce the number and longevity, deposited on pasture plants and reduces yield and feeding the cattle disease.

### **Ways of dealing with dust**

The phenomenon of dust and other similar environmental hazards, natural and other hazards, such as tackling and management, including risk management and crisis management. The cycle of disaster risk management strategies and rescue, restoration and compensation have been made in other words, an attempt to reduce the vulnerability of people did not take the risk. If the risk management cycle and focus attention on measures that can be done before the event As a result, the readiness of people increased, reducing vulnerability factor and thus the risk will be low. But in any event can not be prevented, but the risk management cycle, if an incident occurs, Waste of human and financial capital will be much lower and, if necessary, measures will be needed for reconstruction and helping people run. After working principles like other natural hazards. Gaps and opportunities should be identified and appropriate solutions will be offered. The basic strategy in this way help people to reduce their vulnerability.

- Dam of our most important projects that must be stopped. Braided river's natural life in the biosphere. Cut the arteries leading to strokes nature And if officials from the Ministry of Energy and subsidiaries as well as the continuation of the construction of the largest dam arch dam is the latest project-the world in Bakhtiari Insist, children's and especially indigenous people are the first victims of the dams. The next victims are those who are forced to breathe fine Grdhayy thousand kilometers of water stored behind the dam, which could take them up front And forests and rangelands lives of millions of organisms that are destroyed by construction of the dams. Can be modified by means of a multi-year program of water consumption and increase efficiency in agriculture implemented to prevent any new requirements to be Bgrfth. Construction of the dam dam only to Frbshshdn pocket helps companies and exacerbates the problem of fine dusts every day.

- At the same time stop the dam in the country and reforming the pattern of water use should be taken to prevent urban sprawl. The current trend by selling municipal urban density, spread and create new water demand is very wrong and destructive. If the construction activities and construction of large cities look very large volume of dust and aerosols in production That's because the larger contamination and harmful to health is much more than fine dusts.

- All countries are committed to respect environmental rights And with projects without scientific support ecosystems and natural cycles that do not impair shaped over millions of years. Practical examples of these destructive operations drying Aral Sea in Central Asia in the mid-twentieth century. Last even water transfer project in the Caspian to central desert, God forbid, if implemented Not only help to improve the economy, agriculture and climate but also with the negative effect of their not very widespread in Iran and Central Asia exacerbate desertification.

- Iran is dry. Agricultural land available is limited. Because of its dependence on oil revenues, production in our country is not a healthy trend. Despite the large area, the capacity of our population is comparable to the world's humid countries. The major cause of the increasing urbanization of one dam and water supply in cities and other difficult natural conditions of life in rural areas. Hopefully people understand these limitations we have and more to do with population control to secure the future of their children. I think it is better planning and optimal use of the

knowledge of the people rather than to encourage population growth, current trends and management keep the right to sustainable development to help people improve the quality of life. Quality of life in the New World Literature platforms, personal car and apartment, but a healthy environment and peace.

- We all based on the constitution and religious orders the destruction of nature that should have a healthy growth of children today and where we do not have Frdayman. These rights should be violated by some jobber in the name of development. It is the duty of all cultural and educational environmental education for all disciplines and levels of compulsory education to our future experts who are conscientious and sensitive and familiar with environmental law.

**In the event of the failure of the 5 listed above must go to the following guidelines.**

- The creation of green belts around cities, maintain and expand urban green space
- Development and equipping of health centers and medical
- Control development activities and stationary sources of dust
- The use of new technologies in controlling dust
- Public awareness
- Correct management of soil and water resources
- Combat Desertification

#### **Dust control methods**

To control dust storms, numerous attempts have been made; Most of these efforts includes techniques to control wind erosion.

- Wind erosion control methods will try to increase soil surface roughness, wind speed or speed threshold level to reduce soil erosion increases.
- To reduce the erosion of arable land can be used in different ways.
- In agricultural practices to control erosion of living vegetation or the remains of their agricultural products by reducing the wind shear stress of soil protection.
- When vegetation is large enough and dense, In addition to the speed threshold for particles and soil erosion will not. Origins of the way to help the mechanical strength of soil, prevent erosion.
- The paragraph: Another very efficient yet affordable ways and has many advantages, the use of "the clause is" According to the Environmental Protection Agency led solutions to the formation of rain clouds using fertility and ionization effect will be multiplied. The use of this device experienced in some countries, including America and even Syria And tests showed its high effectiveness. The role of dam with roller blades wedge-like role is submerged in the ground. By doing so, the rout of the upper layer of soil, a container for storing water is provided. However, after about a year when the role of land, under the relatively hard layer are formed while saving water also helps prevent soil erosion.
- The strengthening of the vegetation can be somewhat of wind erosion and dust reduce resonance. Because the plants have increased surface roughness and thus reduce wind speed; Root systems hold soil particles to stick together and create shade, soil moisture to temporarily increase And thus the surface layer of soil has stabilized and is moving. But we have to deal with this massive global phenomenon requires efficient methods and solutions that authorities should seek to resolve them with the help one needs.

#### **Erosion control methods for crops**

In general it can be reduced to the following methods erosion in agricultural lands:

- And the stability of a good establishment of vegetation so that most of the land is covered.
- Use of alternative culture, especially the culture in such a way that parts of uncoated coils are coated.
- Leaving the rest of the crop after harvest.
- Vertical bar relative to prevailing wind direction.
- Use of manure
- Use mulch Sandy
- The use of polymer products (for ships expensive)

### Soil management

- Soil management techniques on soil preparation methods to increase vegetation growth and improve soil structure in order to increase its resistance to erosion is concentrated.
- The use of organic matter is a form of soil management and productivity increases will reduce its erodibility; But most soil management practices that are related to erosion control, rely on different methods of cultivation.
- Plow too, especially in light soil, aggregate breaks down, the soil surface roughness reduces And soil is exposed to wind erosion. Particularly if the straw is gone or the surface of the soil, mulch cover have declined. To prevent the demolition of buildings, planting operations in cohesionless soils should be limited and should also reduce the number of rows in the soil. No-till planting, the sowing directly into stubble crop residue is carried out, Labor costs and reduce soil loss and soil moisture and organic matter increases and remains unchanged.

### Mechanical methods to control erosion

Mechanical methods to control wind erosion to reduce wind speed for the surface topography changes.

- windbreak: Windbreaks and barriers that usually are perpendicular to the direction of the dominant wind erosion by reducing the wind speed limit erosion. A wind break when he plays his role well designed correctly and consistently kept in optimum condition. Cupping with respect to the materials from which they are made to live two types of tree (or biological) and abiotic (artificial or mechanical) divided. wind break action in this case is that the wind speed before hitting the wind break and distance it begins to reduce the And after passing through it gradually proliferate distance it reaches its initial speed. Perhaps one reason for the increasing phenomenon of dust in loss of palm groves south of Iraq is the war in Iraq, Formerly known as green belts and wind break in the area served. Artificial wind break can include stone walls, metal, wood, plastic, wicker or walls made of branches cut from trees in the area.
- Mulch: One way to stabilize the dust, the use of mulch. Land covered with mulch, mulch to bare gravel surfaces Asrqabl substantially on the accumulation of dust have stabilized.
- Mulch series: The results show that the mulch is resistant against the wind, But when they are affected by sand erosion find bombardment. Mulch Mulch resistance also varies according to the composition. Resistance due to increased structural strength of the other types of mulch with straw mulch more. The focus is more clay clay mulch, fine particles of clay to sand particles Fvlykvlh stability of mulch in front operation increases wear. The number of layers of mulch (Read mulch) will increase its resistance to Frshaysh to increase the thickness of the mulch increases.
- Oil mulch: The mulch products, materials or petroleum products from oil refineries is heavy. This type of mulch is obtained after refining and appearance similar to bitumen is diluted. This material is then removed from the desulfurization and aromatic substances that can be used Which further increased in order to prevent dirt, sand dune stabilization and increase the quality and quantity of agricultural products are consumed. 40-year old Iranian oil mulch lining was used years ago to stabilize sand dune and positive results. According to a survey conducted by the Research Institute of the Ministry of Oil in 1384, oil mulch any negative effects on water resources, animals and plants does not But those who are associated with it have safety devices such as masks, gloves and use. Paste oil mulch with sand to create a hard layer are resistant to wind, That can withstand wind speeds up to 110 kilometers per hour and hinder the movement of the sand. Petroleum mulch to prevent evaporation of water from the ground, thus provide ample opportunity for the establishment of vegetation on the ground. But today, due to the high costs and mulch newly discovered methods are not used.
- Polymeric sand dune stabilization nanotechnology: Iranian researchers in Tehran University Science and Technology Park Development Center for the first time were using nanotechnology to produce plastic, To be able to stabilize sand dunes. To run this first project analyzed the sand of Kashan And on the basis of a special polymer called poly lattice of ions produced and the ride was very tiny.. It is 99% water and sand surface sprayed with reactive ions that cause, Causing sticky sand to each other and moving sand dunes prevented.

This material is non-toxic and permeability of its features. With respect to penetrate the space between the sand and prevent ground water from evaporation, rain water easily penetrates the layers of the earth. With a

thickness of 2 to 3 mm against winds of 100 km per hour is resistant, Time limits for use and for the use of gravel mulch material must be determined. Plastic lattice have a negative impact on the plants, but also its ions is used, That is useful to the plant. To sprinkle mulch mulch on the sand should be warm and carry the large volumes to the Mulching adds significantly to the cost. The nano-polymer method, shipping cost is removed, the tank does not need to be sprayed with conventional sprayers.

### **Discussion and conclusion**

This area of the movements and activities of ordinary people has been narrowed. Sometimes visibility was reduced to less than ten meters and over schools and even offices have been shut down. The effect on the lives of millions of people is the hub of agricultural, industrial and the oil shadow In addition to the hard daily life of people, many activities and economic projects, products and services is difficult.

The origin of this phenomenon is outside our borders and in neighboring countries. These countries include Iraq, Syria and Saudi Arabia in recent years and due to some problems, the volume of deserts and deserts of these countries have been added. Drought, land degradation in regional wars, the construction of dams on the river, inappropriate farming and reduction of vegetation cover, 5 main reason for the formation of dust phenomenon. When the area at a certain time, faced with low rainfall and used to be incorrect and inappropriate And the activities carried out on the land without the attitude to sustainable development, that part of the land is damaged and unstable. Some of these factors can be interpreted as follows:

#### **1. Continuous conflict and the disruption of soil physical context:**

In a region where Iran is also considered, over the last 50 years there have been two or three cases of prolonged drought; The military invasion of Iraq, the war between Iraq and Kuwait and the subsequent US invasion of Iraq has made land as a sensitive ecosystem Because of the war, the area becomes an arena for military equipment and the plow there with guns and tanks, which in this case is susceptible to damage caused by ecosystem disruption.

#### **2. The construction of dams on the Tigris and Euphrates river of the main reasons for the formation of dust:**

Construction of dams on the rivers Tigris and Euphrates rivers in the area, such as a dam that created, leads to disruption of soil and dust are looking for. After construction of the dam, the river was out of the normal and the river water area decreased and consequently decreased humidity environment. After the reduction of river water due to dam construction, the ground wet to dry land with soil and turned into dust.

#### **3. Reducing soil moisture and erosion of soil particles due to the sun:**

Iraq is one of the areas of alluvial sediments and mud covered the Mesopotamian plains of Iraq in the area of cultivation has become, But with the reduction of water and moisture and to reduce the movement of military equipment such as tanks, vegetation and the land has been plowed sustainable desert. The damage to the penis in the region, followed by intense solar radiation, low rainfall and high winds, soil, sediment gradually released and the physical texture of soil is eroded. With soil erosion and disruption of its physical structure and lack of vegetation, soil particles if until recently in the wind with a speed of 15 meters per second, was separated from the earth, After these physiological changes by the wind at a speed of 6 to 7 meters per second, large amounts of soil particles are lifted. The main centers of formation of the phenomenon of dust between the Euphrates and Tigris in Iraq (Mesopotamia), the western and southern regions of Iraq, Kuwait, northern Saudi Arabia, East Jordan and southern shores of the Persian Gulf.

Problems caused by dust:

1. The health effects of dust
2. The closure of agencies, organizations and schools, and pause at the beginning of their work
3. cancellation of many flights, especially in western areas
4. blurred vision and cause problems for drivers of vehicles



5. The problem for the Navy in the Persian Gulf
6. Damage to crops such as outbreaks of plant pests and reduce photosynthesis in plants
7. disruption in the industry

### **Ways to avoid raising dust**

Given the environmental and health effects of dust, measures should be taken to control and mitigate them. Some of these measures are as follows:

#### **- Plantation:**

Planting drought-resistant plants and natural species such as Tamarix, reprints, canopy, Prosopis, cow tail, Acacia, Garadagh, Paynkvm, Eucalyptus, ethereal multiplexing, cactus, Qych, antibacterial.

#### **- Obstruction:**

Construction of wind break in the hills of the area prevents the destructive power of wind. Flatulence may be of synthetic or plant trees and shrubs of the region (corn and sunflower) Therefore, there are two types of windbreak:

1. inanimate or artificial barriers or mechanical
2. Live windbreaks.

Abiotic barriers such as stone walls, walls of metal, wood, plastic, straw, or walls made of branches cut trees in the area, the walls of the canvas.

The most important factor abiotic windbreak design, selection of raw materials are readily available When conditions allow for a tree windbreak does not cover non-viable wind Crushers used. Also, in some areas due to early planting, the soil has more value And with that level of protection is limited in areas such as protecting the whereabouts Dtmha and similar areas of a network of cross windbreaks to protect tomato crop on the Mediterranean coast, 65 km West of Algiers was used. To make the first barrier made of a metal framework and then at intervals of 3 m to 3 m triangular form and the hills are covered them.

Windbreak tree usually been composed of one or more rows of trees or shrubs that are generally perpendicular to the main wind direction. Many experts believe that in order to control soil erosion on farms, in addition to operations such as planting windbreaks and strip, covering the soil with crop residues, crop rotation, tillage and the MWD must be performed to remove the software operation. For example, in the United States from 1850 to 1970 more than 320 thousand kilometers Live windbreaks have been built.

The most important factors in the design of selected tree species Crushers wind is consistent and appropriate.

According to Article 5 of the Bylaws to prepare and deal with the phenomenon of the harmful effects of dust (fine dust) in the country, the Ministry of Agriculture is responsible for coordination with Meteorological Organization and corresponding provincial working group determined in accordance with the classifications, To Mulching and other appropriate actions in areas with high erosion potential based on the identification of crisis centers act desertification. Note the following, the oil ministry is responsible for the supply and delivery of free mulch needed to implement this Article, planning for the production of this substance in the refinery area to win them over.

### **Offers**

1. Mulching practice abroad and in wetlands that are affected by drought have already done.
2. Avoid the numerous dams that in some cases cause dryness and dehydration rivers.
3. Preventing the redirection of water for municipal and industrial uses, which is the primary route goes dry.

4. Cloud seeding to fight drought

5. Tree planting and planting seedlings (48 tonnes per hectare of forest can be deposited dust entry 5/2 of the oxygen production)

6. Interactions between the environment ministers of countries in the region and cooperation to deal with the phenomenon of dust

7. Prevent dams on the headwaters of the river area

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