

NATIONAL SAND AND DUST STORM RISK MITIGATION STRATEGY OF TURKMENISTAN

RECOMMENDED STRUCTURE AND CONTENT

STRATEGIC CONCLUSIONS

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KEY TASKS:

- Expanding the use and implementation of modern technologies and methods to combat SDS processes;
- Strengthening the strategic and institutional framework for the management of SDS and strengthening the country's own capacity to address them
- Improving cooperation between government agencies and departments, research institutes, universities, and NGOs;
- Broadening the influence on the mechanisms of systemic decision-making and legislation in the field of sustainable management of SDS processes in the country;
- Strengthening the collaboration between the countries of Central Asia and the international cooperation for the exchange of best practices and modern technologies;
- Identifying the needs for specialized study and training.

In the Programme of the President of Turkmenistan Gurbanguly Berdimukhamedov on socio-economic development of the country for 2019-2025, an important place is given to environmental security and conservation issues. Turkmenistan has emphasized the importance of environmental issues and ways of solving problems related to climate change, rational use of natural resources, careful treatment of water and land resources, and combating desertification processes to the world community.

MAIN OBJECTIVES

Recommendations on the structure and content of the National Sand and Dust Storm Risk Mitigation Strategy of Turkmenistan are intended to develop an understanding of their long-term impact on various sectors of the economy, mitigate their impact on the population and ensure a comprehensive and coherent implementation of the National Policy of Turkmenistan on combating SDS.

It provides a comprehensive analysis and assessment of the manifestations and extent of dust storms in the country. In addition, it highlights the threats that BSE pose to the sustainable development of Turkmenistan's economy: the impact of sand and dust storms on agriculture, water management, infrastructure, industry and public health.

WHAT IS SDS?

Sand and dust storms are common meteorological phenomena in arid and semi-arid regions of the world. Central Asia (CA), characterized by a sharply continental climate, prolonged hot summers, cold winters, a large amplitude of daily temperatures, dry air, low cloudiness and precipitation with an extremely uneven distribution throughout the year, creates conditions for the formation of SDS in the region, including - in Turkmenistan.

Dust storms occur when winds blow over dry bare soil

at speeds of more than 1 m/s and lift loose soil particles into the atmosphere. Sandstorms travel relatively close to the ground, while dust storms can rise to heights of several kilometers and transport particles hundreds or thousands of kilometers away. According to experts, global dust emissions from these natural phenomena range from 1 to 3 Gt per year.

Overgrazing, secondary soil salinization, water resources depletion and irrational use of natural resources are contributing anthropogenic factors to desertification, land degradation and drought (DLDD), resulting in more frequent and severe manifestations of SDS in CA.

According to the UN, more than 2 billion peo-

ple in 100 countries live on dry lands, which occupy 30% of the planet's surface. If the rate of desertification is not reduced, by 2025 every fifth inhabitant of the Earth will live on the drought-prone territory. Experts estimate that 4-10% of crop lands, 27-68% of pastures and 1-8% of forests are significantly degraded in CA.

Regional cooperation is the only way to slow down DLDD and achieve Land Degradation Neutrality (LND). Formation and implementation of country and regional strategies to counteract the SDS formation processes will have a direct positive impact on the environment of each Central Asian country and will accelerate the sustainable development process in the region as a whole.

ADVERSE IMPACT OF SDS



According to the World Meteorological Organization, inhaling dust particles led to **400,000 premature deaths from cardiovascular disease** among those over 30 in 2014.



The impact of SDS on health:

Indirect damage from SDS:



development of asthma, bronchitis, obstructive airway disease, coughing and wheezing

sand drifts of irrigation canals, and deterioration of surface water quality



Cardiovascular disease (CVD), deep vein thrombosis and pulmonary embolism, cerebrovascular disease



reducing the output capacity of solar power plants



viral, bacterial, and fungal infections of the lower respiratory tract

skidding of transport routes, reduced visibility due to dust

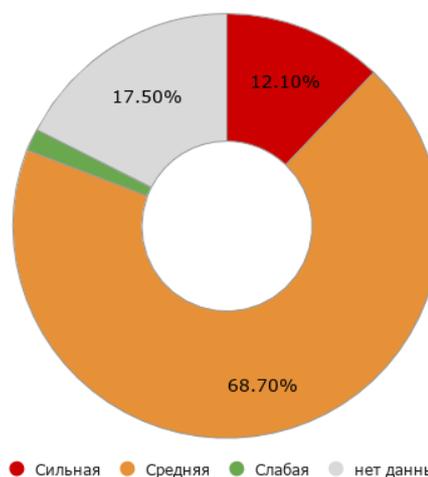


FORMATION OF SAND AND DUST STORMS IN TURKMENISTAN

More than 80% of Turkmenistan's territory is occupied by the Karakum desert, the largest desert in Central Asia. Natural factors contribute to the active development of DLDD processes on the territory of the country. Such anthropogenic factors as extraction of hydrocarbon resources, construction of major highways and railroads, as well as construction of various infrastructure aggravate these processes.

The main cause of dust storms is turbulence created by the wind and lifting of dust and sand particles from the earth's surface. The diurnal temperature difference in the steppes and deserts of Turkmenistan contributes to the distribution of air temperature along the altitude, in which the lower layers are significantly over-

Степень подверженности Туркменистана процессам ППБ, в % от площади страны

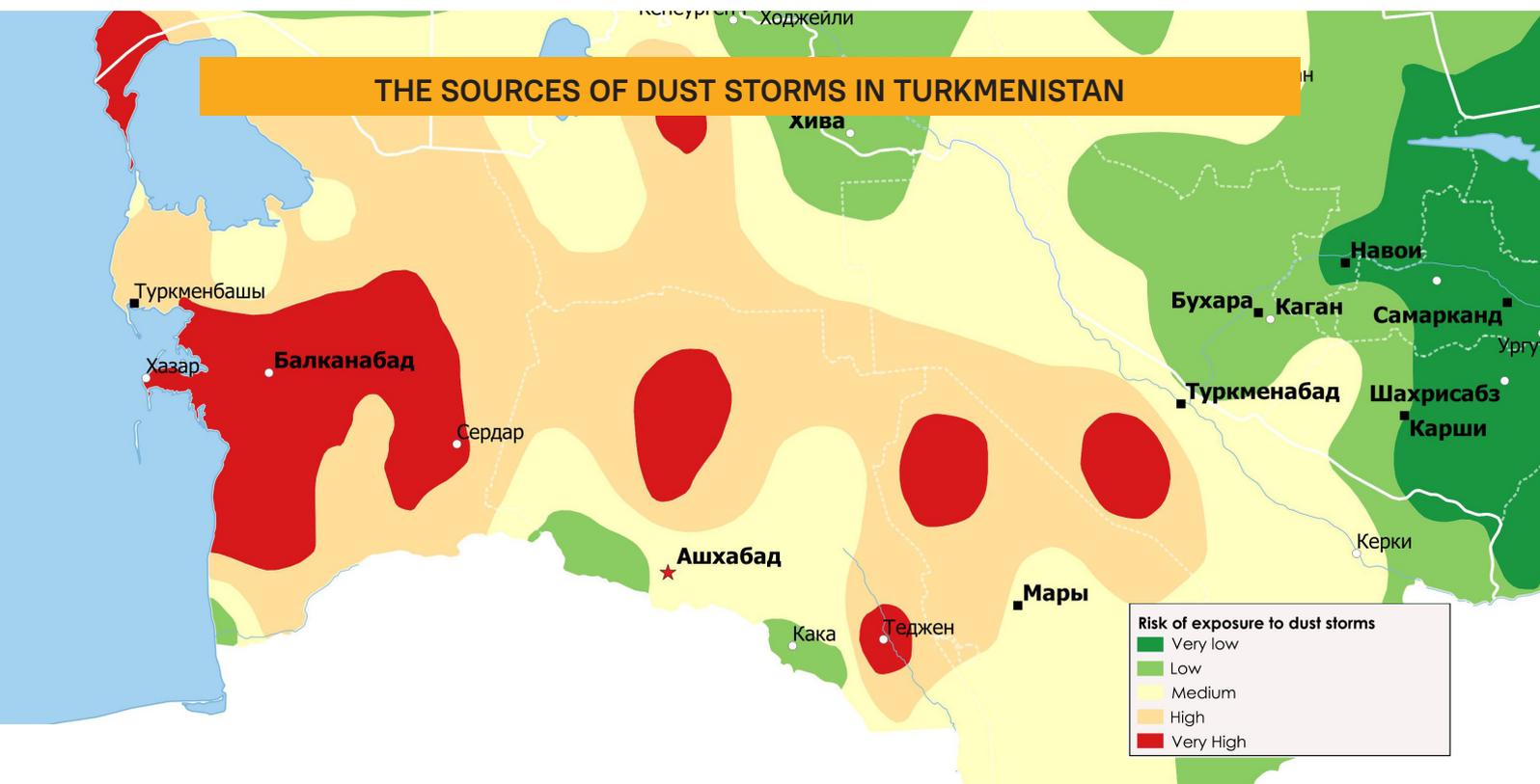


Source: Recommendations on the structure and content of the National Sand and Dust Storm Risk Mitigation Strategy of Turkmenistan. Ashgabat, 2020.

heated during the day. This creates favorable conditions for the occurrence of sand and dust storms.

Dust storms begin at certain critical values of wind speed, which depend on the terrain and

soil structure, and therefore vary from region to region. In most areas, dust storms begin at wind speeds of 10–12 m/s. The duration of dust storms varies widely, from a few seconds to several days.



AGRICULTURAL RISKS OF SDS

Sand and dust storms are a source of significant socio-economic losses. These losses are particularly acute for people engaged in agriculture. The short-term impacts from dust storms include illness in livestock, reduced crop yields, damage to engineering infrastructure, and reduced transport efficiency. Economic losses from a single storm can amount to hundreds of millions of dollars. Long-term impacts include soil erosion, contamination of

ecosystems, chronic health problems, and desertification.

The layer of dust deposited on seedlings as a result of SDS leads to loss of plant tissue, decreased photosynthetic activity of plants, and increased soil erosion. This, along with other effects of SDS, reduces the average income of the population engaged in agriculture and adversely affects the overall standard of living in the country.

HEALTH RISKS OF SDS

Airborne dust is a serious threat to human health, especially when it contains toxic particles. Fine dust particles can carry a wide range of pollutants, spores, bacteria, viruses, fungi and allergens. Dust particles carried by winds

many kilometers from the source can contribute to a wide range of diseases. People with lung or heart disease, as well as the elderly and children, are especially vulnerable to these diseases.

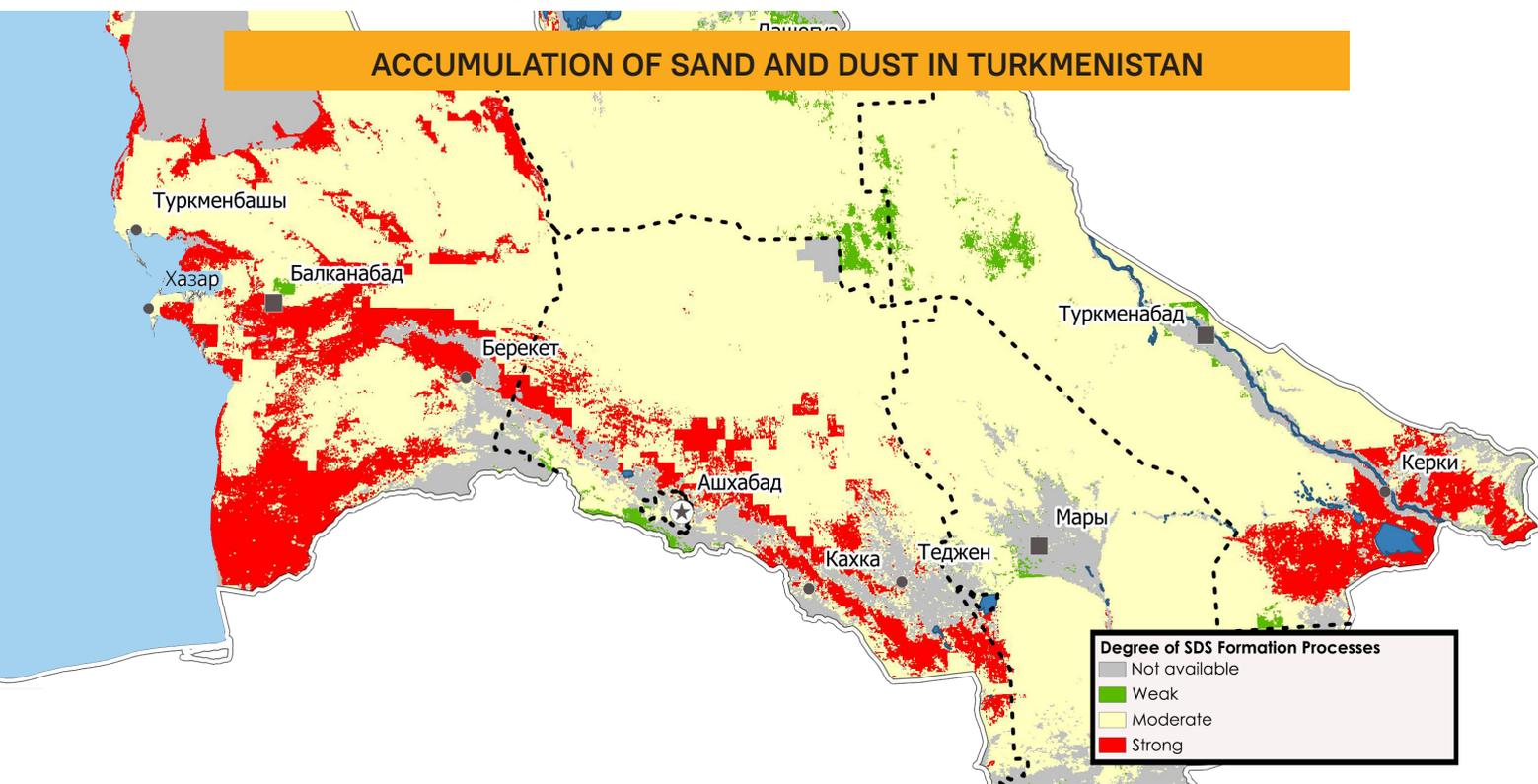
ECONOMIC IMPACT OF DESERTIFICATION

The total economic impact of desertification (including the cost of reforestation and fixing of dynamic sands) is estimated at \$346.9 million annually. In 2017, the share of agriculture in Turkmenistan's GDP was more than 10%, or 14.7 billion manats. With the gross value of agricultural production in 2017 at 20.4 billion manat, the loss of even 15% of the value of agricultural production would be more than 3 billion manat, or \$873.9 millions.

Dust particles have a negative impact on lung development in children, resulting in, among other things, impaired lung function and chronically stunted lung growth. Inhalation of dust particles can cause many serious non-communicable respiratory and cardiovascular diseases, cancer, and premature death. Dust often causes eye disease, skin disease and infections such as meningitis. Dust can ex-

acerbate chronic diseases.

Inhalation of dust from plant fibers, including cotton, which is grown in all regions of Turkmenistan, develops a condition called bissinosis, in which bronchospastic and asthmatic symptoms are observed. Exposure to fine particulate matter reduces life expectancy in the region by an average of 8.6 months.



DLDD AND CLIMATE CHANGE INITIATIVES

Addressing desertification, drought, and SDS take an important place in the National development programmes of Turkmenistan. Reducing the risk of these phenomena and mitigating their consequences will contribute to the sustainable development of the country's economy under changing climate conditions and growing deficit of water resources.

In October 2016, Turkmenistan ratified the Paris Climate Agreement, and in 2019 a new National Climate Change Strategy for Turkmenistan was prepared. The new edition of the strategy meets the objectives of the Program of Socio-Economic Development of Turkmenistan for 2019-2025 and includes a number of measures to combat climate change that meet the realities of today.

To combat desertification Turkmenistan closely cooperates with the United Nations Development Program, the Global Environ-

ment Facility, the UN Food and Agriculture Organization, the German Society for International Cooperation, the UNCCD Secretariat, CAREC and other international organizations. The Korean International Cooperation Agency provides technical assistance to the Ministry of Agriculture of Turkmenistan in the development of GIS technologies.

In recent years, more than 35 million different types of trees have been planted in Turkmenistan to protect large cities from sand and dust. Refilling of the artificial lake "Altyn Asyr" allowed additional watering of 11 million hectares of desert pastures and improving the ameliorative condition of 440 thousand hectares of irrigated land. Uncontrolled drainage water discharge into the Karakum Desert and the Amudarya River was completely stopped. Twenty thousand hectares of forest were planted in the Bostendag area.

CAPACITY-BUILDING ACTION PLAN FOR THE EFFECTIVE MANAGEMENT OF SDS IN TURKMENISTAN

The full version of the Recommendations on the structure and content of the National Sand and Dust Storm (SDS) Risk Mitigation Strategy of Turkmenistan proposes an action plan to build systemic and institutional capacity to implement effective and sustainable management of sand and dust storms in Turkmenistan and strengthen cooperation

between state organizations, local communities and natural resource users to reduce the negative impact of SDS on the lives of people and the state economy.

In the context of international and regional cooperation, this document will be the main tool of Turkmenistan in fulfilling its obligations under the UNCCD and UNFCCC conventions.



Disclaimer:

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United Nations
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