

# NATIONAL ACTION PLAN FOR THE PREVENTION AND MITIGATION OF SAND AND DUST STORMS IN THE REPUBLIC OF TAJIKISTAN FOR 2022-2030

## STRATEGIC CONCLUSIONS

Photo credit: Ussen Kapar

### KEY TASKS:

- Expanding the use and implementation of modern technologies and methods to combat SDS processes;
- Strengthening the strategic and institutional foundations of governance and enhancing the country's tailored capacity to combat SDS;
- Improving interaction between government agencies and departments, research institutes, universities, and NGOs through the development of human resources;
- Increasing the influence on system decision-making mechanisms and legislation in the field of sustainable management of SDS processes in the country;
- Strengthening the collaboration between the countries of Central Asia and international collaboration in sharing best practices and modern technologies;
- Identifying special education and training needs.

### MAIN OBJECTIVE

The National Action Plan (NAP) for the prevention and mitigation of sand and dust storms (SDS) in the Republic of Tajikistan aims to develop an understanding of the long-term impact of SDS, mitigate their impact and ensure a comprehensive and consistent implementation of Tajikistan's SDS policy.

The NAP contains an analysis of the current situation in the sphere of natural disasters and disaster risk management, a study of the socio-economic impact of SDS, a listing of existing national strategies and priorities in the field of SDS management, GIS maps of the main SDS hotspots in Tajikistan, as well as scientific and practical recommendations for decreasing the impact of factors contributing to the formation of SDS.

### WHAT ARE HIGH WINDS AND SDS?

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

Sandstorms occur when wind blows over dry bare ground at a speed of more than 1 m/s and lifts loose soil particles into the atmosphere. Sandstorms travel relatively close to the ground, while dust storms can rise to heights of many kilometers and transport particles hundreds to thousands of kilometers away.

Experts estimate global dust emissions from these natural phenomena at 1 to 3 Gt per year. As the CA region is highly susceptible to the impact of SDS, the Secretariat of the UN Convention to Combat

Desertification (UNCCD) works closely with governments of the region, NGOs, experts and local communities to build capacity to reduce the risks of SDS and mitigate its effects.

According to the UN, drylands, which occupy 30% of the planet's surface, are home to more than 2 billion people in 100 countries. If the rate of desertification is not reduced, by 2025, one in five people on Earth will live in an area prone to drought. In Central Asia experts estimate that 4-10% of crop area, 27-68% of pastureland and 1-8% of forest is significantly degraded.

Overgrazing, secondary salinization of soils,

depletion of water resources and irrational use of natural resources lead to more frequent and severe manifestations of SDS in CA. All these and other anthropogenic factors aggravate the processes of desertification, land degradation and drought (DLDD). The only way to slow down DLDD and achieve Land Degradation Neutrality (LND) is to strengthen regional cooperation. The formulation and implementation of country and regional strategies for counteracting SDS processes will have a direct positive impact on the environment of all Central Asian countries and enhance the pace of sustainable development of 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

of transport routes, reduced visibility due to dust



## FORMATION OF SAND AND DUST STORMS IN TAJIKISTAN

The processes of desertification resulting from the interaction of natural and anthropogenic factors significantly contribute to the formation of SDS. The high values of temperature and air dryness, low precipitation in arid areas, uneven distribution of precipitation during the year and extremely high intra- and inter-annual variability of precipitation all create favorable conditions for desertification.

The climate of Tajikistan is characterized by sharp seasonal and daily variations in meteorological indicators. The relatively cold winter sharply turns into a rainy spring, which is quickly overturned by a dry summer.

The population of Tajikistan, especially in its southern part, is well acquainted with the

SDS, which is commonly referred to as "Afghan winds". Storms are thought to originate from the territory of Afghanistan, which is only partly true. SDS come to Tajikistan from a variety of places. In recent years, storms have become more frequent, with the Aral Sea being the main source.

Such anthropogenic influences as intensive land cultivation, construction of main highways and railroads, and construction of various engineering facilities aggravate desertification processes. For example, significant cutting of forest areas around some settlements in the Western Pamirs has led to the formation of shifting sand dunes. This is just one example of the detrimental impact of human activity on the

environment.

The emergence of SDS is interconnected with the problem of shrinking glaciation in Tajikistan. The decrease in the area and volume of glaciers in the country, in turn, is caused by an increase in the overall baseline temperature and a change in precipitation patterns. The problem

## DANGER OF SDS FOR AGRICULTURE AND THE ECONOMY

Sand and dust storms are a source of major socio-economic losses. Such losses are particularly acute for people engaged in agriculture. It is associated with livestock morbidity, reduced crop yields, damage to engineering facilities, and reduced transport efficiency.

The economic losses from a single storm can run into hundreds of millions of dollars. Long-term costs include soil erosion, ecosystem contamination, chronic health problems, and desertification.

The layer of dust deposited on seedlings as a result of SDS leads to loss of plant tissue, reduced photosynthetic activity of plants and increased soil erosion.

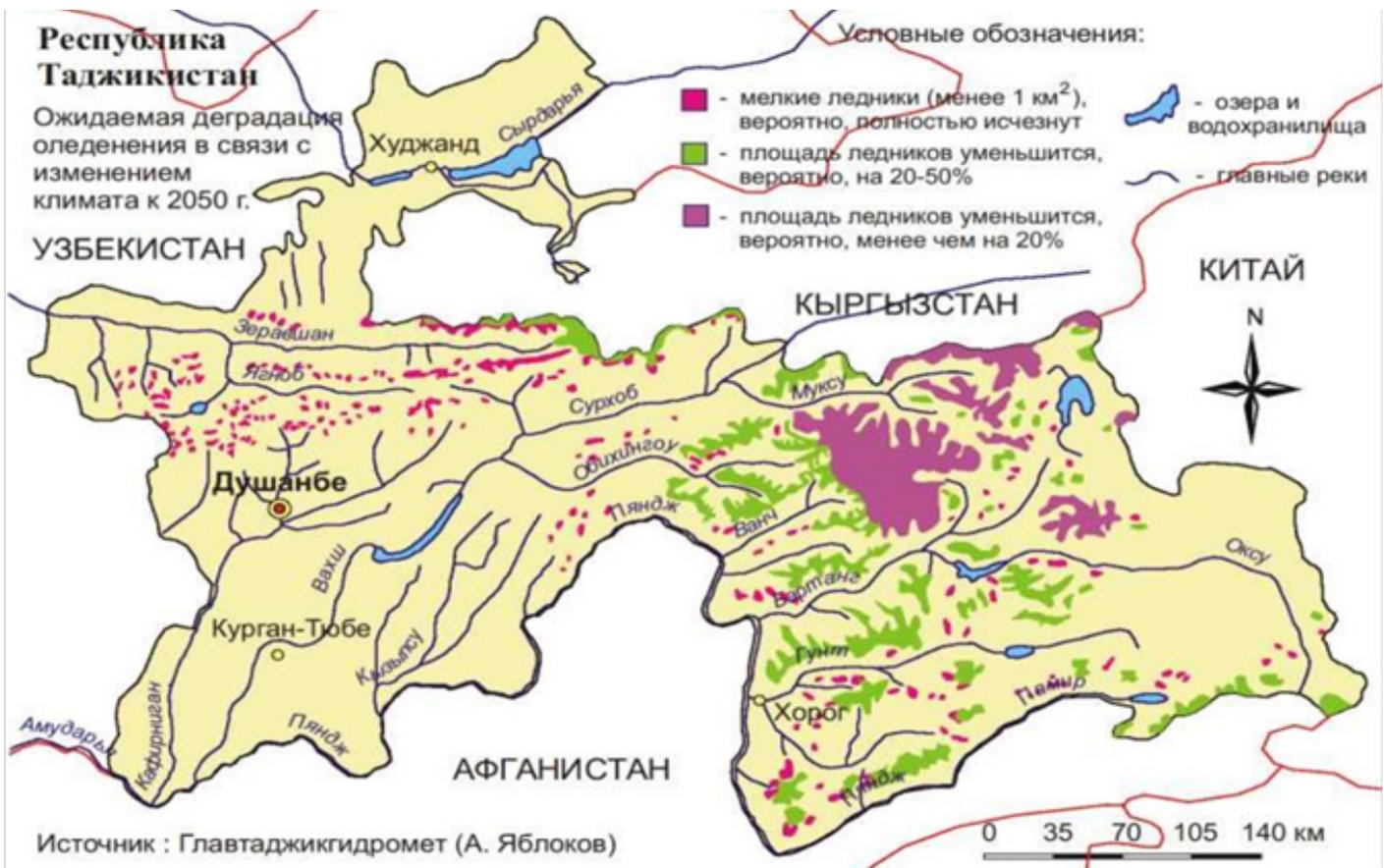
This, together with other impacts of SDS, reduces the overall average income of the

of the emergence of SDS is also exacerbated by the extreme degree of deforestation of the territory of Tajikistan, which belongs to the least forested countries. The area of forests in the country is only 410,000 hectares, or 3% of the total area of the country.

population engaged in agriculture and has a negative impact on the general standard of living in the country.

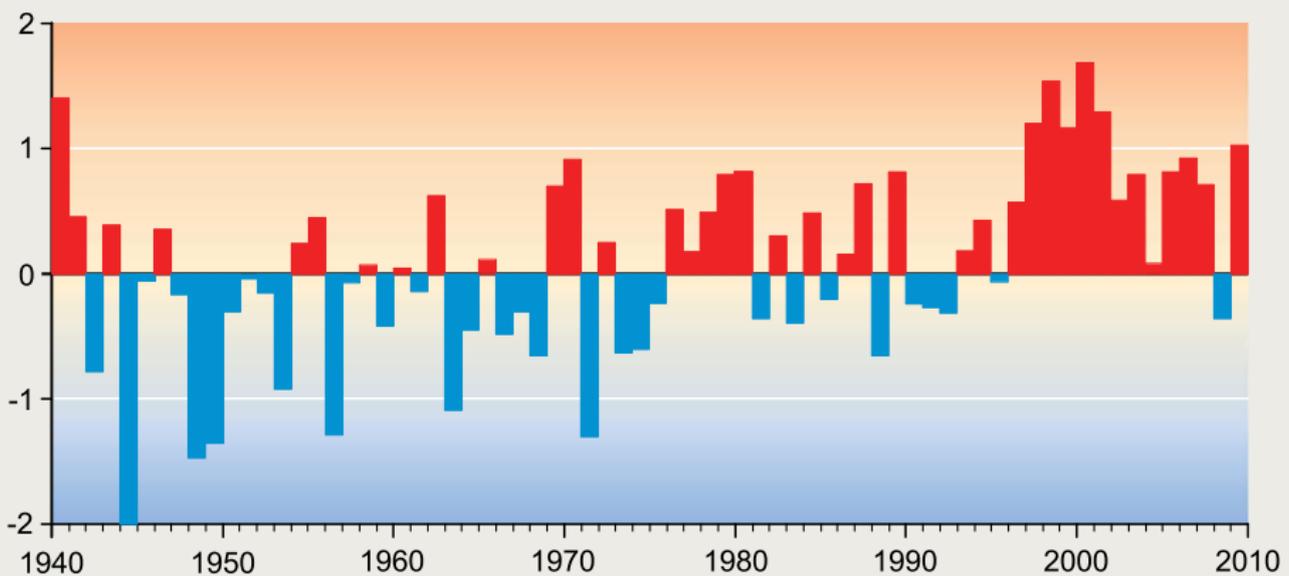
For 60% of the population of Tajikistan, agriculture is the main source of income. Agriculture accounts for about 20% of the country's GDP. The increase in arable land due to intensive plowing of mountain slopes, increasing livestock numbers, and a reduction in forest cover - all these anthropogenic factors lead to more frequent and severe SDS, which cause serious damage to agriculture.

SDS can negatively affect the production and supply of electricity. The vulnerability of these areas is of concern because of Tajikistan's heavy reliance on the hydropower sector: more than 98% of Tajikistan's electricity is generated by hydropower plants.



Expected degradation of glaciation in Tajikistan by 2050 due to climate change

Deviations of air temperature from the long-term annual average, 1961-1990, °C



Source: National Hydrometeorological Service of Tajikistan --- www.meteo.tj

## DANGER OF SDS TO HUMAN HEALTH

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.

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 problems, skin con-

ditions, and infections such as meningitis. Dust can exacerbate chronic diseases.

Respiratory diseases are very common in Tajikistan. Their share in the morbidity structure of the population is more than 29%. The age structure of the country's population is such that 40% of Tajikistan's citizens are children under the age of 17. 8% of the population are elderly people. Thus, almost half of the country's population is particularly vulnerable to the effects of SDS.

In Tajikistan, only 51.4% of the total population has access to drinking water. Among the rural population only 43.4% have access to drinking water. SDS reduce the quality of drinking water and contribute to the spread of various water-related diseases.

## CLIMATE CHANGE ADAPTATION AND SDS PROGRAMS

The Government of the Republic of Tajikistan adopted more than 50 laws and by-laws on climate change and environmental protection. More than 10 state programs and action plans have been approved, and national centers have been established to coordinate work aimed at addressing environmental issues. Such key documents as National Strategy of the Republic of Tajikistan for Disaster Risk Reduction 2019-2030, National Strategy of Adaptation to Climate Change of the Republic of Tajikistan until 2030 give very brief reference to SDS in general.

Currently, Tajikistan is in the process of approval of an updated Medium-Term Develop-

ment Program of the Republic of Tajikistan for 2021-2025. Among the tasks of the Environmental Protection, Climate Change and Disaster Risk Mitigation section is to develop the National Action Plan on Adaptation to Climate Change for 2021-2025 and the Medium-Term Disaster Risk Reduction Program for 2021-2026. The integration of the NAP for the prevention and mitigation of the consequences of natural hazards into the listed documents is necessary for the comprehensive coverage of the problems to which the section is devoted.

In Tajikistan, there is no methodology for analyzing the occurrence of SDS as one of the types of natural disasters. At the same time, in

the National Strategy for Adaptation to Climate Change of the Republic of Tajikistan for the period until 2030, when ranking climate risks (14 types) in descending order of priority, SDS are listed in the third place. The annual damage from SDS in the Strategy is estimated at more than \$450 thousand.

Lack of information, relatively low level of research conducted, lack of coordination among interested organizations, underestimation of the impact of SDS on public health and the economy as a whole contribute to the lack of experience in managing and preventing this disaster.

These problems can only be solved through coordination and exchange of experience with Central Asian countries, international and regional organizations.



## NATIONAL ACTION PLAN

The objective of the NAP is to improve systemic and institutional capacity to implement effective and sustainable management of sand and dust storms in Tajikistan. The plan will strengthen cooperation between organizations and local communities to reduce the negative impact of the SDS events and will serve as a basis for joint work at the sub-regional level.

The main tasks of the NAP:

- Task 1: Identify the risks of SDS and mit-

In the context of international and regional cooperation, this document could serve as Tajikistan's main tool for fulfilling its commitments to the SDGs, the Sendai Framework for Disaster Risk Reduction, and the United Nations Convention to Combat Desertification.

igate their impact on public health and other sectors of the nation's economy;

- Task 2: Ensure that all stakeholders have access to information on the risk of disasters related to SDS;
- Task 3: Integrate SDS risk management measures into development processes;
- Task 4: Improve the mechanism of preparedness to respond to SDS.

### Disclaimer:

*This document has been prepared with the financial support of the United Nations Convention to Combat Desertification (UNCCD) under the "Regional Approaches to Sand and Dust Storms (SDS) and Drought Management in Central Asia" project, which is implemented by the Regional Environmental Center for Central Asia ( CAREC). The document may contain advice, opinions and statements from various sources of information. The UNCCD does not represent or endorse the accuracy or reliability of any advice, opinions or statements or other information provided.*



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