UNCCD Response to Sand and Dust Storms

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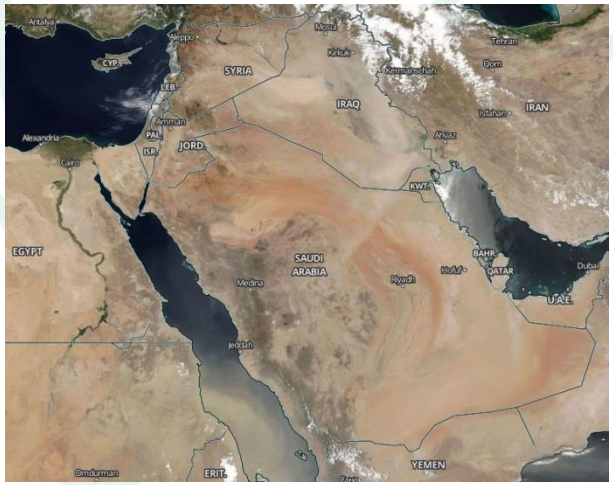
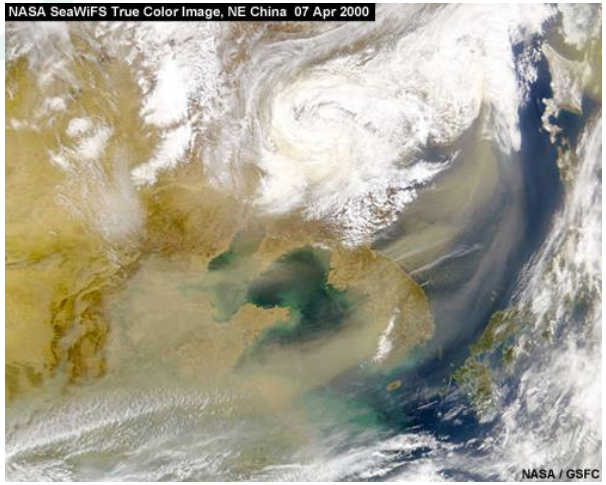
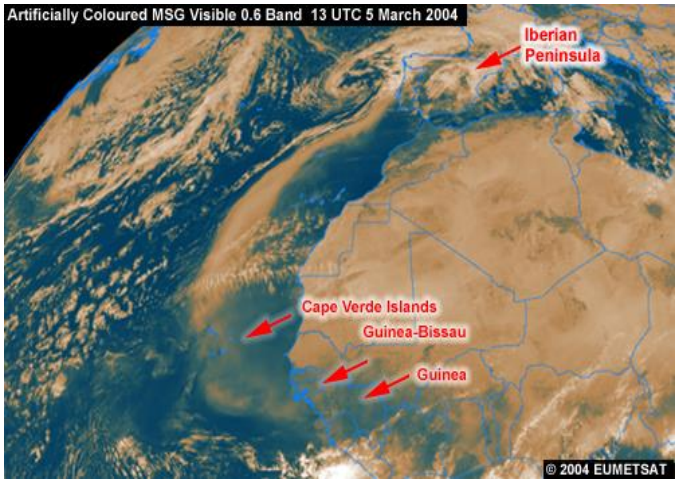
SDS are;

- A global transboundary issue: dust storms of different sources affect neighboring countries and/or can travel even far beyond continent
- A major global challenge to achieving sustainable development, especially in arid and semi-arid regions
- A natural and human-exacerbated disaster with multiple impacts on environment, economy, human, and socio-politics
- SDS and land degradation/desertification are interlinked - both symptoms and causes of each other







Sources of atmospheric particles - SDS in UNCCD policy?

- Volcano
- Sea salt
- Biomass burning
- Anthropogenic pollution
- Organic particles
- MINERAL DUST – originating from land surfaces

SDS have multi-faceted impacts

- **Environmental impact**
  - ✓ Air pollution
  - ✓ Land: soil erosion
  - ✓ Water quality
  - ✓ Drought intensification/weather-climate
  - ✓ Ocean/forest productivity

- **Socio-Economic impact**
  - ✓ Financial cost of damage: infrastructure, industry, agriculture, household
  - ✓ Labor market
  - ✓ GDP
  - ✓ Security/Displacement
  - ✓ Transportation: aviation, ground transportation

- **Health(Human) impact**
  - ✓ Morbidity
  - ✓ Mortality
  - ✓ Infectious disease prevalence

Helicopter Maintenance Unit Crew Strapping a Tarp to a Helicopter to Prevent Possible Damage During a Major Dust Storm Balad Air Base, Iraq

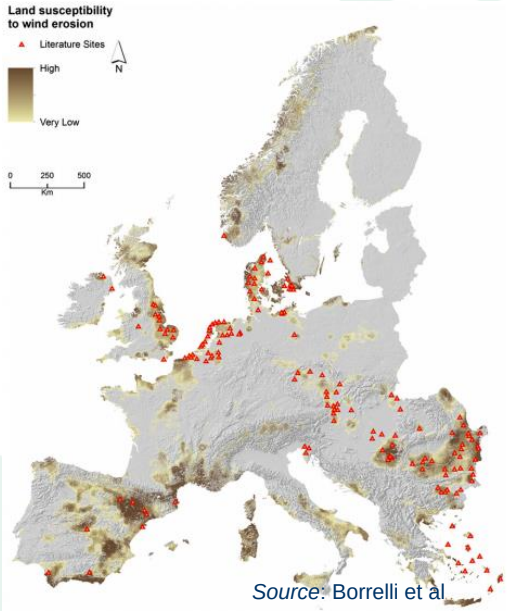
Sand and Dust Storms trends

Causing factors

- **Meteorological factors: wind, low-level turbulence**
- **Soil factors: soil texture, soil humidity, vegetation cover**

Factors contributing trends

- **Soil surface disturbance**
- **Intensified land degradation/desertification**
- **Land use practices**
- **Climate change**
- **Water management/drought**



Source: Borrelli et al

Source: Google images

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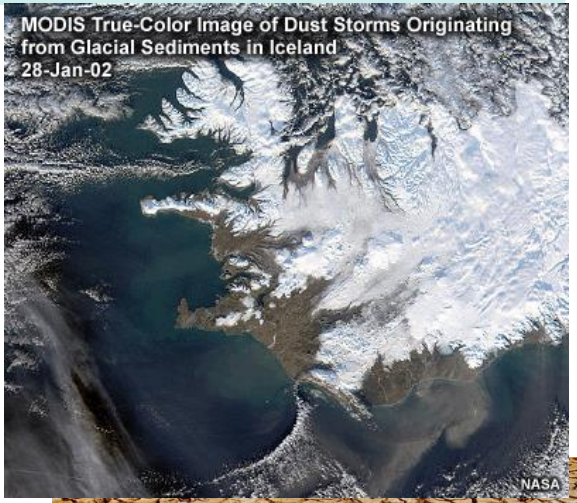
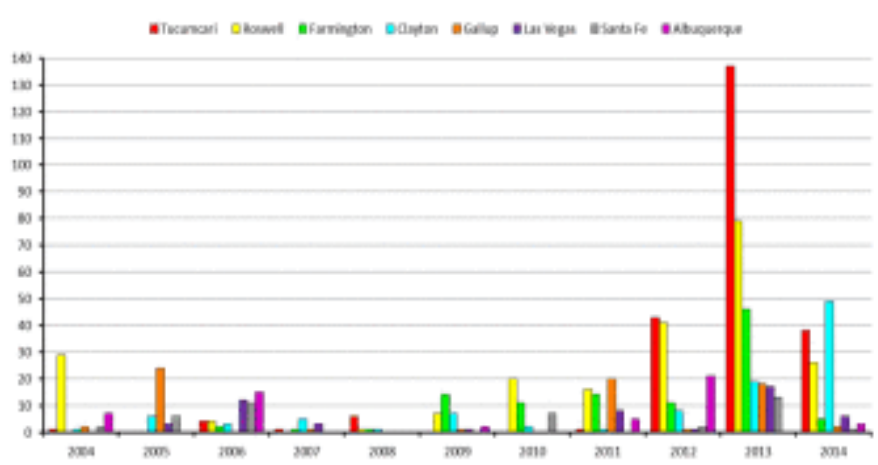


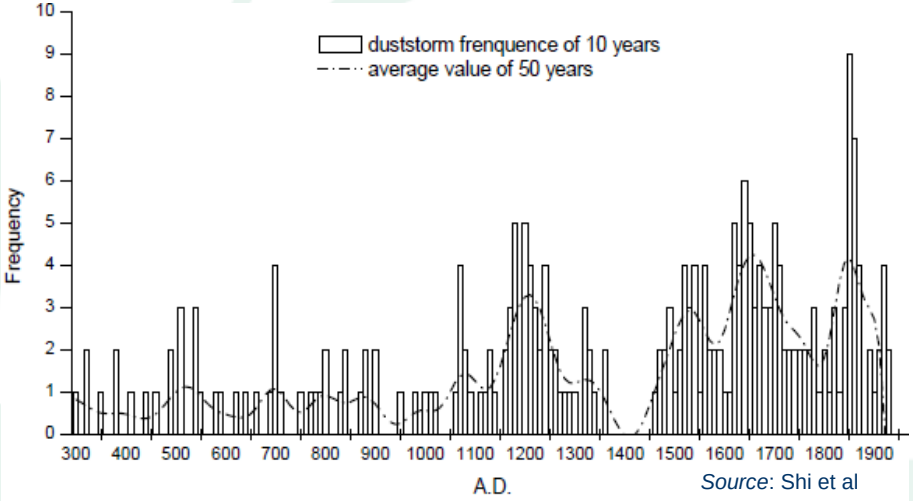
Source: Google images

Sand and Dust Storms trends

- **Frequency and intensity have increased in the last decades in some areas**
- **Future scenario and prediction from the longer term perspective under climate change including drought intensification**

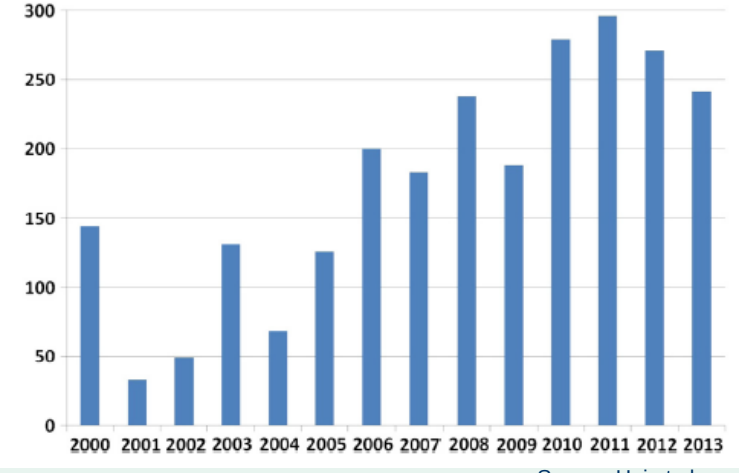


Dust Storms Frequency in New Mexico **(2004-2014)**



Source: Shi et al

SDS Frequency curve in Northern China



Source: Hui et al

Number of Days with SDS in West Asia

SDS relevant interventions

Resolutions/decisions on SDS

- **UNGA resolution** (70/195, 2015) contributed to global momentum to address SDS and requested a global assessment of SDS
- **World Health Assembly resolution** on air quality and health(2015), highlighted that the exposure to particulate matter posed a considerable health threat and was the leading environmental risk factor
- **Sendai Framework** for Disaster Risk Reduction 2015-2030
- **UNCCD decision** (decision 3/COP13, 2015)
- **UNEA-2 resolution** (2016) requested a coordinated approach to combat SDS, through identification of relevant data and information gaps, policy measures and actions by engaging with all relevant UN entities.
- **UNESCAP resolution** (2016)

Challenges/opportunities

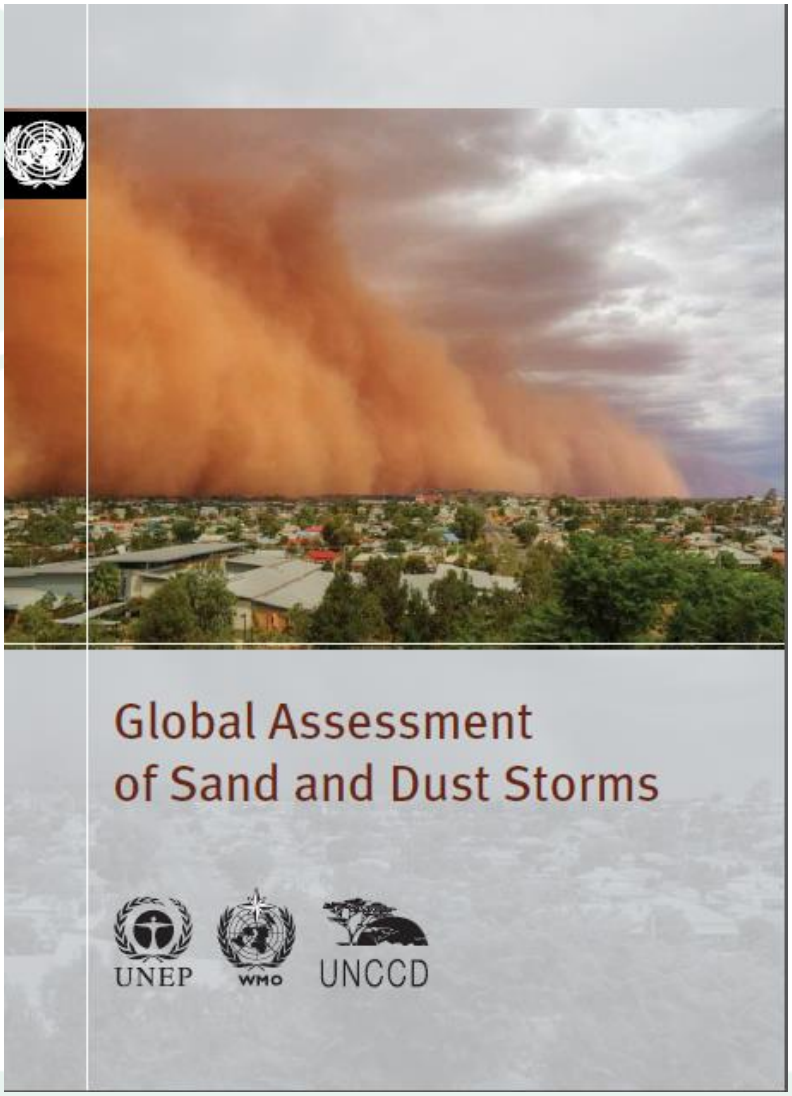
- Global coordination and consolidated policy for SDS
- Capacity in institutional framework, science and technical aspects
- Preparedness measures and strategies for risk reduction
- Global/regional cooperation to address SDS
- Financing opportunities for SDS actions

UNCCD for Sand and Dust Storms

Priority action by UNCCD (2016-2017)

- **Global Assessment of SDS** (UNEP, WMO, UNCCD): presented at the current UNGA session

- Development of a **Policy Framework** and **Technical Guide** for SDS



Policy Framework and Technical Guide for SDS

Objectives

- Provide a framework for developing a SDS policy at national/regional levels
- Inform SDS decision/policy making and facilitate discussion
- Implementation of improved policy and institutional frameworks towards mitigating SDS impact and managing SDS at global, regional and national levels.
- Technical guide, in particular, assists development and implementation of SDS policy as a complement to the policy framework by providing relevant tools/methodologies aiming to improving decision making on SDS

Expected outcomes

- Increased number of affected countries with SDS policies
- Increased availability and access to SDS early warning systems and risk information
- Reduced number of people affected by SDS
- Reduced economic losses and damages caused by SDS
- Strengthened resilience and preparedness
- Reduced erodibility and extent of SDS [anthropogenic] source areas
- Enhanced understanding of SDS
- Enhanced coordination/cooperation among stakeholders in SDS action at all levels

Principles for Policy Framework and Technical Guide

- Suggested principles
  - SDS policy and governance for SDS management
  - SDS early waring and monitoring, including health warning
  - SDS vulnerability and impact assessment
  - SDS impact mitigation, preparedness and response: ex ante/ex post measures
  - SDS knowledge management and awareness raising
  - SDS source mitigation in the context of LDN target

Information/Knowledge		Mitigation Measures	Policy Goal
Impact assessment Risk assessment Vulnerability mapping Source monitoring	Investment Options	Early waring Emergency preparedness Impact mitigation Source mitigation	Increased resilience
Policy/decision makers Experts		Experts Practitioners	Affected population /Society

SDS Policy Framework: three pillars policy areas

Early Warning	Resilience	Source Mitigation
• SDS monitoring and early waring/ forecasting • Health early warning	• SDS risk management • *ex ante* and *ex post* measures for impact mitigation	• SDS source monitoring • Mitigation of anthropogenic sources • Regional/global cooperation

Increased knowledge and information for a better SDS policy

- **Data collection and accessibility (sharing)**
- **Technical cooperation**
- **Health early warning**

- **Comprehensive impact assessment**
- **Risk assessment**
- **Vulnerability mapping**

- **SDS source mapping and monitoring with multiple data sets**
- **Integrated land/water management strategy**

Technical Guide of SDS

Tentative outlines

- Introduction: An overview to SDS
- National policy framework for SDS
  (Issues in national SDS policy: legislation/institutional arrangement, process, stakeholder engagement)
- Impact assessment of SDS
  - Framework for a comprehensive impact assessment of SDS
    (environment, health (human), economy, socio-politics)
  - **Methodology for economic impact assessment of SDS**
    including methodology for input/output analysis of mitigation measures
- SDS risk assessment and risk/vulnerability mapping
  - Risk assessment of SDS
  - **Vulnerability mapping of SDS**
  - SDS source monitoring and long-term prediction
    (satellite information with multiple data sets, including land cover, soil moisture and precipitation)
- Early warning and forecast/health warning
- Source mitigation: integrated land/water management
- **Case studies**
- **A catalogue of impact mitigation measures: ex ante/ex post**

Impact assessment of SDS

Why?

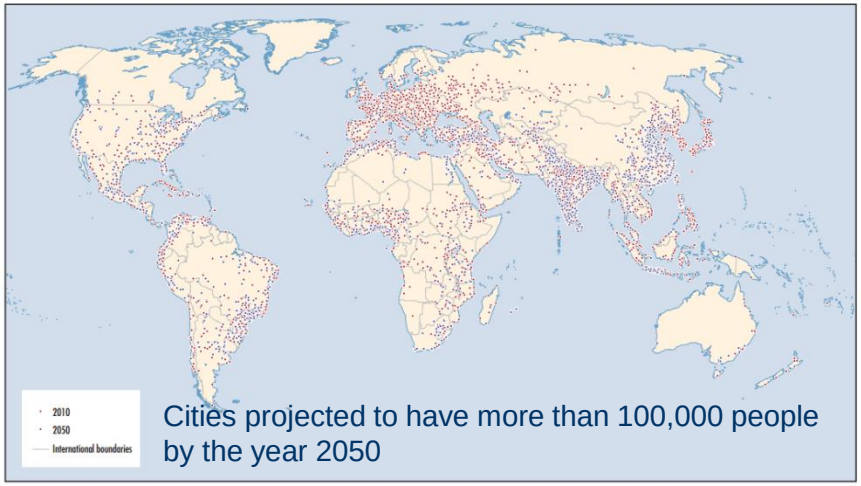
- Adequate characterization of impact of natural disaster is required to understand disaster
- Comprehensive and integrated analysis of SDS impact is needed for crisis management/emergency response including a holistic disaster management policy/procedure
- Tailored strategic framework of impact assessment of SDS with an aligned methodology is necessary for comprehensive assessment and vulnerability mapping
- A framework for comprehensive impact assessment will include categories on **economic,** environment, human(health) and socio / political impact assessment

Economic Impact Assessment of SDS

- Provide information in decision making of SDS policy and implementation options
- Mapping/categorization of impacts
  - direct/indirect, tangible/intangible, time span(long term-short term), sectoral classification
- An agreed outline of aligned methodologies for economic impact assessment
- Cost/benefit analysis of different mitigation options will be included
- Pilot test

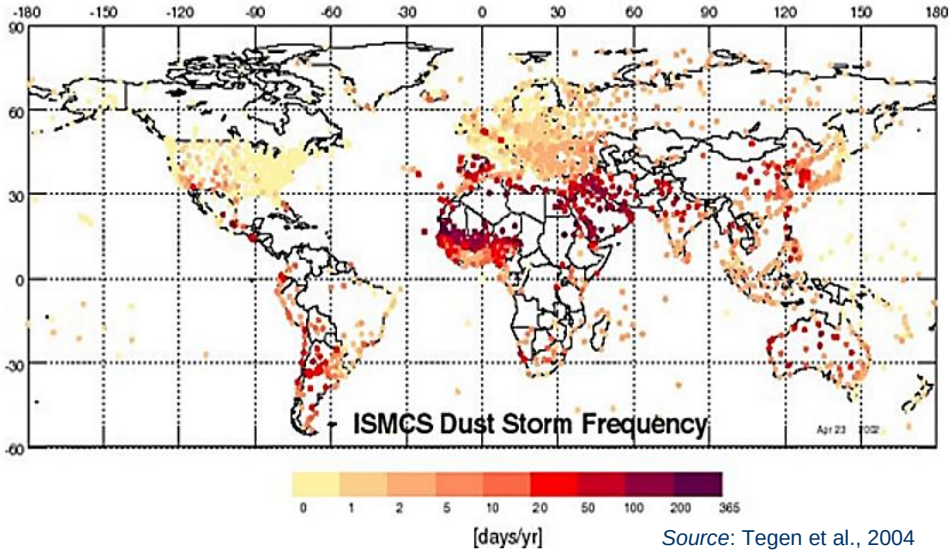
Risk assessment and vulnerability mapping
- Who/What is vulnerable to SDS?

- Risk assessment is required for disaster risk reduction to enhance resilience and reduce vulnerability
- A common risk assessment methodology will be developed with a methodology for vulnerability mapping taking into consideration different classes, i.e., human health, economy, agriculture, business, transportation etc.
- Risk assessment and vulnerability mapping contribute to early waring



Cities projected to have more than 100,000 people by the year 2050

Source: Brecht and others 2010.



Source: Tegen et al., 2004

Milestones/way forward

November 2016	• Source monitoring and early warning of SDS (Workshop on Space Technology applications for Dust Storms and Drought monitoring, Iran) • Inception meetings for pilot economic impact assessments (tbc) • Launch of impact analysis and vulnerability mapping
December 2016	• First Draft policy framework • 1st meeting of the technical guide
March 2017	• Draft policy framework • Working draft technical guide (2nd meeting)
June 2017	• First draft technical guide
September-October 2017 (UNCCD COP 10)	• Presentation of policy framework • Launch of technical guide
December 2017	• Final version of technical guide

Thank you