



Sand and Dust Storms (SDS) Technical Scoping Meeting

*Geneva,
15 – 16 April, 2019*

Table of Contents

Acronyms	2
Executive Summary	3
Background	4
Chairing of the Meeting	4
Opening of the Meeting and Introductory Remarks	4
Technical Scoping Meeting	5
Day 1.....	5
Day 2.....	5
Annex I – Participants List	1
Annex II – Annotated Agenda	4

Acronyms

AEMET	La Agencia Estatal de Meteorología
APDIM	Asia and Pacific Centre for the Development of Disaster Information Management
BSC	Barcelona Supercomputing Centre
CIHEAM	Centre International de Hautes Études Agronomiques Méditerranéennes (Mediterranean Agronomical Institute of Bari)
FAO	Food and Agriculture Organization
NASA	National Aeronautics and Space Administration
SDS	Sand and Dust Storms
SDS-WAS	Storm Warning Advisory and Assessment System
TSMS	Turkish State Meteorological Service
UN ESCAP	UN Economic and Social Commission for Asia and the Pacific
UN	United Nations
UNEP	UN Environment Programme
UNEP-IEMP	UNEP International Ecosystem Management Partnership
WHO	World Health Organization
WMO	World Meteorological Organization

Executive Summary

UN Environment (UNEP) together with the World Meteorological Organization (WMO) hosted a sand and dust storm (SDS) technical scoping meeting at the WMO headquarters in Geneva with key partners and experts to discuss and agree on the way forward for a technical project on sand and dust storm (SDS).

The aims of this meeting were to learn about current work happening across the UN and partners on the topic of SDS, to identify problems and objectives and develop a Theory of Change. This would lead to determination of potential SDS project themes, outcomes and outputs and to outline the relative roles of UN agencies and partners. Also, to identify potential funding, donors and other stakeholders.

The meeting was structured as follows (see Annex I – Annotated Agenda, for the complete programme):

Day 1 – Presentations from meeting participants (UN and partners) to learn about their current work on SDS. Development of a Theory of Change, splitting into two groups.

Day 2 – Discussions on the identification of key areas for project development, funding opportunities for the project, key partnerships and potential donors. Finalization of the Theory of Change.

Action Items:

- Meeting report (including 1 round of comments) (**UNEP**)
- Theory of Change (Includes assumptions & drivers for comment) (**UNEP**)
- Clarify work streams (**UNEP**)
- Stakeholders list (**UNEP**)
- Contributions to UNCCD COP SDS day (**UNCCD**)
- Contributions to SDS-WAS 11-14 Nov 2019 meeting (**WMO**)
- Further follow-up to this meeting (**UNEP**)

Background

Sand and dust storms (SDS) play an integral role in the Earth system, but they also present a range of hazards to human society that will impede the achievement of sustainable development in its economic, social, climate and environmental dimensions. SDS can result in damage to crops and the removal of fertile topsoil, adversely affecting food production. Atmospheric dust can cause and/or aggravate a number of human health problems, including respiratory ailments and cardiovascular disease. Poor visibility can result in air and road traffic accidents. Other common forms of economic disruption include closure of transport services and cleaning of roads, houses and business premises. These socio-economic impacts are frequently transboundary in nature, because desert dust events commonly involve long-range transport over thousands of kilometers and occur at local to global levels.

Various UN resolutions have recognized the importance of SDS as an emerging issue and called for assistance from the UN system to address the associated problems. These include resolutions from the UN General Assembly (A/RES/70/195, A/RES/71/219, A/RES/72/225 and A/RES/73/237), the United Nations Environment Assembly (Res. No. 2/21 and paragraphs in Res. UNEA 4-L11)¹, the 15th World Meteorological Congress (Cg-XV, Decision 3.3.3.6), the United Nations Economic and Social Commission for Asia and the Pacific (E/ESCAP/RES/72/7), and a Ministerial Declaration and set of technical recommendations endorsed at the International Conference on Combating Sand and Dust Storms, held in Tehran from 3 to 5 July 2017, hosted by the Government of Iran with the cooperation of several UN entities.

To respond coherently to these resolutions, a project concept titled '5.VII Increasing capacity to combat SDS in Asia and Africa' was included in the approved 2018-2021 Project Portfolio of UN Environment Programme's fifth Subprogramme on Chemicals Waste and Air Quality. This project will enhance the capacity of countries to monitor and assess air quality deterioration by SDS and enable countries to take well-informed policy actions to improve air quality as a result of reduction of SDS. In addition, an interagency initiative is envisaged, led by UN Environment and working closely with UN Convention to Combat Desertification (UNCCD), WMO and other relevant UN bodies.

Chairing of the Meeting

The Scoping Meeting for SDS was co-chaired by Sr. Maarten Kappelle, Head of Thematic Assessment Unit, UN Environment Nairobi, Dr. Nicholas Middleton, UN Environment SDS Consultant, Nairobi and Dr. Tessa Goverse, Subprogramme-Coordinator for Chemicals, Waste and Air Quality programme, UN Environment, Nairobi.

Opening of the Meeting and Introductory Remarks

Prof. Dr. Pavel Kabat, WMO Chief Scientist and Director of Research, welcomed participants to the scoping meeting, noting that WMO's interest in SDS will broaden beyond the current provision of its Dust Storm Warning Advisory and Assessment System (SDS-WAS), now that WMO's approach is more in line with work on the Earth System as a whole. Maarten Kappelle, Head of Thematic

Assessment Unit, Science Division, UNEP Nairobi, provided the context for the meeting, emphasising the need to identify the gap between science and policy for SDS issues and UNEP's timeline of 2019-2021 as part of its Project Portfolio for the fifth Subprogramme on Chemicals Waste and Air Quality. A wider UN context was provided by Hossein Fadaei, Head of the Environment Management Group Secretariat, UNEP Geneva, who outlined progress made to date on formation of a UN Coalition on SDS, for which a concept note has been agreed. Terms of Reference for the Coalition are being developed and it is proposed that a formal signing ceremony take place in conjunction with a suitable high-level event, such as the fourteenth meeting of the Conference of the Parties to the UN Convention to Combat Desertification (UNCCD COP 14) that is scheduled to take place from 2-13 September 2019 in New Delhi, India.

Technical Scoping Meeting

Day 1

After the welcoming remarks, the meeting held the first block of participant presentations, designed to give participants a broad understanding of current work in their respective organizations. Presentations were given by representatives of UNEP, WMO, UNCCD, WHO, UN ESCAP, UNEP-IEMP, CIHEAM Bari.

The second block of participant presentations comprised contributions from the Asian Disaster Reduction Center (ADRC) in Japan (by teleconference), UNEP Africa Office, AEMET Spain, BSC Spain, FAO, the Asian and Pacific Centre for the Development of Disaster Information Management (APDIM), University of Arizona, Turkish State Meteorological Service and the Atmospheric Science and Meteorological Research Center (ASMERC), Iran.

The afternoon session began with a presentation by Ms. Tessa Goverse, UNEP, to explain the main steps in designing a project. She also spoke about Problem Trees and explained how to develop a Theory of Change. After this presentation, meeting participants were divided into two breakout groups, one group led by Maarten Kappelle, the other by Tessa Goverse.

The groups had discussions to identify the problems, objectives and solutions to develop a Theory of Change on SDS. These discussions would be later translated into charts and tables in the second day sessions.

Day 2

The second day of the meeting was co-chaired by Nick Middleton, Tessa Goverse and Maarten Kappelle, UNEP and started with a presentation by Tessa Goverse on the finalization of the Theory of Change. She defined and explained the difference between drivers and assumptions, and also spoke about stakeholder analysis.

The same two breakout groups met up again to discuss the drivers and assumptions, reporting on the following:

Assumptions:

1. Political will
2. Willingness to collaborate / share data
3. Sufficient resources
4. Implement capacity
5. Viability of investment
6. Mainstreaming
7. Alternatives available (land use, health benefits)
8. Funding availability
9. Population growth + Migration
10. Climate change
11. Law enforcement
12. Peace and Security

Drivers:

1. National services are invested in SDS (health, land, EPP, NMHS)
2. Regional bodies push SDS agenda
3. Land users are open to change
4. Mobilize research to fill gaps (build community)
5. Increased (public) awareness (media attention at health effects)
6. City campaign to include SDS
7. Local administrators
8. Sectoral economic cost
9. Resource mobilization
10. Technology
11. Adaptation
12. Mitigation
13. Land Management
14. Vulnerability + resilience

The two groups met for two hours to Identify key areas for project development (Science, Policy, Action): Project outcome, Project Outputs, Log Frame and Milestones. They reported back on the following:

Mains *Workstreams* covering activities, outputs and outcomes

A) Science (Data and Information)

1. Project Outcome
 - a) Enhanced capacity building
 - b) Data exchange and open data approach
 - c) Improved knowledge on SDS drivers and sources

2. Outputs

- a) Data + information sharing platform
- b) Source Map
- c) Data Platform
- d) Monitoring Network
- e) Data to measure impact
- f) Use of tools EW + Integrand
- g) Orient the research agenda
- h) Observation system and parameters

3. Activities

- a) Data Processing
- b) Data access and creation
- c) Establish data exchange protocol (s)
- d) Data Models and OBS (NRT and long-term or climate projections data)
- e) Analysis Gap
- f) Information Dissemination

B) Science (Assessments, early warning, foresight)

1. Project Outcome

- a) Improved risk knowledge
- b) Forecasts and reanalysis
- c) Enhanced knowledge of impacts
- d) Enhanced preparedness

2. Outputs

- a) Assessment reports
- b) Early warning alert system (coordinated activity)
- c) Toolkits
- d) Integrated tools for SDS impact assessment and combating SDS
- e) Economic assessment tool
- f) Early warning data systems

3. Activities

- a) Preparation of Assessment Reports
- b) Information dissemination
- c) Additional observations and measurements
- d) Policy dialogues at different levels
- e) Desertification SDS
- f) Forecasting of SDS
- g) Impact based forecast
- h) Early warning
- i) Measuring progress

C) Policy and Decision Making

1. Project Outcome
 - a) Resilient ecosystems
 - b) Better management of SDS
 - c) Transboundary cooperation
 - d) Enhanced evidenced policy making
 - e) SDS on political agenda
 - f) Stemming migration

2. Outputs
 - a) Less economic loss
 - b) Improved land and water policies
 - c) Coordination mechanism strategies
 - d) Governance mechanisms strategies
 - e) Cross-sectoral policy emergence
 - f) Capacity building
 - g) Public-private partnership
 - h) SDS mainstream

3. Activities
 - a) Education/ Ext programs
 - b) Data models and observations
 - c) Damage and Loss of SDS is mitigated.
 - d) Information delivery to end-users in right form ('last mile' problem)

D) Implementation of Actions

1. Project Outcome
 - a) Green jobs
 - b) Sustainable land and water management
 - c) SDS Mitigation
 - d) Reduced Vulnerabilities
 - e) SDS Prevention (DRR)
 - f) Restoration of Natural Dust Cycle

2. Outputs
 - a) Sustainable land and water management
 - b) Less economic loss
 - c) Practice and policy
 - d) Green investment
 - e) Ecological restoration

3. Activities
 - a) Stakeholder engagement
 - b) Data observations and models
 - c) Information Dissemination
 - d) Education capacity building

E) Communication and Awareness Raising

1. Project Outcome
 - a) Raised Awareness
 - b) Informed Decision Making
2. Outputs
 - a) Data and Information Exchange (Evidence)
 - b) Communication Strategy SDS
 - c) Knowledge Management among partners
3. Activities
 - a) Collaboration and Concerted actions
 - b) Public Dialogue
 - c) Information Dissemination
 - d) Awareness and outreach campaigns
 - e) Data models and observations
 - f) Education and training

F) Coordination and Collaboration

1. Project Outcome
 - a) Services Media Collaboration (Public information)
 - b) Cross-sectoral coordination
 - c) Transboundary cooperation
 - d) Improved management
2. Outputs
 - a) UN Coalition
 - b) SDS-WAS
 - c) Coordinated and harmonized observations of SDS
 - d) Joint messaging communication strategy
 - e) Regional plans of action integrated into higher levels

- f) Knowledge share platform
- g) Global Response on SDS
- h) Multidisciplinary better coordination between agencies
- i) Action Plan Global

3. Activities

- a) Mapping of initiatives/ gaps
- b) Joint reporting
- c) Information dissemination
- d) Data models and observations
- e) User engagement strategies

In the afternoon session, meeting participants identified funding opportunities, key partnerships and potential donors. They mentioned the following:

1. Data Capture Software, IBM (Datacap)
2. Google
3. Google-NASA
4. Mapping water quality online
5. Partnership with IBM on artificial intelligence
6. Exoscale Cloud company
7. Map X, GRID, Geneva
8. GEF, Global Environment Facility
9. GCF, Green Climate Fund
10. PMEH Program focuses on emissions
11. FUJITSU- Japanese computing company which gave significant funding to UNDP in Asia Bangkok.
12. The European Space Agency (ESA)- Copernicus Space Component
13. Center for Agriculture and Rural Development (CARD), Armenia. (Research experts in agriculture in dryland areas. They have experience in Dust storms towards agriculture sector)
14. The Center for Agribusiness and Rural Development (CARD), Armenia ???
15. Centre for Agriculture and Rural Development (CARD), India ???
16. United States Environmental Protection Agency (EPA)
17. Center for Disease Control and Prevention (CDC)
18. Private sector
19. ECMWF, in kind contribution computer, infrastructure,
20. ESIAM W provides services
21. LDN (UN Fund only given to the countries upon request)
22. Support from supercomputing centers many is underused, not only IBM
23. Environment investment bank
24. Bilateral aid: foreign affairs departments of European countries sometimes have regional programs
25. UN environment signed MOU with Google
26. Microsoft resources

27. Bill and Melinda Gates Foundation
28. Ethiopian airlines
29. Qatar airways
30. Emirates airline
31. SDC, Swiss Agency for Development and Cooperation
32. JICA Japan

33. WMO SDS-WAS trust fund

34. USAID IJS\

35. South-South program

36. Belmont Forum

37. McCarthy Foundation

38. Asian Development Bank

39. Islamic Development Bank

The Scoping meeting was finalized by listing Action Items and closing remarks.

It was agreed to take action on the following points:

Action Items

- Meeting report (including 1 round of comments) (**UNEP**)
- Theory of Change (Includes assumptions & drivers for comment) (**UNEP**)
- Clarify work streams (**UNEP**)
- Stakeholders list (**UNEP**)
- Contributions to UNCCD COP SDS day (**UNCCD**)
- Contributions to SDS-WAS 11-14 Nov 2019 meeting (**WMO**)
- Evaluate the inclusion of potential other UN partners such as ICAO
- Follow-up to this meeting (**UNEP**)

There were closing remarks from Alexander Baklanov (WMO) and Maarten Kappelle (UNEP), thanking everybody for making time to come to the meeting in Geneva and for all the valuable inputs that were presented and discussed over the two days.

Annex I – Participants List

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Annex II – Annotated Agenda

Meeting Objectives:

- To learn about current work happening across the UN and partners
- To identify problems and objectives and develop a Theory of Change
- To determine potential SDS project themes, outcomes and outputs
- To outline the relative roles of UN Environment and other agencies
- To identify potential funding, donors and partners

Monday 15 April, 2019

TIME	
08.15-08.30	Registration
08.30-09.00	Welcome and Introductions <ul style="list-style-type: none"> • WMO welcoming remarks - Pavel Kabat (WMO Chief Scientist and Director of Research) • UN Environment welcome and context - Maarten Kappelle (UNEP Science) • UN SDS Coalition context - Hossein Fadaei (UNEP EMG)
09.00-11.00	Setting the Stage: Current Work 1 (Moderator: Maarten Kappelle, UNEP) Presentations (10 mins each plus 5 min. Q&A) <ul style="list-style-type: none"> • UN Environment ongoing SDS work – Nick Middleton (UNEP) • UN Environment, 6th Global Environm. Outlook’s Land Results – Pandi Zdruli • WMO SDS-WAS - Alexander Baklanov (WMO) • UNCCD ongoing SDS work – Utchang Kang (UNCCD) • WHO ongoing SDS work - Sophie Gummy (WHO) • ESCAP ongoing SDS work - Sanjay Srivastava (UN ESCAP) • UNEP-IEMP/Elion ongoing SDS work in Asia - Chao Fu (UNEP-IEMP)
11.00-11.15	<i>Coffee break</i>
	Setting the Stage: Current Work 2 (Moderator: Nick Middleton, UNEP)
11.15-12.30	Presentations (10 mins each plus 5 min. Q&A) <ul style="list-style-type: none"> • QZSS satellite project - Koji Suzuki (Asian Disaster Reduction Center, ADRC) • UNEP Africa - Levis Kavagi (UNEP) • Burkina Faso Dust Warning Advisory System - Ernest Werner (Aemet, Spain) • Towards the development of dust user-oriented services: inDust and DustClim projects - Sara Basart (BSC, Spain)
12.30-13.00	Discussion and questions
13.00-14.00	<i>Lunch</i>
	Identifying the Problems, the Objectives/Solutions and Developing a Theory of Change (Facilitator: Tessa Goverse, UNEP)
14.00-14.30	Introduction and guidance to the methodology – Tessa Goverse
14.00-16.00	Break-out groups – all
16.00-16.30	<i>Coffee break</i>
16.30-17.30	Break out groups reporting back and group discussion – all

Tuesday 16 April, 2019

TIME	
	Recap from Yesterday and Project Development (Moderators: Nick Middleton, Tessa Goverse and Maarten Kappelle, UNEP)
09.00-11.00	Plenary reflections and finalization of the Theory of Change
11.00-11.30	<i>Coffee break</i>
11.30-13.00	Identify key areas for project development (Science, Policy, Action): Project outcome, Project Outputs, Log Frame, Milestones

13.00-14.00	<i>Lunch</i>
	Project Funding Opportunities and Partnerships (Moderators: Nick Middleton, Tessa Goverse and Maarten Kappelle, UNEP)
14.00-15.45	Identify funding opportunities, key partnerships and potential donors
15.45-16.15	<i>Coffee break</i>
16.15-17.15	Wrap up and next steps: Action items, responsible persons and timelines
17.15-17.30	Closing remarks – UNEP, WMO