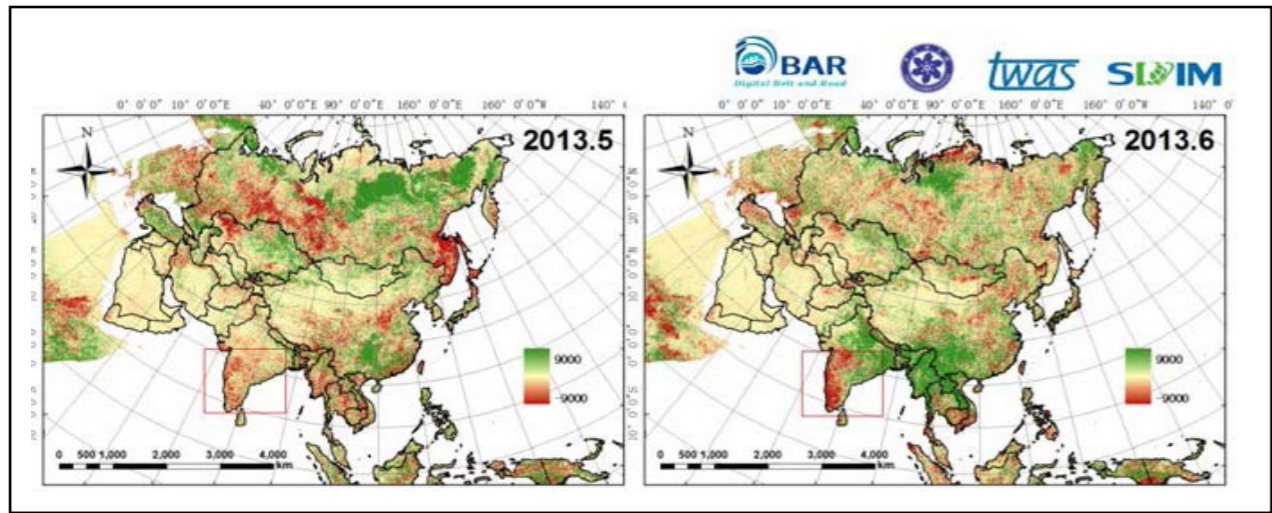# Drought Monitoring and Assessment in Typical Regions of the Belt and Road – using the Drought-Watch System by CAS-TWAS SDIM

Priority for Action 1 - Drought Severity and Drought Risk in the Belt and Road

Application field: To improve drought monitoring abilities in the Belt and Road (B&R), activities were implemented with close cooperation among the B&R countries. Activities included the prioritization of drought indices, field observations, model calibration and validation, capacity building for drought monitoring technology and systems, and customization of a drought monitoring system, Drought-Watch, developed by SDIM.

Methodology and workflow: The Drought-Watch system applies several Earth observation drought indices (EO-derived drought indices), as well as meteorological drought indices, e.g., PED index and Standard Precipitation Index (SPI), for drought monitoring at different temporal scales (day, month, pentad and decade) in the Belt and Road. Drought severity is categorized into 5 levels, indicating normal, abnormally dry, moderate drought, severe drought and extreme drought.

Key results: Using the five types of Drought-Watch drought products (NDDI, VSWI, TCI, VCI and VHI), drought conditions in the Belt and Road can be assessed. For example, Drought-Watch EO-derived drought indices demonstrate that a severe drought occurred in India during the period from May to June in 2013, where similar results were detected using the PED index, SPI, soil moisture, summer conditions, biomass normalization, and biomass anomaly.

Innovative impact: The simplicity of the system, availability of free data, evidence-based research, and minimal requirements for input are deemed to be the main innovations. Some improvements should be considered in the future for perfecting the drought monitoring model.

GP-STAR Factsheet

Application status: Pre-operational at the country-level in the Belt and Road, in countries such as Mongolia, Pakistan, Sri Lanka, Cambodia and Thailand.
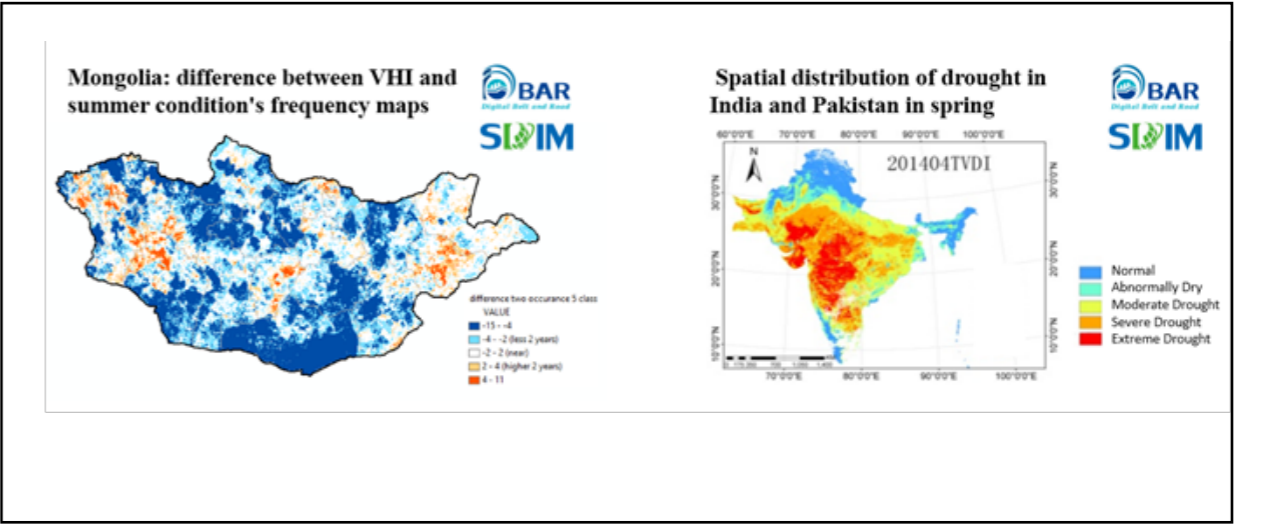
Background: The Drought-Watch Indices module can calculate five EO-derived drought indices and two meteorological indices in four temporal scales (day, month, pentad and decade), with composition parameters. Both the single index and combination index are applied for drought classification in the drought module.

Key publications:
Nana Yan, Bingfang Wu, Vijendra K. Boken, Sheng Chang, and Yang Leidong (2016). A drought monitoring operational system for China using satellite data: design and evaluation, Geomatics, Natural Hazards and Risk, 7,264-277

Bin Li, Fang Chen, Feng Xu, and Wang Xinrui (2016). Changes of the time-varying percentiles of daily extreme temperature in China, Theoretical and Applied Climatology, DOI:10.1007/s00704-016-1938-z

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