Satellite Data for Climate, Crisis and Disaster Risk Finance

WORLD BANK GROUP
Finance, Competitiveness & Innovation

A joint technical partnership

esa
European Space Agency
Agence spatiale européenne

Supported by

Global Risk Financing Facility
Supporting Early Action to Climate Shocks, Disasters, and Crises

Global Index Insurance Facility
Funded by

Federal Ministry for Economic Cooperation and Development

UKaid
from the British people

Implemented and Managed by

Disaster Risk Financing & Insurance Program
SUPPORTED BY WORLD BANK GROUP

GFDRR
Global Facility for Disaster Reduction and Recovery

A technical partnership on Satellite Data and Risk Financing

Context

-> **Problem Statement**: Need for new and robust information on a broad range of financial risks

-> **Development Objective**: Improved financial resilience through comprehensive, timely, global information on climate, crisis and disaster risks

Key Features

- Timeline: 2021-2023
- World Bank FCI/CDRF-led
- 3 Components ; 5+ partner Global Practices
- 10+ core Projects
- 30+ key stakeholders and technical partners
- Target Impact: 100 million beneficiaries

Planned Activities

Technical Assistance in support to operational engagements :

- Financial exposure mapping
- Climate risk monitoring
- Forecast and near real-time risk information
- Models and triggers for "new" risks
- Improved parametric insurance products
- Capacity Building on use of EO/Big Data, AI/ML

-> Focus on integrating value-add risk information into WBG operations and products, across World Bank teams, with key stakeholders and partners

Global Risk Financing Facility

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3 Highlights:

- Next Generation Drought Index Insurance
- Climate-related financial risks
- Financial resilience in MENA

Next-Generation Drought Index:

Leveraging satellite data for drought insurance in Senegal

Input Data Selection

- Rainfall
- Water Balance
- Evapo-Transpiration
- Soil Moisture
- Temperature
- Vegetation Greenness
- Any other dataset or model

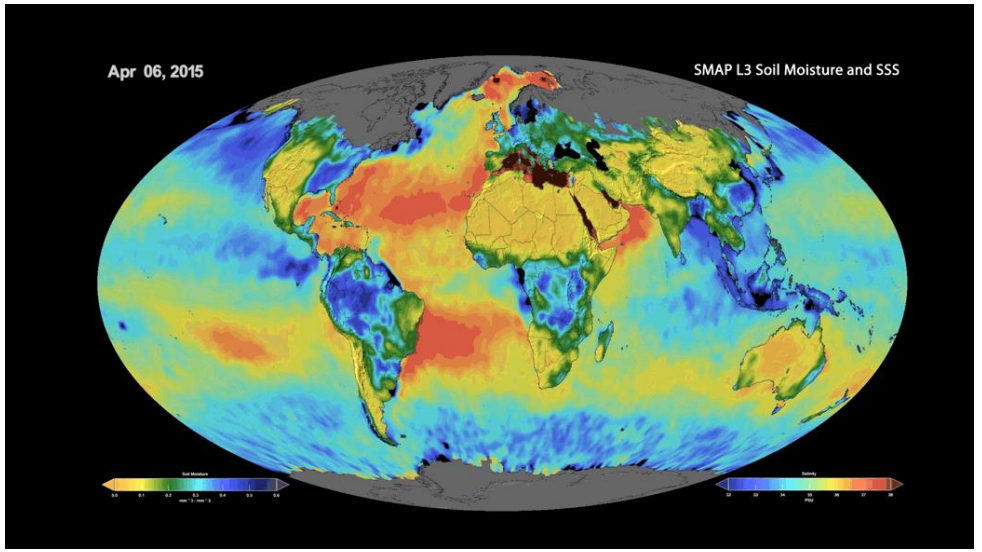
Pre-processed drought datasets made available under single interface

Parametrization

- What is the plant growth cycle and seasonality?
- Any geographic pattern of drought ? *(grouping agricultural areas together)*
- How to combine indicators into single index?
- How vulnerable is the target population to drought?
- What are the reference/historical performance values to be considered?

Step-by-step parametrization and data integration to guide users through design process

Transparent design process: users are empowered to generate and visualize drought risk indices that best meet their expectations



Satellite-based soil moisture data provides unique insight into drought risk and through continuous, global and free coverage with the Copernicus constellation
Source: ESA/SMAP

Next-Generation Drought Index:

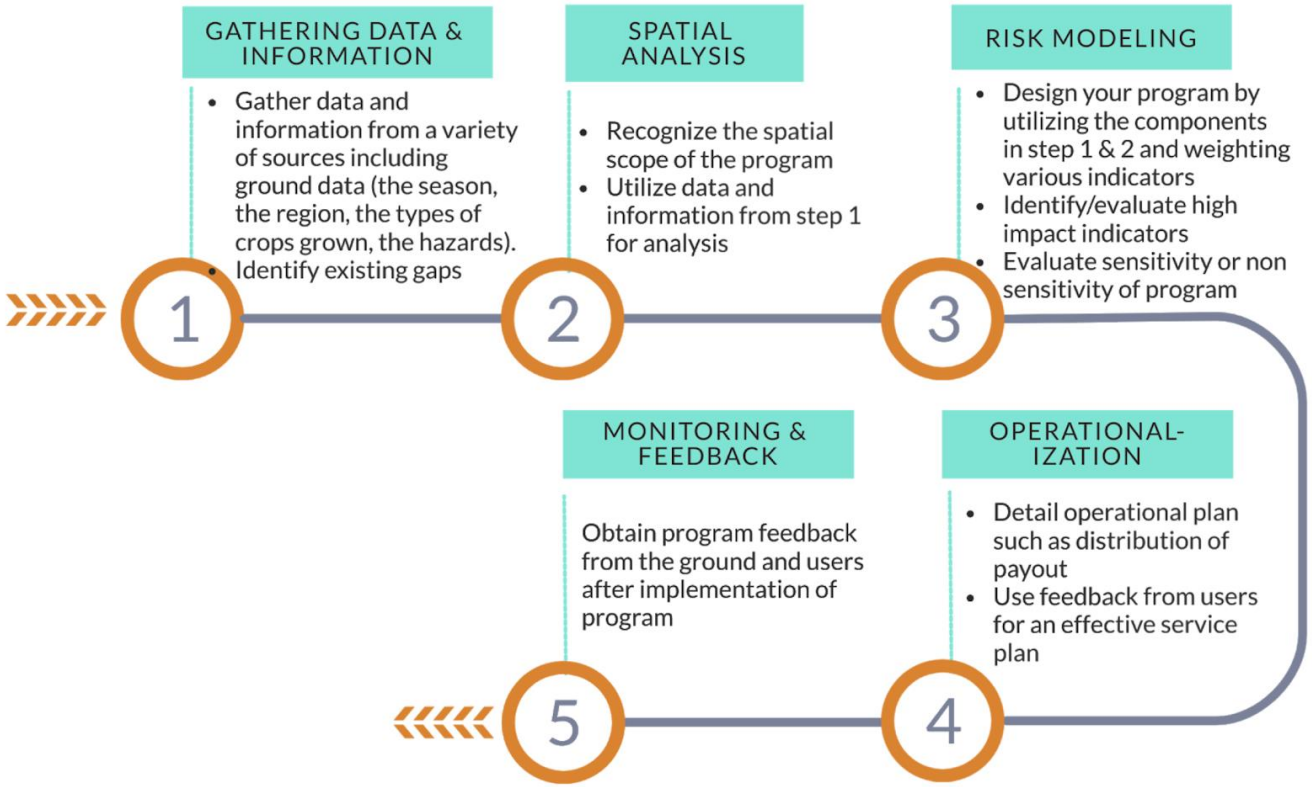
Understanding Crop Exposure & Value-at-Risk globally

Leveraging state-of-the-art satellite technology for high-resolution crop mapping

Source: ESA/Copernicus

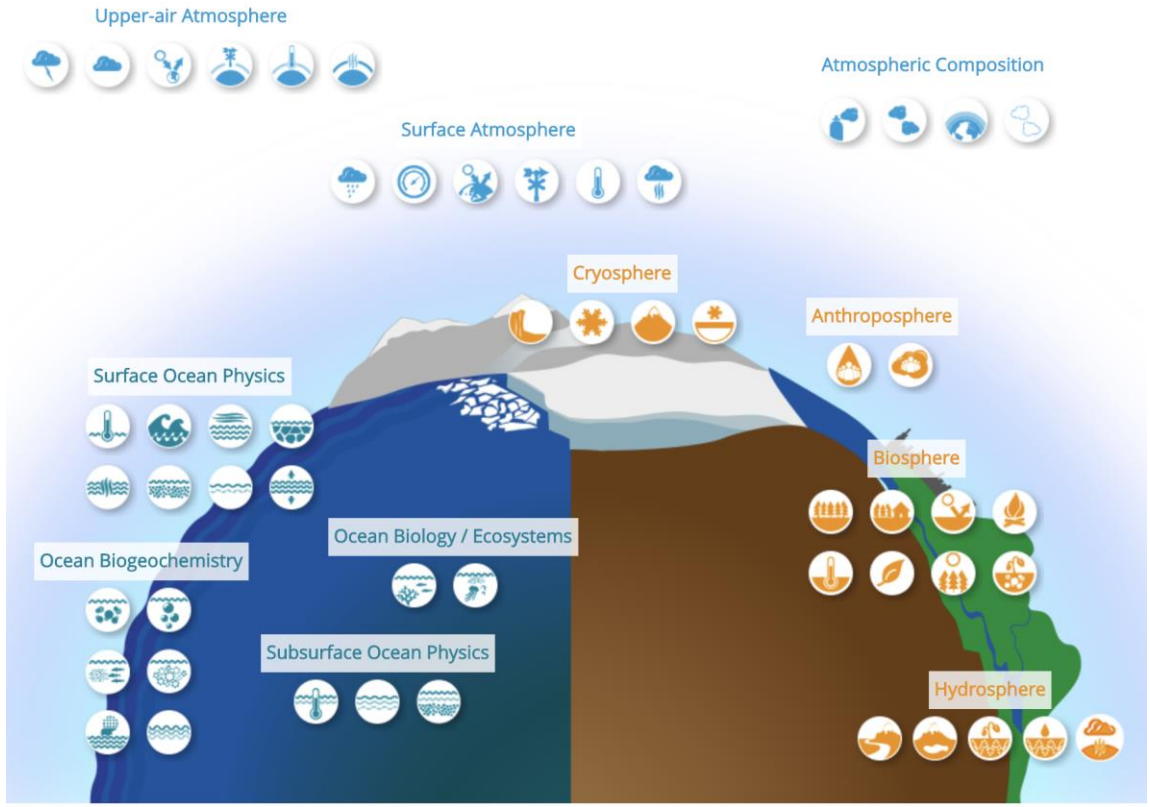
Next-Generation Drought Index:

Translating satellite data into relevant risk information for financial risk management



Tracking climate-related financial risks:

Leveraging global coverage of critical climate indicators to inform on environmental impact of investments



Essential Climate Variables
Source: Global Climate Observing System

Tracking climate-related financial risks:

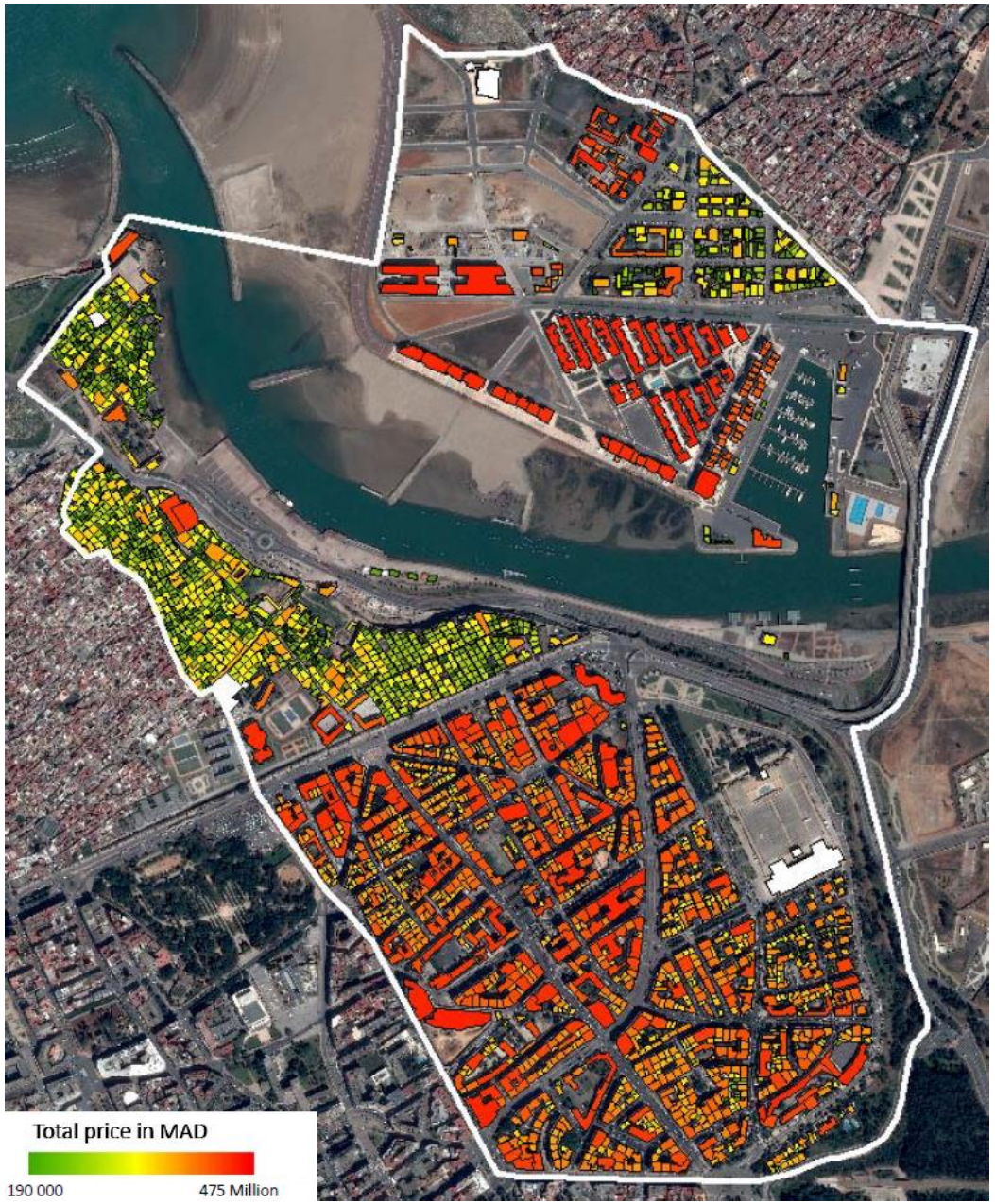
Understanding financial sector's exposure to climate

Source: IceEye

Mapping Financial Exposure in MENA

Leveraging high-resolution satellite data and AI/ML

EO derived urban blocks manual mapping over Rabat/Sale, Morocco
Source: Pléiades © CNES 2019, distribution Airbus DS



Total economic value of properties per EO based building footprint
Source: SERTIT/WBG

Supporting rapid financial response in Morocco

Supporting fully integrated response through disaster risk management and financial response

Rapid financial loss estimates for Morocco's Ministry of Finance, with technical support from Moroccan Space Center and UNOSAT
Source: UNOSAT

Key messages

- **Gap between resilience agenda/demand and technology/supply:**
  - Need for critical information on risks : global, timely, operational
  - Latest satellite technology / Copernicus: enabling new applications in crisis risk management and financial resilience
- **Bridging the gap: World Bank/ESA joint pipeline of activities**

  at the forefront of innovation on financial resilience against climate, crisis and disaster risks, for better protected populations and economies globally. Which does require capacity building for clients and sustainable integration/mainstreaming into World Bank activities over time.

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