Cotton 2040: Creating a resilient cotton industry in turbulent times

Creating sector-wide collaborative action to understand and adapt to the changing climate

Laudes Foundation

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Image courtesy of Cotton Australia

Forum for the Future

Forum for the Future is a leading international sustainability non-profit with offices in London, New York, Singapore and Mumbai. We specialise in addressing critical global challenges by catalysing change in key systems.

For over 20 years, we've been working in partnership with business, governments and civil society to accelerate the shift toward a sustainable future. Together we are reinventing the way the world works.

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building climate resilience
Willis Towers Watson

Acclimatise is a specialist advisory and analytics company that provides world-class expertise in climate change adaptation and resilience. With experience in more than 90 countries, our work plays an important role in shaping the international adaptation agenda. Since November 2020 Acclimatise is wholly owned by leading global advisory, broking and solutions company Willis Towers Watson. The Acclimatise team is now part of Willis Towers Watson's Climate and Resilience Hub (CRH). The CRH is a market leading centre of climate adaptation expertise, supported by the Willis Research Network, a network of more than 60 organizations in science, academia, think tanks and the private sector working to improve the understanding and quantification of risk, with the aim to improve the resilience of our clients and society as a whole.

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Our services & expertise

Climate risk assessments & plans

We prepare climate change vulnerability and risk assessments and implementation plans for corporates, governments and multi-lateral organisations.

Climate finance

We are fluent in climate adaptation finance, helping clients to mobilise public and private capital to deliver climate resilience projects.

Communicating climate resilience

We are specialists at climate change communications and knowledge management.

Analytics: data, tools and software

We create user-centric climate change risk assessment applications, running on some of the world's most sophisticated datasets.

TCFD-aligned financial disclosures

We are at the forefront of developing methodologies and metrics that help corporates and financial services organisations identify, quantify, and disclose physical climate risks and opportunities.

Learning services

We design and deliver engaging, interactive learning processes and events to drive real change.

About Cotton 2040

The cotton system will need significant, and in cases radical, change to become resilient in an increasingly climate-disrupted world. This can only be achieved by a systemic, collaborative approach involving actors across the supply chain.

Cotton 2040 is a pre-competitive multi-stakeholder initiative which exists to support the shift to a sustainable global cotton industry,

- which is resilient in a changing climate;
- which uses business models that support sustainable production and livelihoods; and
- where sustainably produced cotton is the norm.

Facilitated by Forum for the Future and supported by Laudes Foundation, Cotton 2040 aims to accelerate progress and maximise the impact of existing sustainability initiatives across the global cotton industry, by bringing together leading international brands and retailers, sustainable cotton standards, existing industry initiatives and other stakeholders across the value chain.

Cotton 2040's progress to date includes building the CottonUP Guide to sourcing sustainable cotton and foundational work in standards alignment. As we enter the critical decade for action on the Sustainable Development Goals, Cotton 2040 is now embarking on an exciting, ambitious next phase of work to continue to drive transformational change in the cotton industry.

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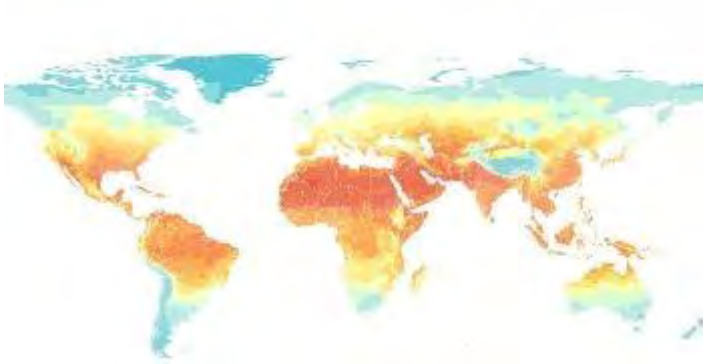
Driving transformational change across three collaborative workstreams

From 2020-2022, Cotton 2040 and its partners will deliver three interconnected, sequenced workstreams that present the most significant potential to create a systemic shift to mainstream sustainable cotton.



1

Creating sector-wide collaborative action to understand and adapt to the changing climate

2

Increasing uptake of sustainable cotton from brands and retailers

3

Scaling sustainable business models that enable a sustainable cotton industry

Overall picture of deliverables

'Call to action' report

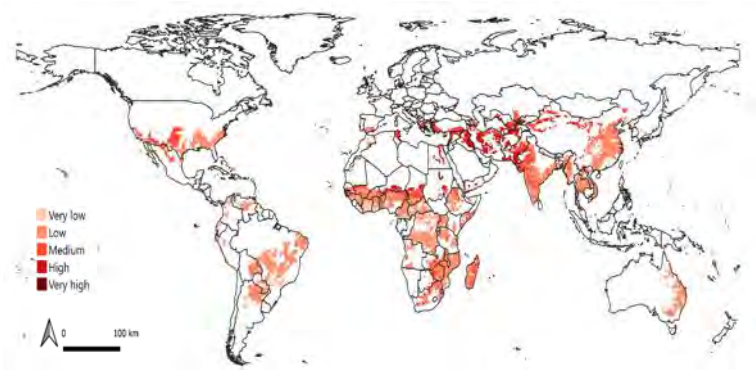
A report which consolidates the findings following feedback from stakeholders, raises awareness within the industry and drive change – a 'Call to action' report. A product which will be used to highlight good practice and provide solutions across the supply chain

Year 1 → **Year 2** → **Year 3**

- **Year 1:** Map projected climate impacts
- **Year 2:** Understand implications
- **Year 3:** Action planning to build resilience

GLOBAL CLIMATE RISK MAPPING

A tool to rapidly screen cotton production across multiple countries



INDIA CVRA [Climate Vulnerability Risk Assessment]

A **CVRA report** which highlights risks to production and processing of cotton in India in 2040s.

Outputs will be determined by the pilot studies undertaken (tbc)

Task 1
Global climate risk mapping

Global climate risk mapping – The methodology

Innovative approach to rapidly identify climate hazards in cotton production globally

(1) Analytics reveal hazards for **present-day** (2000-2019) and **future projection** (2040)

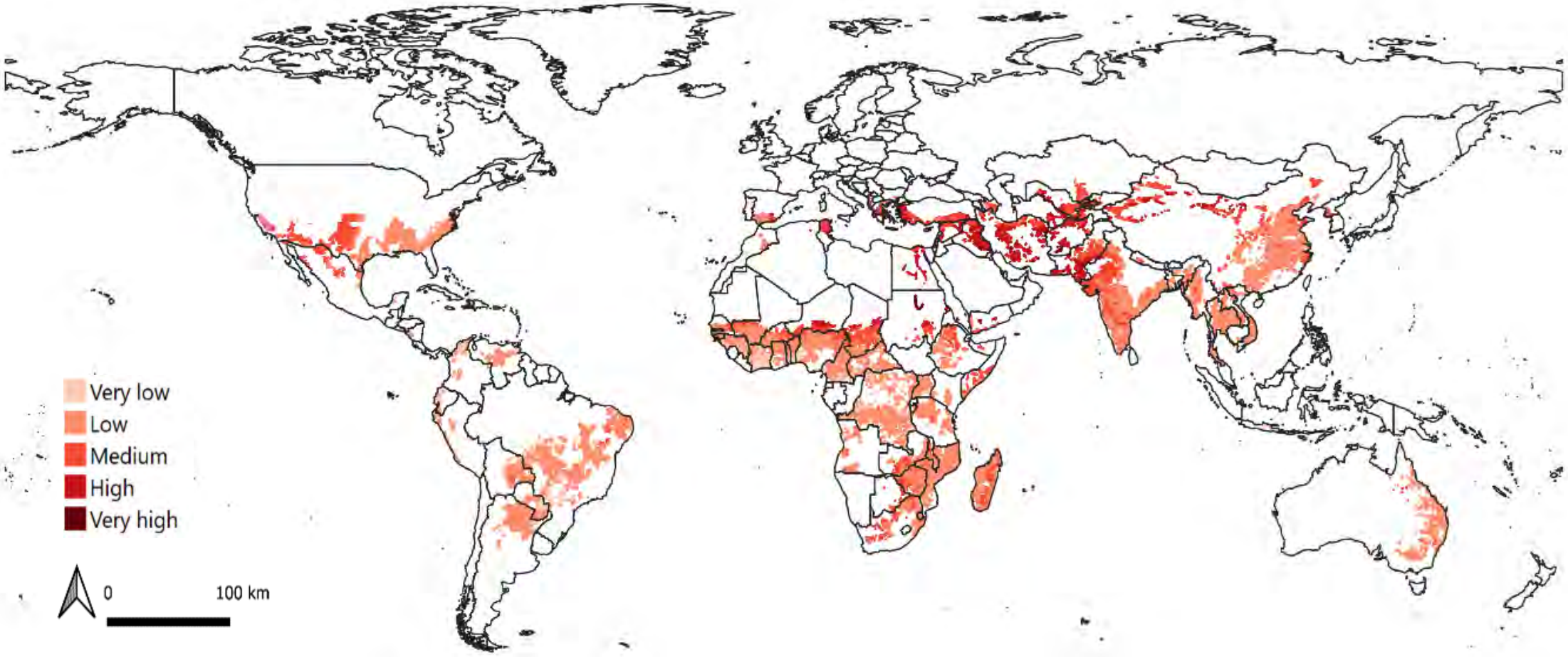
(2) Provides a **snapshot of where risks may lie** across cotton's global production by telling us which cotton growing regions in the world will experience **the greatest and most profound changes** in the climate and other climate-related hazards

Example climate indicators used include:

- Effective Growing Degree Days (EGDD)
- Maximum threshold for cotton growing
- Total growing season rainfall
- Extreme precipitation
- Meteorological drought
- Hydrological drought
- Fluvial flood
- Coastal flooding
- Strong wind
- Storms
- Wildfire
- Landslides

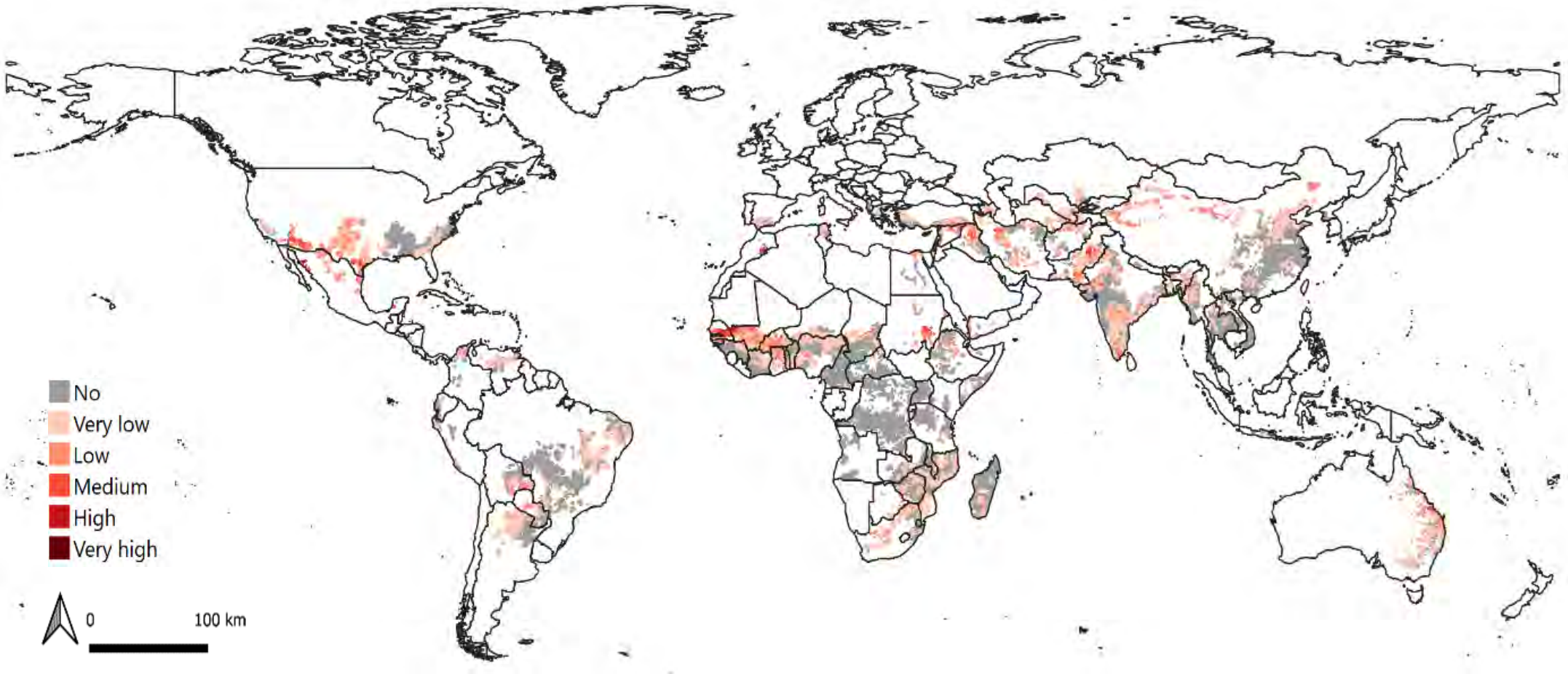
Global climate risk mapping – results

Global multi-indicator climate hazard index – Absolute risk for 2040



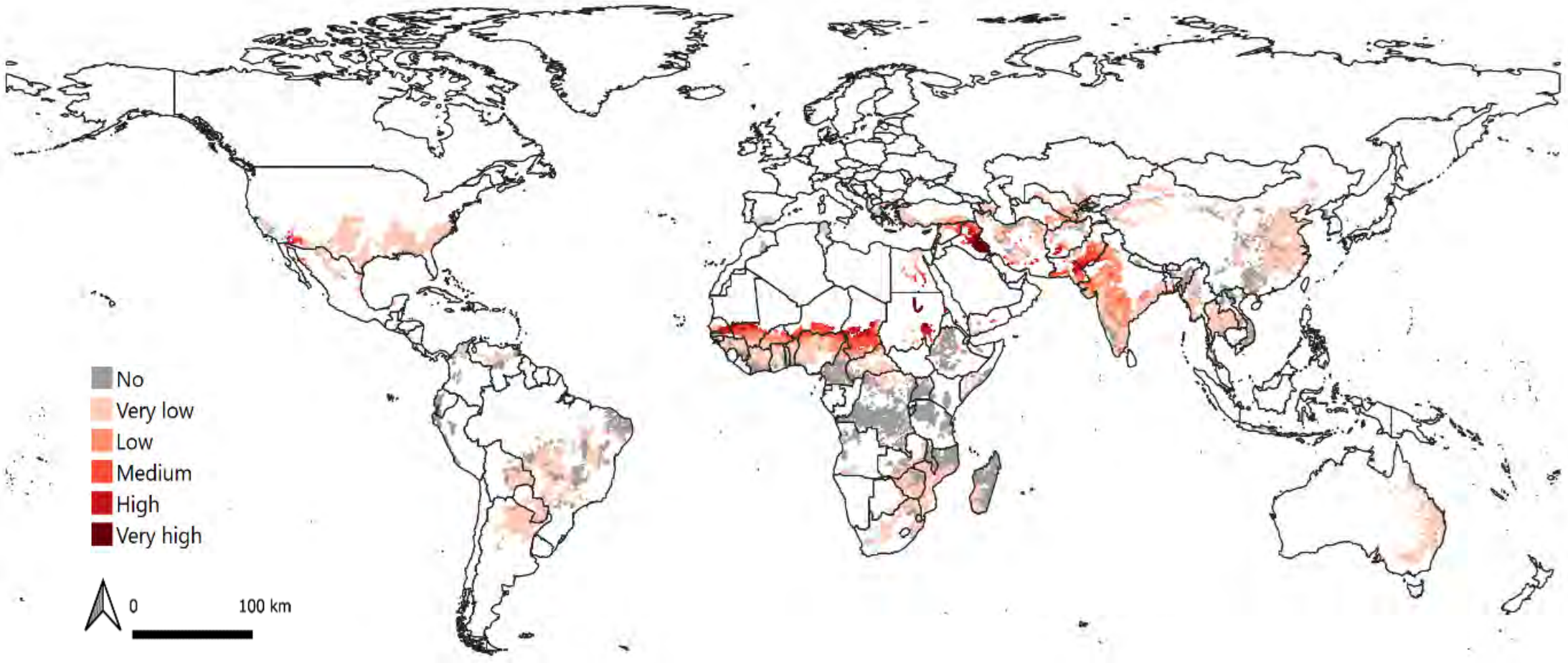
Global climate risk mapping – results

Global multi-indicator climate hazard index – Increase in risk by 2040 relative to today (2000-2019)



Global climate risk mapping– results

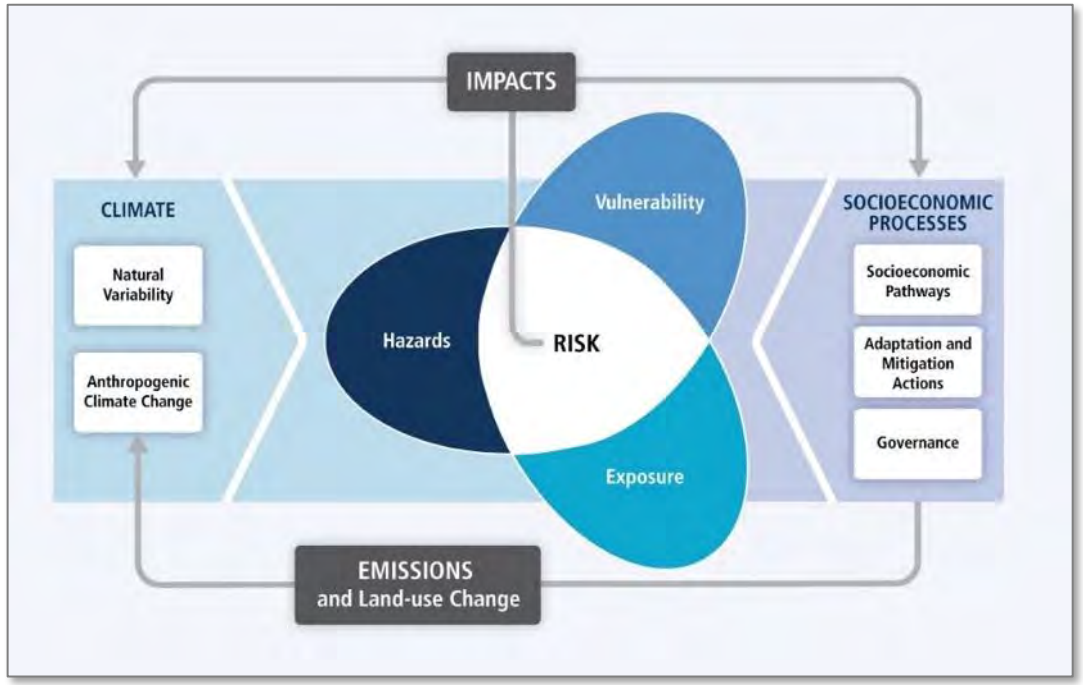
Example of an individual indicator: Number of days number of days when temperature exceeds 40°C by 2040 across all cotton growing regions, i.e., a proxy for the upper limit of survival of cotton crop.



Task 2
India Climate Vulnerability and Risk Assessment

India Climate Vulnerability and Risk Assessment - Methodology

- India Climate Vulnerability Risk Assessment (CVRA) utilises a method supported by the Intergovernmental Panel on Climate Change, comprising hazard, exposure and vulnerability.
- The CVRA provided **district-by-district** insights for **three** states in India
- This study covers two separate components of the CVC: **cotton cultivation** and **cotton processing** up until the pre-garment manufacturing stage.
- 41 bespoke indicators have been developed – based on many months of literature research and engagement with experts
- Indicators are tailored to:
  - **rural, agricultural communities** for the cotton cultivation CVRA and
  - **urban, manufacturing communities** for the cotton processing CVRA.



India Climate Vulnerability and Risk Assessment - Indicators

Hazard	
1	Effective Growing Degree Days (EGDD)
2	Temperature threshold (40*C)
3	Heatwave
4	Total growing season rainfall
5	Extreme precipitation
6	Meteorological drought
7	Hydrological drought
8	Fluvial flooding
9	Relative humidity
10	Coastal flooding
11	Damaging wind speeds
12	Wildfire
13	Landslides

Exposure	
1	Net sown area of cotton
2	Rural population density
3	Number of people employed as cotton farmers and cultivators

Vulnerability

Adaptive capacity	
1	Wages of male cotton grower labourer
2	Wages of female cotton grower labourer
3	Rural work participation rate
4	Rural female work participation rate
5	Male literacy rate (cultivators)
6	Female literacy rate (cultivators)
7	Area under irrigated cotton
8	Crop diversity
9	Rural households with access to bank accounts
10	Road density
11	Rural households with access to technology and information
12	Soil organic carbon stocks
13	Soil water holding capacity

Sensitivity	
1	Primary sector share of total GDP
2	Employment in agriculture as cultivators or agricultural labourers
3	Marginal cultivators
4	Gender pay gap in the wages of male and female cotton farmers
5	Multidimensional Poverty Index
6	Rural female head of household
7	Rural dependent population
8	Rural mean household size
9	Size of agricultural land holdings
10	Cotton yield volatility
11	Degraded land
12	Water stress

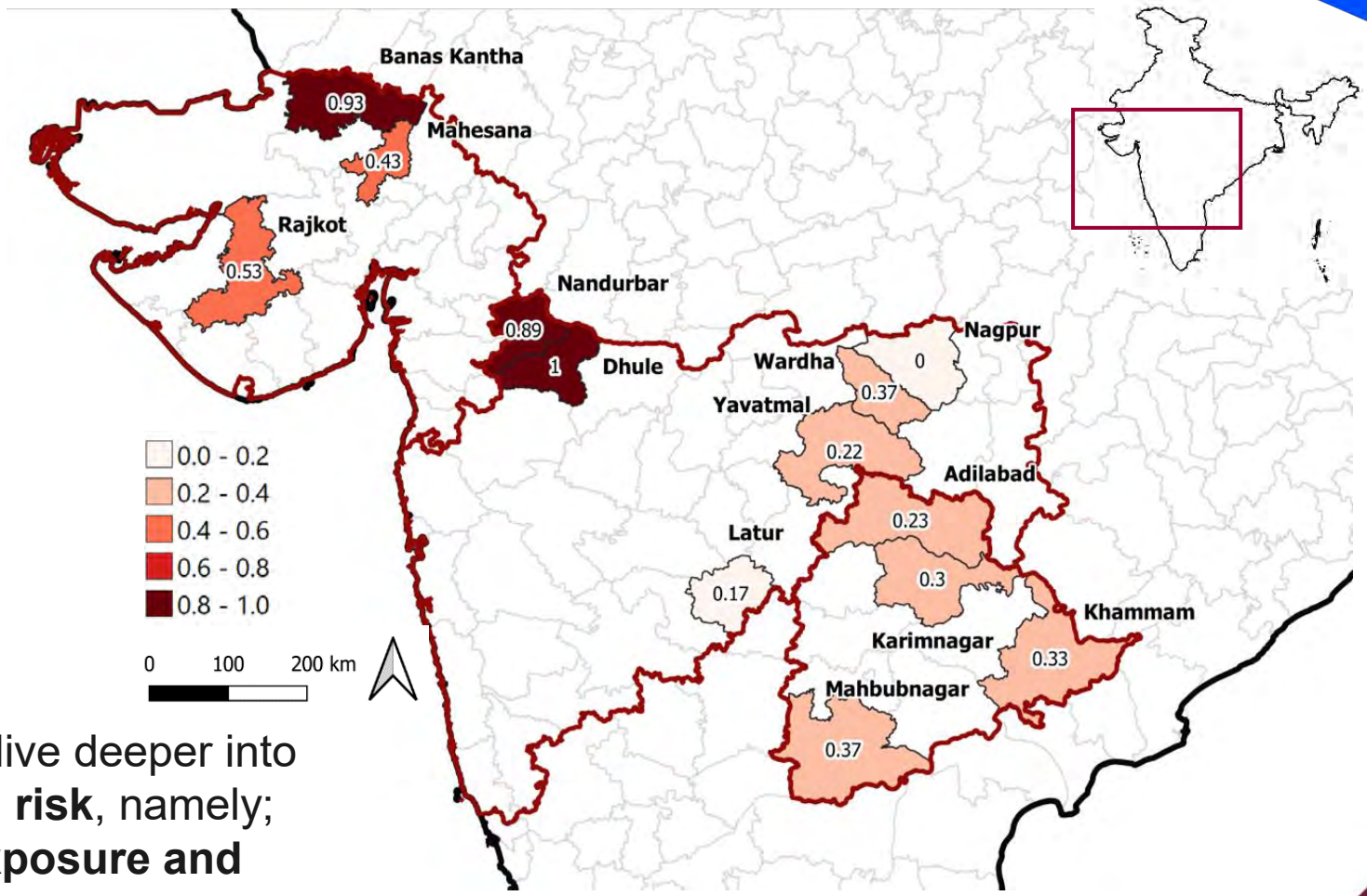
A “**risk**” score is calculated for each district which comprises **Hazard, Exposure** and **Vulnerability**

India Climate Vulnerability and Risk Assessment – Results

Cotton Cultivation CVRA

Main findings

1. Overall, the risk scores appear higher for the northern districts relatively to the southern districts.
2. The district with the highest risk score is Dhule, and the district with the lowest risk score is Nagpur.



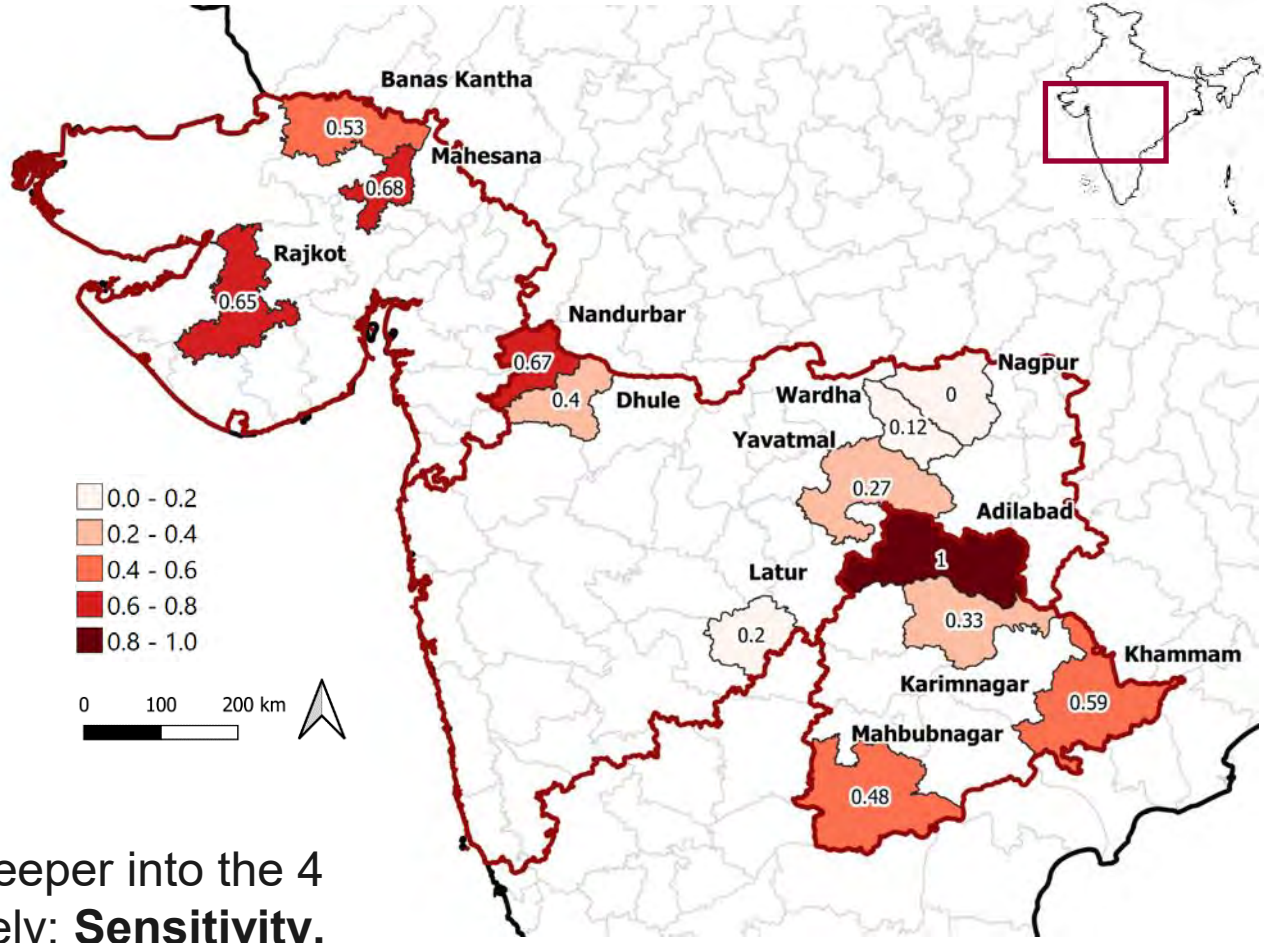
The climate risk scores allow us to dive deeper into the 4 components which determines **risk**, namely; **Sensitivity, Adaptive Capacity, Exposure and Hazard**

India Climate Vulnerability and Risk Assessment – Results

Cotton Processing CVRA

Main findings

1. Districts located in the states of Gujarat and Telangana appear to have a higher risk score relative to Maharashtra.
2. The district with the highest risk score is Adilabad, and the district with the lowest risk score is Nagpur.



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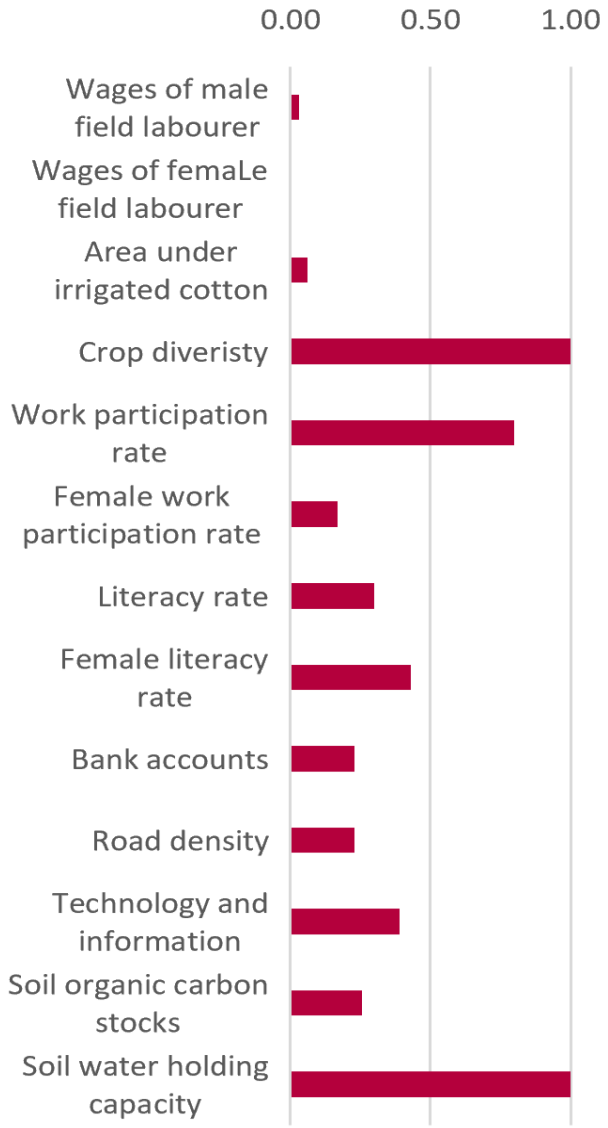
India Climate Vulnerability and Risk Assessment - Results



- Dhule is the district with the ***highest climate risks score*** for **cotton cultivation** + strong difference in **Adaptive Capacity** indicators.

Adaptive capacity **indicators describe the ability of a system to adjust to climate change. How well does a system cope with change?**

What do the results suggest?

For cotton farmers in Dhule, climate vulnerability partly stems from problems associated with their capacity to adapt:

1. Low **wages** of both **male** and **female** cotton growers.
2. Reliance on rainfed cotton instead of **irrigated cotton**
3. Access to finance and other **banking** services;
4. Low levels of **technology** and **access to information**, including the Internet; and
5. Poor **soil quality** and low SOC

Understanding where the key drivers of risk lie, allows for the prioritization of the support and implementation of adaptation actions by stakeholders.

1 Cotton 2040 and climate risk: what's next?

Join us to increase the cotton industry's resilience to climate change.

We are now inviting cotton producers, brands, retailers and industry initiatives to join us in 2021 to collectively examine these climate impacts 'maps' for the cotton sector. Together, we will develop a common understanding across the cotton system as to how climate change is likely to impact key stakeholders and regions, and agree on a shared set of priorities for action across the cotton sector.

This will be achieved by:

- **Raising awareness** of the risks along the entire value chain – (providing an evidence base)
- **Building an understanding of the implications of these risks** for stakeholders within the value chain – (connecting the science to practice); and
- **Increasing understanding of solutions** to reduce vulnerability and implement action – (Co-developing adaptation options and facilitating dialogue between industry leaders to share experiences and best practice.)

Each stage of this process requires active engagement of cotton industry stakeholders. Having more input from engaged stakeholders and working group members will be crucial to the project's success.

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Join us in creating a resilient cotton industry in turbulent times

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