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# Karina Whalley

## Head of Public Sector, AXA Climate

*“The work of AXA Climate in smart Climate insurance”*



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# AXA Climate

Science

To infuse scientific knowledge into all business decisions.

Data

To quantify physical and financial risks.

### Insurance

We protect people, nature, and economic activities from climate risks.

### Training

We enable companies to upskill and engage all employees to succeed in the sustainable transition.

### Consulting

We support organizations in their adaptation and transformation journey.

### Finance

We build new mechanisms and strategies to finance the shift to regeneration.







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We assess climate risks and opportunities across all activities & agri-value chains to prioritise adaptation measures.

**Objective**

Assess the global impacts of climate change on your activities by assessing the risks on pedoclimatic zones.

FLAVOUR &  
PERFUME COMPANY

Global climate risk assessment (actual & future – 2030/2050) on main strategic raw materials & more than 90 supply areas.

**USE CASE**



**Results**

The study shows an intensification of droughts, water stress, and heat waves in the most at-risk areas of production. Alternative supply areas are under investigation as well as adaptation solutions

**Methodology**

- CAPITALIZE on existing work, climate policies & projects by engaging your stakeholders
- MODEL climaterisks and opportunities in 2030/2050 on your activities.
- PRIORITIZE the most at-risk activities and territories





# We quantify the local specific vulnerabilities of agricultural value chains, taking into account agronomic specificities & assess the impacts



**Objective**

Quantify the vulnerabilities of a crop at the phenological stage level and identify the 1st local adaptation solutions.

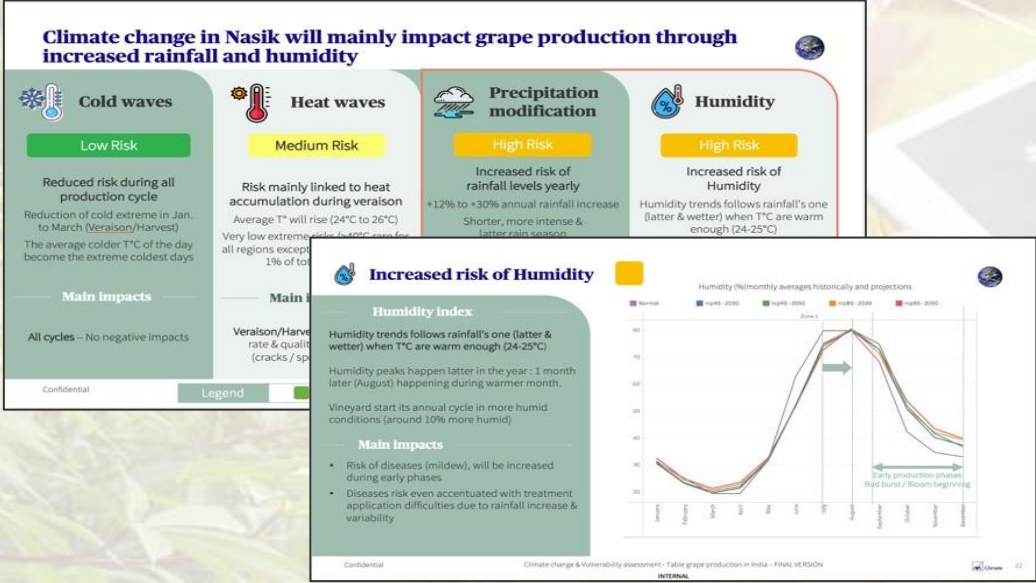
**Methodology**

- SELECT indicators & and thresholds of vulnerability according to varietal specificities
- MODEL the specific crops' vulnerabilities at phenological stages &
- QUANTIFY impacts on resilience, yields & quality.

## Use case

FRUITS & VEGETABLES COOPERATIVE

Assessing the climatic vulnerability of table grape and tomato production in India & the resilience of new varieties



**Results**

The study showed that both chronic hazards (rainfalls, humidity rate, heat waves & cold waves) & acute hazards (flood, strong winds & wildfire) impact table grapes production in India. But increased rainfall and humidity risks due to shorter, more intense & latter rain season represent main concerns. The resulting financial impacts will be mainly focused on losses linked to berry cracking, inflorescence necrosis, flooded soil (due to rainfall) & mildew (due to humidity).





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## We identify the most relevant mitigation solutions & build tailored strategic adaptation roadmaps



### Objective

Build an adaptation plan for each sector in a systemic approach.

### Methodology

- IDENTIFY AND SELECT adaptation practices and measures to implement
- MEASURE the impacts of these practices on the resilience of agri value chains to climate change.
- BUILD relevant strategic adaptation action plans.

### Use case

FRUITS & VEGETABLES  
COOPERATIVE

Assessing the climatic vulnerability of table grape and tomato production in India & the resilience of new varieties.



### Results

The study identified 3 categories of solutions to adapt to the main climate risks identified: animal well-being and health, building improvements & and input management. All solution has been granted depending on their implementation feasibility (cost + technical difficulty) & and their impact (climate risk mitigation & and carbon impacts)



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## We can even predict yields in a yearly basis thanks to AXA Climate's Yield Forecasting Tool

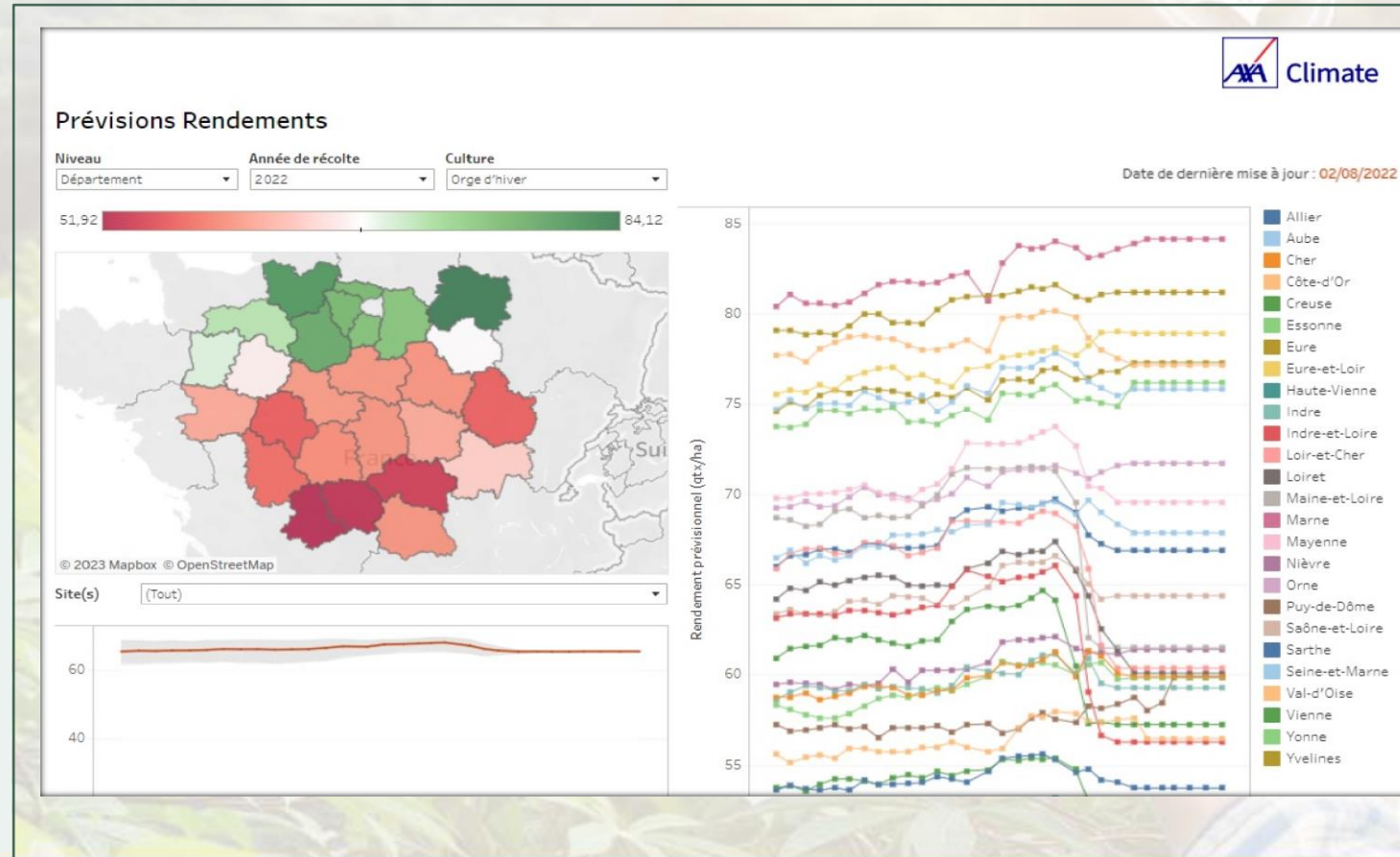


### Objective

Forecast seasonal yields based on statistical modeling combined with weather data.

### Methodology

- Yield forecasts for soft winter wheat and winter barley in France are updated every week
- Benefits that can be exploited as early as April
- A small granularity on the scale of commercial sectors and departments
- A model accuracy up to 95%



Actual scope of the tool  
Cereals in Europe





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**But we are not only consultants.**





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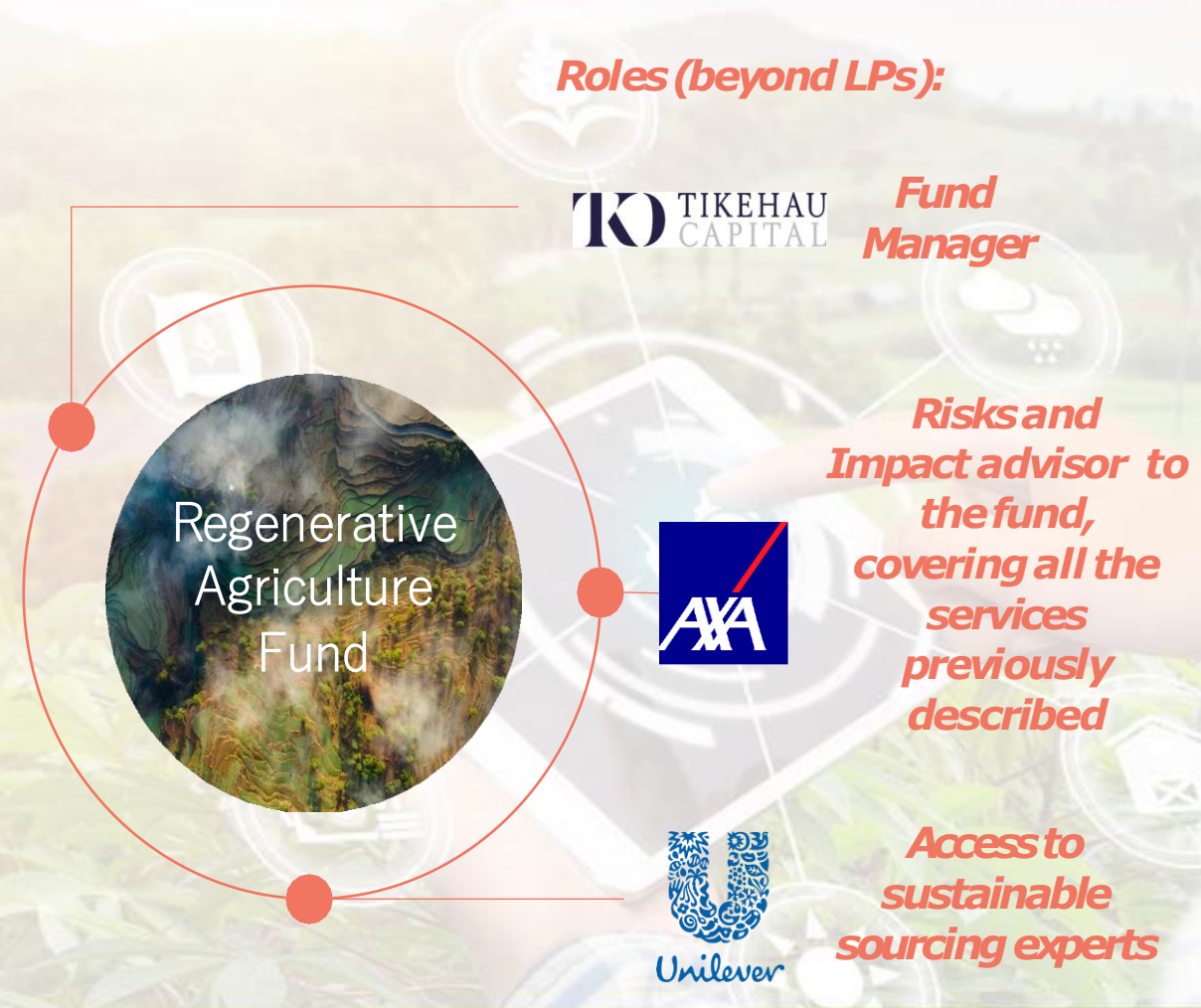


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## We also support investors deploying innovative strategies

Together with Unilever and Tikehau Capital, we are creating THE REGENERATIVE AGRICULTURE FUND, a private equity fund (SFDR Art 9) fully dedicated to supporting companies and projects that put at scale this transition.

Each founding partner aims to invest €100 million  
The target fund size is €1 billion







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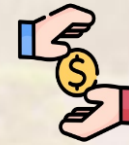


# Finally, we leverage parametric insurance as a new approach of risk-covering



## Customer's pain points

- 1 High administrative costs, leading to:
  - × lower payout/premium rate
  - × delays in receiving the payout
  - × longer recovery process
- 2 Mutual suspicion about data objectivity when a disaster strikes
- 3 No insurance offered for some risks or assets / no payout when there is no physical damage
- 4 High distribution costs due to low scale effects to coordinate disaster relief funding



## Parametric solutions

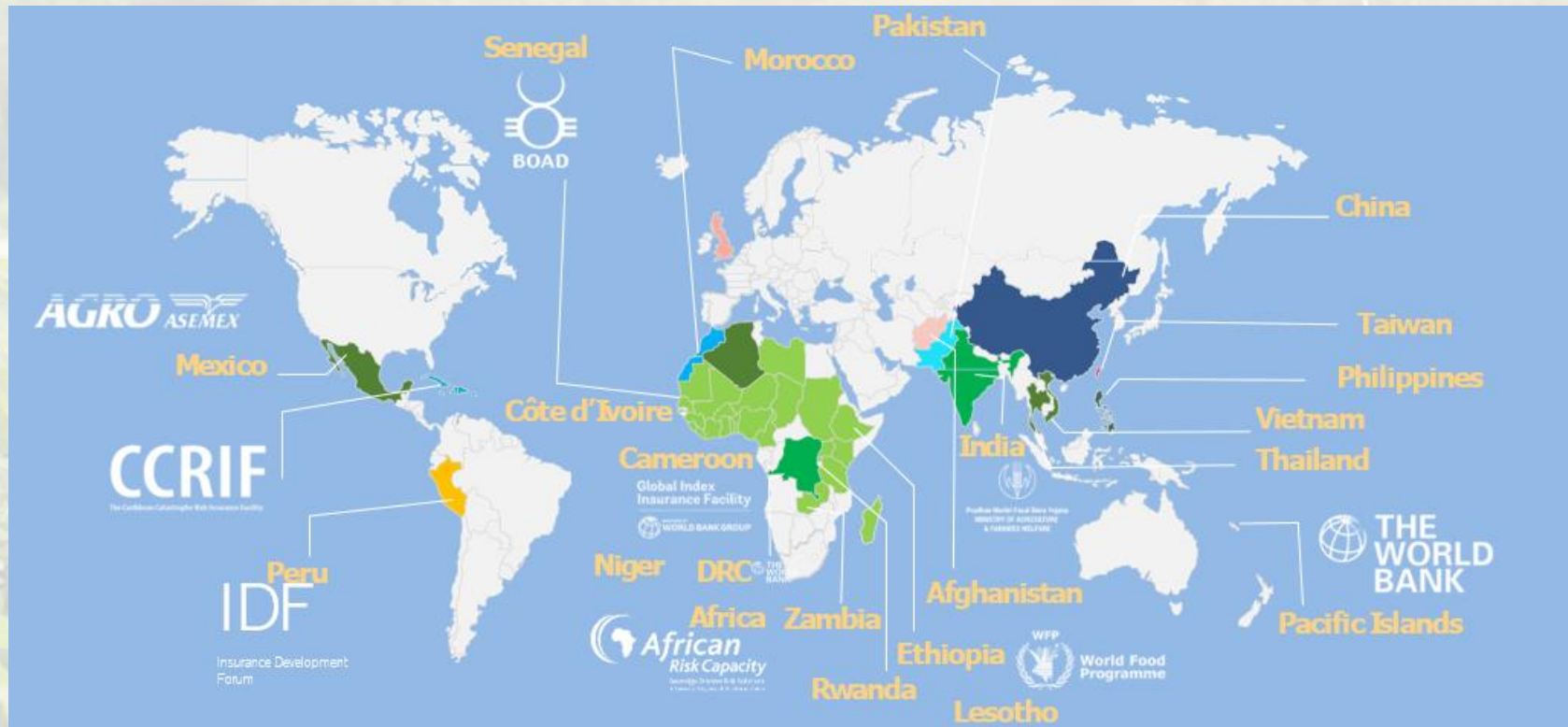
- 1 Quick payout as soon as the index value reaches the pre-defined threshold
  - ✓ No discussion
  - ✓ No loss adjuster sent onsite
- 2 The indices we use from official statistics or third-party objective data providers
- 3 No exclusions in terms of perils, goods or type of loss
- 4 Low distribution costs thanks to the mobilization of existing public structures to coordinate post-disaster action



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AXA Climate has a significant track record in public sector programmes including agriculture







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## A few examples of indices we can design for agriculture/livestock insurance projects



### Lack of rainfall (ERA 5)

Spatial Granularity	0.25° (~27km x 27km)
Temporal Granularity	Daily

### Evapotranspiration (ET)

Spatial Granularity	0.25°
Temporal Granularity	Daily

### Cumulative rainfall (CHIRPS)

Spatial Granularity	0.05° (~5.5km x 5.5km)
Temporal Granularity	Daily

### Water Requirement Satisfaction Index

Spatial Granularity	25km
Temporal Granularity	Daily

### Vegetation (NDVI)

Spatial Granularity	250m
Temporal Granularity	16-Day

### Soil Moisture (SWI)

Spatial Granularity	0.1° (~11km x 11km)
Temporal Granularity	Daily

... we usually test all relevant indices before choosing the most efficient one for our client!



Based on the computation of large volumes of historical satellite data, we can cluster large territories into Unit Areas of Insurance sharing a similar risk profile.

### Clustering exercise (Lower Juba region)

This tool allows to test the statistical similarity and the correlation of average NDVI levels in the provinces of the regions of interest of Somalia. We propose to group districts in the same Unit Area of Insurance when they simultaneously share four qualities: statistically similar values for at least 65% of calculated days for both SAVI and NDVI data, as well as when their correlation is above 80% for both SAVI and NDVI data between 2000 and 2022.

**AXA Climate's clustering suggestion:**

Risk period	
Start date	01/04/2022
End date	31/12/2022

← Choice of the risk period for which average NDVI value is computed below

#### NDVI

Year	Districts			
	Afmadow	Badhaadhe	Jamaame	Kismaayo
2000	0,2141	0,2843	0,2540	0,2748
2001	0,2308	0,3008	0,2681	0,2991
2002	0,2553	0,3150	0,3097	0,3166
2003	0,2704	0,2971	0,3026	0,3253

#### Statistical similarity between districts (confidence interval, %)

	Districts			
	Afmadow	Badhaadhe	Jamaame	Kismaayo
Afmadow	100%	89%	82%	91%
Badhaadhe	89%	100%	82%	94%
Jamaame	82%	82%	100%	92%
Kismaayo	91%	94%	92%	100%







For livestock, in a preventive logic, we design drought insurance products who allow to compensate herders before harm is done.



### Dryness

- The product, on a **parametric basis** (eg. based on NDVI), compensates the herder when the rainy season is abnormally dry.
- The payout allows the farmer to purchase forage or move livestock, limiting the need for strategic destocking.



### Mortality

- The product, on an **indemnity basis**, compensates the farmer when his livestock dies as a result of a climatic event that reduces available resources (pasture, forage, water).
  - Each animal must be tagged to avoid fraud.
- The product is more **reactive than preventive**. It is more expensive to implement as it requires the deployment of control procedures and creates a **moral hazard among breeders**.



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**THANK YOU FOR YOUR PARTICIPATION!**  
გმადლობთ მონაწილეობისთვის!



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