



# Climate Adaptation Design at the Front Lines



**design activism**



design



A large crowd of people is gathered in a city street, participating in a protest or demonstration. The crowd is diverse in age and appearance. Many individuals are holding signs and flags. In the background, there are multi-story buildings with many windows. A red flag with a white circle and a red slash is visible in the upper left. A white banner in the center reads "KVINDERNES INTERNATIONALE FOR FRED OG FRIHED". To the right, a sign features a portrait of a man and the text "UNDSKYLD" and "JEG SKULLE HAVE SÅT KLIMAEY FORST". Another sign on the far right says "THE OCEAN RISING SOARE". The word "activism" is overlaid in white text in the center of the image.

activism



[climate activism]

SKOLSTREJK  
FÖR  
KLIMATET





**design activism**



[my 'home' ecology]



IMG: Chris Segal - Crested Butte Mountain Resort



[warm up]

# sketch your 'home' ecology



**To what extent is your 'home'  
affected by climate change?**



**http://tiny.cc/ciidDM**

Nah,  
It's all cool



EVERYTHING  
IS DIFFERENT



**“ [This Year] has the distinction of being the year global warming captured the public’s attention ... crop-destroying drought that devastated many American farms ... raging forest fires that spread uncontrollably through our commercial timber and pristine wilderness ... Hurricanes Gilbert and Helene, which ravaged the Caribbean ... a record heat wave ... tragic flooding of Bangladesh ... ”**



**“ 1987 has the distinction of being the year global warming captured the public’s attention ... crop-destroying drought that devastated many American farms ... raging forest fires that spread uncontrollably through our commercial timber and pristine wilderness ... Hurricanes Gilbert and Helene, which ravaged the Caribbean ... a record heat wave ... tragic flooding of Bangladesh ... ”**



**2018**  
**411 ppm**

**2100**

**2200**

**Hundreds of years...**

**+5°C**

**+3°C**

**+1°C**



**stories from the front line**





**Kanchan**

**+1.1°C / Bihar**





**Muhamed**

**+1.1°C / Northern Mali**



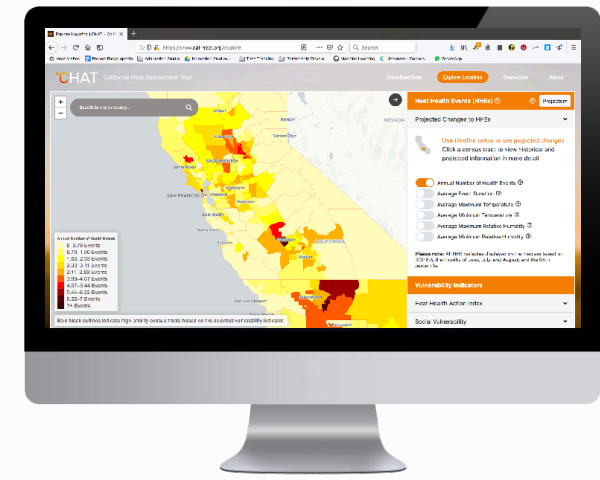


**Tim**

**+1.1°C / California**



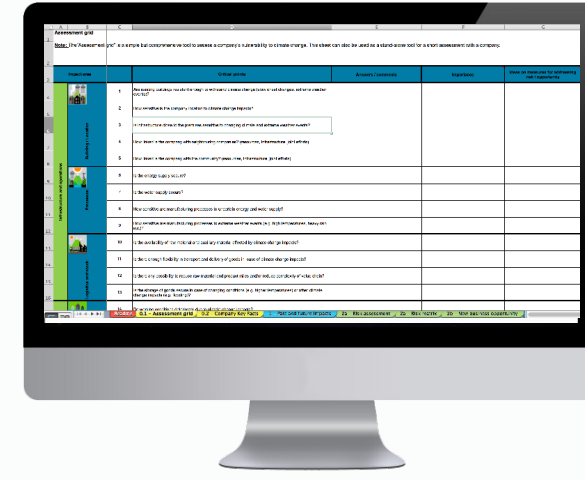
# [adaptation services]



**CHAT**



**Garbal**



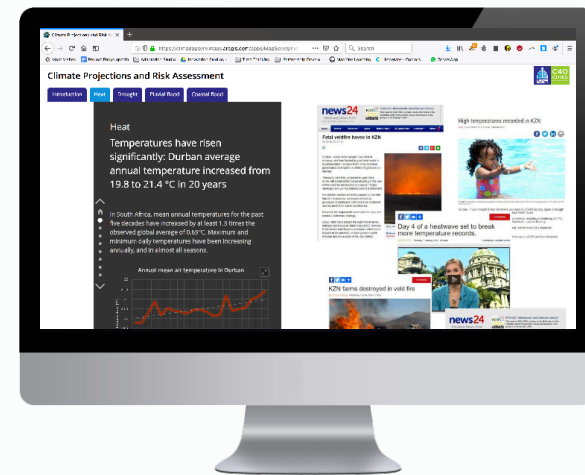
**Climate Expert**



**Digital Green**

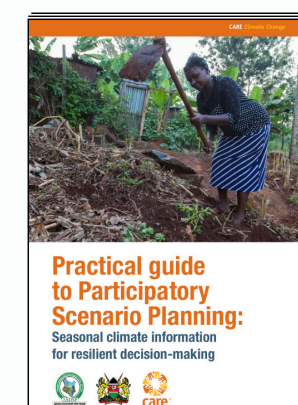


**iska**



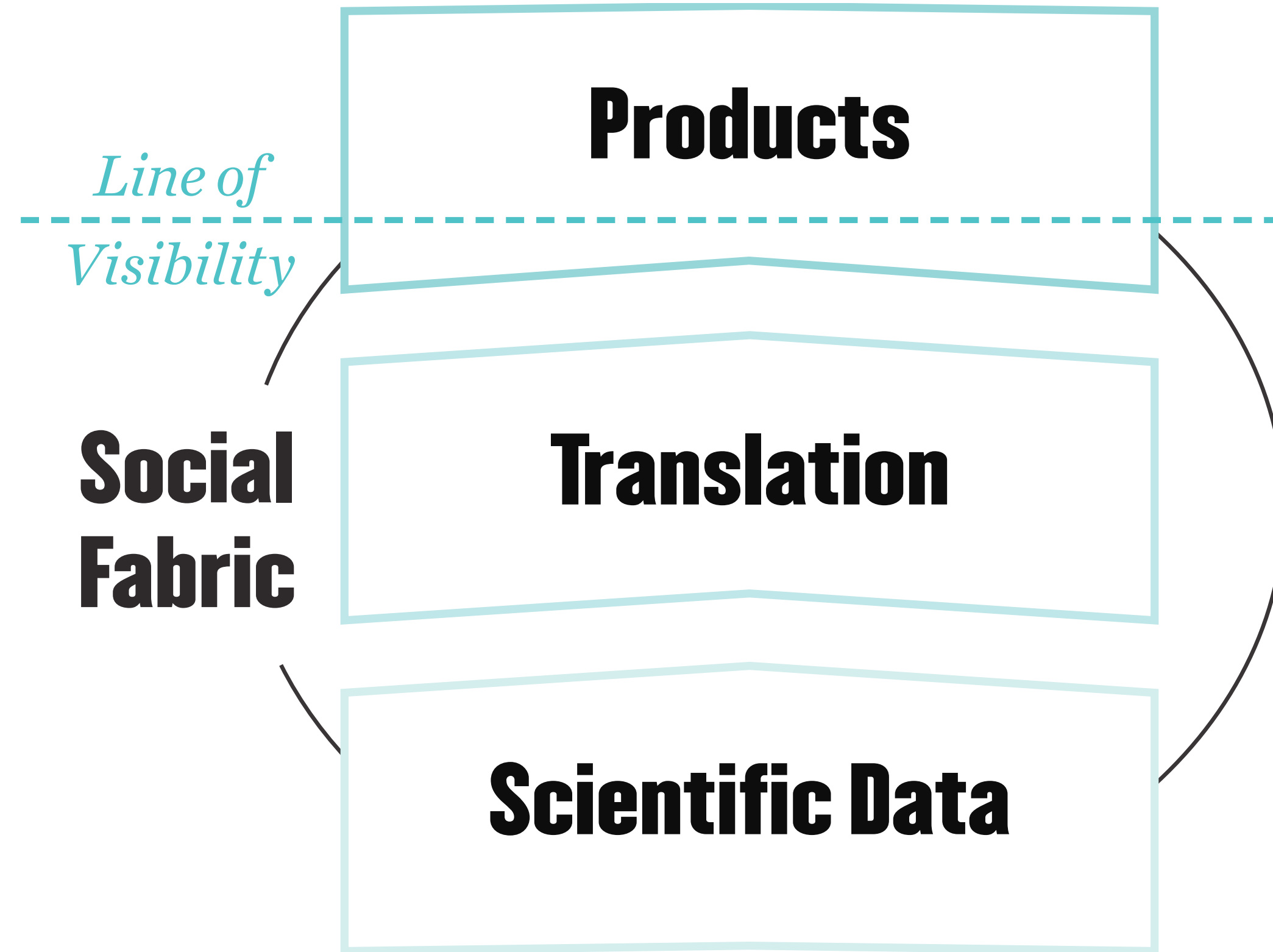
**Durban Climate Atlas**

**PSP**





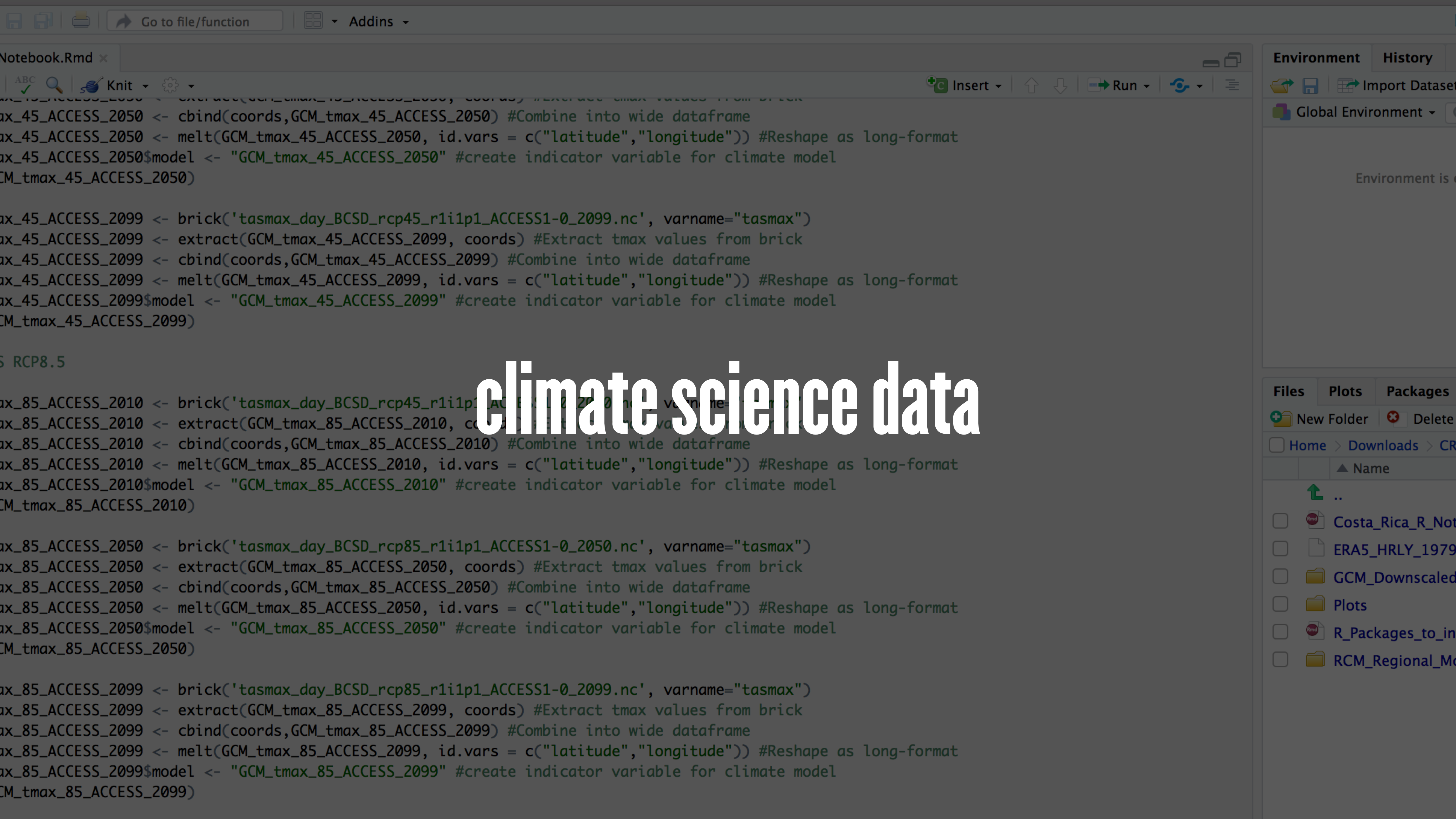
# [framework: adaptation services]





**future is data-driven**





# climate science data

```
GCM_tmax_45_ACCESS_2050) #Extract tmax values from brick
GCM_tmax_45_ACCESS_2050) #Combine into wide dataframe
GCM_tmax_45_ACCESS_2050) #Reshape as long-format
GCM_tmax_45_ACCESS_2050) #create indicator variable for climate model
GCM_tmax_45_ACCESS_2050)

GCM_tmax_45_ACCESS_2099) #Extract tmax values from brick
GCM_tmax_45_ACCESS_2099) #Combine into wide dataframe
GCM_tmax_45_ACCESS_2099) #Reshape as long-format
GCM_tmax_45_ACCESS_2099) #create indicator variable for climate model
GCM_tmax_45_ACCESS_2099)

RCP8.5

GCM_tmax_85_ACCESS_2010) #Extract tmax values from brick
GCM_tmax_85_ACCESS_2010) #Combine into wide dataframe
GCM_tmax_85_ACCESS_2010) #Reshape as long-format
GCM_tmax_85_ACCESS_2010) #create indicator variable for climate model
GCM_tmax_85_ACCESS_2010)

GCM_tmax_85_ACCESS_2050) #Extract tmax values from brick
GCM_tmax_85_ACCESS_2050) #Combine into wide dataframe
GCM_tmax_85_ACCESS_2050) #Reshape as long-format
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GCM_tmax_85_ACCESS_2099) #Extract tmax values from brick
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GCM_tmax_85_ACCESS_2099) #Reshape as long-format
GCM_tmax_85_ACCESS_2099) #create indicator variable for climate model
GCM_tmax_85_ACCESS_2099)
```

Environment History

Import Dataset

Global Environment

Environment is

Files Plots Packages

New Folder Delete

Home > Downloads > CR

Name

- ..
- Costa\_Rica\_R\_Not
- ERA5\_HRLY\_1979
- GCM\_Downscaled
- Plots
- R\_Packages\_to\_in
- RCM\_Regional\_Mo



**our work in action**

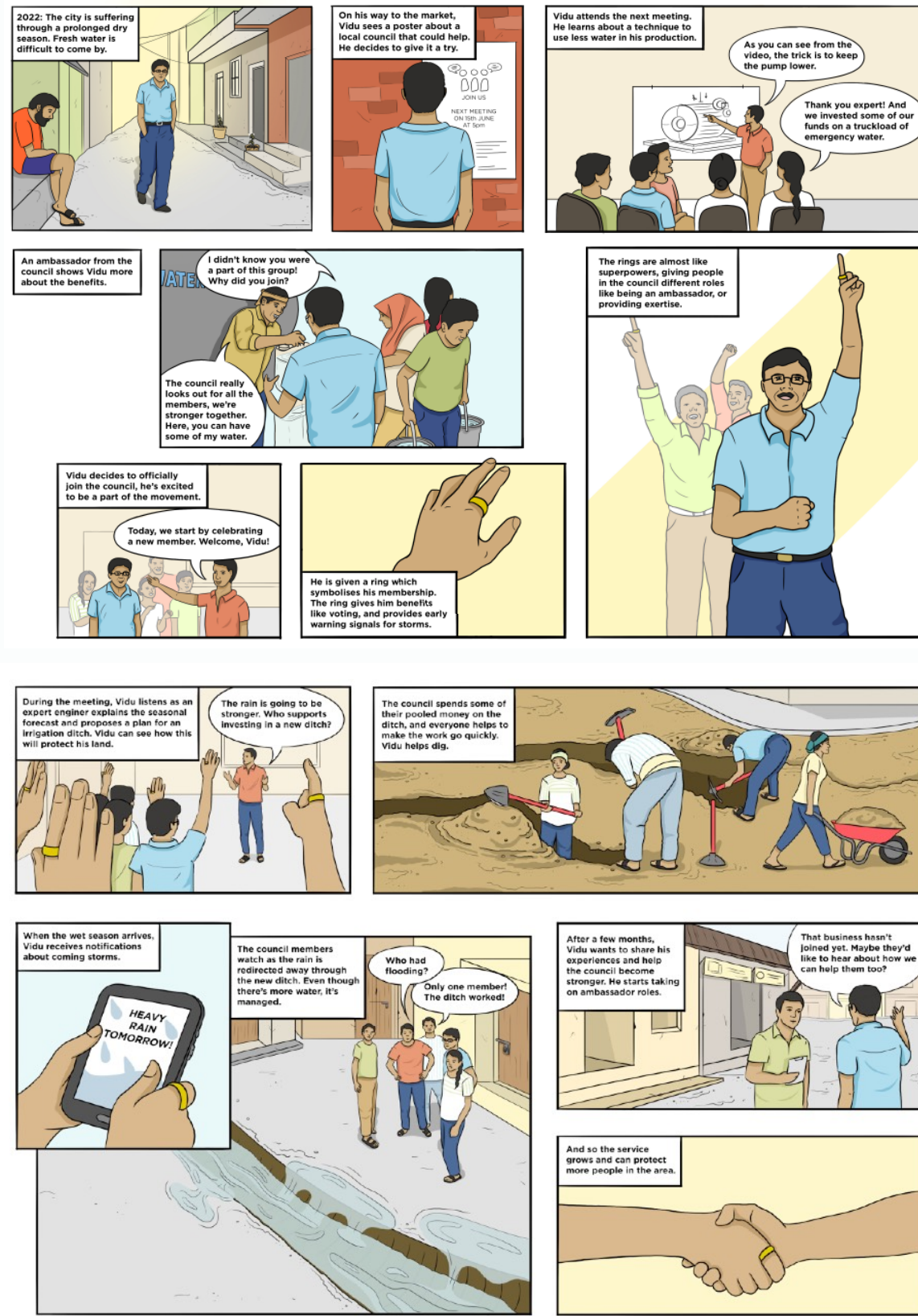


[Sri Lanka]

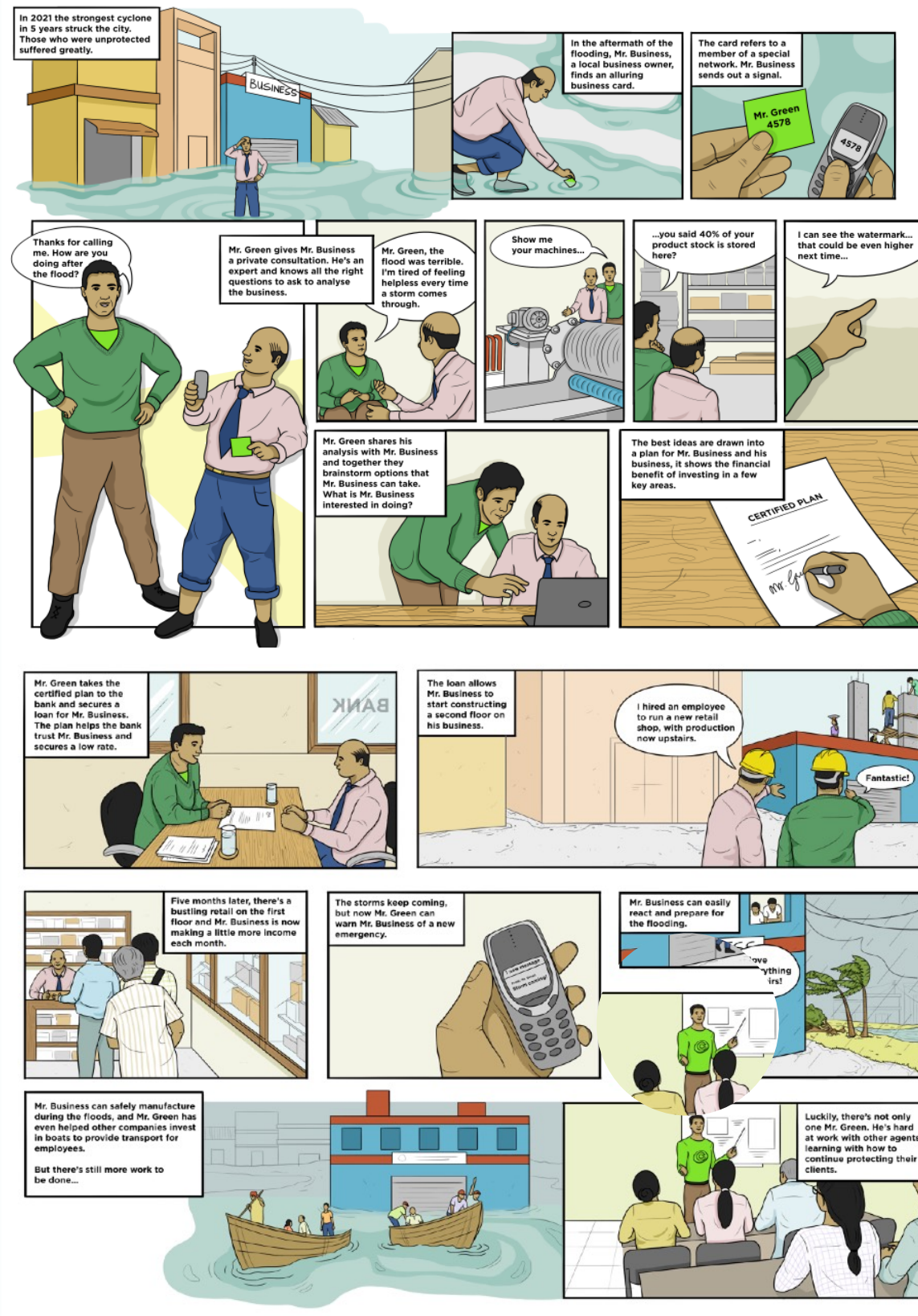




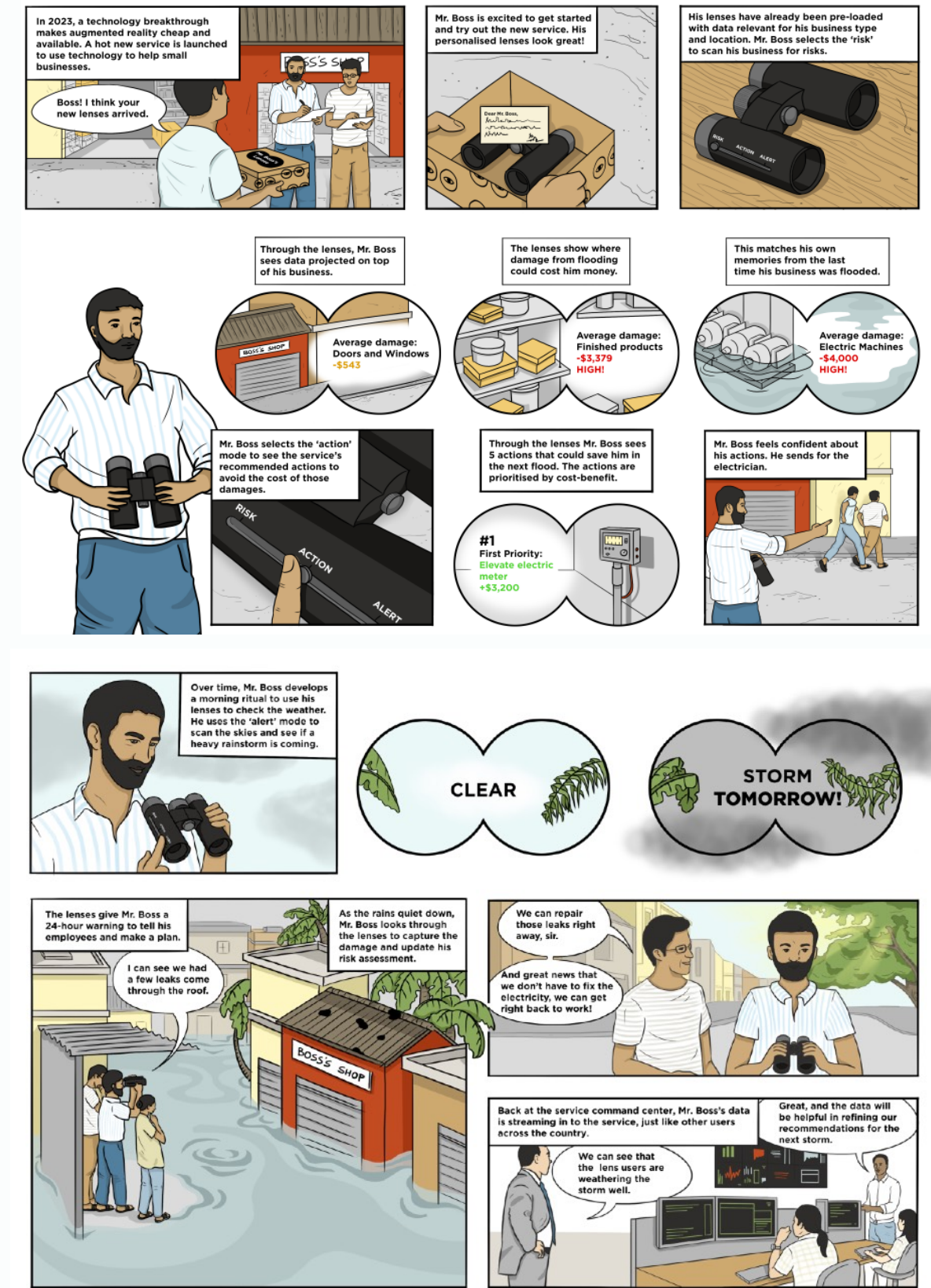
# The Council



# The Agent

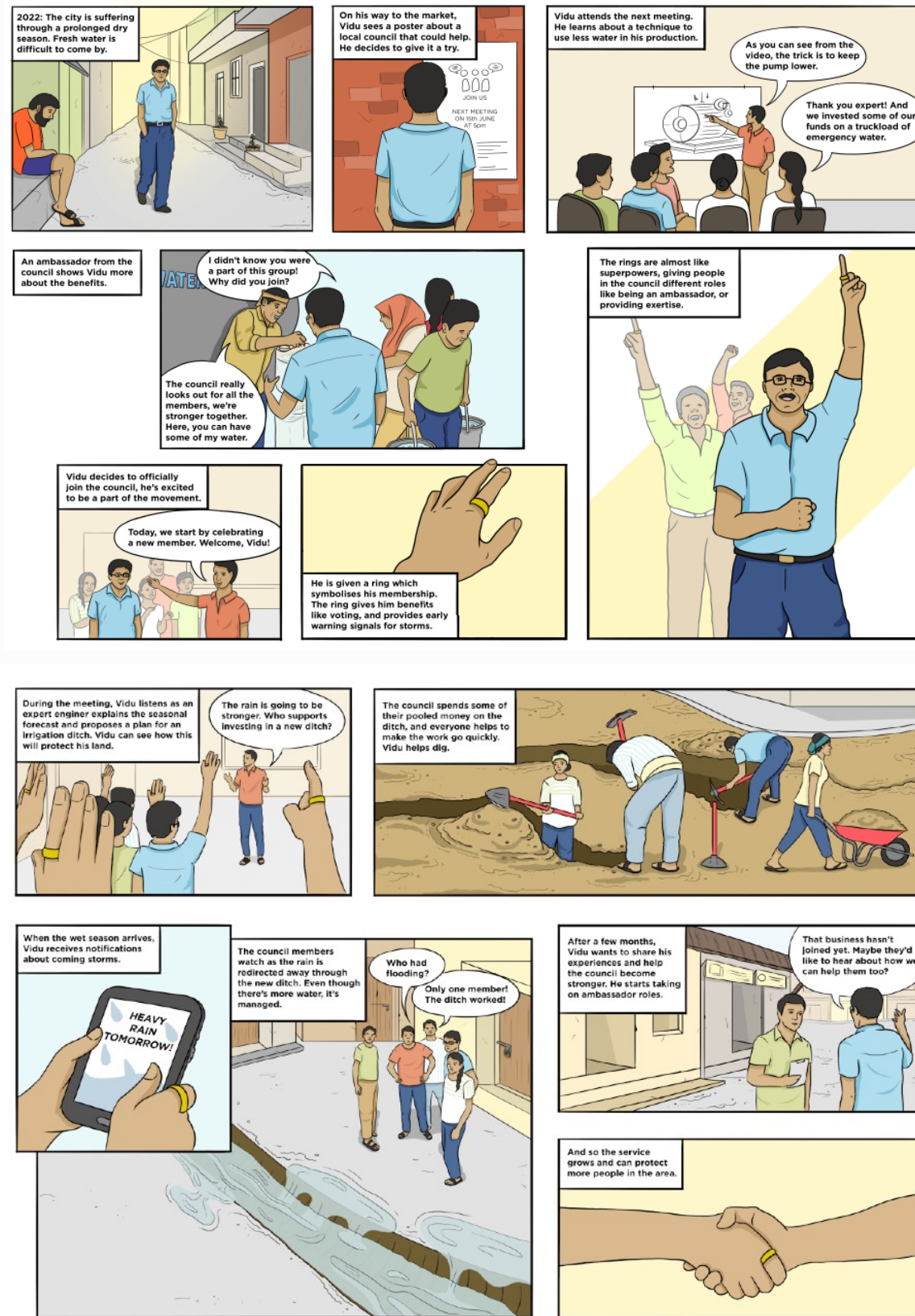


# The Lenses

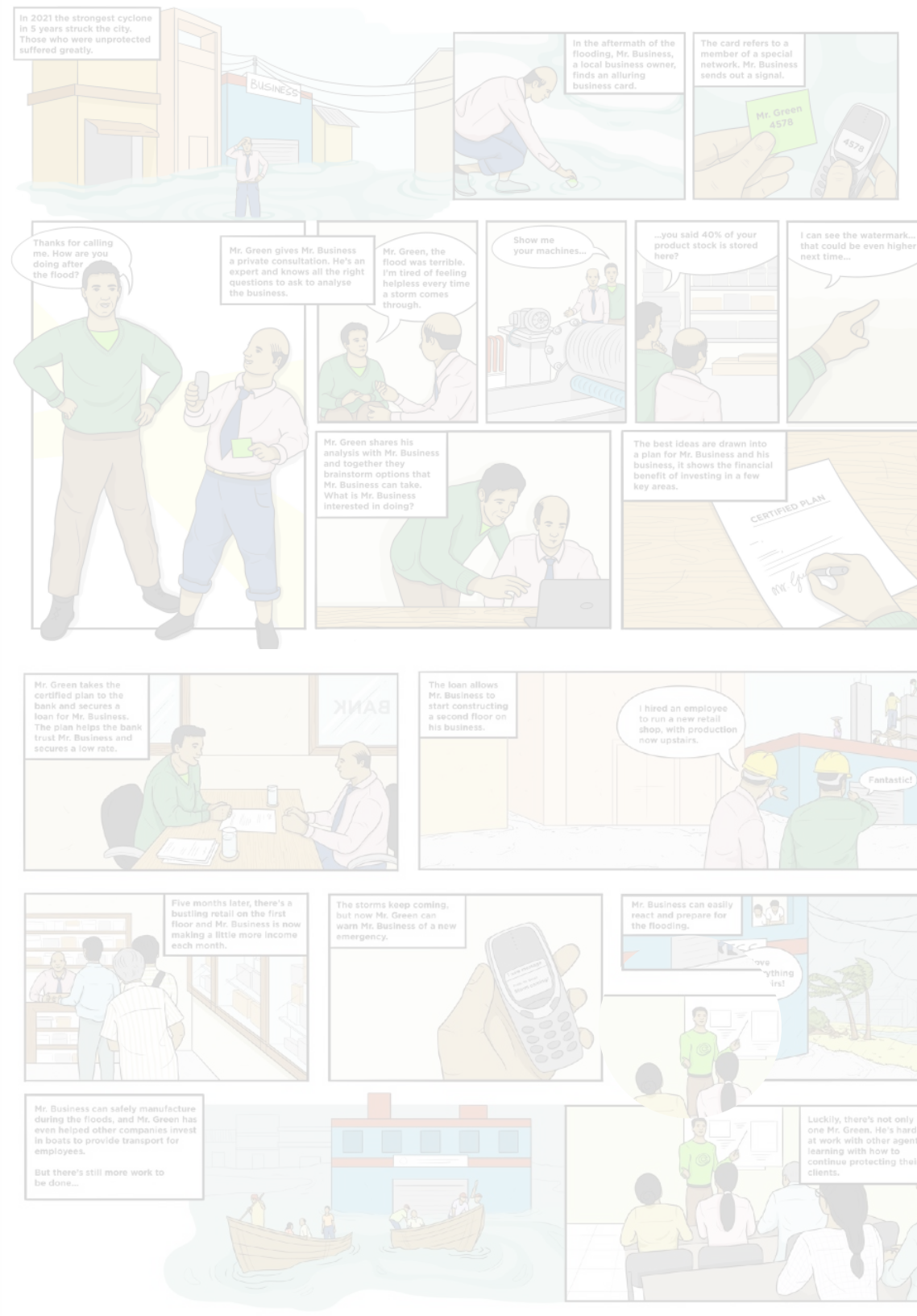




# The Council



# The Agent



# The Lenses





# The Council

2022: The city is suffering through a prolonged dry season. Fresh water is difficult to come by.

On his way to the market, Vidu sees a poster about a local council that could help. He decides to give it a try.

Vidu attends the next meeting. He hears about a technique to use less water in his production.

As you can see from the video, the trick is to keep the pumps lower.

Thank you expert! And we invested some of our funds on a truckload of emergency water.

An ambassador from the council shows Vidu more about the benefits.

I didn't know you were a part of this group! Why did you join?

The council really looks out for all the members, we're stronger together. Here, you can have some of my water.

The rings are almost like aquariums, giving people in the council different roles like being an ambassador or providing expertise.

Vidu decides to officially join the council, he's excited to be a part of the movement.

Today, we start by celebrating a new member. Welcome, Vidu!

He is given a ring which symbolizes his membership. The ring gives him benefits like voting, and provides early warning signals for storms.

During the meeting, Vidu listens as an expert engineer explains the seasonal forecast and proposes a plan for an irrigation ditch. Vidu can see how this will protect his land.

The rain is going to be stronger. Who supports this plan?

The council spends some of their pooled money on the ditch, and excavates holes to make the work go quickly. Vidu helps dig.

When the wet season arrives, Vidu receives notifications about coming storms.

The council members watch as the rain is redirected away through their new ditch. Even though there's more water, it's managed.

Who did I vote for?

Only one member! The ditch worked!

After a few months, Vidu wants to show his experience and help the council become stronger. He starts taking on ambassador roles.

That business hasn't joined yet. Maybe they'd like to hear about how we can help them too?

And so the service grows and can protect more people in the area.

# The Agent

In 2021 the strongest cyclone in 5 years struck the city. Those who were unsuspected suffered greatly.

In the aftermath of the flooding, Mr. Business, a local business owner, finds an alarming business card.

The card refers to a member of a special network. Mr. Business sends out a signal.

Mr. Green 4578

Thanks for calling me. How are you doing after the flood?

Mr. Green gives Mr. Business a private consultation. He's an expert and knows all the right questions to ask to analyze the business.

Mr. Green, the flood was terrible. I'm tired of feeling helpless every time a storm comes through.

Show me your machines...

...you said 40% of your product stock is stored here?

I can see the watermark... that could be even higher next time...

Mr. Green shares his analysis with Mr. Business and together they brainstorm options that Mr. Business can take. What is Mr. Business interested in doing?

The best ideas are drawn into a plan for Mr. Business and his business. It shows the financial benefit of investing in a few key areas.

Mr. Green takes the certified plan to the bank and secures a loan for Mr. Business. The plan helps the bank trust Mr. Business and secure a low rate.

The loan allows Mr. Business to start constructing a second floor on his business.

I hired an employee to run a new retail shop, with production now upstairs.

Five months later, there's a bustling retail on the first floor and Mr. Business is now making a little more income each month.

The storms keep coming, but now Mr. Green can warn Mr. Business of a new emergency.

Mr. Business can easily react and prepare for the flooding.

Mr. Business can safely manufacture during the floods, and Mr. Green has even helped other companies invest in boats to provide transport for employees.

But there's still more work to be done...

Luckily, there's not only one Mr. Green. He's hard at work with other agents, learning with how to continue protecting their clients.

# The Lenses

In 2023, a technology breakthrough makes augmented reality cheap and available. A hot new service is launched to use technology to help small businesses.

Boss! I think your new lenses arrived.

Mr. Boss is excited to get started and try out the new service. His personalized lenses look great!

His lenses have already been pre-loaded with data relevant for his business type and location. Mr. Boss selects the 'year' to scan his business for risks.

Through the lenses, Mr. Boss sees data projected on top of his business.

The lenses show where damage from flooding could cost him money.

This matches his own memories from the last time his business was flooded.

Average damage: Doors and Windows - \$1,200

Average damage: Floated products - \$3,375 (hourly)

Average damage: Electric Machines - \$4,000 (night)

Mr. Boss selects the 'factor' mode to see the service's recommended actions to avoid the cost of those damages.

Through the lenses Mr. Boss sees 5 actions that could save him in the next flood. The actions are prioritized by cost-benefit.

Mr. Boss feels confident about his actions. He sends for the electrician.

#1 First Priority: Upgrade electric meter +\$3,000

Over time, Mr. Boss develops a morning ritual to use his lenses to check the weather. He uses the 'alert' mode to scan the skies and see if a heavy rainstorm is coming.

CLEAR

STORM TOMORROW!

The lenses give Mr. Boss a 24-hour warning to tell his employees and make a plan.

As the rains quiet down, Mr. Boss looks through the lenses to capture the damage and update his risk assessment.

I can see we had a few leaks come through the roof.

We can repair those leaks right away, sir.

And great news that we don't have to fix the electricity, we can get right back to work!

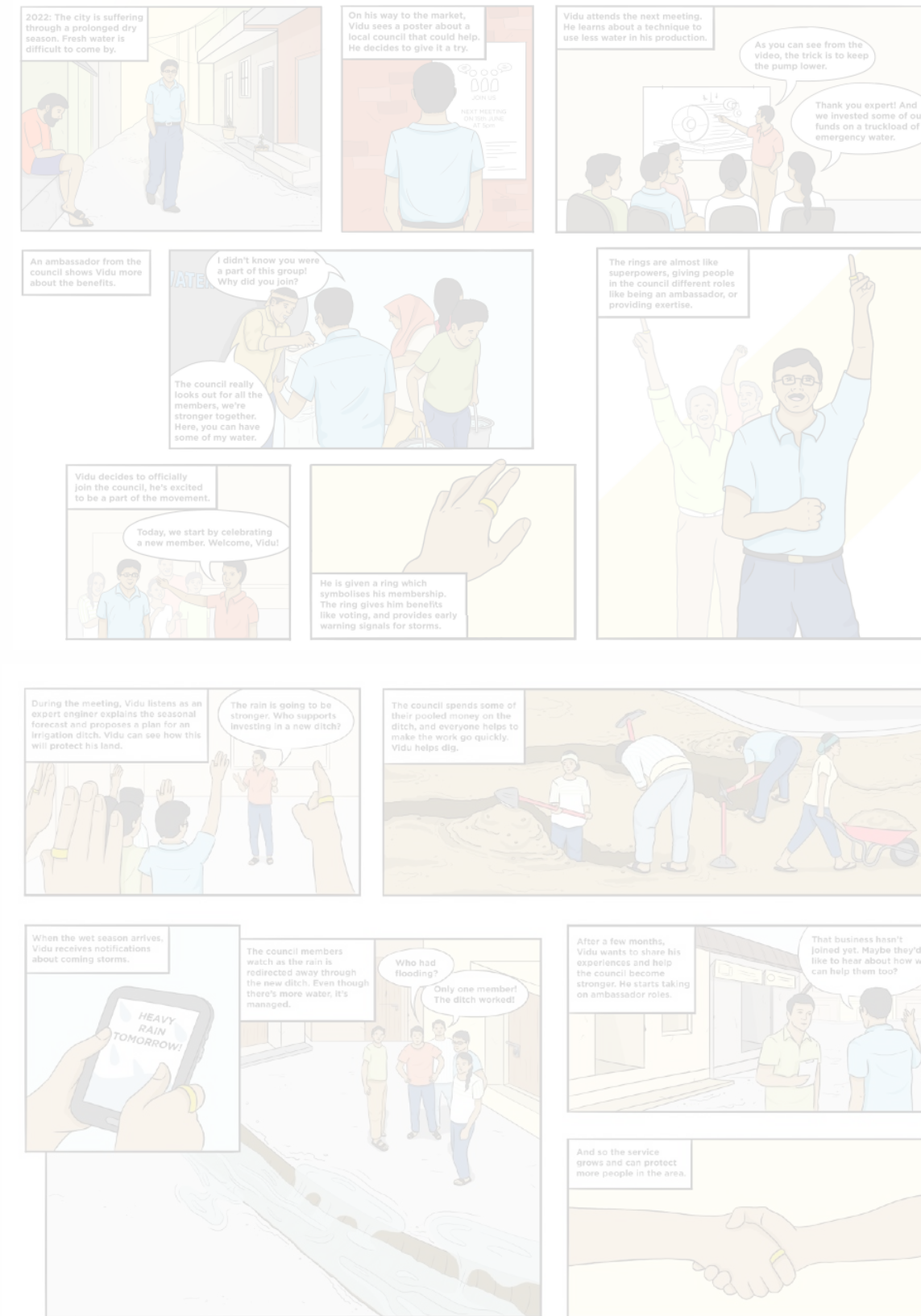
Back at the service command center, Mr. Boss's data is streaming in to the service, just like other users across the country.

Great, and the data will be helpful in refining our recommendations for the next storm.

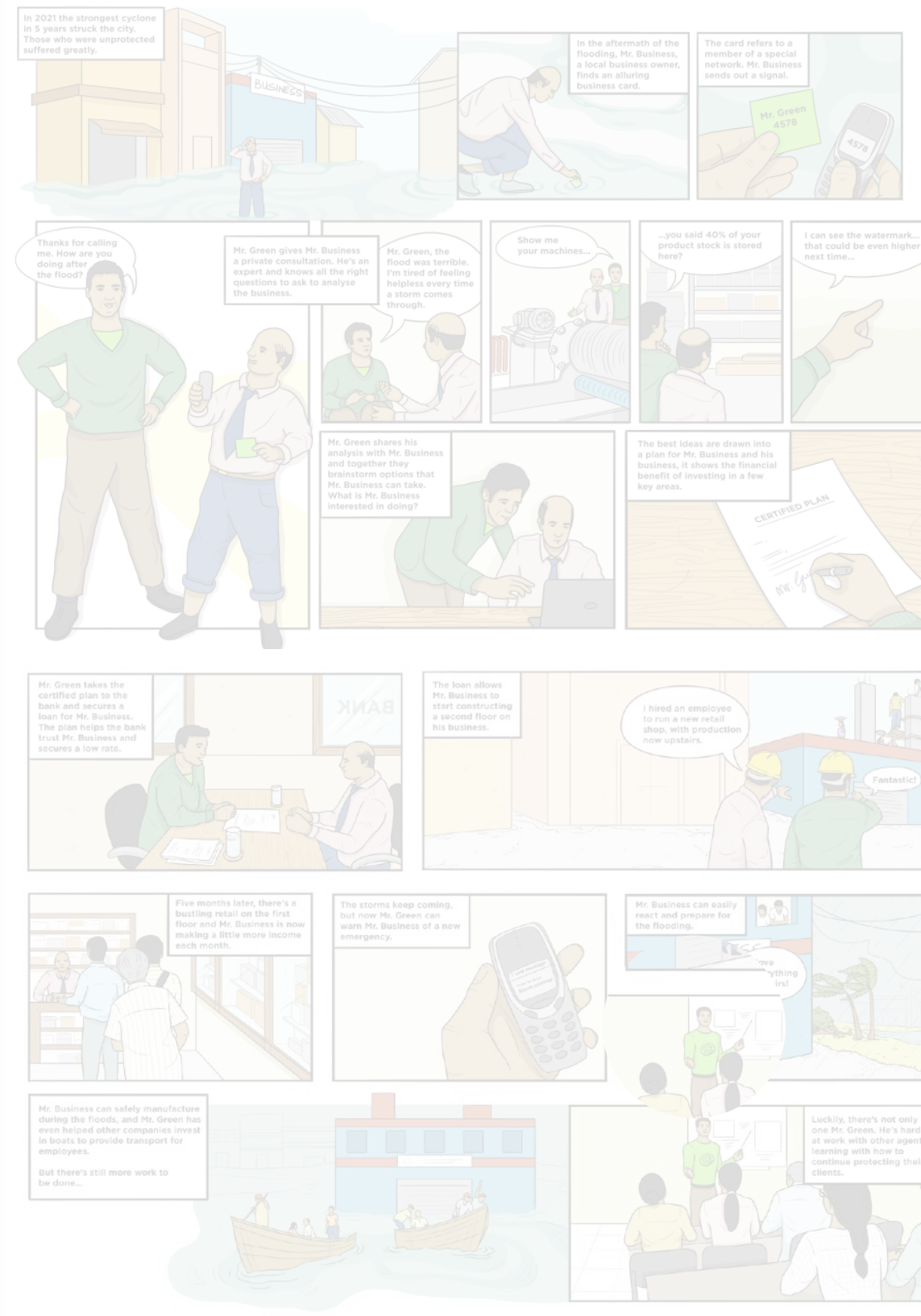
We can see that the lens users are weathering the storm well.



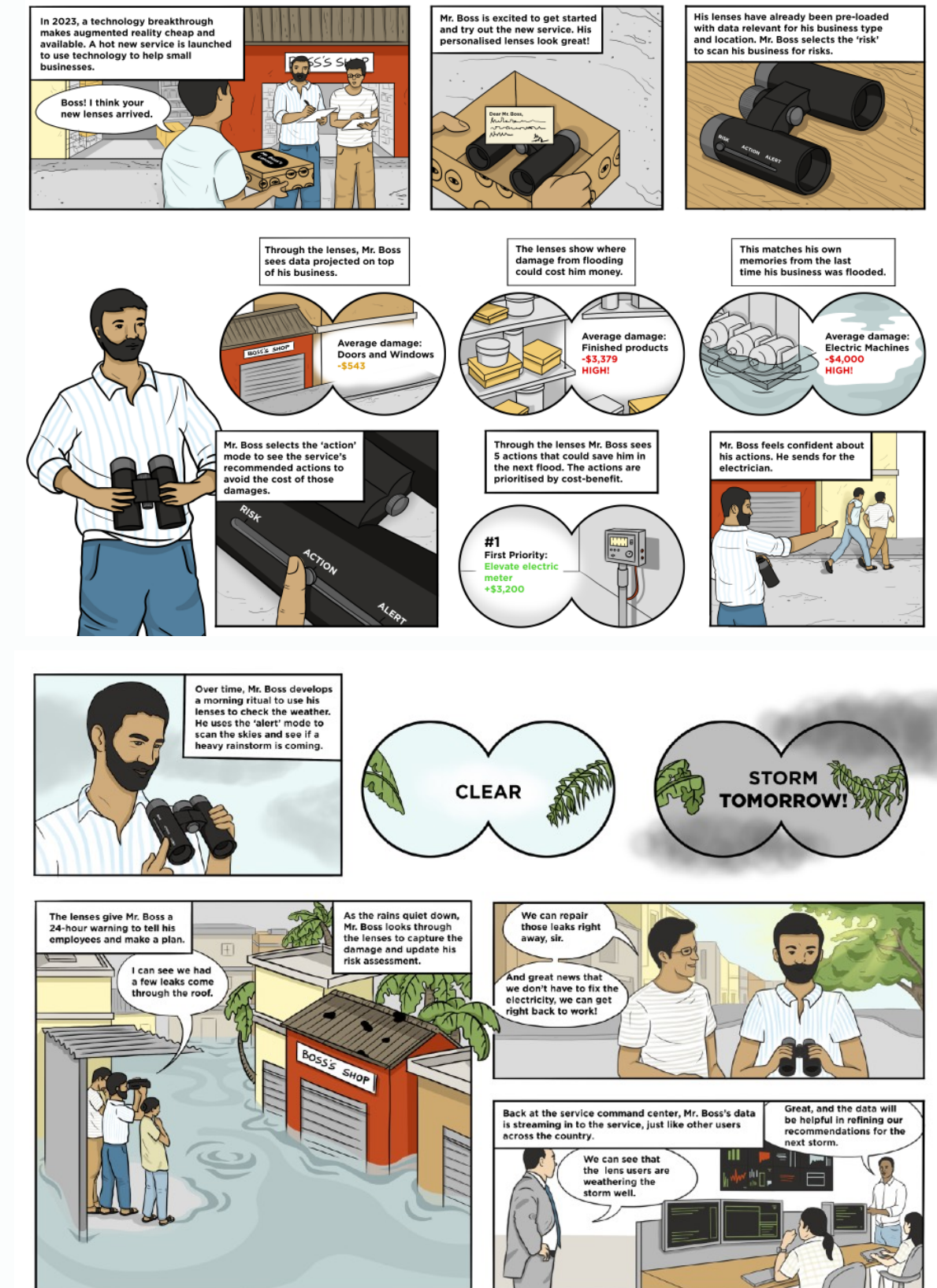
# The Council



# The Agent

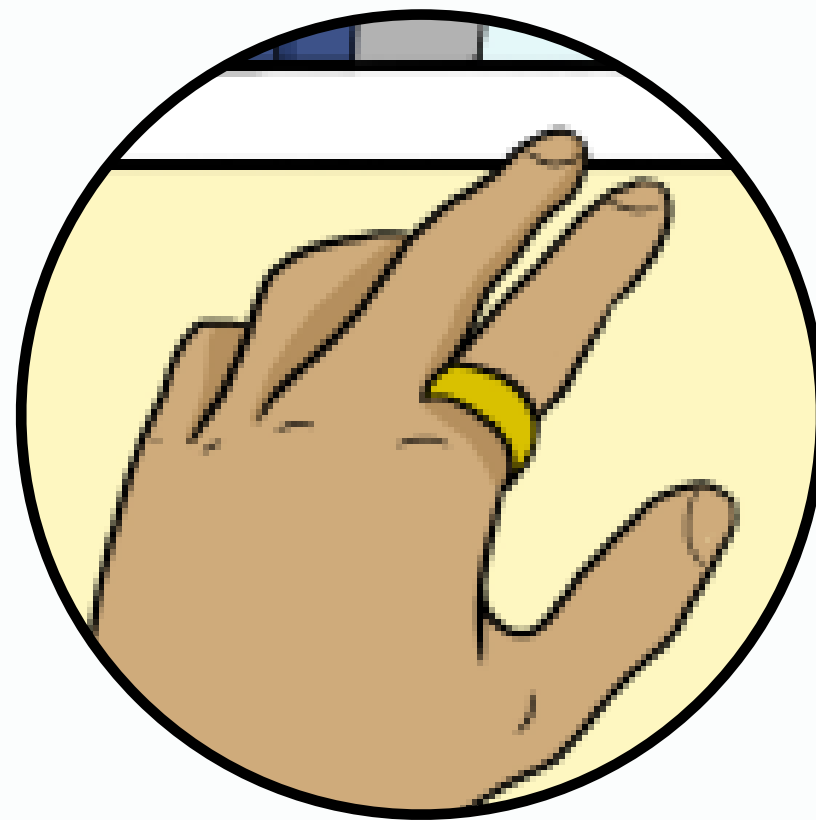


# The Lenses





# [superpowers]



**Collective Action**



**Expert Knowledge**



**Seeing the Future**



**“An activist’s job in the 21st Century is to figure out how  
to use technology to change society... **every activist  
has to be a bit of a science fiction writer,  
and most science fiction ends up being pretty activist.”****

**- Cory Doctorow**



# [challenges / opportunities]

**PREPARING PUBLIC HEALTH OFFICIALS  
FOR CLIMATE CHANGE: A DECISION  
SUPPORT TOOL**


*A Report for:*  
**California's Fourth Climate Change Assessment**

*Prepared By:*  
**Steinberg, Nik C.<sup>1</sup>; Mazzacurati, Emile<sup>1</sup>; Turner, Josh<sup>1</sup>; Colin  
Gannon<sup>1</sup>; Dickinson, Robert<sup>2</sup>; Snyder, Mark<sup>2</sup>; Trasher,  
Bridget<sup>2</sup>**

<sup>1</sup> Four Twenty Seven  
<sup>2</sup> Argos Analytics

**DISCLAIMER**

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Edmund G. Brown, Jr., Governor

August 2018  
CCC4A-CNRA-2018-012

CHAT

Tuesday • 7:24 AM



Today, likely dry.  
Tomorrow, likely dry.  
/iska

Wednesday • 8:57 AM

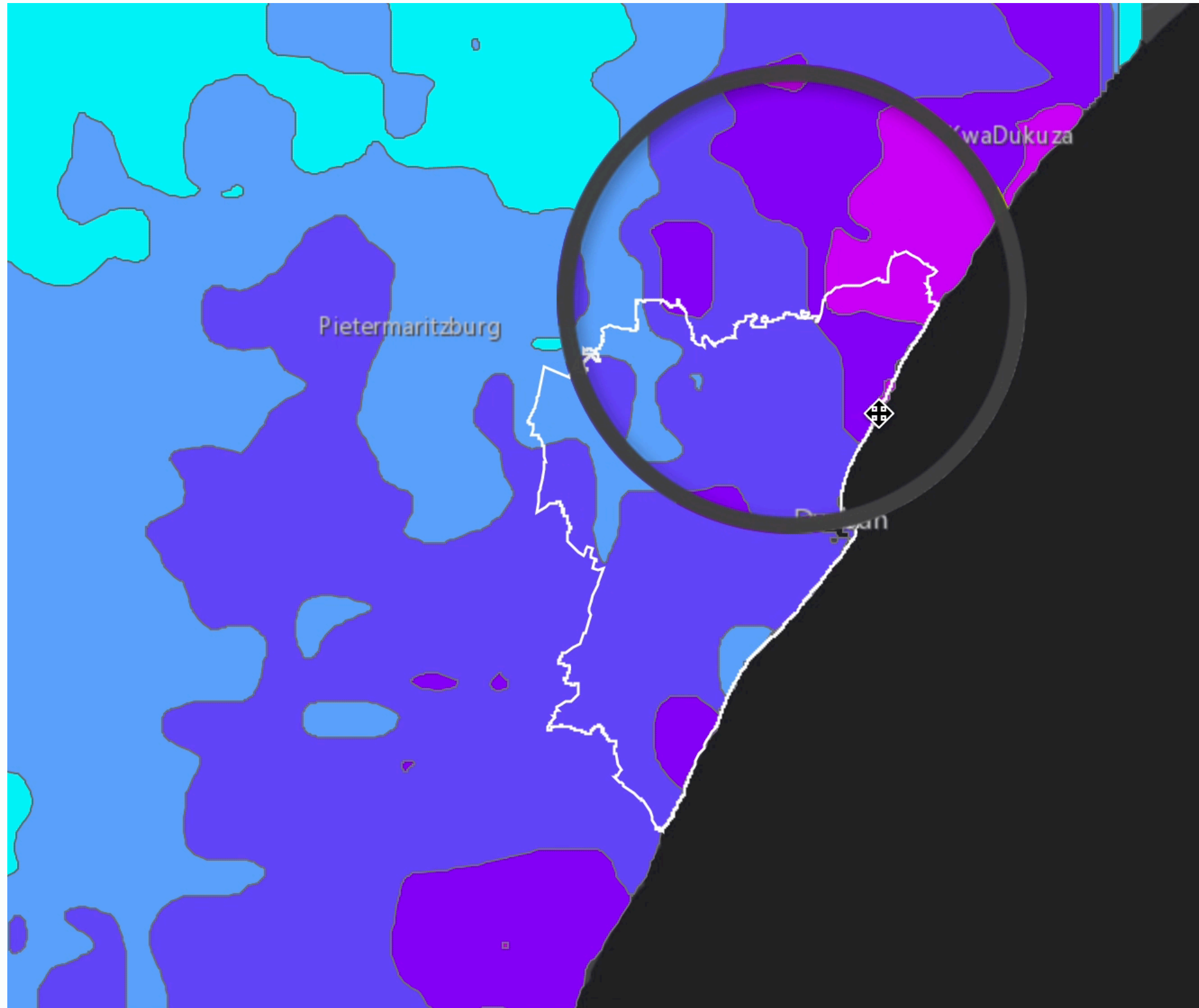


Today, likely dry.  
Tomorrow, rain likely.  
/iska

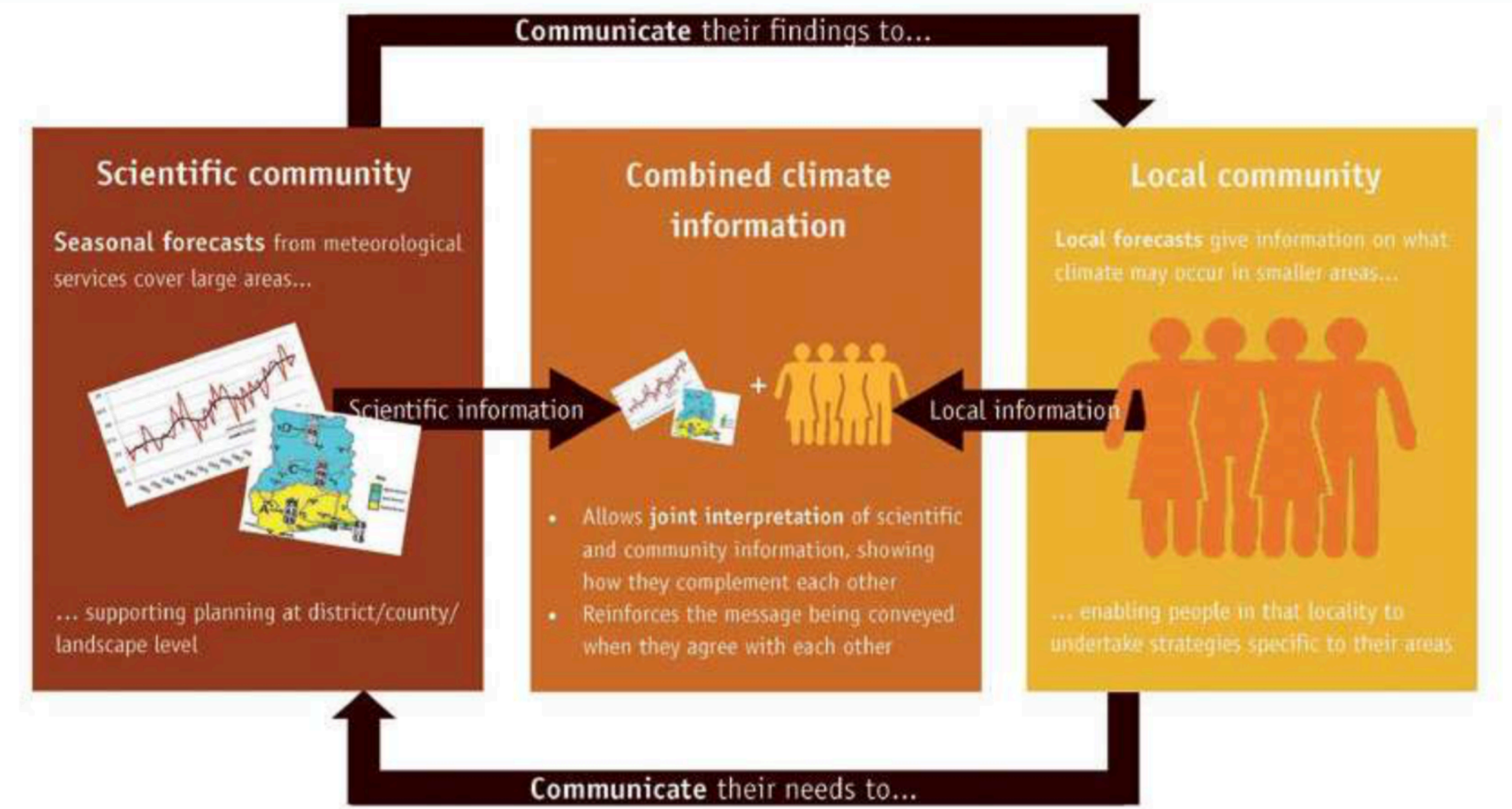
iska



# [challenges / explorations]



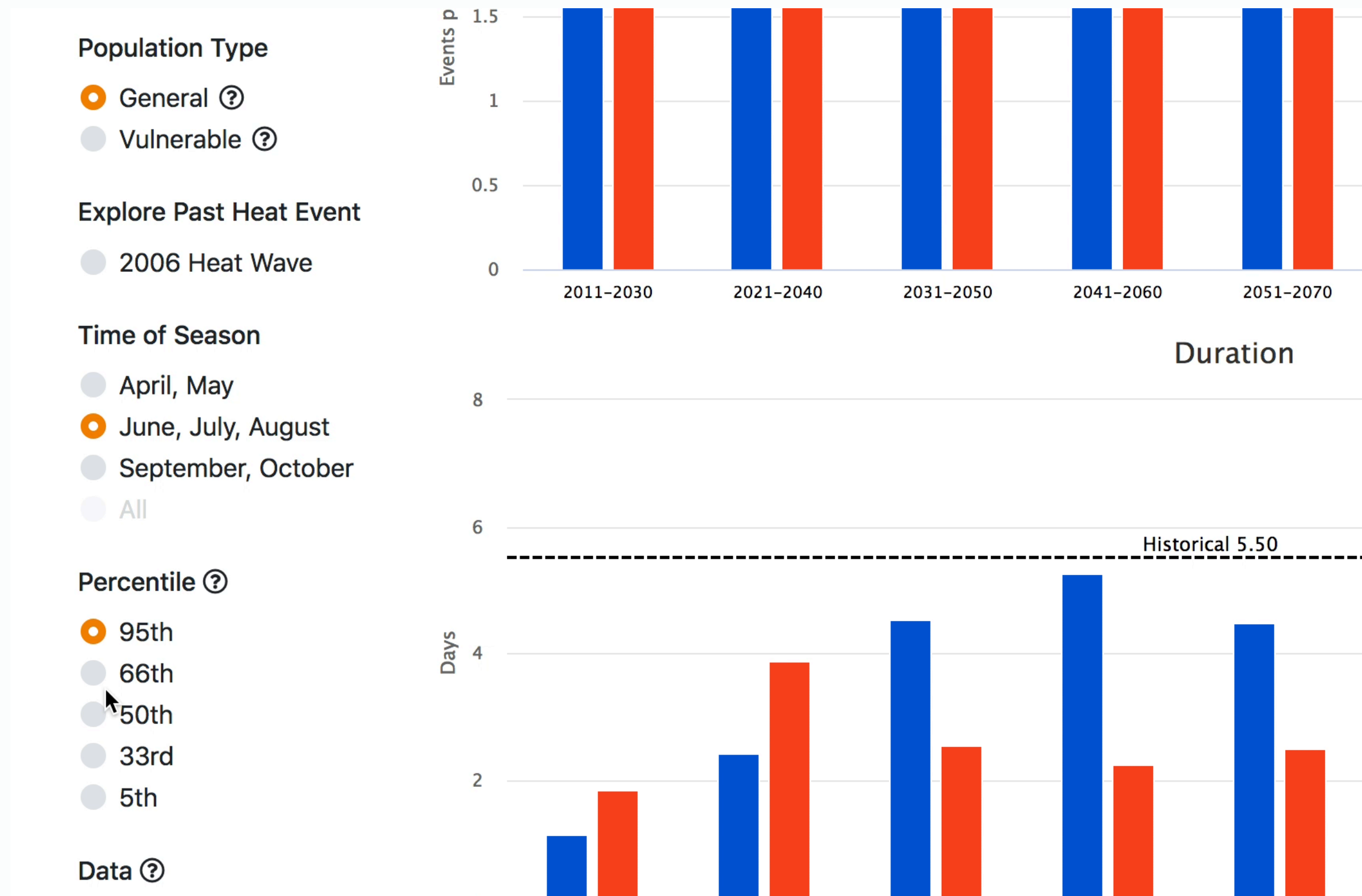
Durban Climate Atlas



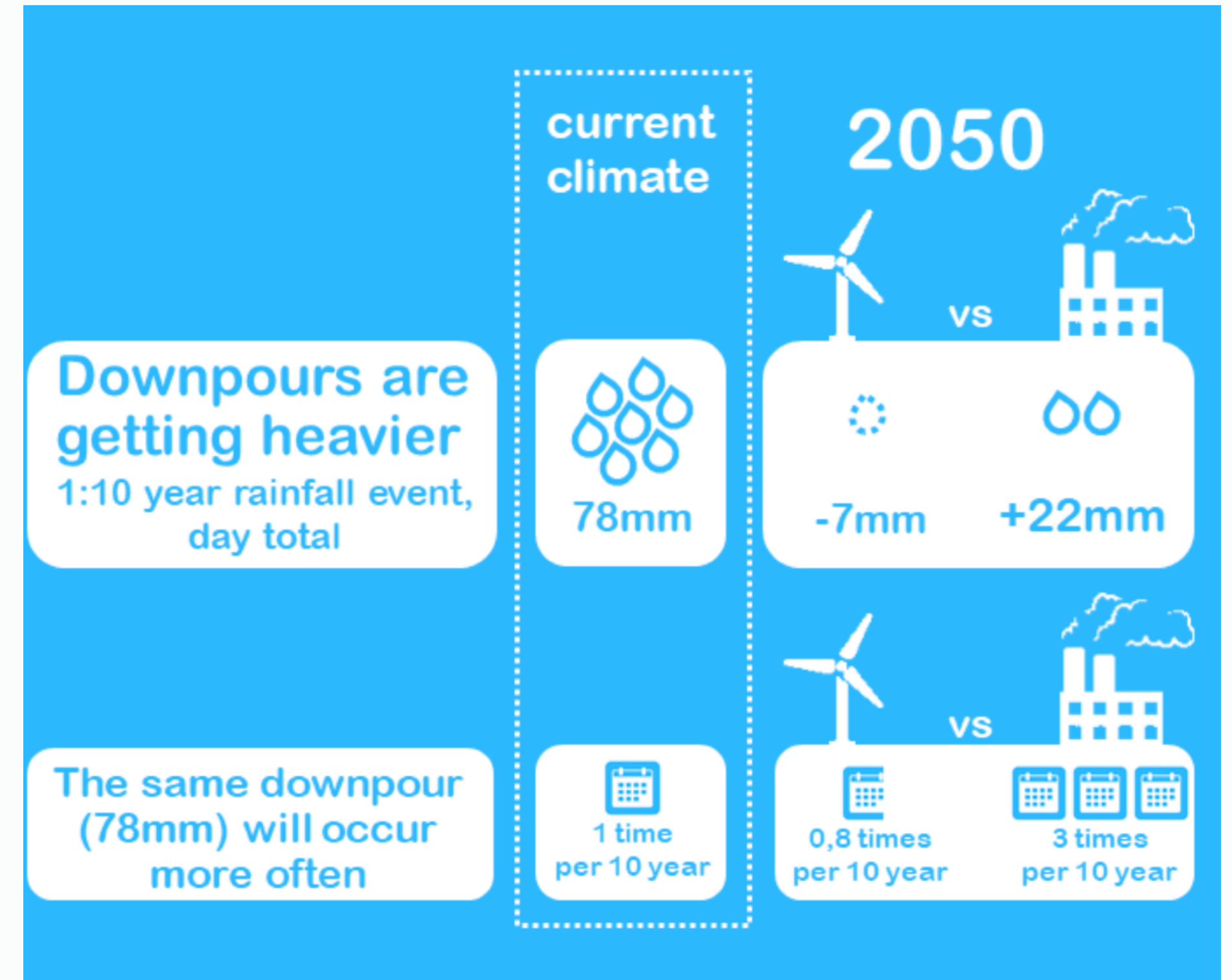
PSP



# [challenges / explorations]



CHAT



Durban Climate Atlas



# life-centred design





**“Design activism is as much about **creating new,**  
**ethically surcharged markets** for professional services  
as it is about social responsibility.”**

**- C. Greig Crysler**



**3 reflections**

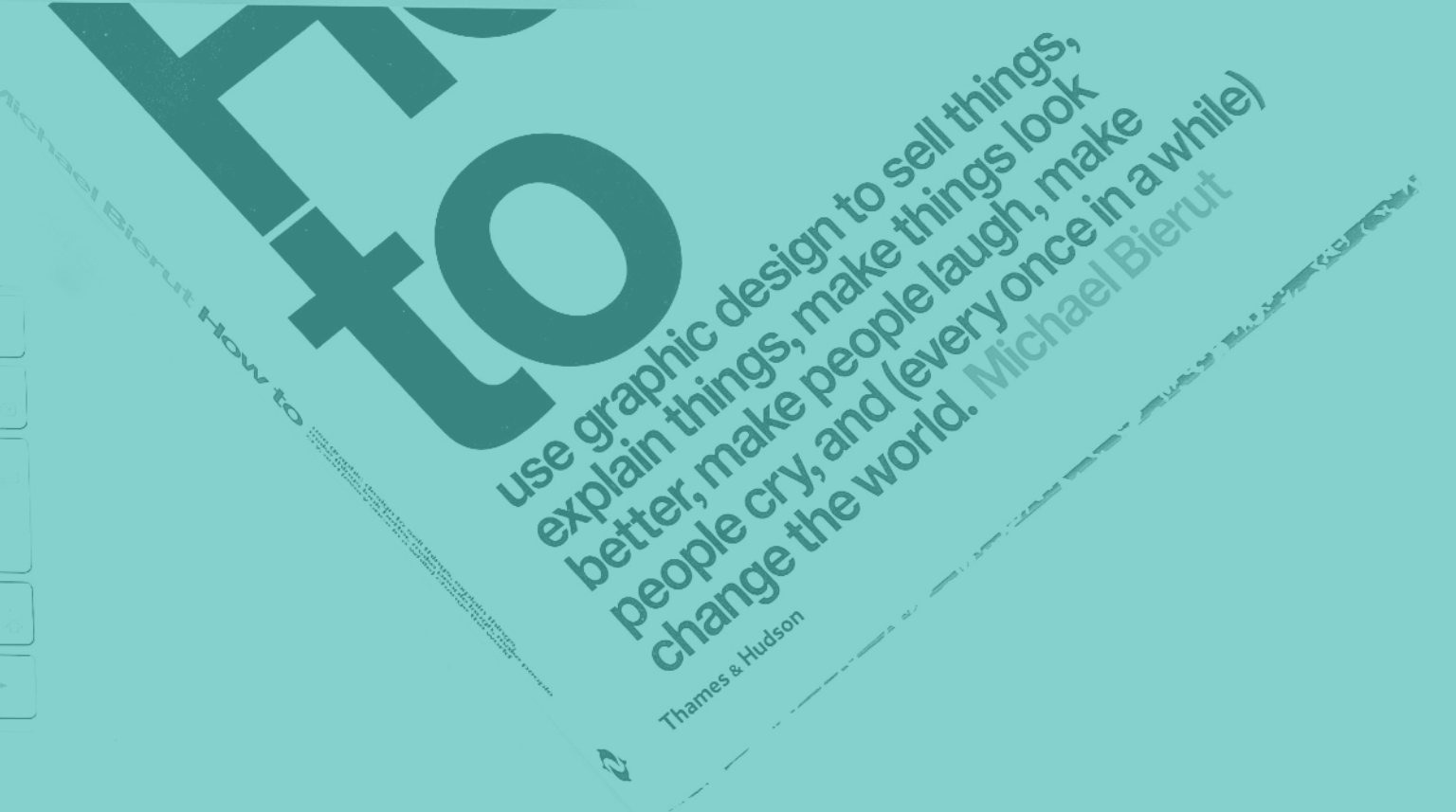




go to the front lines

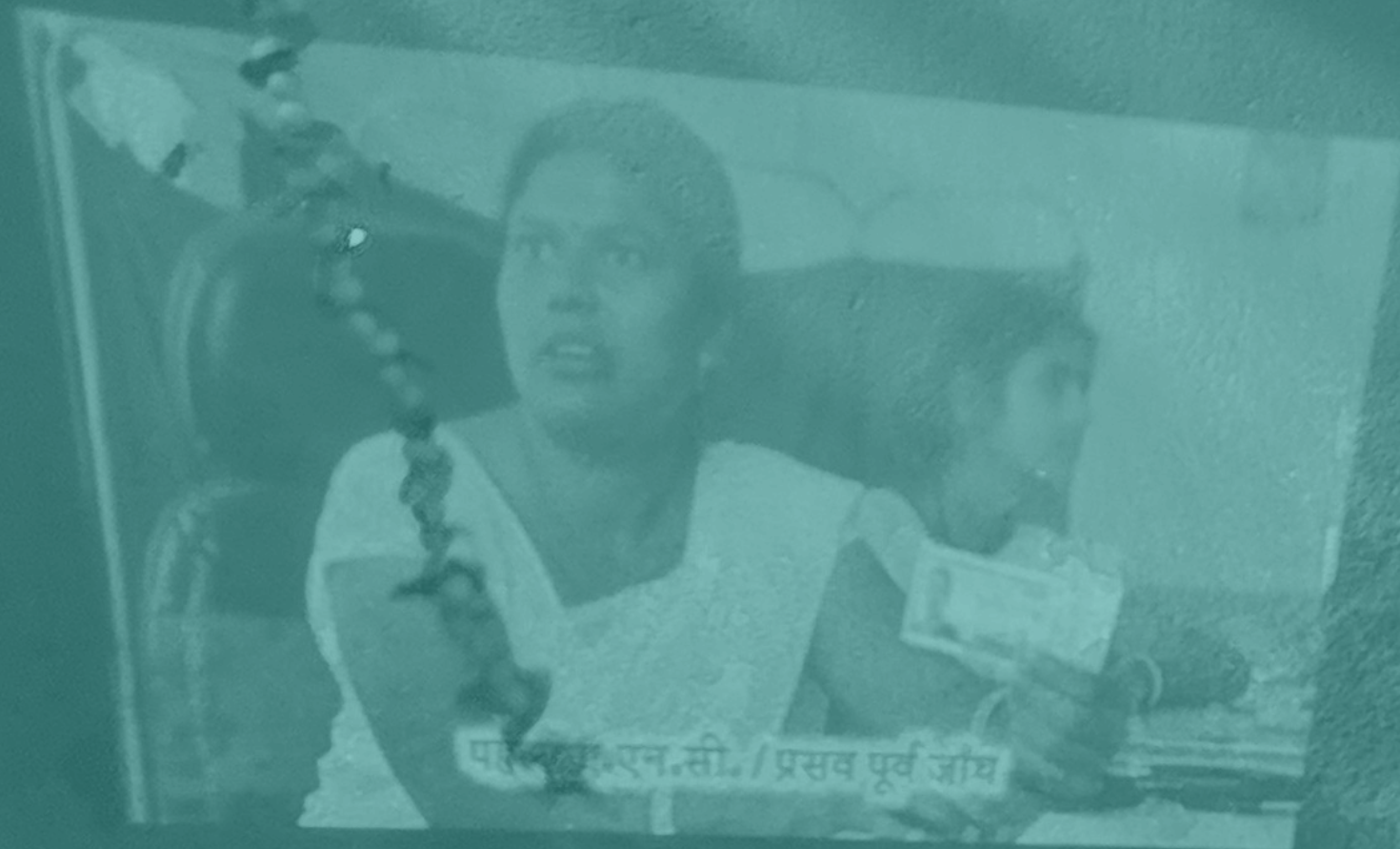


find your niche





**amplify people**





**CIID** COPENHAGEN  
INSTITUTE OF  
INTERACTION  
DESIGN

**@francescadesmarais**

**@CIIDnews**

*Launching  
Soon!*

