

# Enhancing Supply Chain Resilience through Digital Technology

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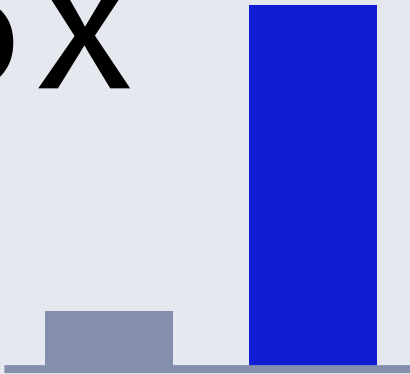
GX Business Development Department

NEC Corporation

# Background : Disaster countermeasure situation

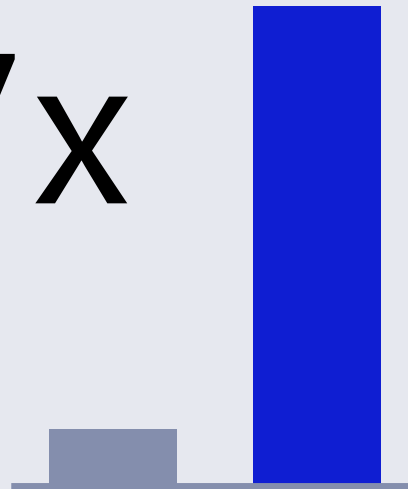
Increase in the number of  
**Disasters**

5x



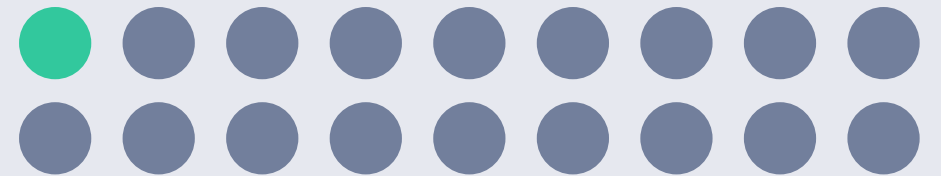
Increase in  
**Economic Losses**

7x



**Adaptation Investment**  
compared to Mitigation Investment

1/18



Source: WMO, "Atlas of Mortality and Economic Losses from Weather, Climate and Water-related Hazards (1970-2021)"

Source: Climate Policy Initiative, "Global Landscape of Climate Finance 2023"

# Why NEC

Provide solutions for strengthening supply chain resilience using advanced sensing technology and AI/digital technology.



## sensing technology

Accurate observations of the real world



## AI/digital technology

Processing and Predicting  
Complex and Vast Information

# Efforts to enhance supply chain resilience against risks from climate change

## Risks to the supply chain due to climate change



Risks such as floods and droughts in the agricultural sector

### Production risk

NEC's Challenge

Calculation of yield changes and return on investment when adaptation measures such as the introduction of irrigation facilities and variety changes are implemented.



Risks of building flooding and transportation route disruptions due to flooding

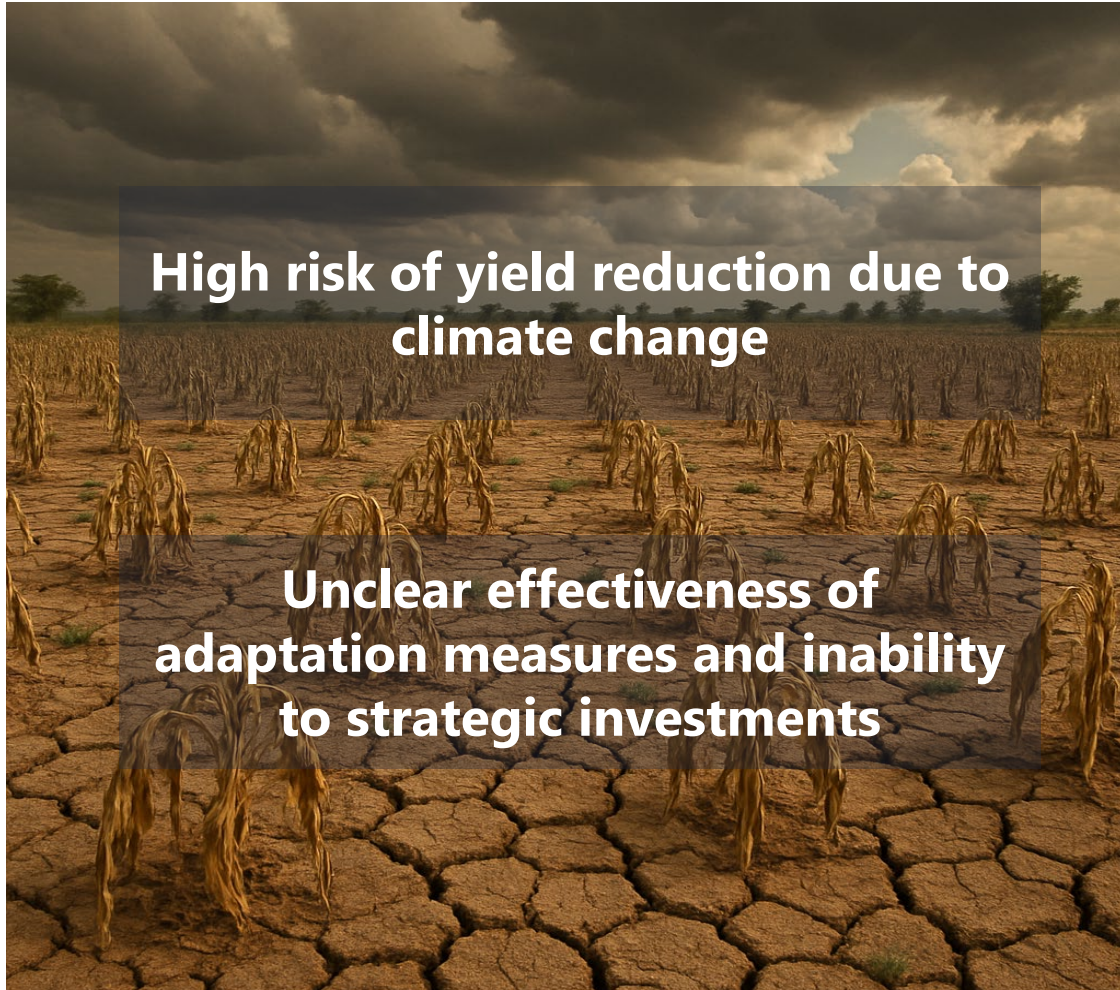
### Physical risk

NEC's Challenge

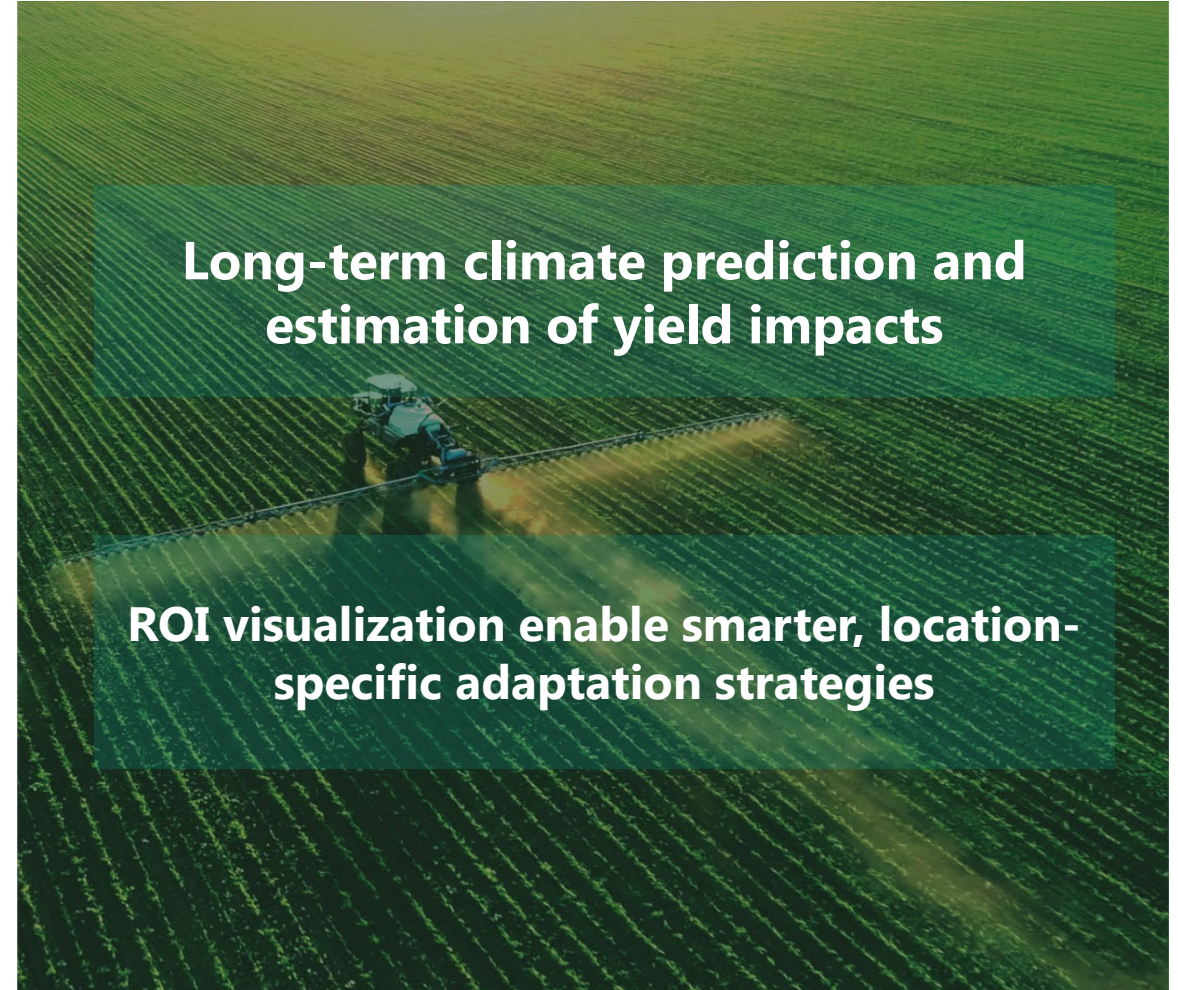
Calculation of the risk reduction effect of inland flooding/external or riverine flooding by implementing adaptation measures such as levee installation.

# To enhance supply chain resilience in the agricultural sector

As is

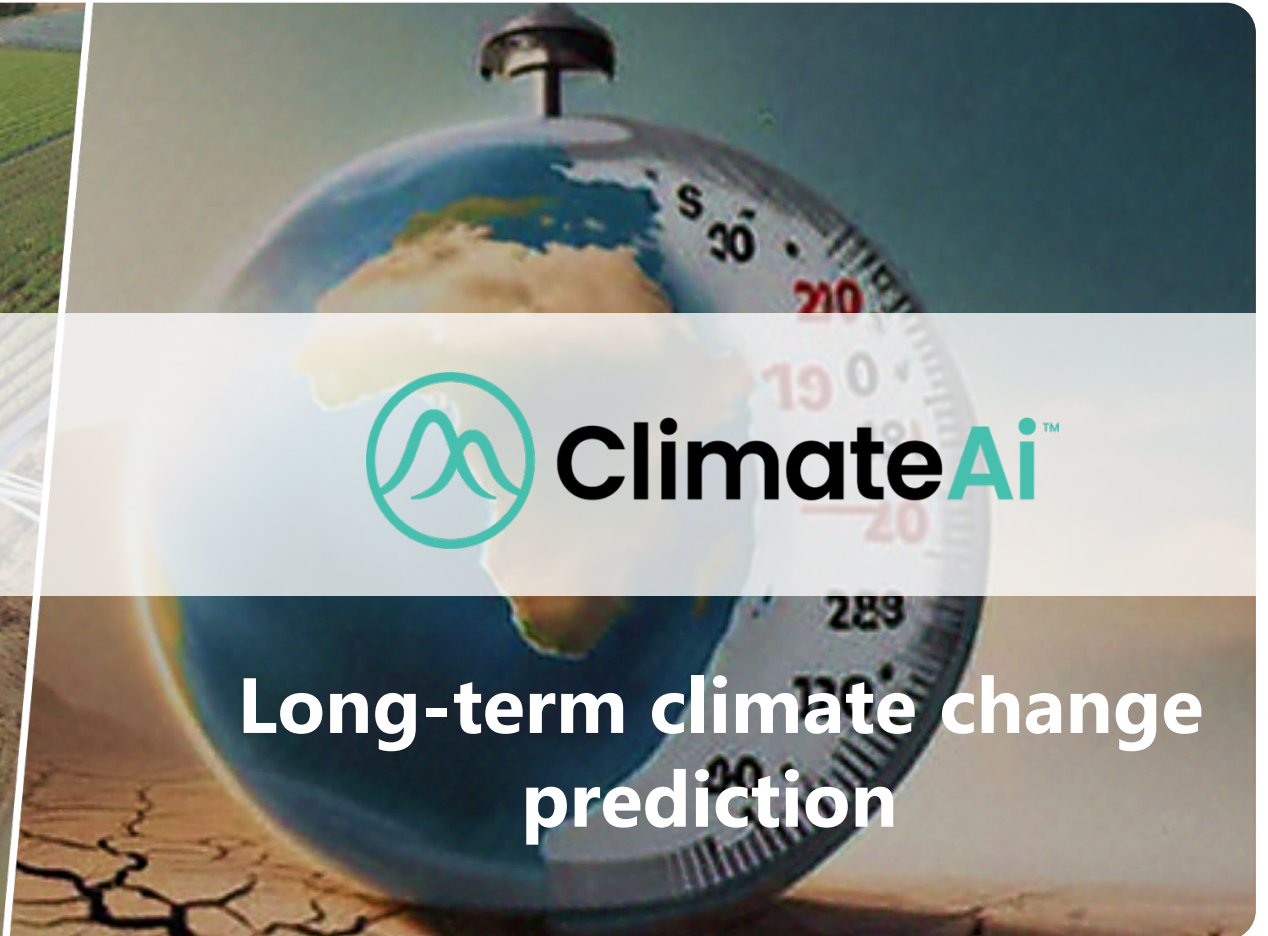


To be



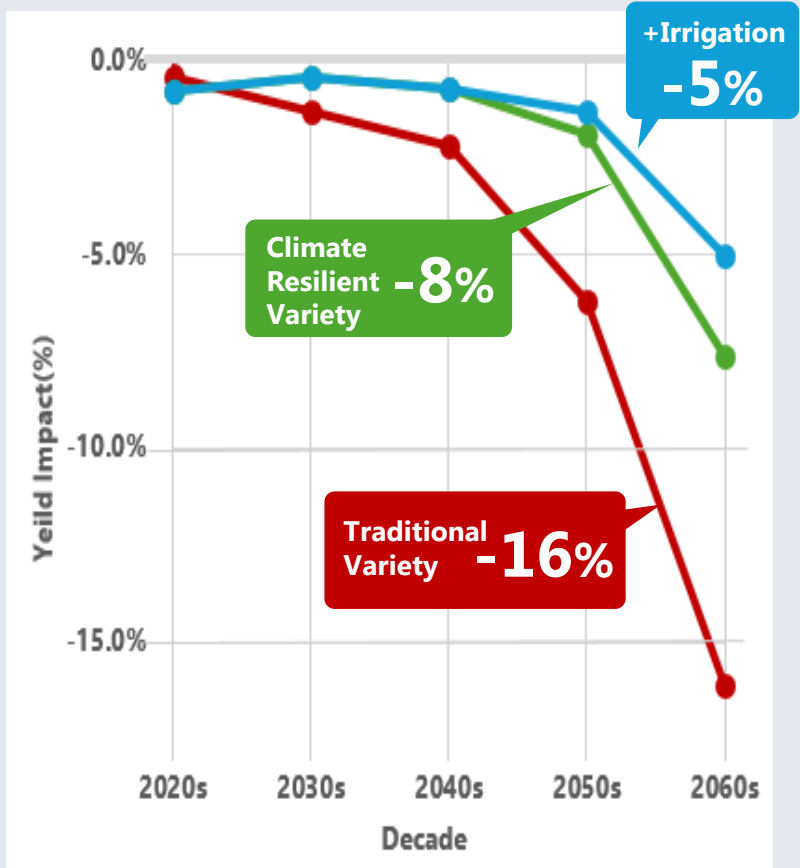
# Our Technology

Quantify the impact of climate change on agriculture and assess the return on investment in adaptation measures. It is possible to select the most effective adaptation investment based on location.



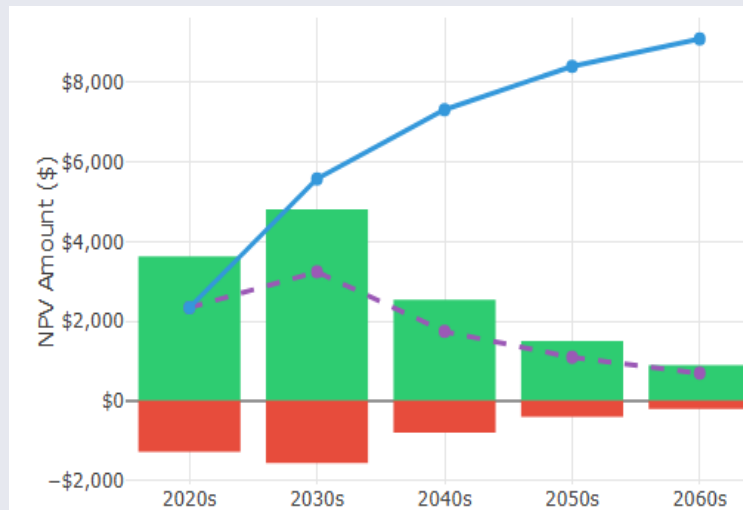
# Use case : Rice | Yield prediction and return on investment

## Yield prediction

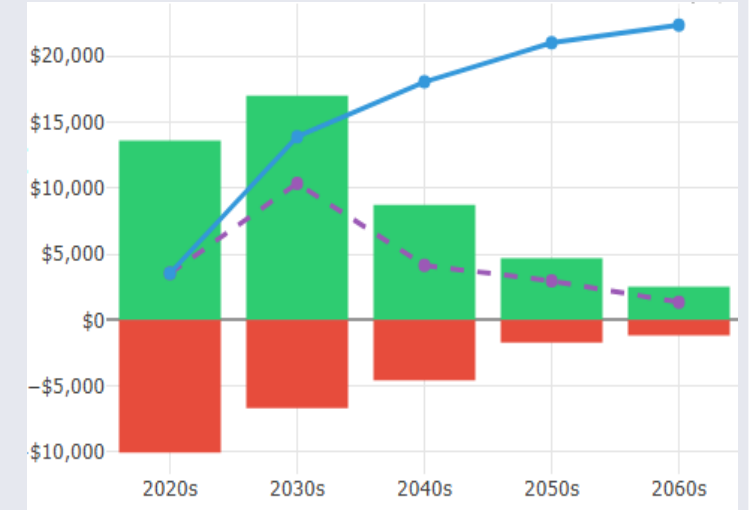


## Return on investment

### Climate Resilient Variety



### + Irrigation



**213%**

Revenue \$ 13,360  
Gains \$ 9,100  
Cost \$ 4,270

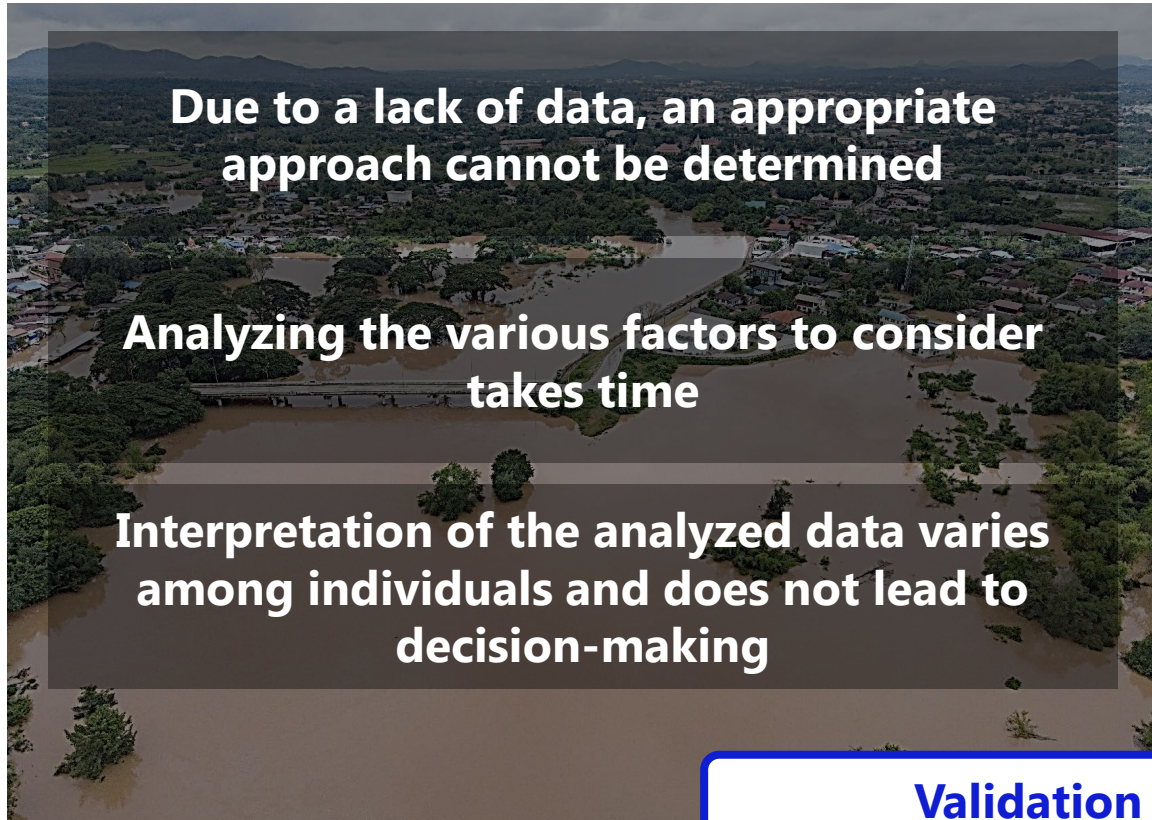
**92%**

Revenue \$ 46,560  
Gains \$ 22,360  
Cost \$ 24,190

# To enhance supply chain resilience against physical risks from flooding

To address the challenges of data collection, analysis, and visualization, we have launched a project using flood simulations in the real field.

As is



To be



Validation in the real field

# Use case : Joint feasibility study with Sinar Mas Land

**PJ schedule** June 2025 to March 2026 (on-going)

**Target area** BSD city, Indonesia

**Theme** Feasibility study of the business models leveraging adaptation value\*

## Scope

- Conducting flood damage simulation and visualization utilizing actual data in BSD with/without drainage system
- Evaluation of Business models, revenue plans and business expansion plan based on the simulation results

## Project Scheme

Construction  
Consultant

**NEC**  
ICT Company

 **sinar mas land**  
City Developer

## Target area

**BSD City**

Jakarta



Source: Sinar Mas Land

\*Difference in estimated damage costs before/after implementing flood adaptation measures

# Use case : Flood damage simulator overview

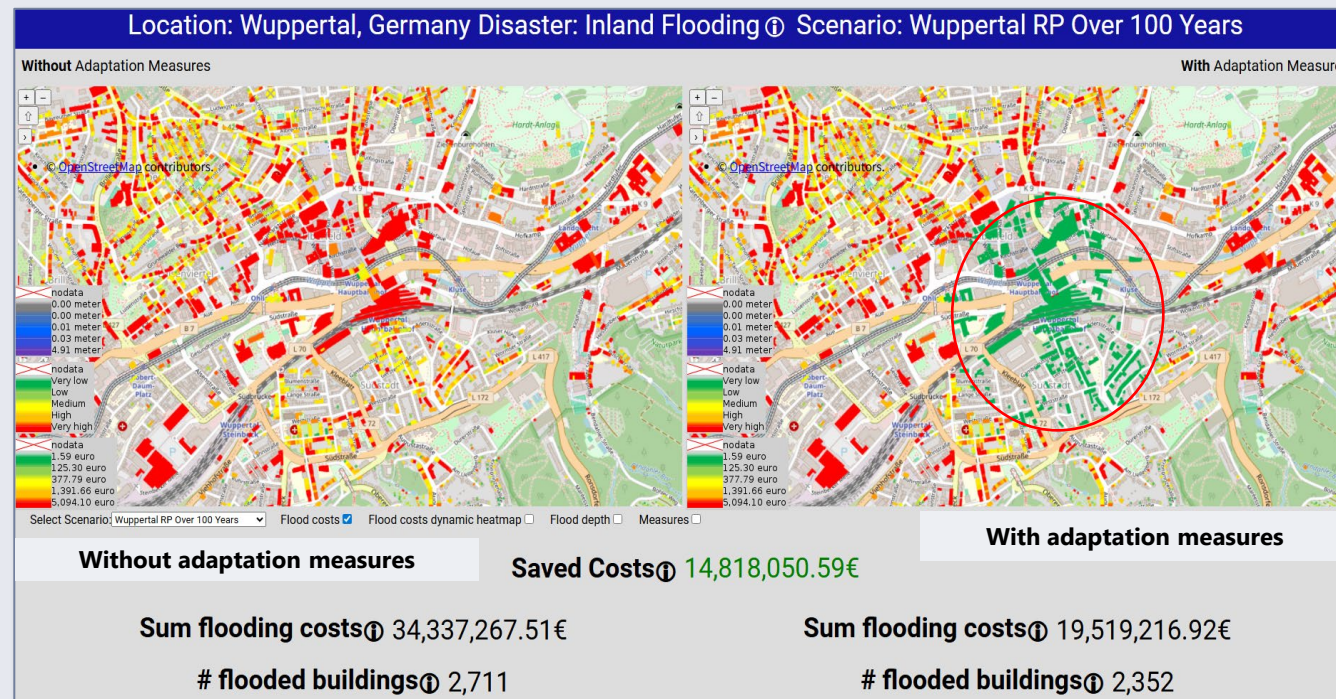
## Value offered

Visualization of potential risk areas

Visualization of flood damage and saved costs

Visualization of damage costs for individual buildings

## UI example



(Note) Assuming a drainage system that reduces the flood depth by 1m with a radius of 500m (Red circle)

# Demonstration

The screenshot displays a GIS application window titled "BSD\_test-25Y-25m.wsx - GISAp Standard". The interface includes a menu bar with options like "ファイル", "ホーム", "検索", "編集", "表示", "分析", "共有", and "カスタム". A toolbar at the top provides various map manipulation tools such as "拡大", "縮小", and "範囲拡大".

On the left side, there are two panels: "マップ" (Map) and "凡例" (Legend). The "マップ" panel shows a list of layers including "全て", "コンテンツ", "マップ", "Adaptation value calculation", and "Base map". The "凡例" panel shows "レイヤ", "色塗り", and "グラフ" options, with "OSM" selected.

The main map area shows a street map with several colored overlays: a red line representing a path or boundary, and yellow and green areas representing different adaptation value zones. A scale bar indicates 700 meters. A north arrow is located in the top right corner. The text "Map data : openstreetmap.org/copyright" is visible in the bottom right of the map area.

At the bottom of the application, there is a panel titled "AdaptationValue" containing the text "Total adaptation value: \$" followed by a large empty input field and a dropdown menu.

The bottom status bar shows "Webメルカトル S 6.17.38 E 106.38.17".

# NEC Adaptation Solutions

<b>Recognition Extraction</b>	Disaster Scenario Planning	By analyzing area characteristics and long-term climate trends using AI, future disaster scenario patterns are presented.
<b>Evaluation Analysis</b>	Visualizing the Effects of Adaptation Measures(Flood Damage Simulator)	Mapping the effects of adaptation measures on a map to demonstrate their effectiveness. (Refer to front page of the leaflet)
	Estimating Land Price Decline	Learning past disaster information and land price data for estimating land prices during disasters.
	Estimating Land and Building Types Using Satellite Image Analysis	By analyzing geospatial data such as satellite imagery with AI, land parcel and building classifications required for calculating adaptive value are estimated.
<b>Planning Selection</b>	Recommending Optimal Adaptation Strategy Patterns	Identify areas requiring priority countermeasures and present an optimal implementation plan for adaptive measures.
	Strategic Decision Support in Multiple Scenarios	Multi-agent simulation supports damage simulation for each disaster scenario from a micro perspective and optimal strategy determination.
<b>Implementation Observation</b>	Estimating Disaster-Affected Locations Using Cross-View Image Matching	Compare ground-level landscape images with aerial images (such as satellite imagery) to identify disaster-affected areas.
	Calculating Estimated Damage Amounts in Emergencies	Visualizing and predicting changes in building flood depth and damage costs in real time during flood disasters to support prioritization and decision-making for emergency building preservation operations.
<b>Improvement</b>	Calculating Damage Amounts by Building Type and Efficient Reporting	Calculate flood damage for each building type managed by national and local governments , and quickly report damage status.

(Note) Subject to change without notice as currently in planning.



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To enhance supply chain resilience

**Would you like to try risk visualization and calculating the return on investment for adaptation measures in the real field?**

- From risk visualization based on past weather/ disaster records to **risk visualization based on future predictions** using sensing technology and AI.
- **Quantifying the return on investment of adaptation measures using AI.**

**NEC**

\Orchestrating a brighter world