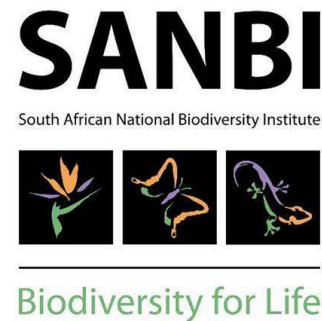




# **NATURE-RELATED RISKS IN SOUTH AFRICA: A socioeconomic, financial and spatially-explicit assessment**

**Presenter: Professor Martine Visser (EPRU/NATCAP,UCT)  
NCA FORUM, STATSSA, Pretoria  
8 August 2024**

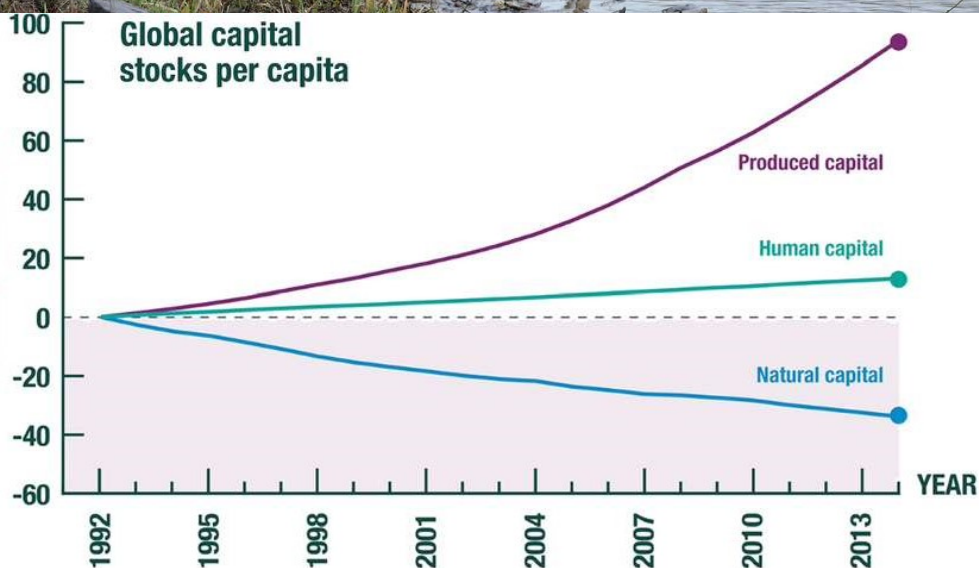




# BACKGROUND

- **PHASE 1:** 2022-2023 study by AFD, in collaboration with South Africa's DFFE and SANBI:  
“Assessment of **socio-economic and financial risks and opportunities** associated with **ecosystem services degradation** and **changes in regulations, consumer preferences, & technological innovations.**”
- **PHASE 2:** Creation of knowledge products to support **mainstreaming of biodiversity in South Africa's finance and business sector:**
  - synthesis report; slide deck, 2 fact sheets, 5 policy briefs; 2 workshops

# NRRO: STATUS OF NATURAL CAPITAL IN SA



- South Africa is one of the **most biodiverse countries worldwide**
- **Half of the 1021** ecosystems within South Africa are considered threatened
- **12% and 14%** of animal and plant species are threatened respectively
- This **biodiversity drives employment**
- **The destruction of the ecosystem services** which provide for South Africa **could result in economic failure**



# AIMS OF THIS PROJECT

- Further **understand nature-related risks** and opportunities in South Africa
  - Expert input: DFFE, NT, SARB, WWF, Conservation SA
- **Integrate data sets** to model NRROs and effects on socio-economic and financial risks
  - Resource modules data
  - IO data
  - Socio-economic data
- Aid **decision makers** with practical tools to implement biodiversity mainstreaming
  - Which sectors to support to integrate biodiversity
  - Policy dialogues



# KEY CONCEPTS EXPLAINED

## PHYSICAL RISKS

- Shocks to environment
  - Drought, flood, etc.



1. A FLOOD OCCURS



2. A FARMER'S CROPS ARE DESTROYED



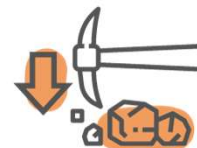
3. THEY CAN NO LONGER MAKE A LIVING

## TRANSITION RISKS

- Related to changes in consumer preferences/behavior regarding biodiversity



1. A POLICY IS ENACTED TO PROMOTE SOLAR ENERGY USE



2. DEMAND FOR COAL DECREASES



3. EMPLOYMENT IN THE MINING SECTOR DECREASES



# METHODS OVERVIEW

- Explore how **nature related risks** influence **economic activities** and the related **socioeconomic** impacts



Identify **sources** and **transmission channels** of **risks**

- From **physical or transition shocks** in economy

Determine resulting disruptions in firm **activity**

- Analysed at **sector level**

Determine resultant loss of **socio-economic** returns



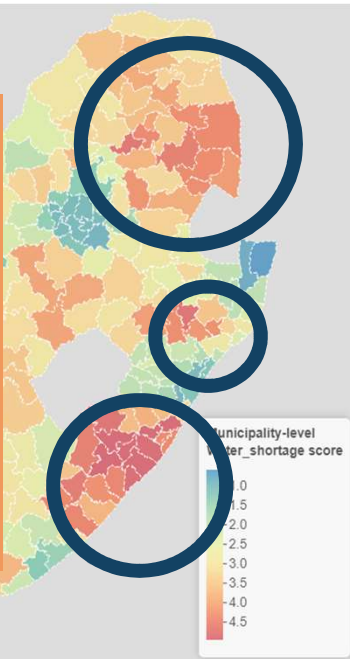
# SPATIALLY EXPLICIT ASSESSMENT: SURFACE WATER

**Spatially explicit analysis** determines how likely nature related risks are (**likelihood of shock**) and who (which sectors) would be affected (**exposure**) = vulnerability

Risk of water shortages

**Water sensitivity**

- 113 municipalities identified, occurring mostly in the Eastern Cape, Kwa-Zulu Natal, and Limpopo
- contribute 23-26% to all SEIs

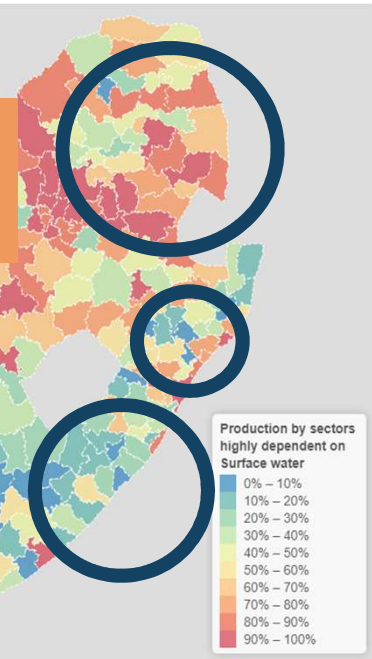


% of production dependent on surface water

**+ Water dependence** of production output of municipalities'

**= vulnerability to water shortages**

- Mpumalanga, Eastern Cape, Limpopo, and Free State most vulnerable



(Extract from WWF Water risk filter; 2012 study)

# DATA



**BIODIVERSITY AND ECONOMY**



Nature related shocks - physical and transition



**ACTIVITY**



**SOCIO-ECONOMY**

- ENCORE
- BGIS/SANBI
- Environ Satellite Accounts (EMRIO)
- WWF's Water Risk Filter

- Input/Output Linkages (EMRIO)
- Quantec Easydata Regional Data

- Annual Financial Statistics
- Socio-economic Satellite Accounts (EMRIO)
- SARB Financial Holdings





# ECONOMIC ACTIVITIES

## National scale:

- Valuation through GLORIA MRIO Table which shows economic activity of country or region.
  - Includes trading between sectors
- Identify indirectly exposed sectors with IO data
- Assess impact by evaluating inter-industry linkages – we shock the directly exposed sector and assess the impact on other sectors
- **Final demand** = Total amount of final consumption of households = how much households are spending on goods and services



- Intermediate Goods Exchanges
- Final Demand Components
- Value-Added Components



# RESULTS OVERVIEW

## PHYSICAL RISKS

- Direct Exposure and Indirect Exposure
- Case Study: **Pollination**
  - Direct
  - Indirect demand
  - Indirect supply
- **Spatial assessment:** Surface water

## TRANSITION RISKS

- Case study: **Coke oven production**
  - Direct
  - Indirect demand
  - Indirect supply
- **Spatial assessment: Mining and vegetation**

## PHYSICAL AND TRANSITION RISKS:

- The financial sector: an overview of Impacts on **Banking Sector**

# PHYSICAL RISK

## DIRECT EXPOSURE

Dependence of economic sectors on ecosystem services

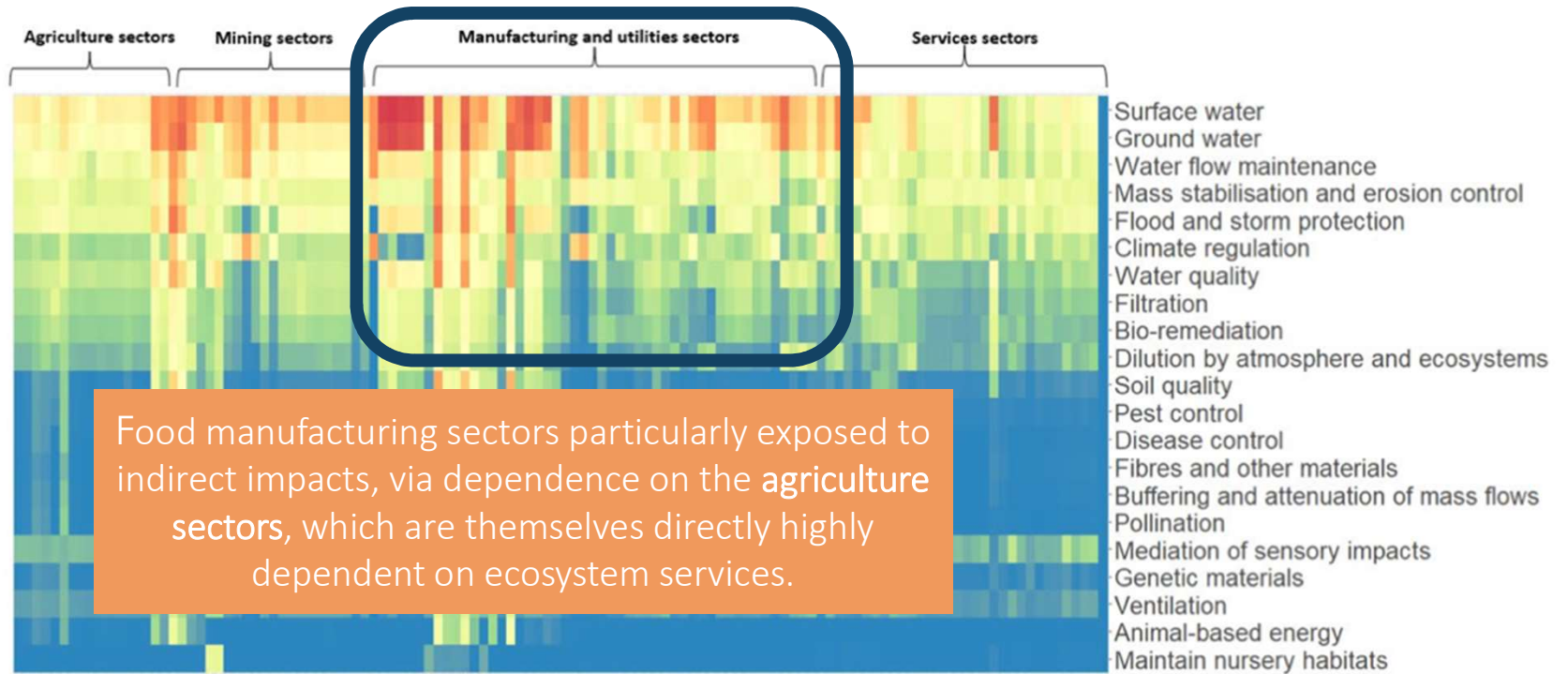




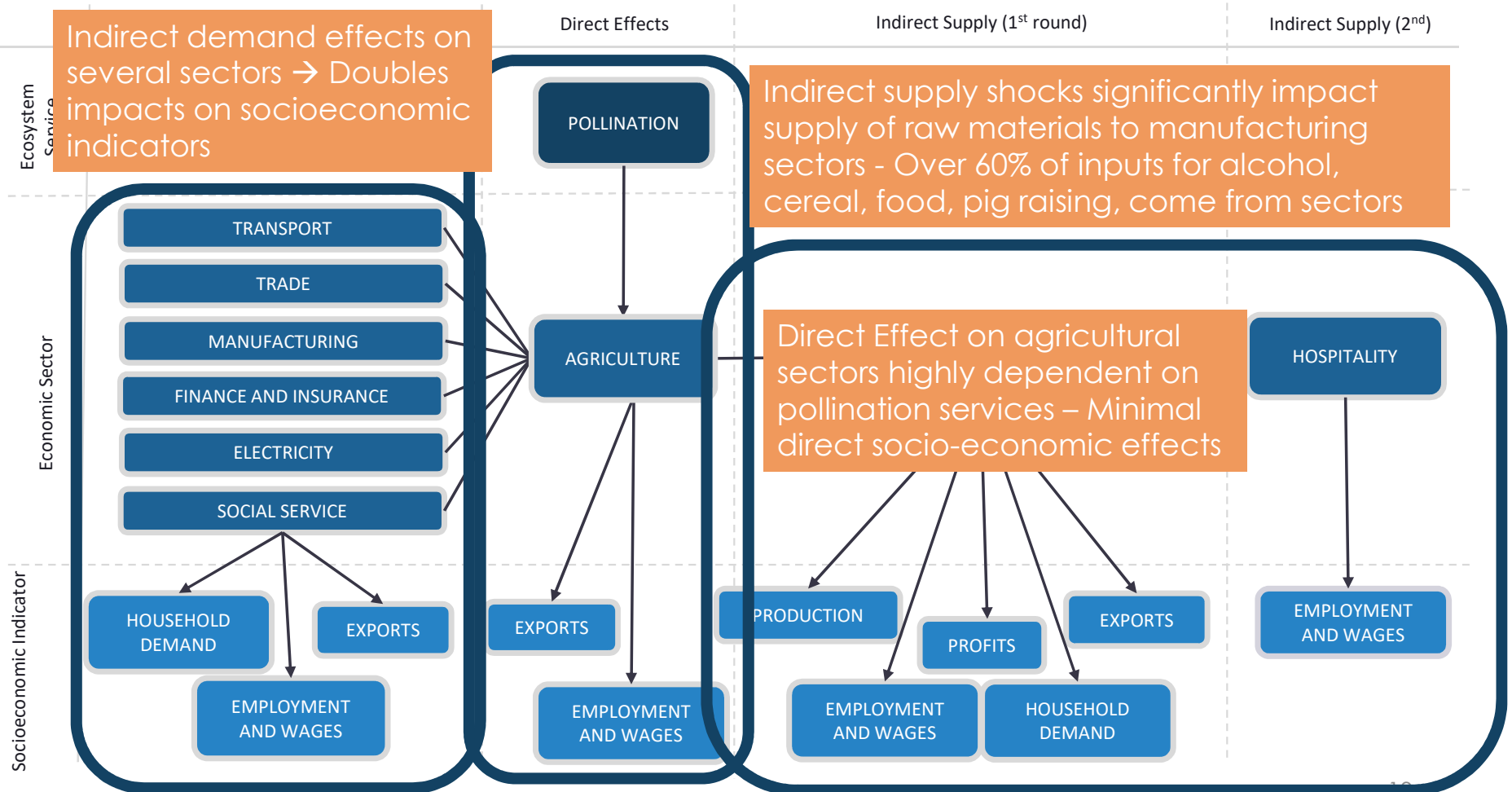
# PHYSICAL RISK

## INDIRECT EXPOSURE

Sectors interconnected through trade in goods and services → Indirect dependence of economic sectors on ecosystem services

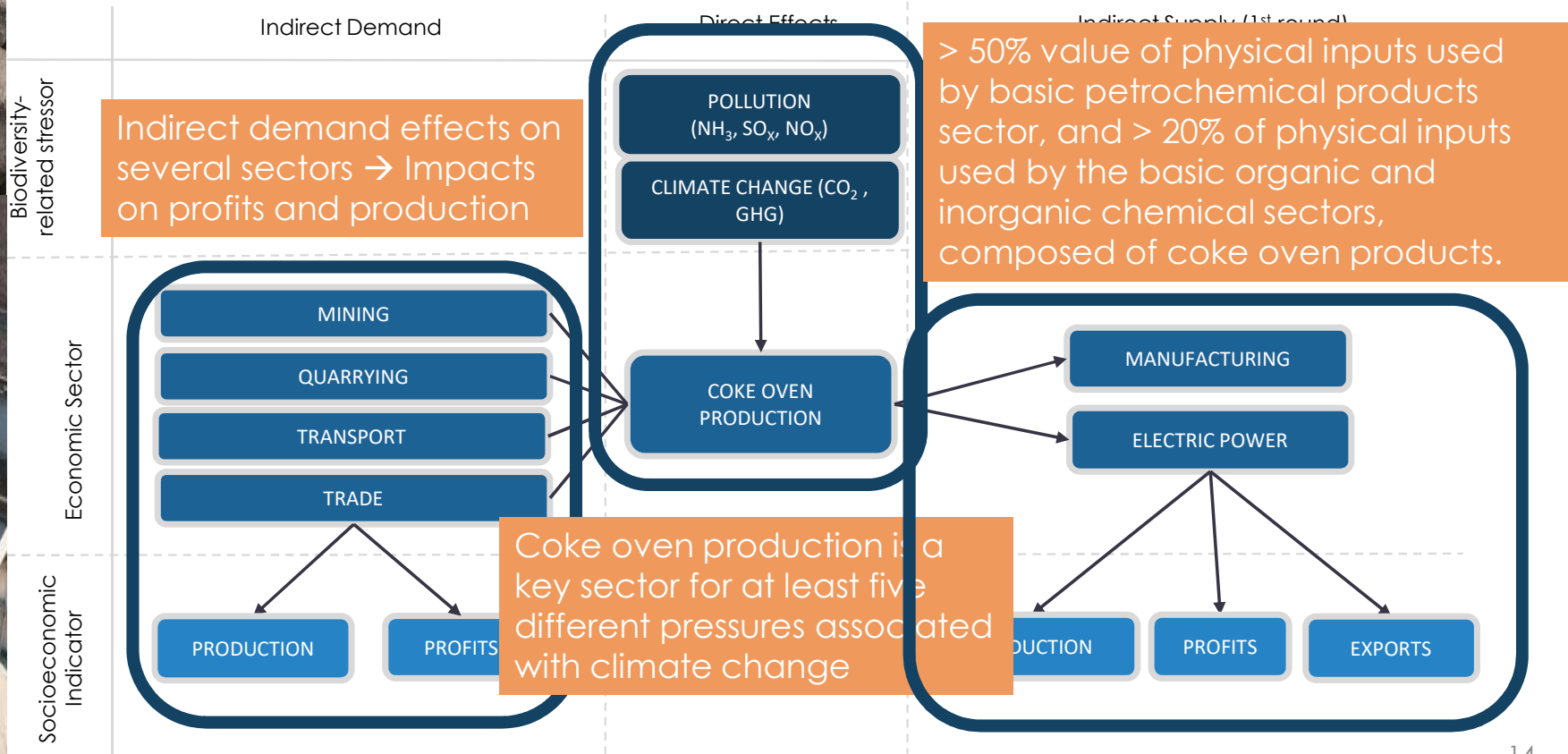


# CASE STUDY: POLLINATION



# TRANSITION RISK INDIRECT EXPOSURE

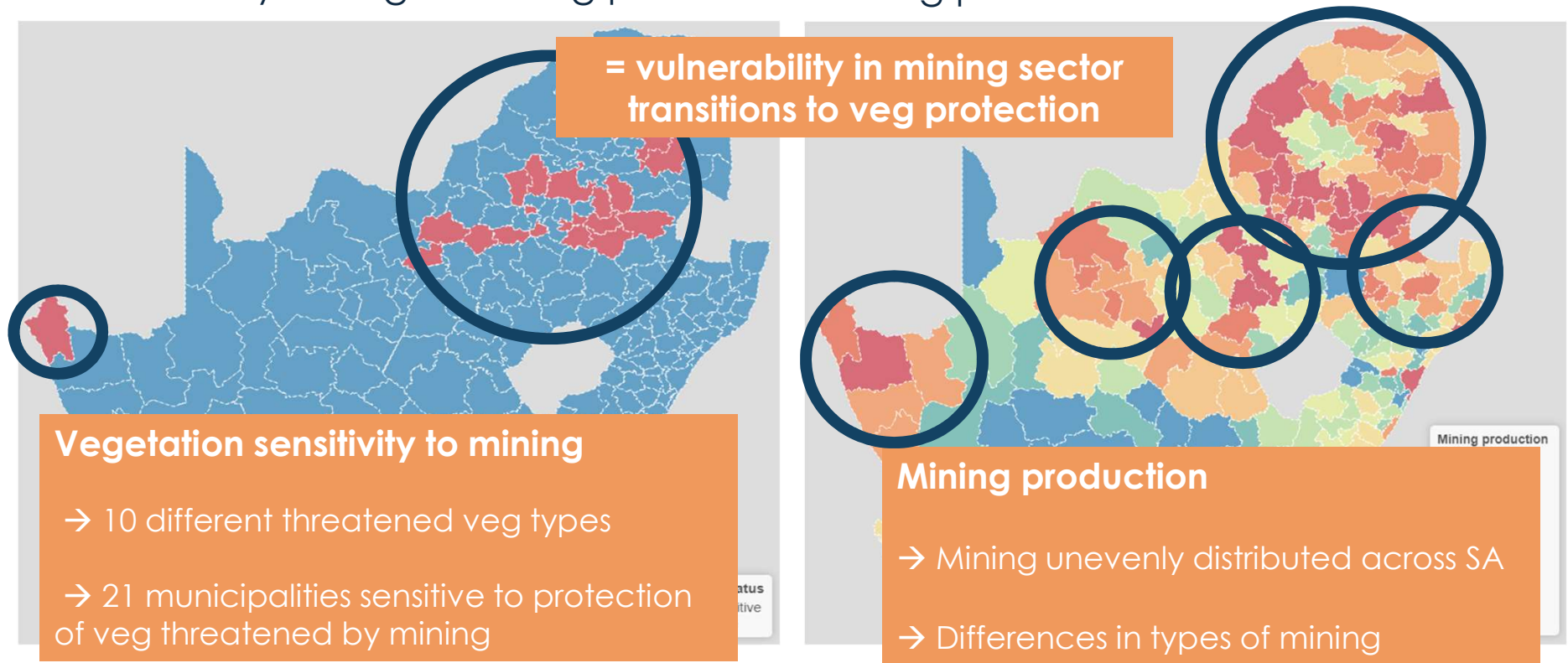
## CASE STUDY: COKE OVEN PRODUCTION





# SPATIALLY EXPLICIT ASSESSMENT: MINING AND THREATENED VEGETATION

Sensitivity of veg to mining pressure + Mining production value



# KEY FINDINGS

- **Significant portion of economy depends on ecosystem services**
  - > 30% of production depends on **water supply, quality, and flow regulation**, and **flood and storm protection**
  - 20-30% of economy depends on **climate regulation** and **erosion prevention**
- **The dependence on and risk to sectors varies**
  - **Mining and Manufacturing** heavily depend on **water (physical risk)** and **regulatory changes aimed at reducing environmental impact** pose significant challenges (**transition risk**).
- **The risk to socioeconomic indicators varies**
  - **Exports: Highly vulnerable to physical and transition shocks** which could severely affect South Africa's export capacity.
  - **Household Consumption:** Sectors supplying goods to households are **particularly at risk to physical and transition shocks**, leading to **price inflation for consumer goods**.
- The impact of physical and transition shocks on sectors **varies spatially**, with some areas facing more significant economic and social consequences.





# **POLICY RELEVANCE**

- **Financial Sector**
- **Development Finance Institutions**
- **Business Sector**
- **Agricultural Sector**
- **Water Sector**

**TO BE DISCUSSED IN  
BREAK-AWAY SESSIONS!**





# Thank you!

Martine Visser [Martine.Visser@uct.ac.za](mailto:Martine.Visser@uct.ac.za)

Jane Turpie [Jane@anchorenvironmental.co.za](mailto:Jane@anchorenvironmental.co.za)

Justine Neke [Jneke@indlelagrowth.co.za](mailto:Jneke@indlelagrowth.co.za)

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