

# Education, Research and Reality: How to proceed with water management in Yemen?

Richard Soppe

# About the Title

- Education:
  - What we think is important to know
- Research:
  - What we think we should know
- Reality
  - What we think we know

And are trying to change when the situation is not  
as we wish it to be

# Current reality

- What do we know about the current reality?
  - Water shortage
    - Where?
    - Why?
    - How much?

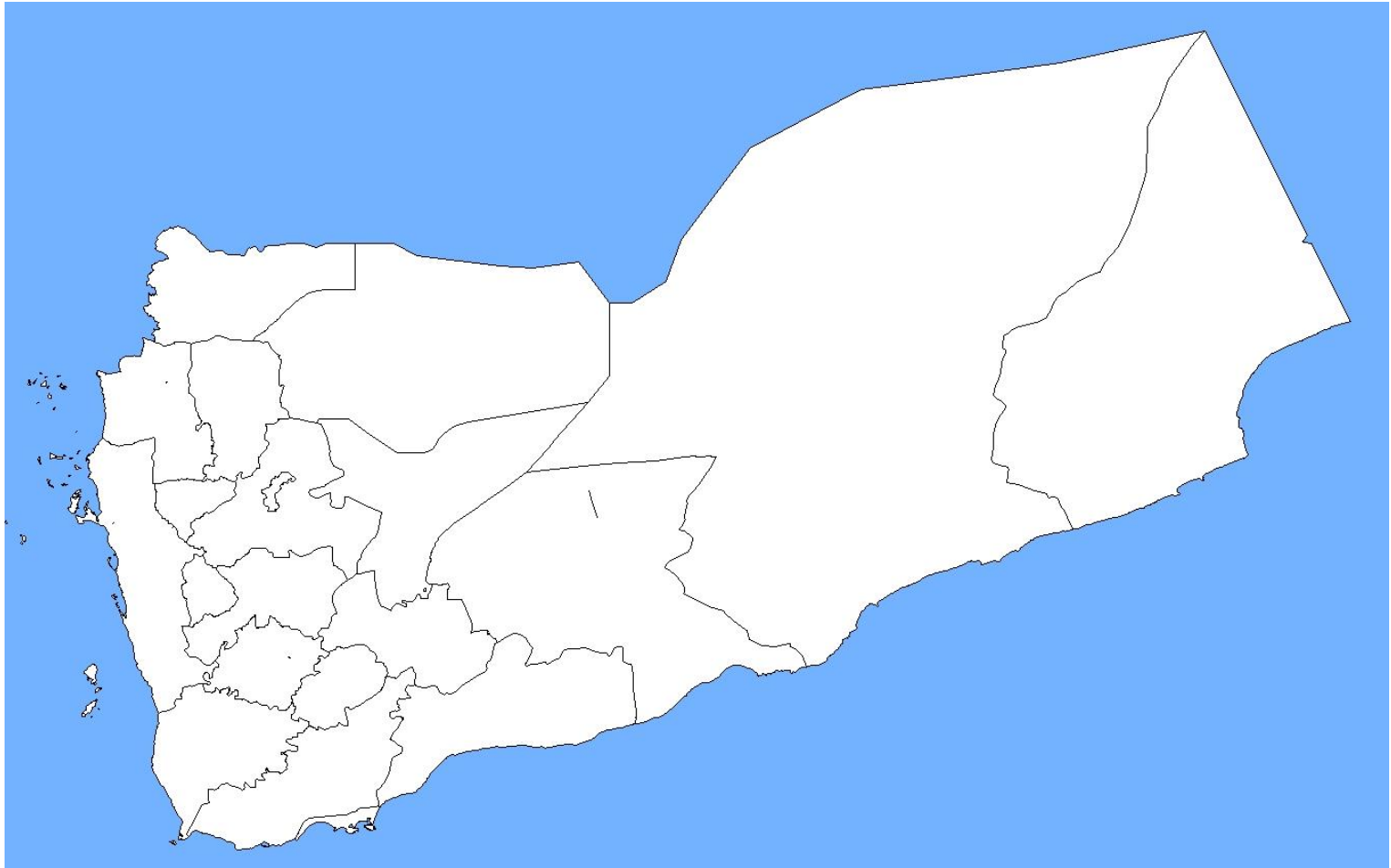
# Key figures

- 1.4 million ha agricultural cultivated area
  - 45% rainfall dependent (including terraces)
  - 35% groundwater irrigated
  - 20% spate irrigated
- 90% of groundwater extracted water used in agriculture
- Population 22 million
  - 5 million in Ibb/Taiz governorates
  - 3 million in Sana'a (city + surroundings)
  - 2.5 million in Hodeidah governorate
  - 1.5 million in Dhamar governorate

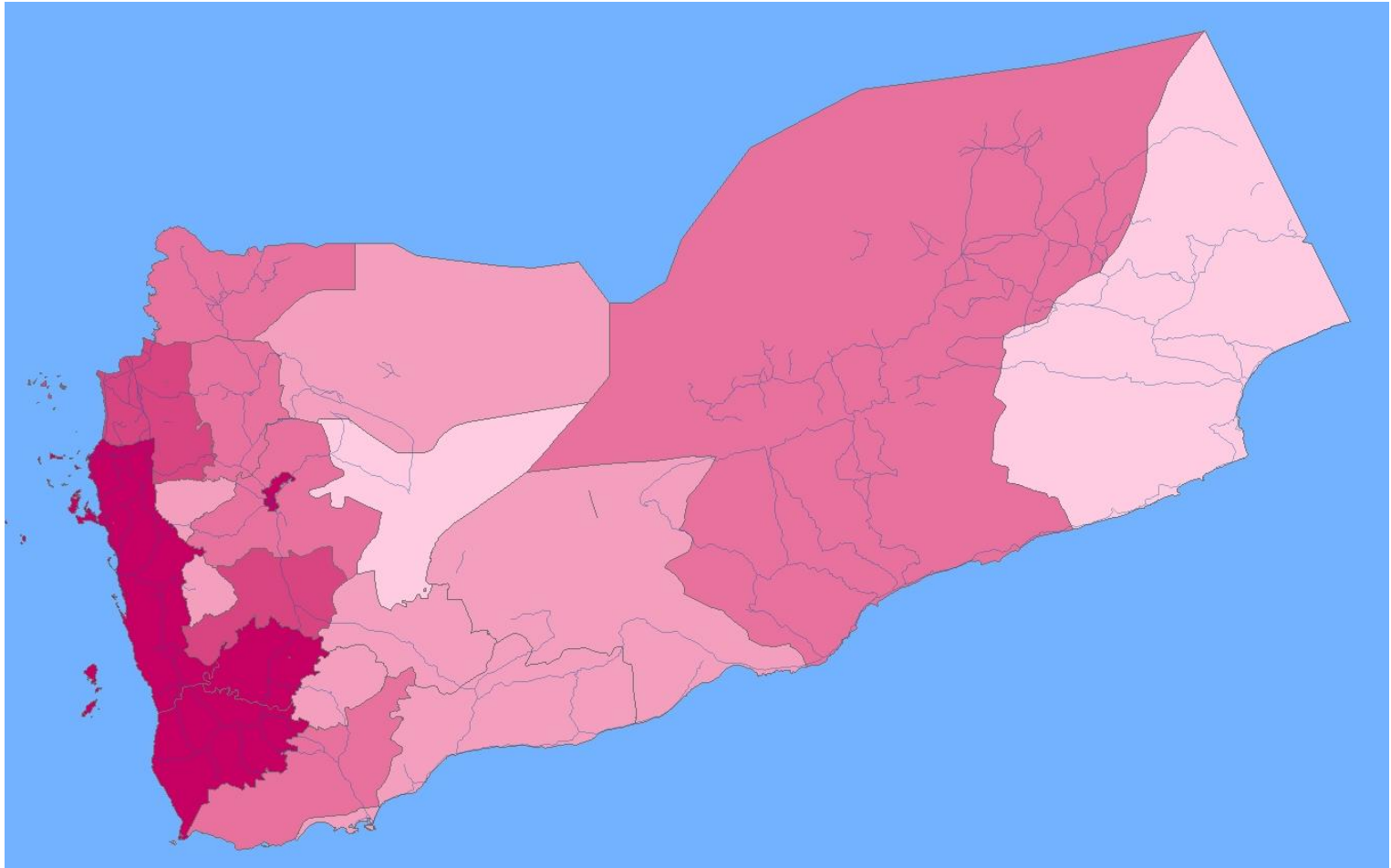
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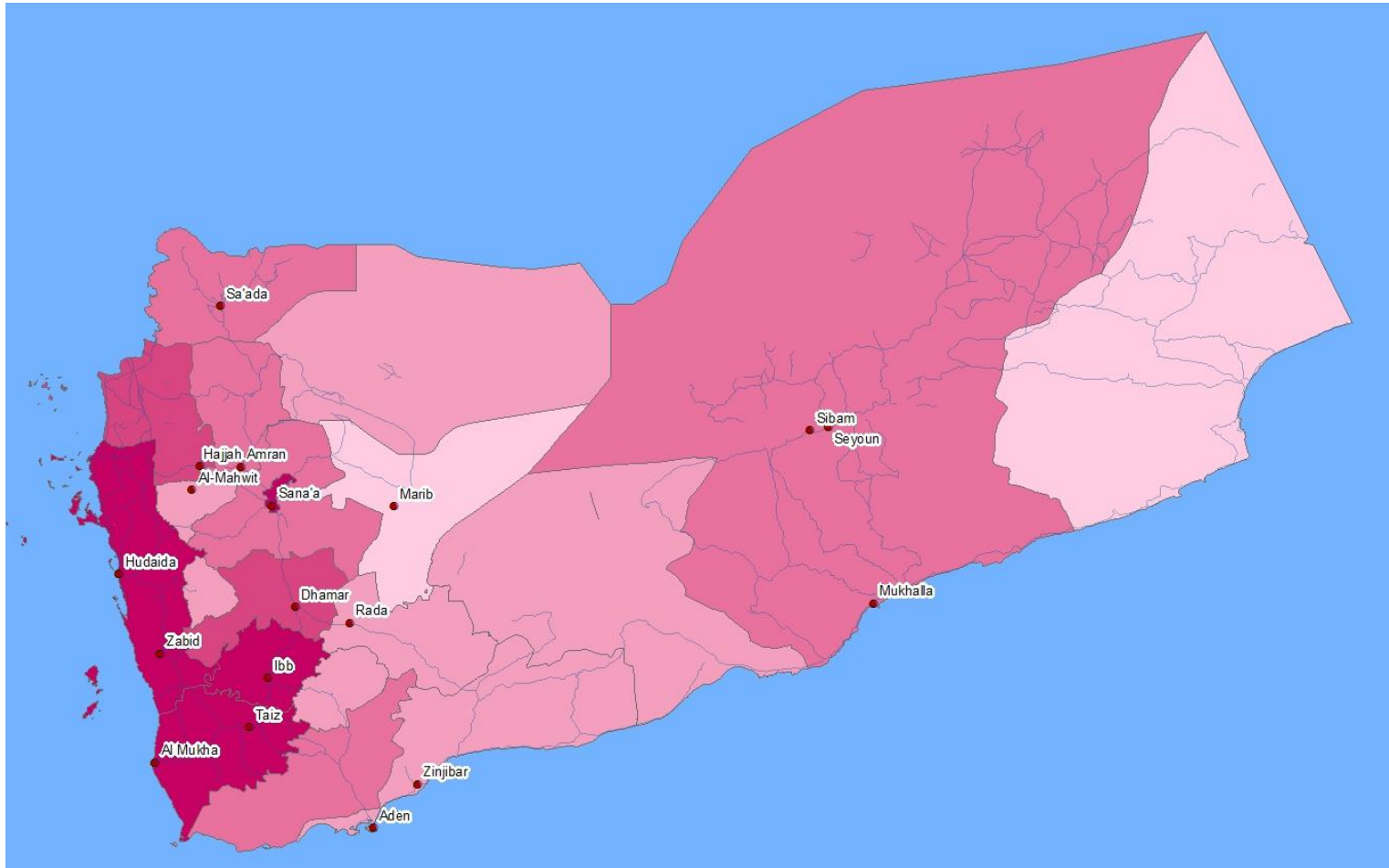
# Spatial data



# Population distribution

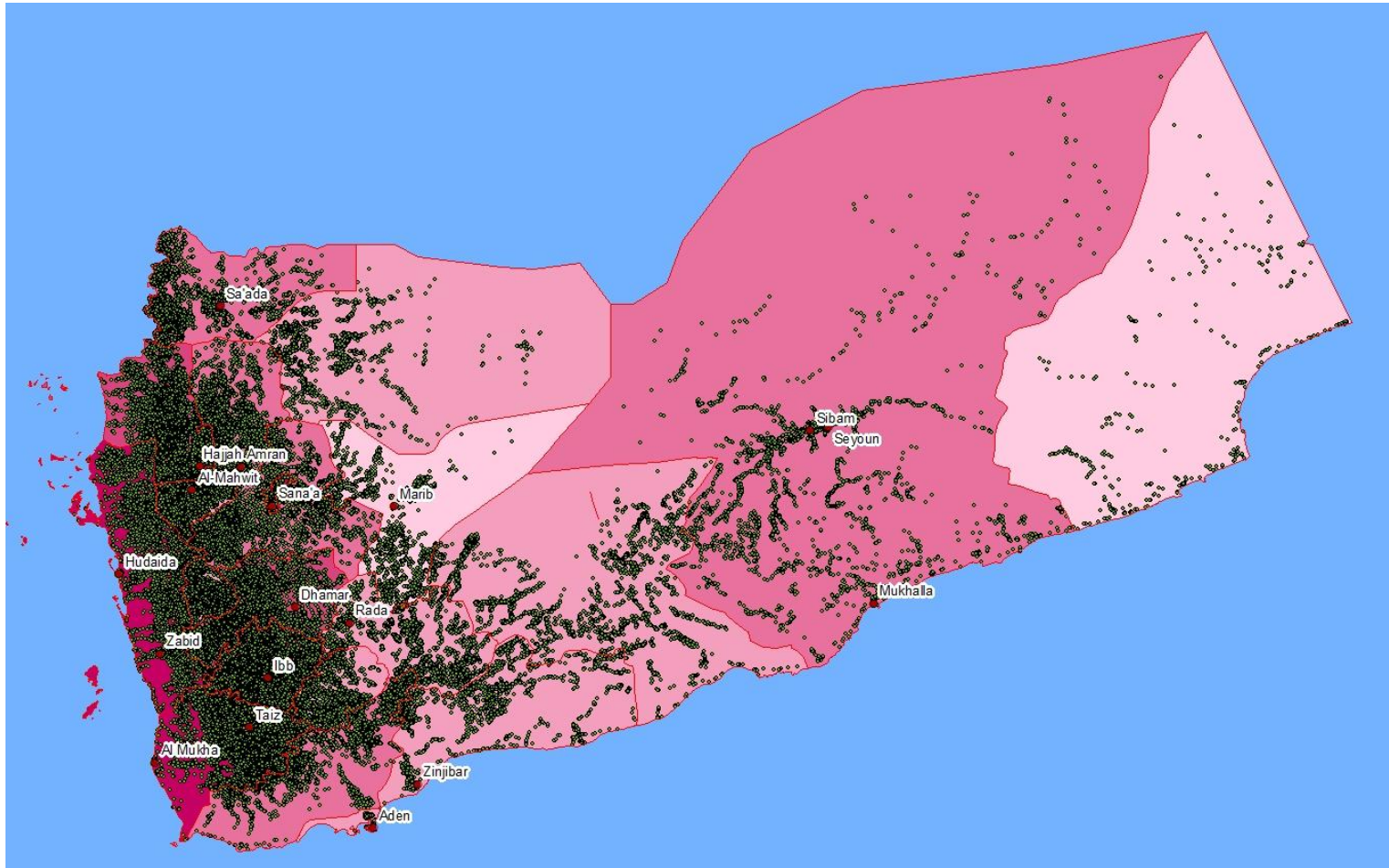


# Large cities

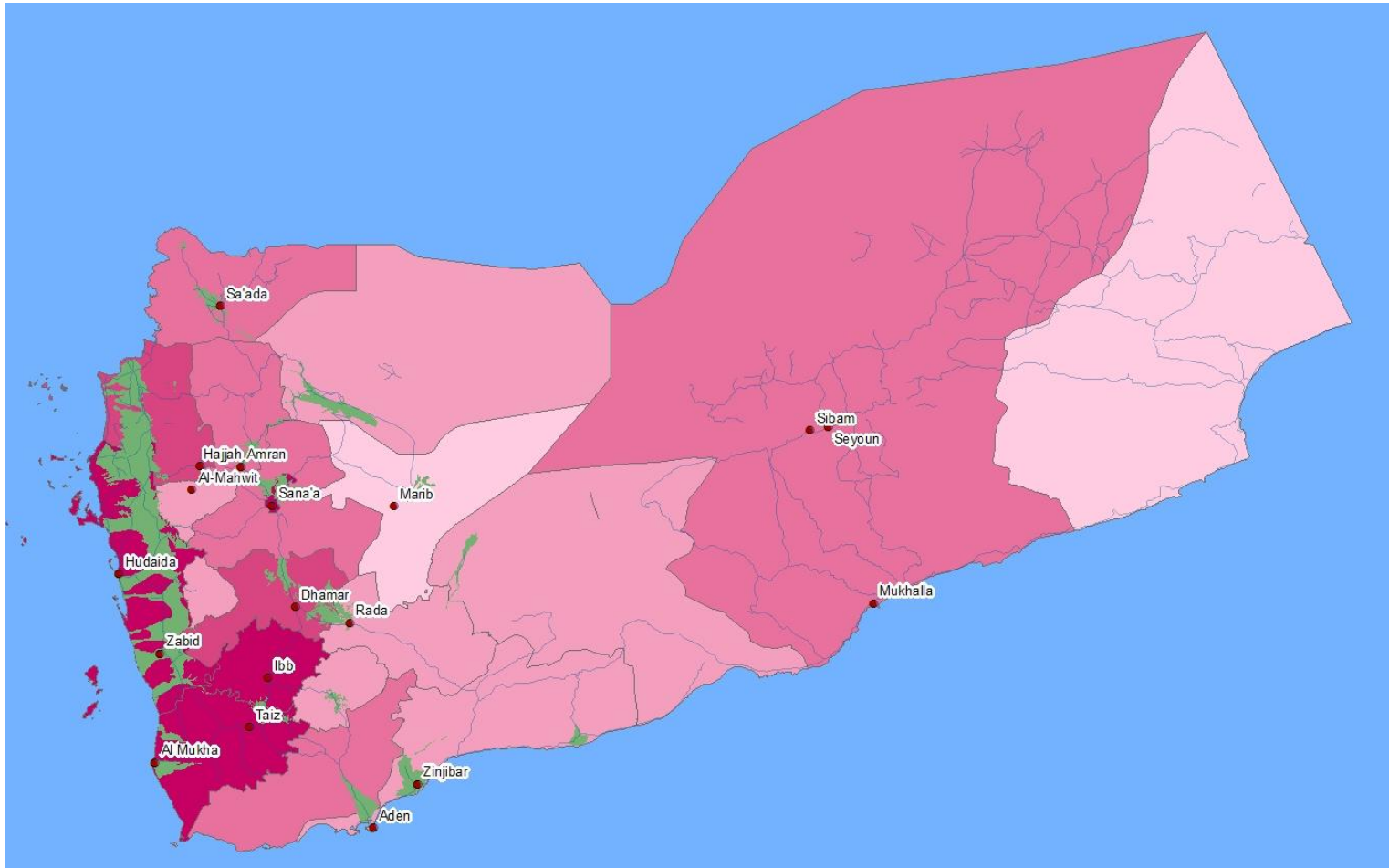




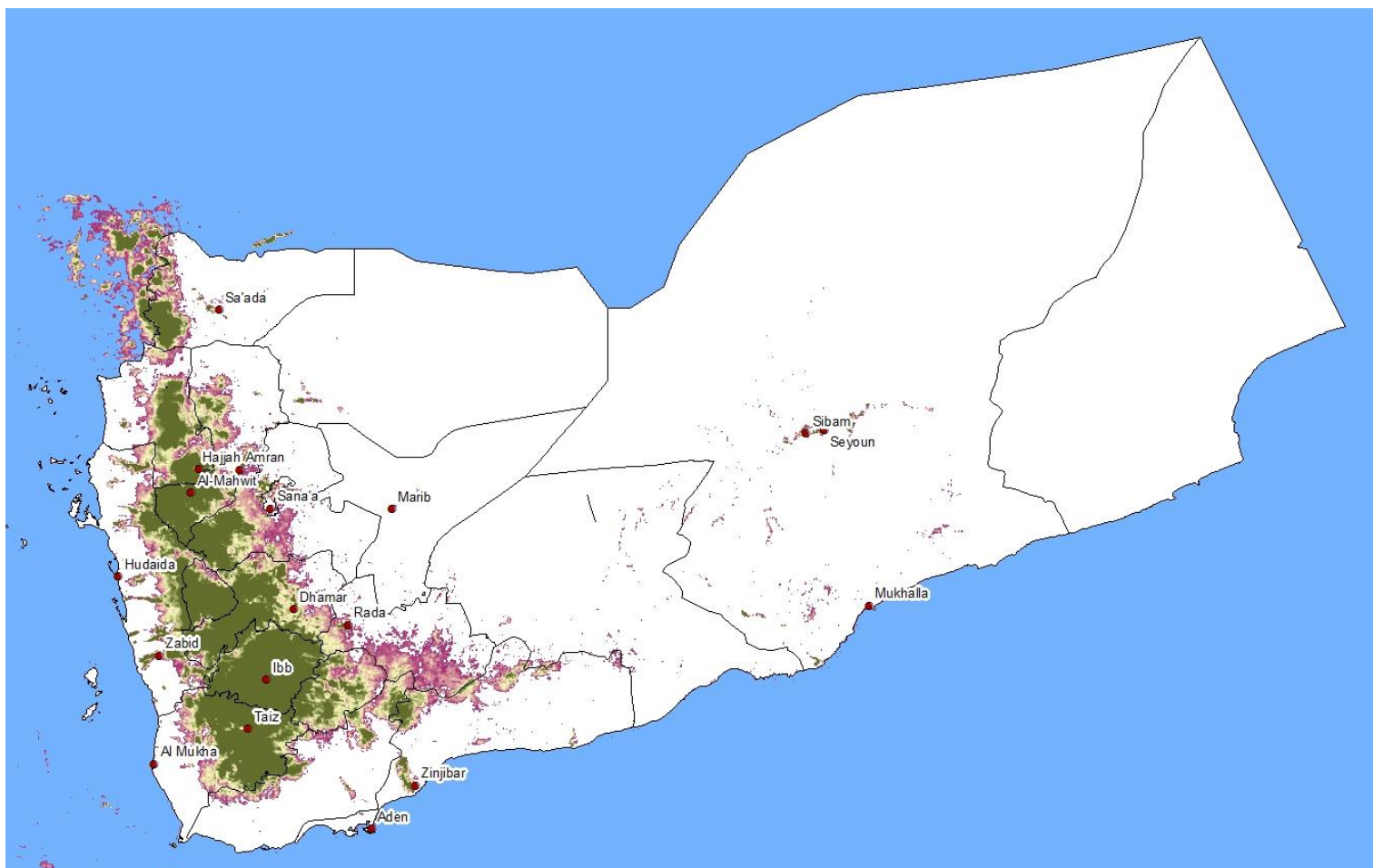
# Small settlements



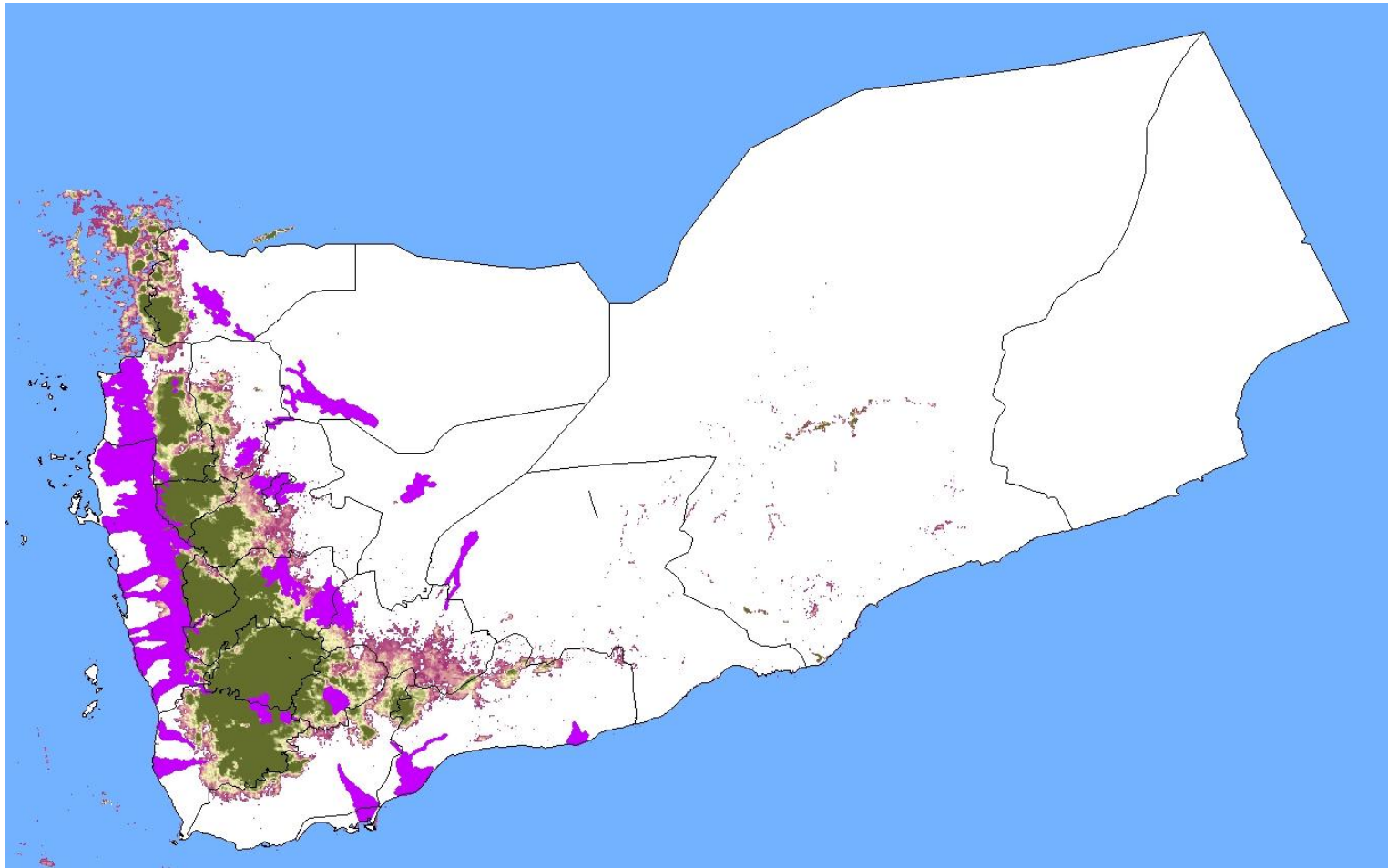
# Agricultural areas



# Green growth - 2006



# Natural and agricultural growth



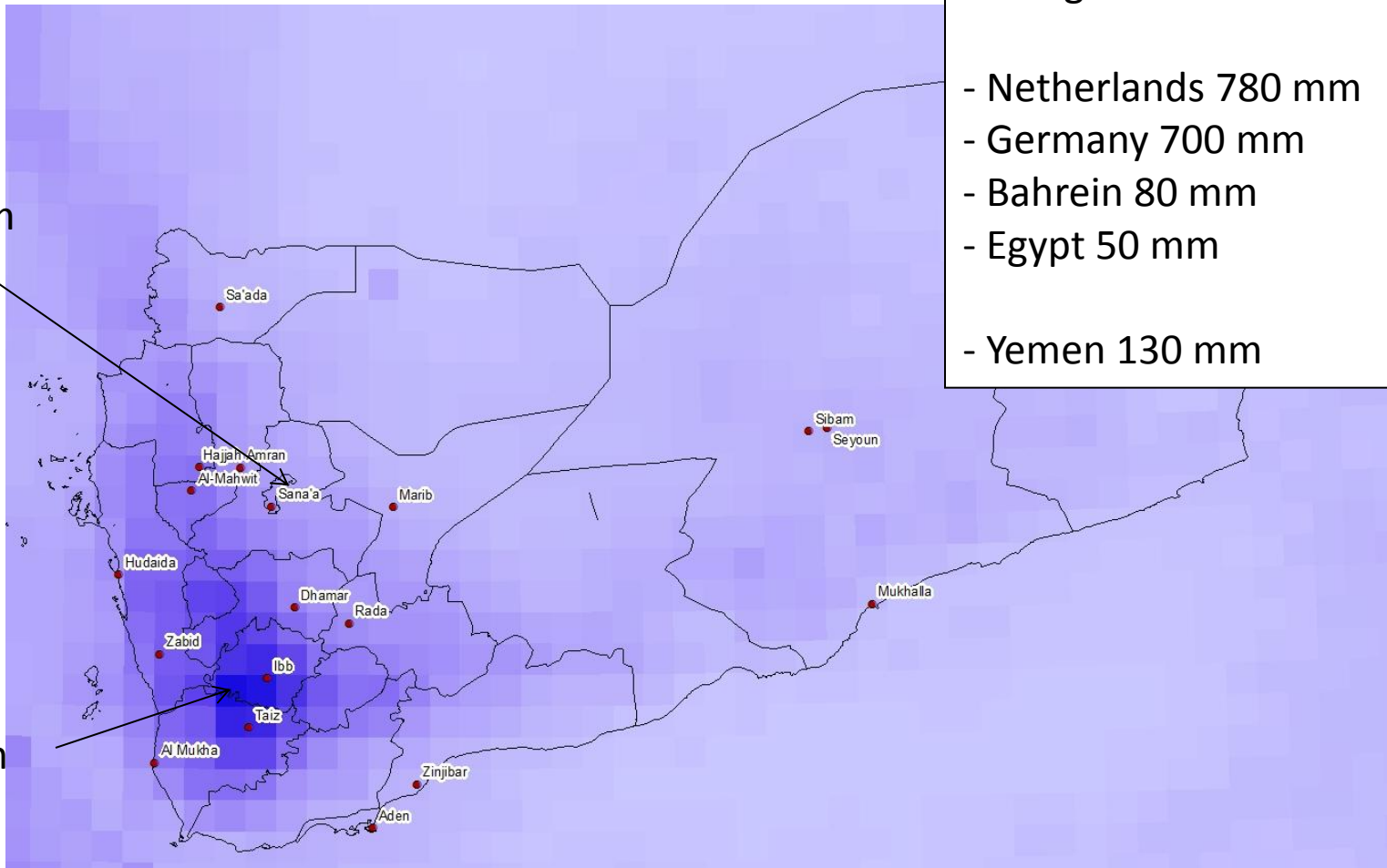
# Rainfall distribution

Average annual rainfall

- Netherlands 780 mm
- Germany 700 mm
- Bahrein 80 mm
- Egypt 50 mm
- Yemen 130 mm

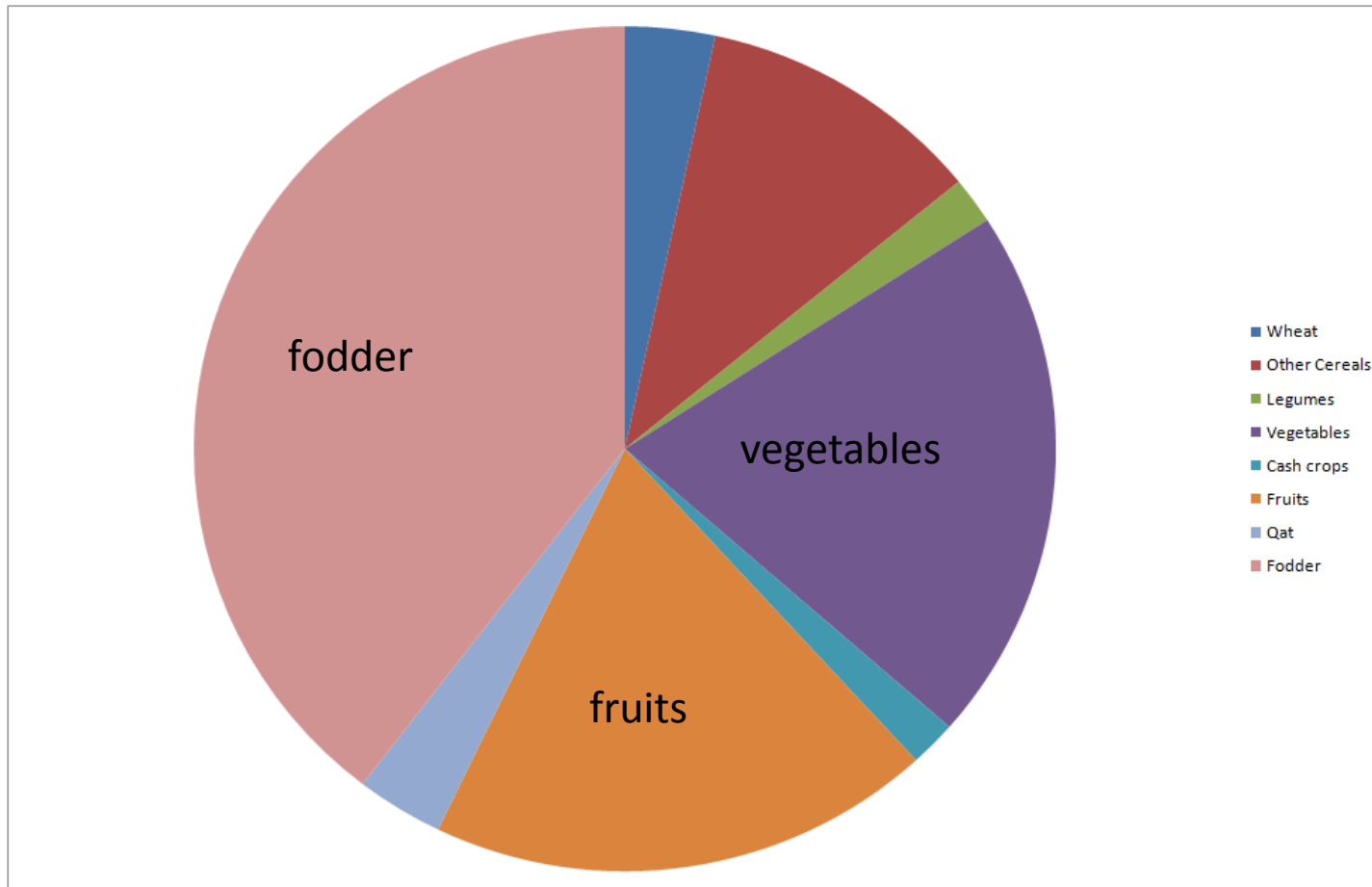
200 mm

1000 mm



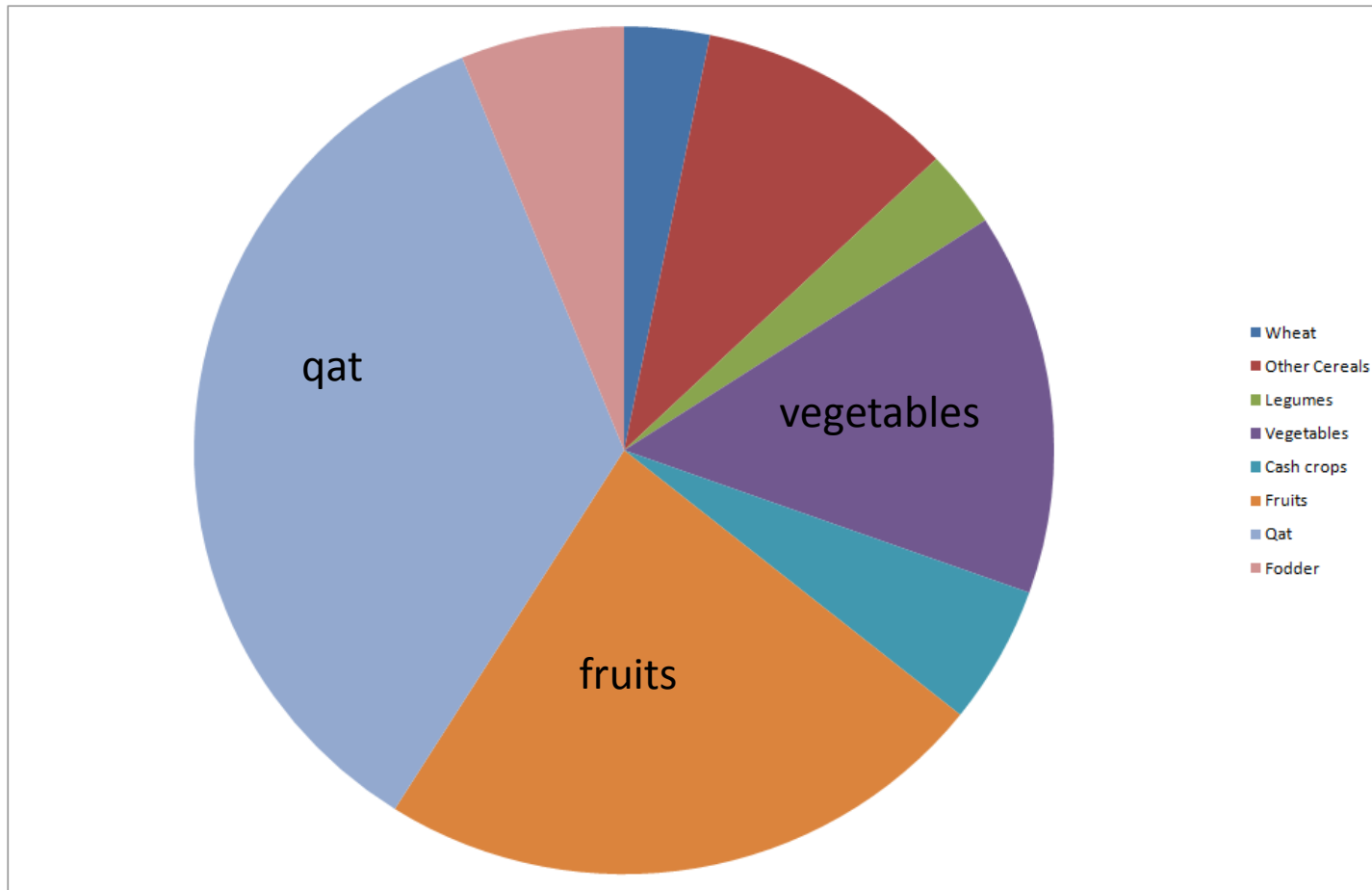
# Agricultural production

Production: 5 million ton



# Agricultural production

Production: 705 million YR



# Current reality

- What do we know about the current reality?
  - Water shortage
    - Where? → location and sectors
    - Why?
    - How much?

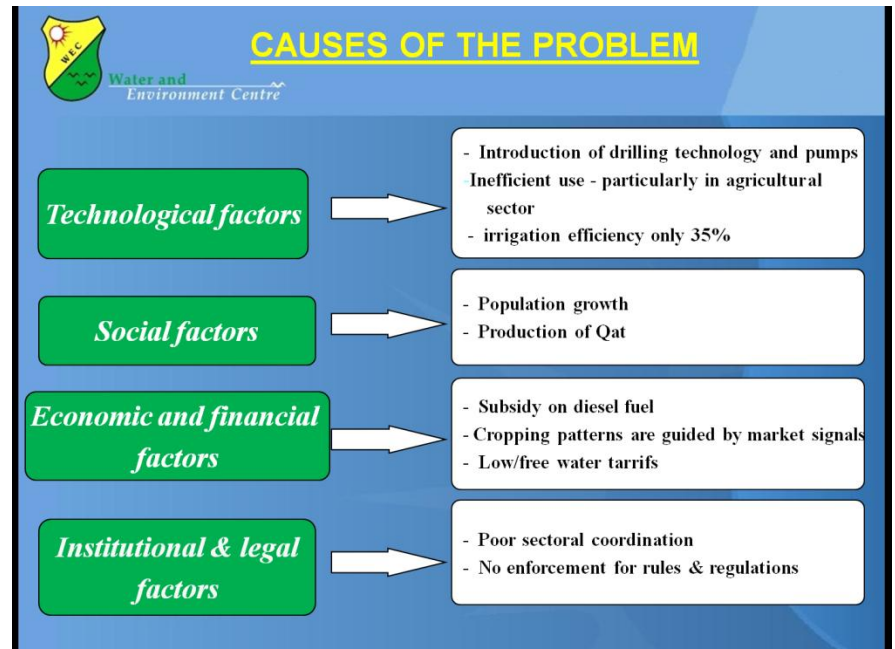


# Current reality

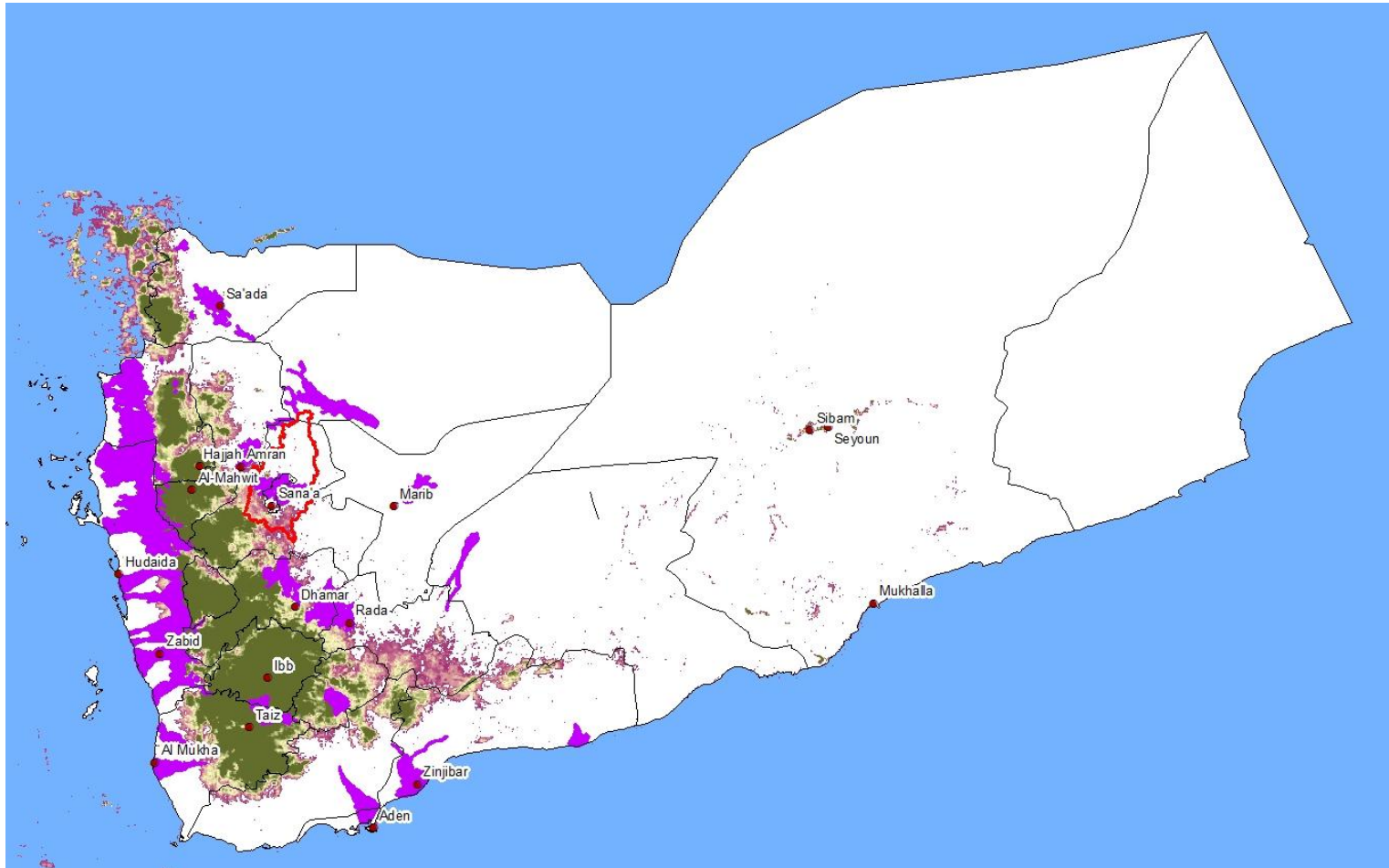
- What do we know about the current reality?
  - Water shortage
    - Where? → location and sectors
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# Type of issues

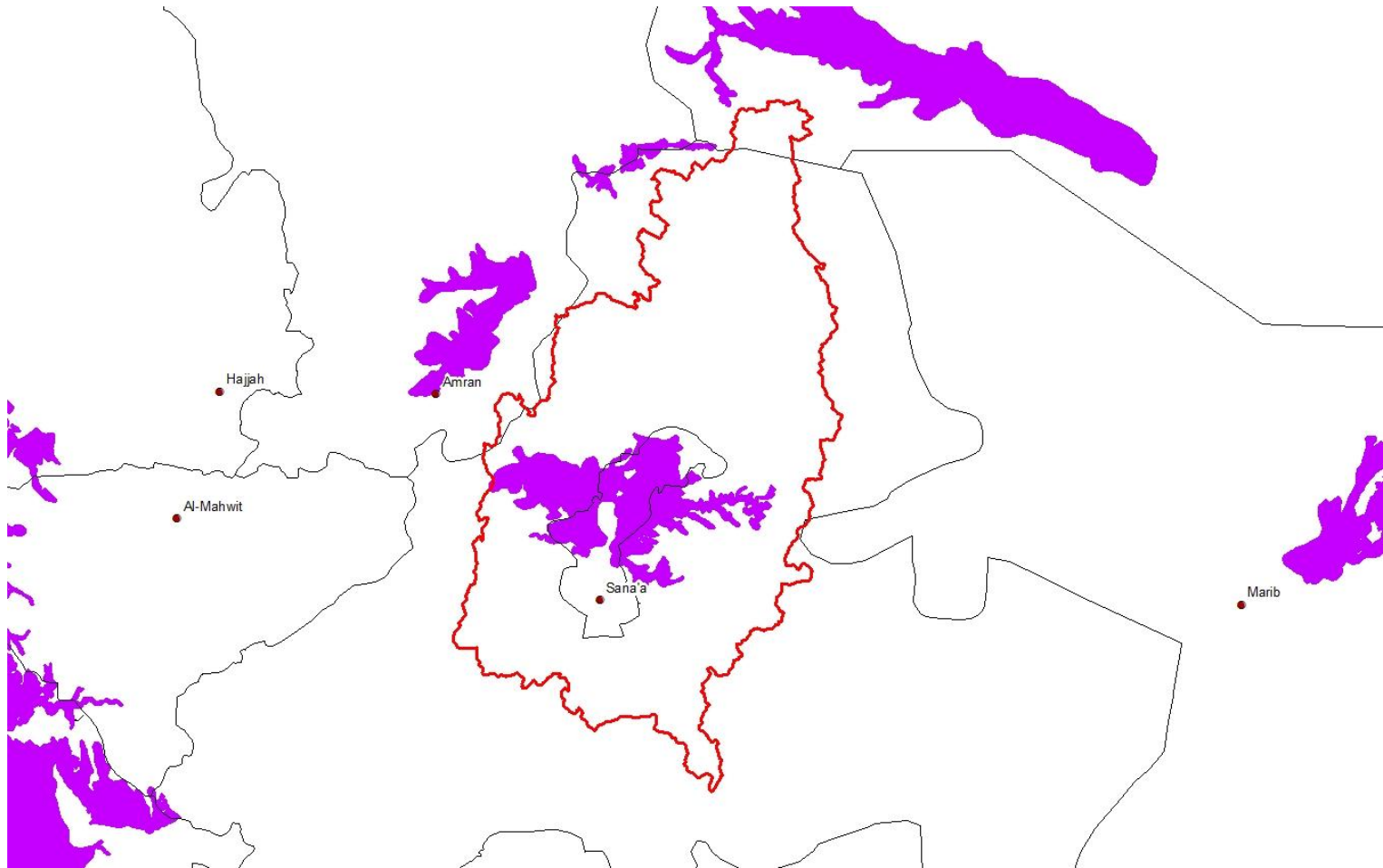
- Institutional
- Economical
- Technical
- Environmental
- Social



# Sana'a Basin



# Sana'a Basin



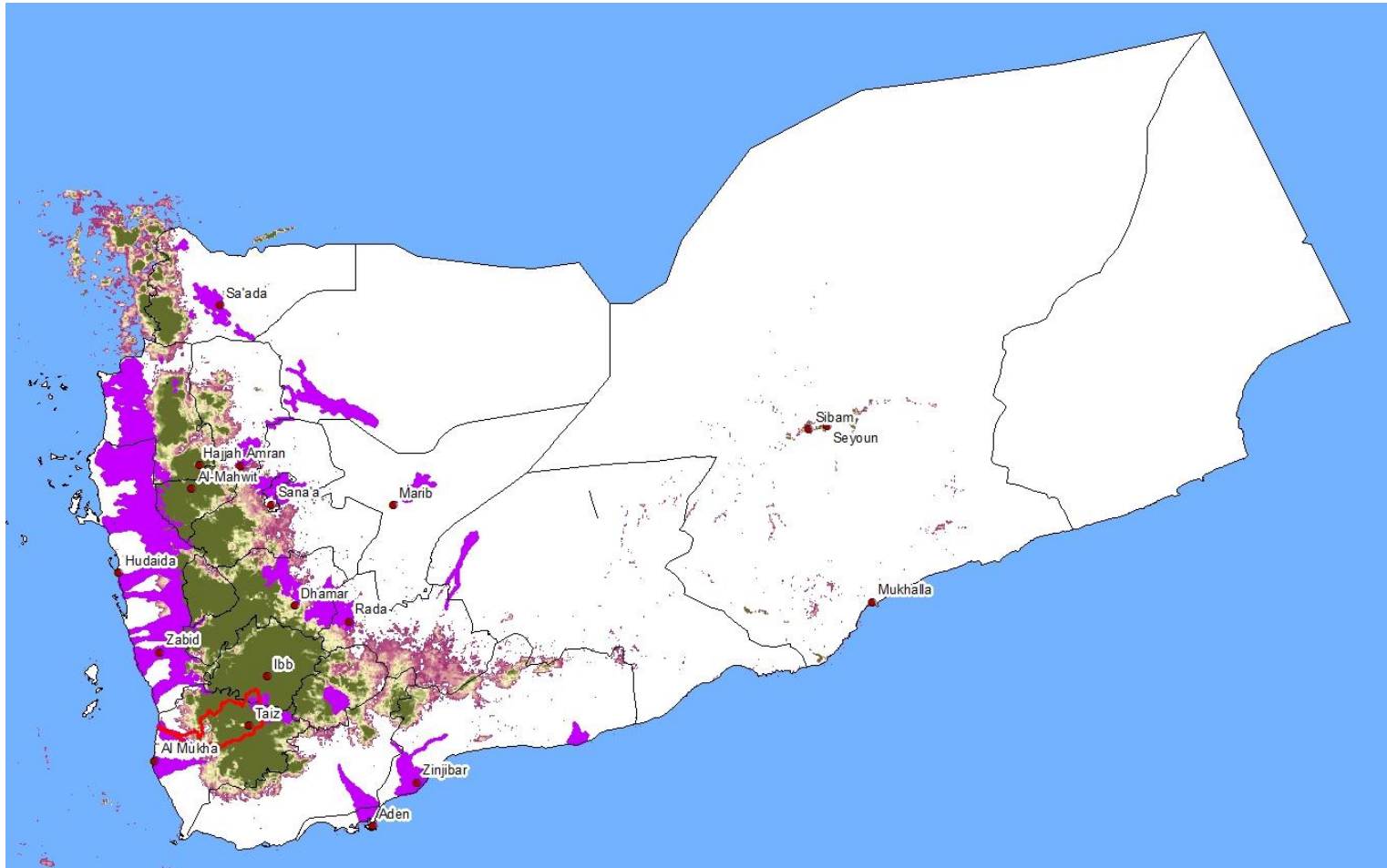
# Sana'a Basin

- Groundwater based basin
- Large population
- Large area of agriculture
  
- Very limited water supply
- Very high water demand

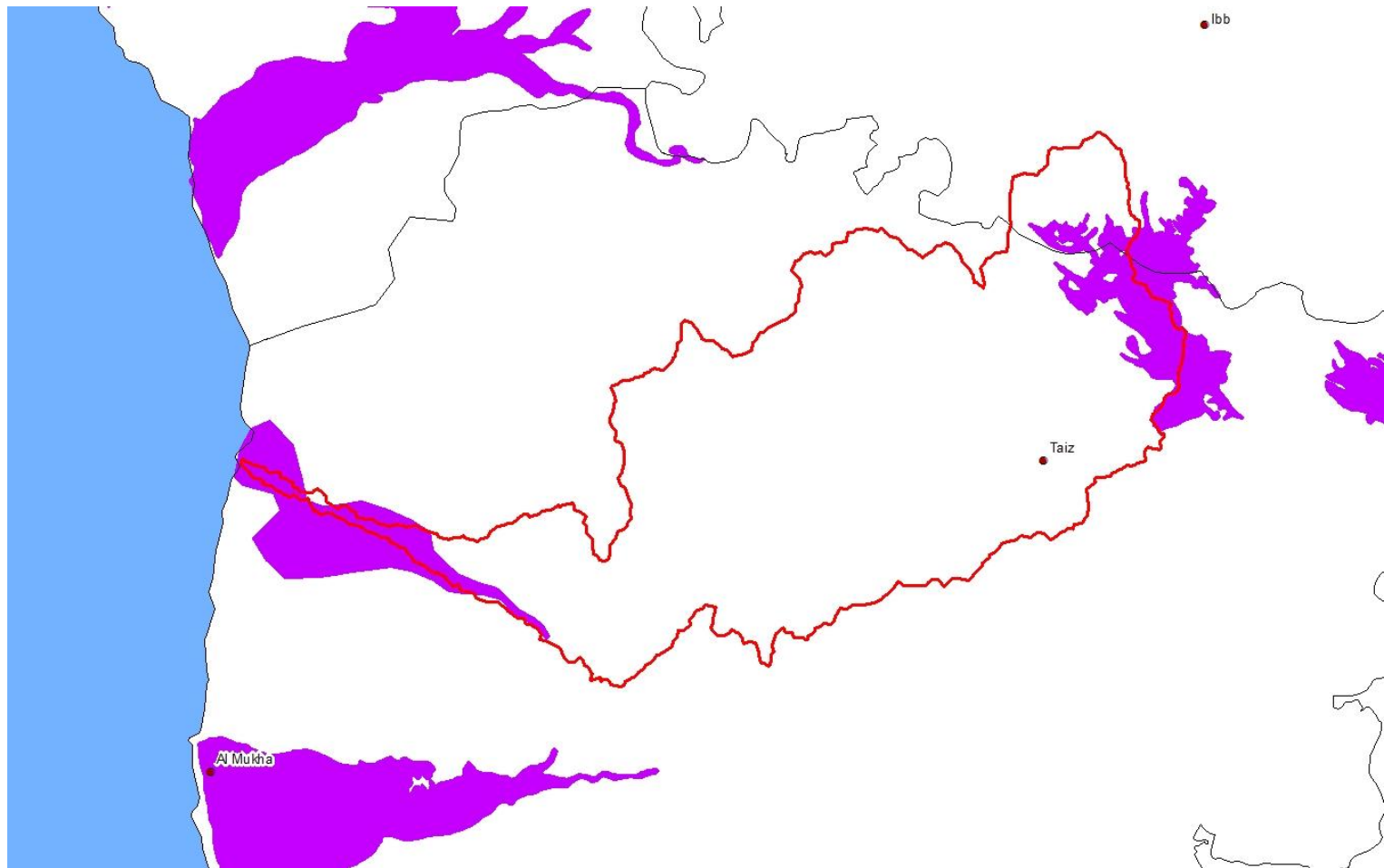
# Type of issues

- Institutional
  - SBWMP / NWRA
  - Drilling licensing
- Economical
  - Water supply fees
  - Markets for agricultural products/qat
- Technical
  - Several dams
  - Drinking water supply system
  - Water treatment system
- Environmental
  - Groundwater pollution issues
- Social
  - Health problems with drinking water
  - High population demand for household water
  - High demand for qat

# Taiz



# Taiz – Wadi Rasyan





# Types of issues

## – Institutional

- Urban water supply management (VITENS project ended)

## – Economical

- Water tariffs not reflecting water supply cost

## – Technical

- Activities for large part in the upper catchment
- Falling groundwater levels

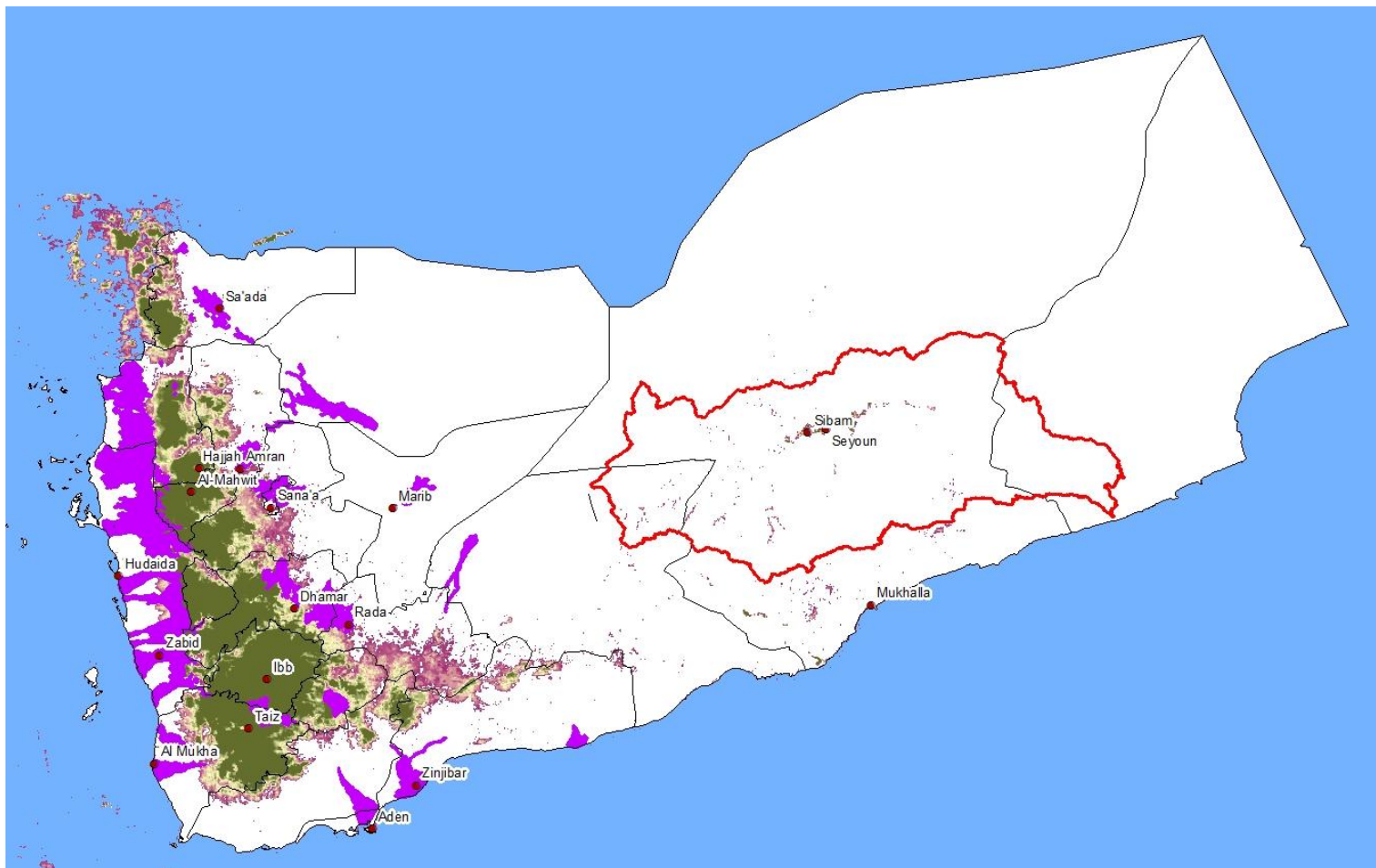
## – Environmental

- Drinking water quality issues
- Urban and industrial pollution of groundwater

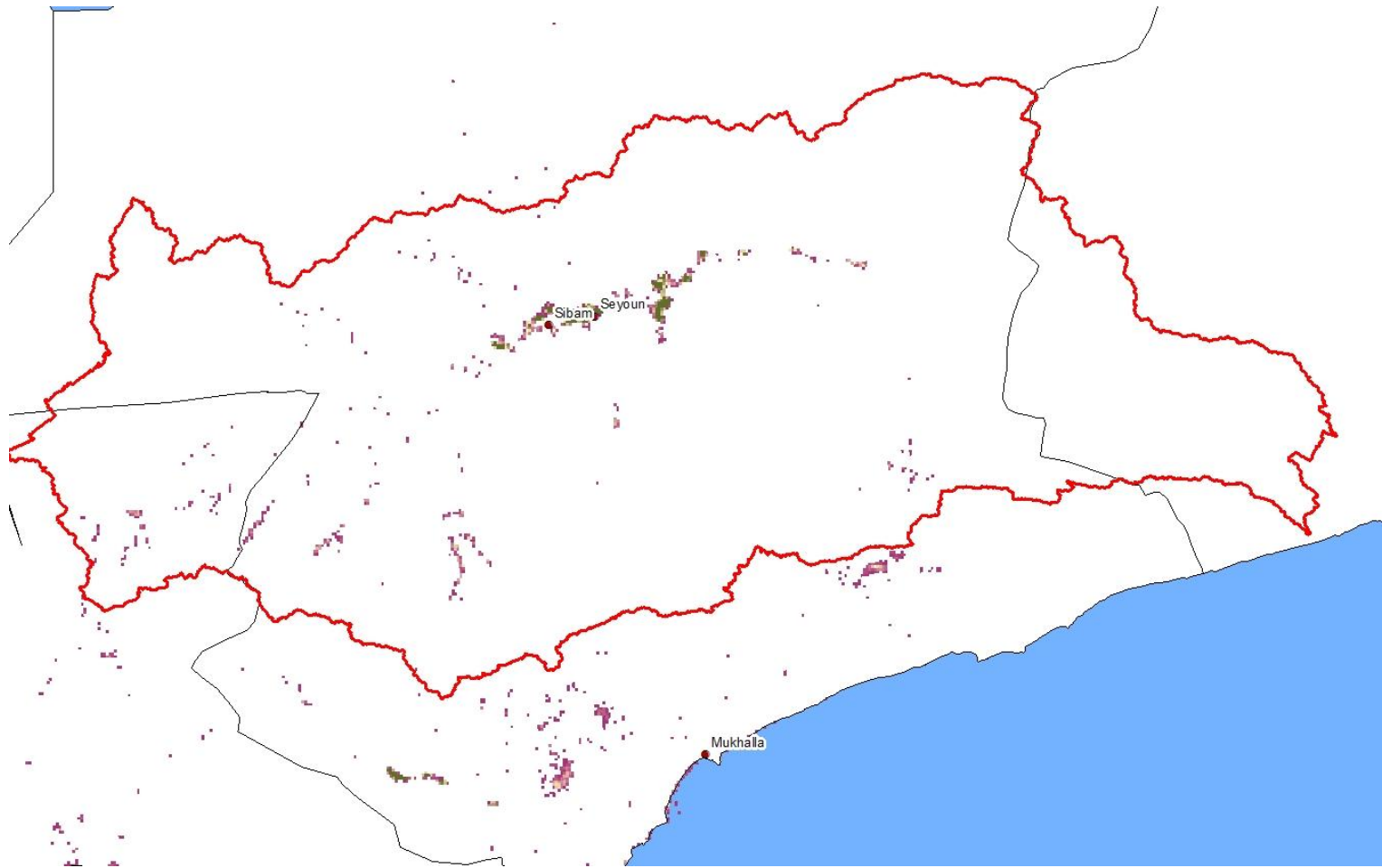
## – Social

- High population growth

# Hadramout



# Hadramout



# Types of issues

- Institutional
  - Strong local involvement
- Economical
  - Oil drilling industry
- Technical
  - Large surface water catchment
  - Floods
  - Groundwater overdraft
- Environmental
  - Oil drilling influence on groundwater resources (quality and quantity)
  - Oases of natural springs
- Social
  - Relatively low population pressure

# Managing water in Yemen?

- How do we proceed in Yemen?
  - National government decides where to provide assets
    - What has the largest real impact on solving the location specific water problems?
    - How to be as efficient as possible with the available assets?
  - Local government offices responsible for implementation (or overseeing implementation) of actions
    - Location specific
  - Local and private initiatives

# Role of WEC: Education

- More well-trained people in national offices
- More well-trained people in local offices
- More well-trained people in private sector
- More well-trained people in Universities

# Managing water in Yemen?

- “Bring science into politics, and let politics indicate the need for science”

(Dr. Hammou Lamraani – opening session)

# Need for research

## – Policy supporting

- What actions do we have available that have the largest impact (against the lowest cost)
  - Impact, impact, impact

## – Basic

- Collecting and combining high quality detailed data across issues – e.g. combine hydrological data with legal data

## – Action based

- Apply methods and measure the impact, evaluate implementations (scientifically sound)



# Need for research

- Policy supporting

**WHAT CAN WE DO WHERE?**  
• What actions do we have available that have the largest impact (against the lowest cost)

- Impact, impact, impact

- Basic

**WHAT IS THE SITUATION WE ARE IN?**  
• Collecting and combining high quality detailed data across issues – combine hydrological data with legal data

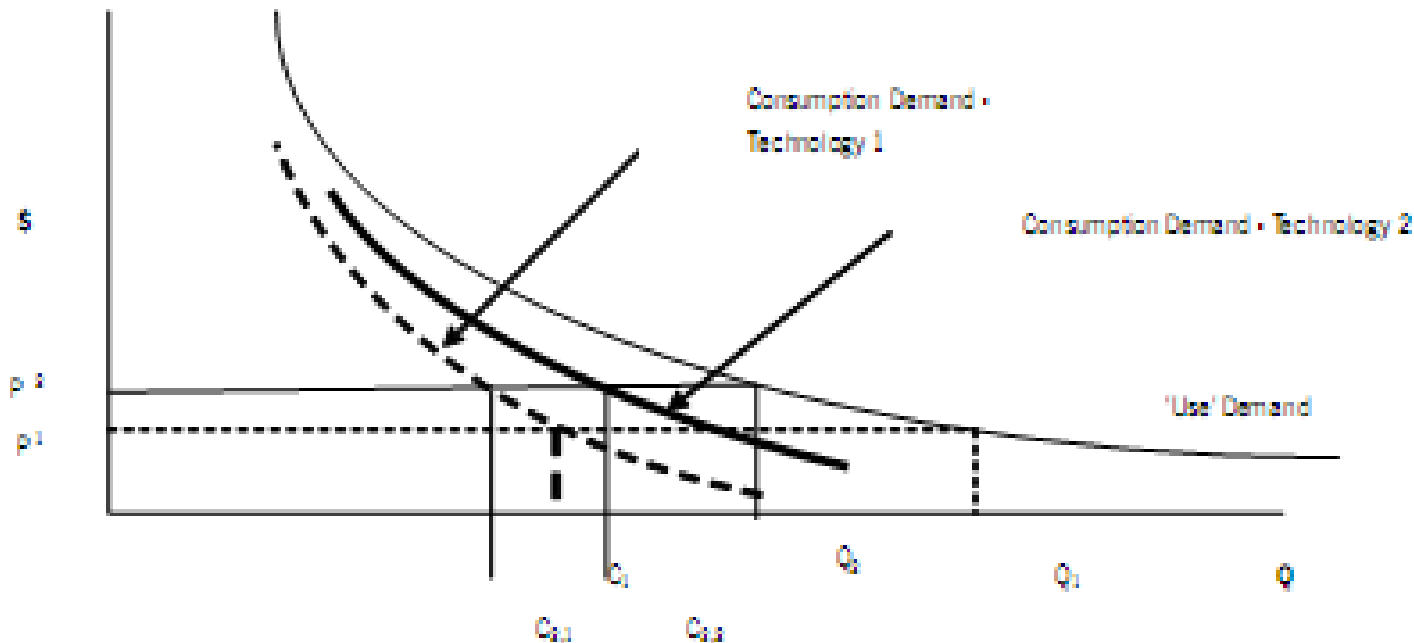
- Action based

**WHAT IMPACT WHEN WE IMPLEMENT?**  
• Apply methods and measure the impact

# Managing water in Yemen?

- Example of action evaluation

Figure 2.1 Modern technologies may induce an increase in water consumed



Source: Hellegers and Perry (2004).

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**WHAT IMPACT WHEN WE IMPLEMENT?**  
Apply methods and measure the impact

Thank you