



# Water Management Issues and Government Responses

Understanding how government in The Republic of Cyprus is responding to the issues of water scarcity and quality

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# Background

The management of water resources

# Previous research - water management

## Infrastructure and treatment

- Literature regarding the management of water resources has focused on two key themes:

### 1. Infrastructure and treatment responses

#### *Infrastructure*

- Supply-side and urban system development
- The role of infrastructure in terms of water stress mitigation
- Supply infrastructure development and progress in the developing world

# Previous research - water management

## Infrastructure and treatment

### ***Pollution and treatment***

- Understanding socio-economic parameters
- Public health requirements
- Wider influences on resource management
- The development and improvement of treatment processes to ensure a water supply that is of sufficient **quality** and **quantity**

# Previous research - water management

## Supply and demand

### 2. Supply and demand management concepts

#### *Supply-side management*

- 'Hard' engineering and anthropocentric
- Primary aim is to expand the water supply system
- Focuses on centralised technology and hierarchal management

#### ADVANTAGES

- Social development
- Economic development
- Human health
- Agricultural expansion

#### DISADVANTAGES

- Sustainability issues
- High financial costs
- Ecosystem degradation
- Encourages exploitation

# Previous research - water management

## Supply and demand

### *Demand-side management*

- The failures of traditional supply management responses, as well as changes in social values, political conditions, and economic systems, have forced governing agents to consider an alternative paradigm of water development
- Concept evolved to provide a 'soft' approach which advocates decentralised technology and participatory concepts

#### ADVANTAGES

- Challenges exploitation
- Ecosystem conservation
- Encourages behaviour change
- Integrative and holistic
- Socio-economic benefits

#### DISADVANTAGES

- Existing infrastructure needed
- Difficult to change behaviour
- Negative feedback mechanism may reinforce exploitation

# Previous Research - water scarcity & quality

## Availability and quality

- The wider literature has focused on two key themes with regard to the effects of water scarcity and quality:

### 1. Water Availability

- Climate change and precipitation variability
- Changes in surface and groundwater systems
- Potential impacts on agricultural systems
- Socio-economic impacts
- Behaviour-attitude dimensions

# Previous Research - water scarcity & quality

## Availability and quality

### 2. Water Quality

- Concept of quality-scarcity
- Nutrient distribution in freshwater systems
- Groundwater management issues
- Changes in ambient quality and effects on drinking water
- Variation in chemistry, temperature and related ecosystems

# The Republic of Cyprus

## Case study



# The Republic of Cyprus

## Contextual setting



Figure 1: Map of Cyprus (CIA, 2012)

# The Republic of Cyprus

## Contextual setting - water



Troodos mountains (MOA, 2010)



Desalination (Nirosoft, 2011)



Tourism (Hellander, 2003)



Kouris dam (MOA, 2011)



Agriculture (Parikiaki, 2011)



Residential (Hellander, 2003)

# The Republic of Cyprus

## Case study justification

- Cyprus offers an appropriate case study example due to a range of key elements
  - ⇒ **Limited Previous Research**
    - Wider literature relating to water management in Cyprus has mainly focused on the development of infrastructure, agricultural water use, and desalination
    - Water policy and environmental problem-solving has been a neglected topic area
  - ⇒ **A Water Management Dilemma**
    - Inherent issues:
      - ♦ Arid/semi-arid climate
      - ♦ Spatial separation of supply & demand
    - Imposed issues:
      - ♦ Overuse of groundwater
      - ♦ Increasing demand
      - ♦ A decline in quality
      - ♦ Irrigation for agriculture
      - ♦ Limited supply capacity

# The Republic of Cyprus

## Case study justification

### ⇒ **A complex socio-political setting**

- Administration of the island is divided
- Political issues that influence management of shared water resources

### ⇒ **A unique case study**

1. History of single track supply-side management and limited use of demand management approaches
2. Growing pressures on water resources, both in terms of quantity and quality
3. Incompatibility between hydrogeological and political boundaries
4. Implementation of EU legislation in a 'peripheral' nation
5. The Cypriot experience is relevant to other nations that share similar conditions

# **Problem-solving and decision-making**

Traditional approaches and an alternative understanding

# The importance of decision-making

## Wider research

- The decision-making and problem-solving process is key to forming an effective [water] management approach, as well as developing and implementing appropriate policy to tackle existing or emerging issues
- Research has tended to focus on exploring the experiences of and roles played by state and private sector institutions in this process, while the underlying roles and actions of government have often been explored through specific models or frameworks
- Understanding how governments are tackling problems associated with the provision of water services, and what in turn drives governments to behave in a particular manner, seems to be ***a neglected area from the perspective of water policy research***

# Understanding problem-solving responses

## Three key methods

- Three core organisational principles through which human societies coordinate collective responses to socio-environmental problems

### 1. Bureaucratic systems

⇒ Top-down / hierarchy

⇒ Experts

⇒ Regulation

### 2. Economic markets

⇒ Financial system

⇒ Competition

⇒ Incentives

### 3. Public networks or communities

⇒ Bottom-up

⇒ Democracy

⇒ Participation

# A new understanding of problem-solving responses

## Three rationalities

- **Dryzek** identifies three organisational responses that democratic societies embrace, more specifically defined through bureaucracy, democracy and markets
- Theoretically, these give rise to three fundamental problem-solving rationalities;

### 1. Administrative Rationalism

⇒ State      ⇒ Experts      ⇒ Anthropocentric      ⇒ Agents act in public interest

### 2. Democratic Pragmatism

⇒ Citizens      ⇒ Equality      ⇒ Participation      ⇒ Interactive political system

### 3. Economic Rationalism

⇒ Markets      ⇒ Incentives      ⇒ Anthropocentric      ⇒ Agents maximise self-interest

# A new understanding of problem-solving responses

## Key elements

- Dryzek's problem-solving approaches differ from other theoretical conceptions of how societies organise problem-solving responses;
  - Focuses on how institutions and practices associated with a given response are brought together as a result of the behaviour of policy actors
  - Moves away from explanations focusing on self-interest as the driver for bureaucratic action, towards a vision in which public servants do [or can] act in the public interest
  - Explanation of behaviour differs from previous conceptual theories, such as pluralism, elitism, or public choice theory - instead multiple theories are used to explain behaviour within any single rationality

# A new understanding of problem-solving responses

## Key elements

- In particular, the problem-solving rationalities offer two unique features based on the organisational principles for each rationality, which are inherent to the framework, and the individual actors that are deemed to lead a given response:
  1. Organisational principles of bureaucracy, democracy, and markets are considered to give rise to administrative rationalism, democratic pragmatism, and economic rationalism respectively.
  2. Specific individuals are argued to lead certain responses, with experts and managers central to an administrative rationalism approach, citizens key to the response of democratic rationalism, and the consumer-producer dynamic vital in directing the problem-solving response of economic rationalism.

# The Study

Rationale, aim and objectives

# Rationale

## Why the study is needed

### ***In the wider literature.....***

- Previous research mainly considers infrastructure and treatment, supply and demand management, as well as availability and quality
- Research relating to policy analysis mainly considers the isolated position of certain theories, models, or discourses [such as elitism, technocracy, public-choice theory, and pluralism] that endeavour to explain and conceptualise policy-making processes

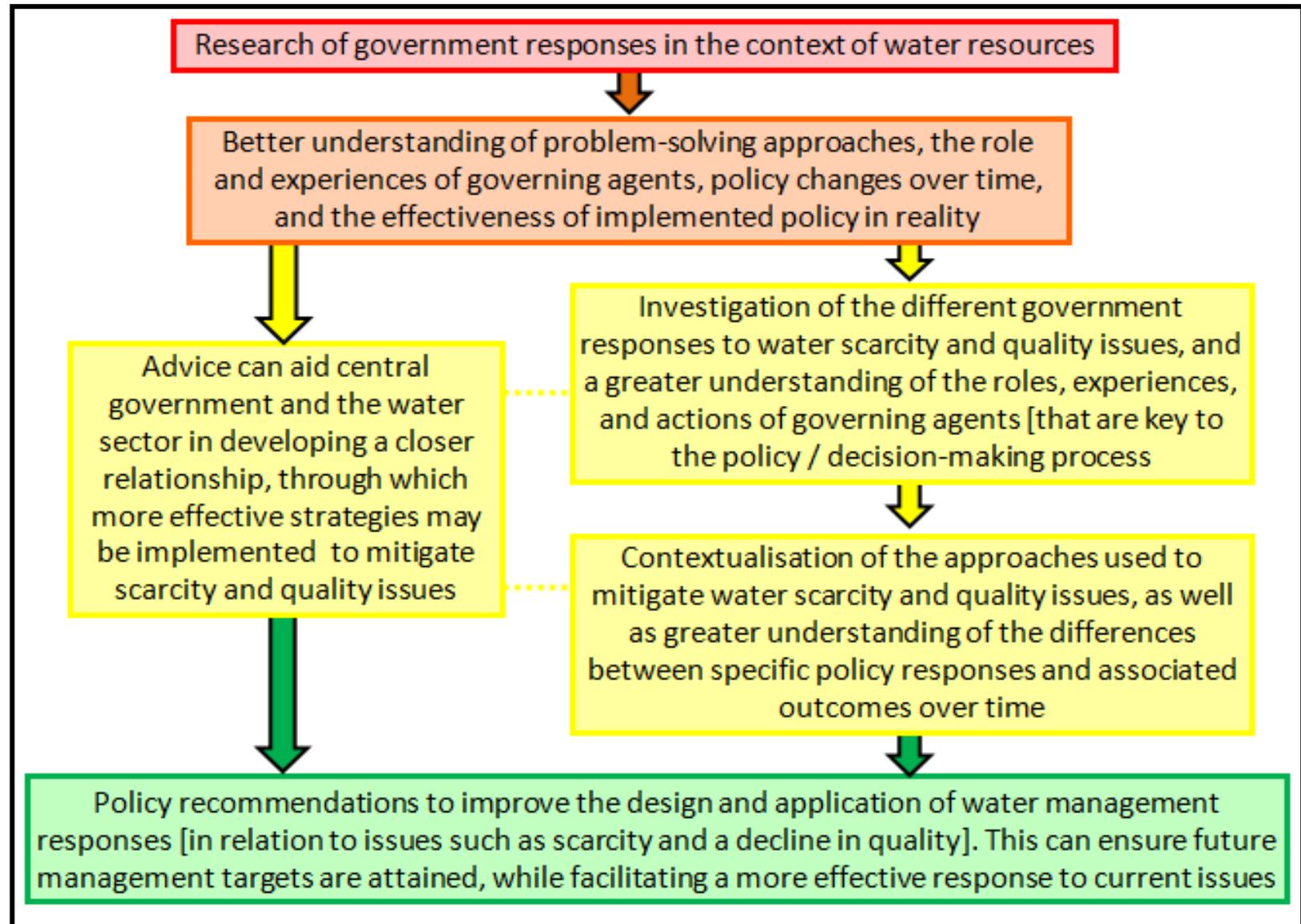
### ***However.....***

- Few authors seem to prioritise the underlying roles, experiences, and actions of governing agents in relation to the policy-making process [in the context of water scarcity and quality]
- The link between these complex variables and the way in which policy is shaped [over time] seems to be a neglected topic area

# Rationale

## Wider implications of the study

- Study can have wider implications
- Findings can aid the design and implementation of future policy



## Aim

The overarching project aim

- To advance our knowledge of how government in The Republic of Cyprus can be understood as tackling the problems of water scarcity and quality

# Objectives

## Achieving the project aim

1. To ascertain the potential utility of the problem-solving rationalities as proposed by Dryzek
2. To examine the roles and responses of key governing agents and agencies in relation to the environmental problems of water scarcity and quality in The Republic of Cyprus
3. To identify and examine the evolving nature of governmental responses to the environmental problems of water scarcity and quality
4. To make recommendations for improving the design and application of government responses to the issues of water scarcity and quality

# Data Collection and Further Work

Methods and project phases

# Data Collection

## Qualitative methods

### ***Qualitative approach***

- Suitable in the context of this thesis as can help develop original insights on issues about which a great deal may not already be known
- Particularly appropriate when respondents hold multiple perspectives [highly likely to occur in this case] as it can afford the researcher the opportunity to explore such differences

### ***Case study approach***

- Need to focus upon a single national context, to secure a manageable research project with respect to data collection and analysis
- To gain a deeper level of understanding, rather than a broader but more superficial overview of trends or patterns

# Data Collection

## Qualitative methods

### *Interview*

- Semi-structured format
- Obtain the views of key actors in the policy/decision-making process
- Information gained will be used to identify and analyse the roles and experiences of water sector and government actors
- The information gained will be used to test the applicability of Dryzek's rationality framework

# Questions

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