

# Investigating the use of natural capital for participatory decision making in integrated water management

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## Introduction

Concepts of **natural capital**, the stock that provides ecosystem services, enable alternative approaches to **understanding management impacts** across river catchments. Applying natural capital as the ‘**connecting unit**’ at this scale can demonstrate **how decisions impact the system** in a variety of ways, which allows stakeholders to reach **evidence-based consensus** on management interventions (Pahl-Wostl and Hare 2004). By **reframing the debate** towards a common understanding of the system, natural capital can facilitate participatory decision making (Garcia-Nieto *et al.* 2015).

This research aims to take co-development approach to modelling natural capital to create a framework engagement with catchment stakeholders.

## Methods

There are **two streams** (*fig.1*), with **constant exchange of information** between stages and therefore continued learning throughout.

**Key outputs**, detailed in this poster, are:

1. A Systematic Map review of literature
2. System model of Natural Capital
3. Case studies of collaboration with stakeholders
4. Engagement Evaluation Process

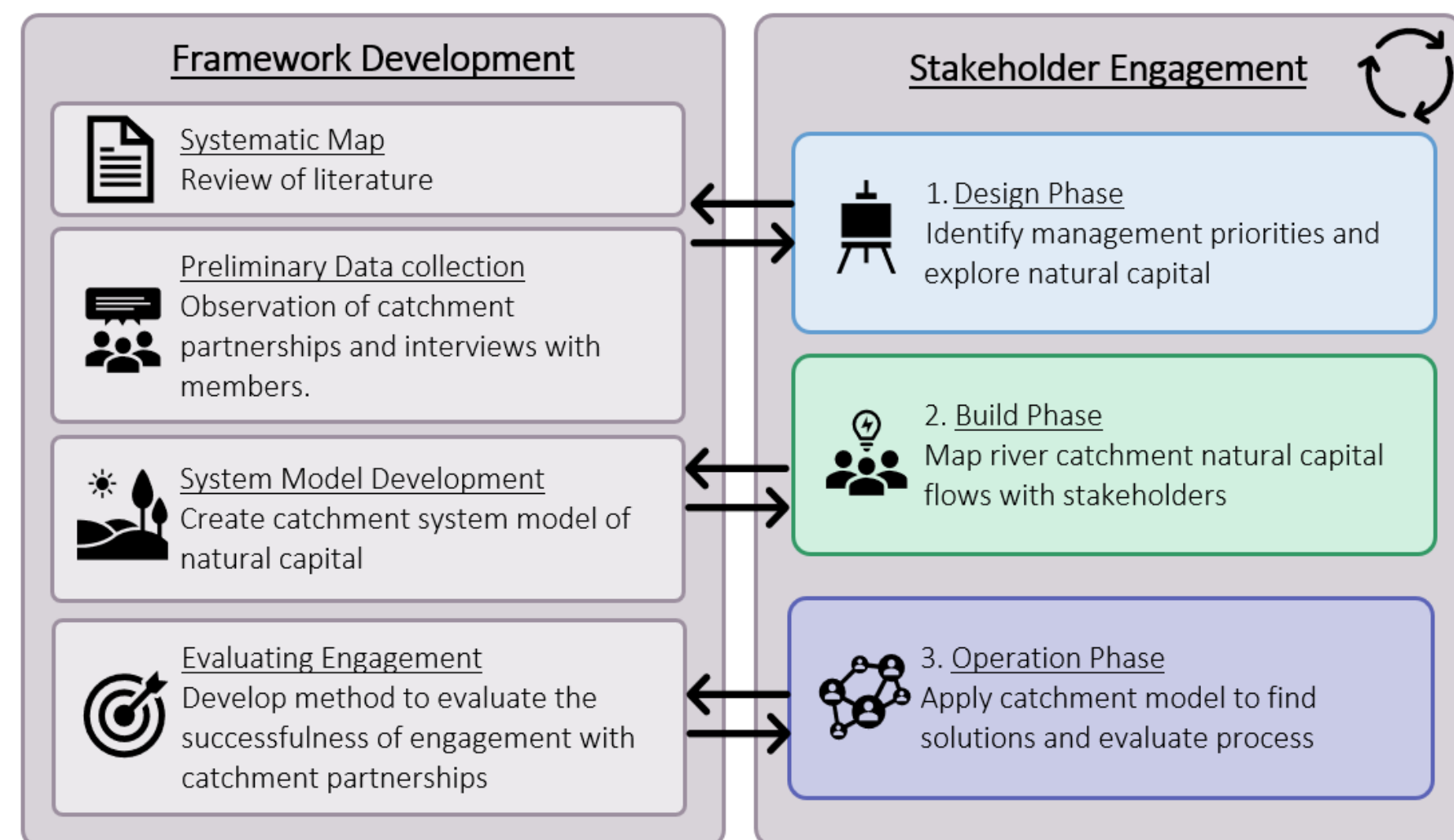


Figure 1 – Project Method flowchart

## Preliminary Data Collection

**Observation** of various London river catchment partnership meetings and **interviews** with key stakeholders will provide **baseline information** for project design. The following data will be collected:

- **Information** and **processes** used during decision making
- **Challenges** of decision making within river catchment management
- **Understandings** of Ecosystem Services and Natural Capital.

## 1. Systematic Map

### Overview

Systematic methods **reduce source bias** when reviewing literature, (James *et al.* 2016) and are emerging in environmental science. This systematic map will collate evidence for participation in **environmental decision making** using **natural capital approaches**.

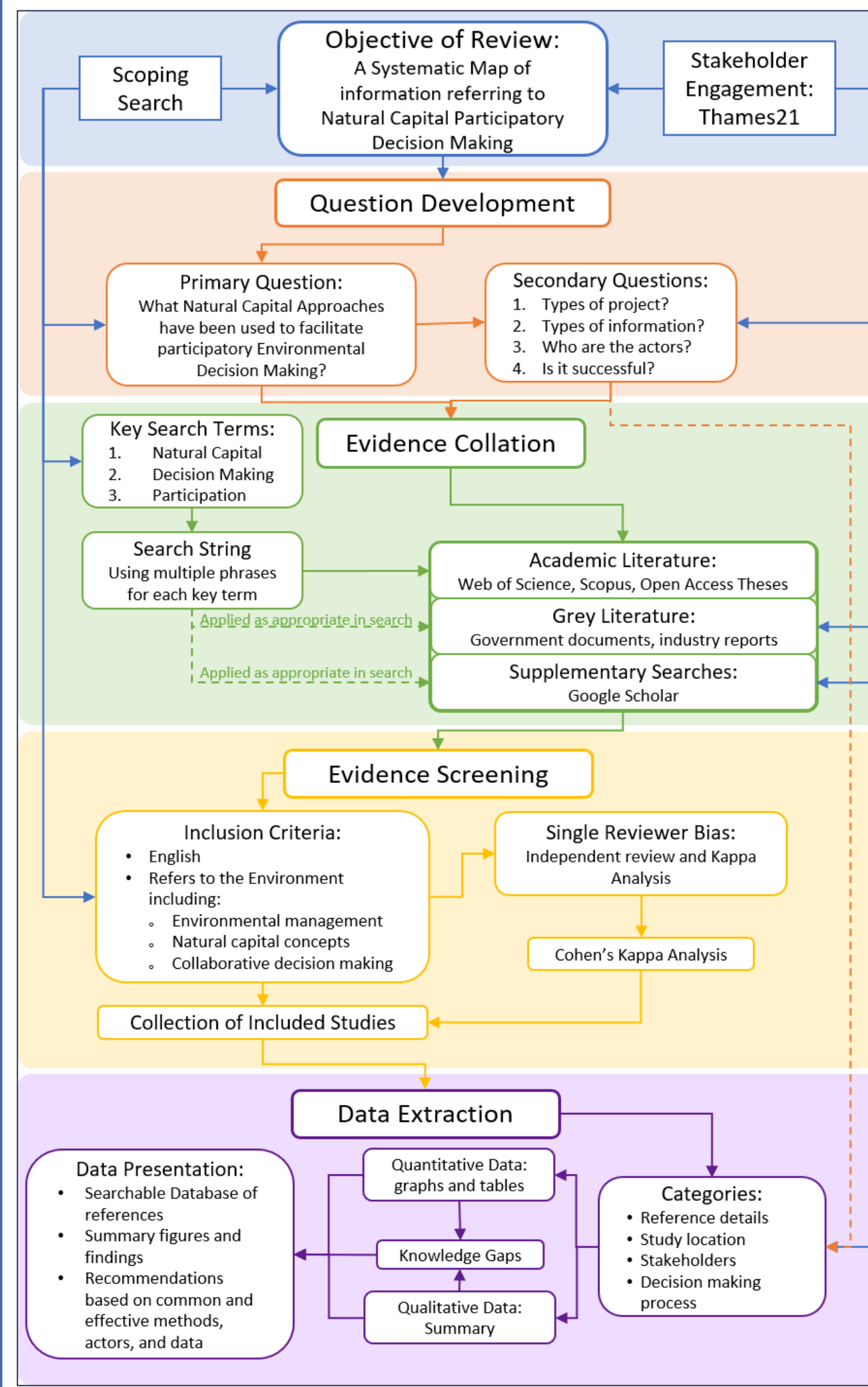


Figure 2 – Systematic Map Protocol flowchart

### Method

The **map protocol**, (*fig.2*) follows stages of method development; record collation, screening and extraction. Screening is in subsequent stages at title, abstract, method and full text (*fig.3*).

### Results

Screened 3585 records and will assess ~200 at methods/full text level (*fig.3*). Evidence-basis for stakeholder engagement using natural capital to be **applied in case studies**, including evaluation processes.

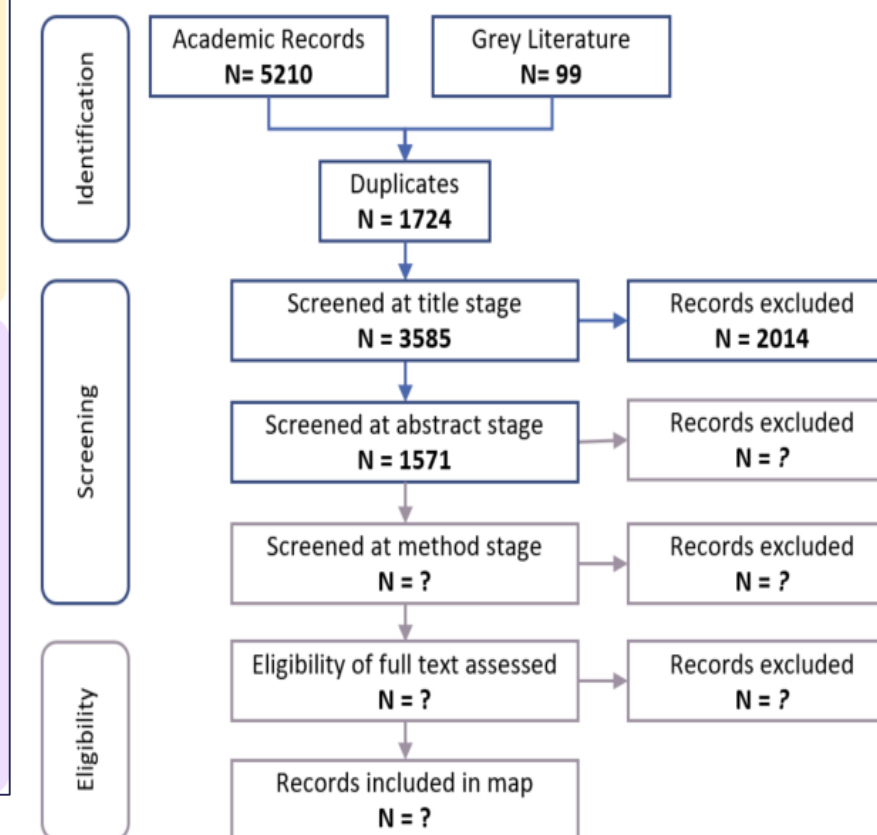


Figure 3 – Systematic Map screening record

## 2. System Model of Natural Capital

### Overview

A **conceptual system model** of river catchment natural capital, can demonstrate how changes within a catchment can affect different types of natural capital.

### Method

Build a **representation of a system** from information from systematic map, wider literature review, industry reports and preliminary data collection.

### Expected Results

A systems perspective of a catchment can **inform planning decisions**.

## 3. Collaboration Case Studies

### Overview

Catchment partnerships, hosted by Thames21 (*Fig.4*), are approached as **case studies** to collaborate on system catchment mapping to understand environmental connections using natural capital.

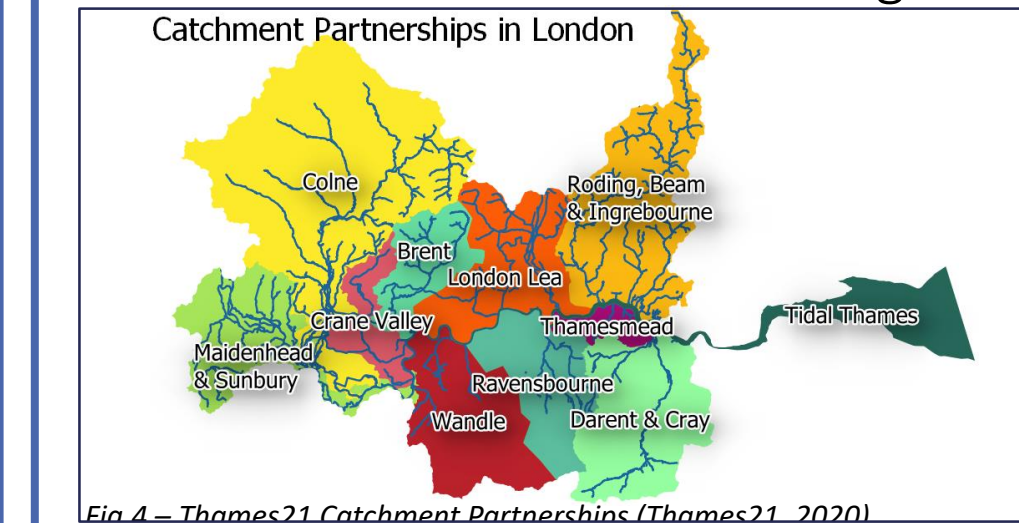


Fig. 4 – Thames21 Catchment Partnerships (Thames21 2020)

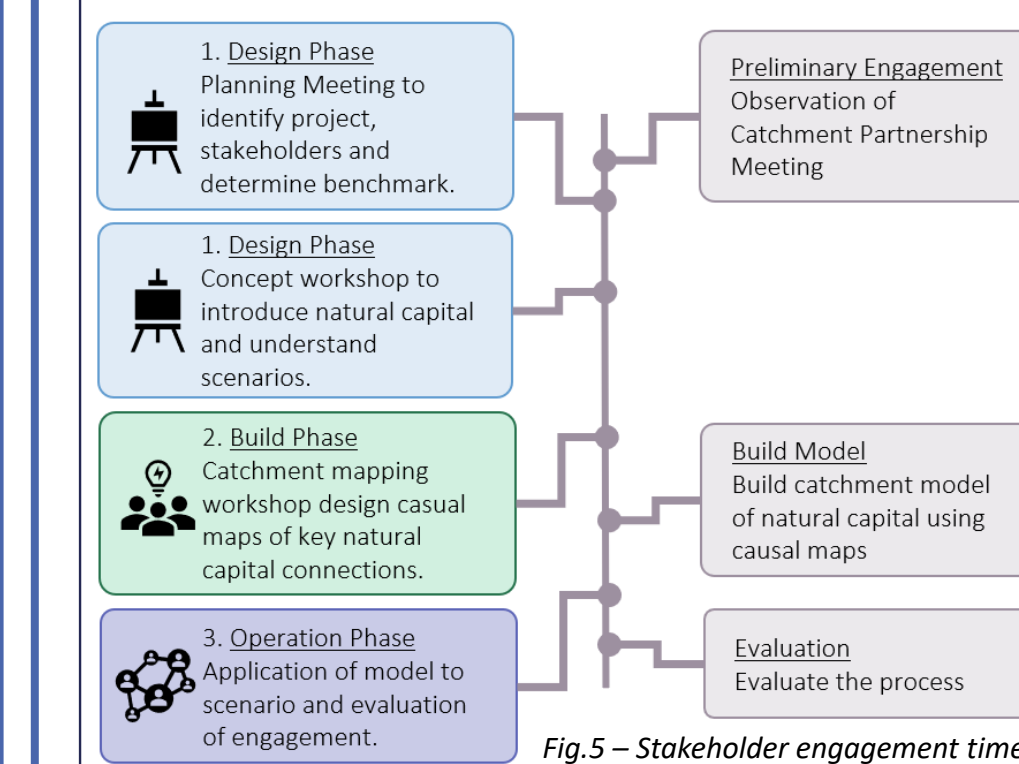


Fig. 5 – Stakeholder engagement timeline

### Method

A timeline (*Fig.5*) of **3 stages** of stakeholder engagement to co-produce **natural capital catchment model** for specific project and additional researcher work between stages including model building and evaluation.

### Expected Results

Provision of **evidence** for stakeholder target using natural capital to **re-frame catchment needs**. Engagement process enables **refinement of framework** and case studies to evaluation development.

## 4. Evaluation Process

### Overview

Collaboration **evaluation is missing** from participatory management (Barinaga-Rementeria *et al.* 2019) in river catchments and is **essential for determining success** for catchment partnerships.

### Method

Determine needs for evaluation through **observation** of catchment partnership meetings and **interviews**; results from systematic map, collaboration case studies and co-supervised MSc project.

### Expected Results

Development of method to **evaluate successfulness of engagement**.

## Conclusion

This project aims to develop an **evidence-based process of collaborative stakeholder engagement** using **Participatory Natural Capital Decision Making** that will facilitate catchment partnerships to deliver collaborative integrated water management.

### References

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