Shaping More Sustainable Communities

A Case Study in Urban Water Management

Developing sustainable environmental and sound business agendas

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Water Headlines

One week in November 2009

Introduction

43 cents in each NZ dollar of urban rates goes to water, stormwater, and wastewater management (KCDC, 2006). Evident pattern of decline in water resources

Research Objective – find out the critical constraints to achieving healthier systems that are affordable

How – scrutinise the specific challenges facing Kapiti, a community pursuing sustainable urban water management objectives

Motivation?

Nearly a decade ago the PCE (2000/1) predicted that reaching consensus on environmental, social and economic goals would become one of the greatest challenges facing New Zealand communities. Can we meet the challenge? How?

Methodology

- Pilot Study
- The **Theory of Constraints** (TOC) & **Stakeholder typology** to identify 'typical' and 'atypical' stakeholders and systematically examine their perspectives
- **Causal Loop Diagrams** (CLDs) to explore and circumvent potential negative outcomes or 'fixes that fail' (Senge, 1994)

What to Change? How?

1. What is the destination?
2. What to change?
3. What to change to?
4. How to make the change happen?

…with TOC Thinking Processes (Dettmer, 2007).

A model for thinking

State of Change	Applicable Logic Tree
What is the standard?	**Intermediate Objectives Map**
What to Change?	**Current Reality Tree**
What to Change to?	**Evaporating Cloud (EC)**, Future Reality Tree
How to Cause the Change	**Prerequisite Tree**, Transition Tree

Dettmer (2007)

Approach to Data

- Reviewed consultant engineers' and PCE reports, community surveys/studies, attended public workshops

- Interviews individually and in small groups

- Workshop with Councillors
  - helped identify and break a clear conflict using the TOC Conflict Clouds
  - resolved 'fixes that fail' with Causal Loop Diagrams

The Stakeholder map

following Elias, Cavana and Jackson (2002). Note the two directional arrows, illustrating the nature of the relationship between the stakeholder and system issue. Study participants are represented in each of the ten categories.
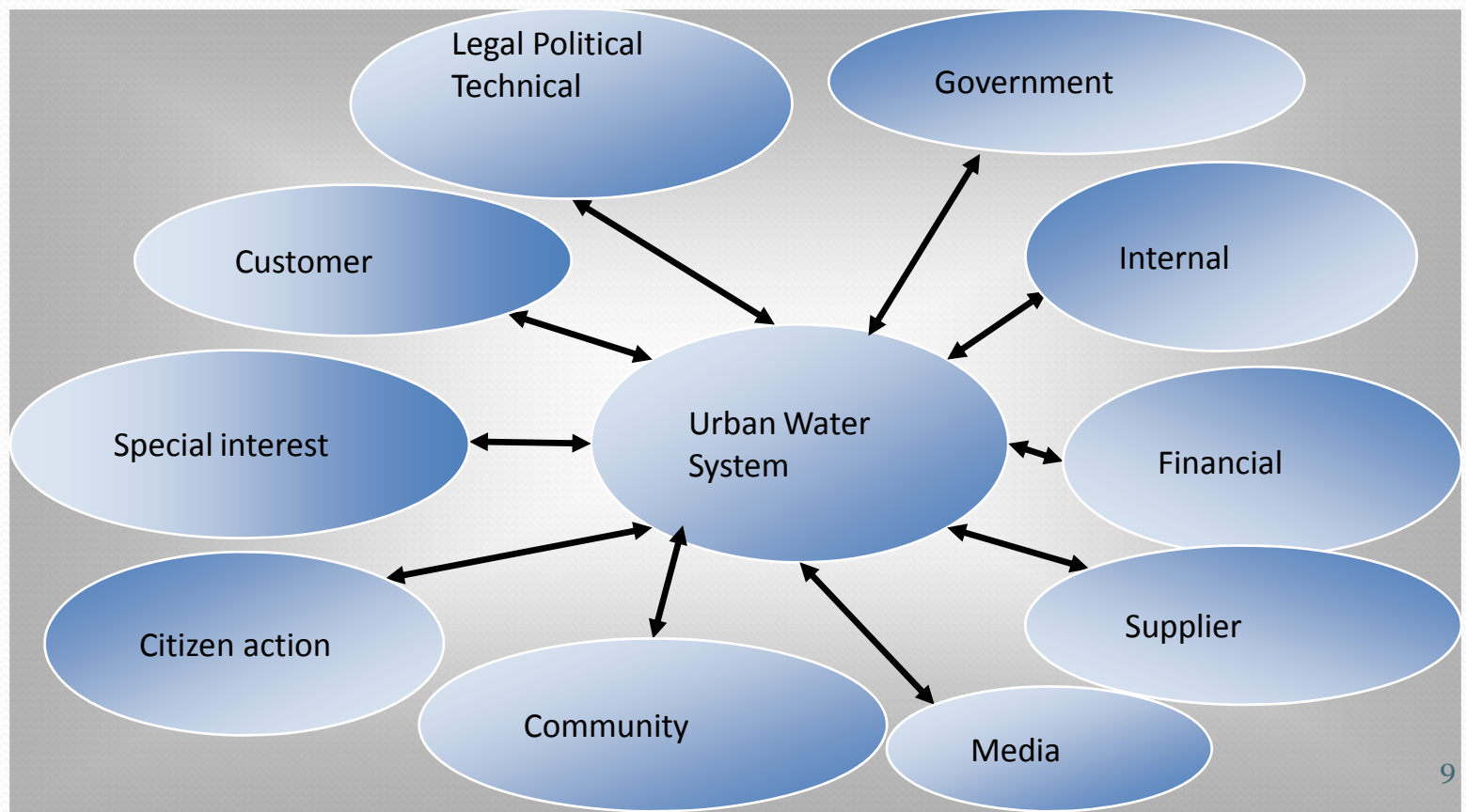
Voices

[…] there's plenty of rain in the hills so we need to answer, where exactly is the problem? – Participant

The search for a magic bullet goes on (when) really we need a coherent package of options[…] we need good advice and good science to support it – Participant

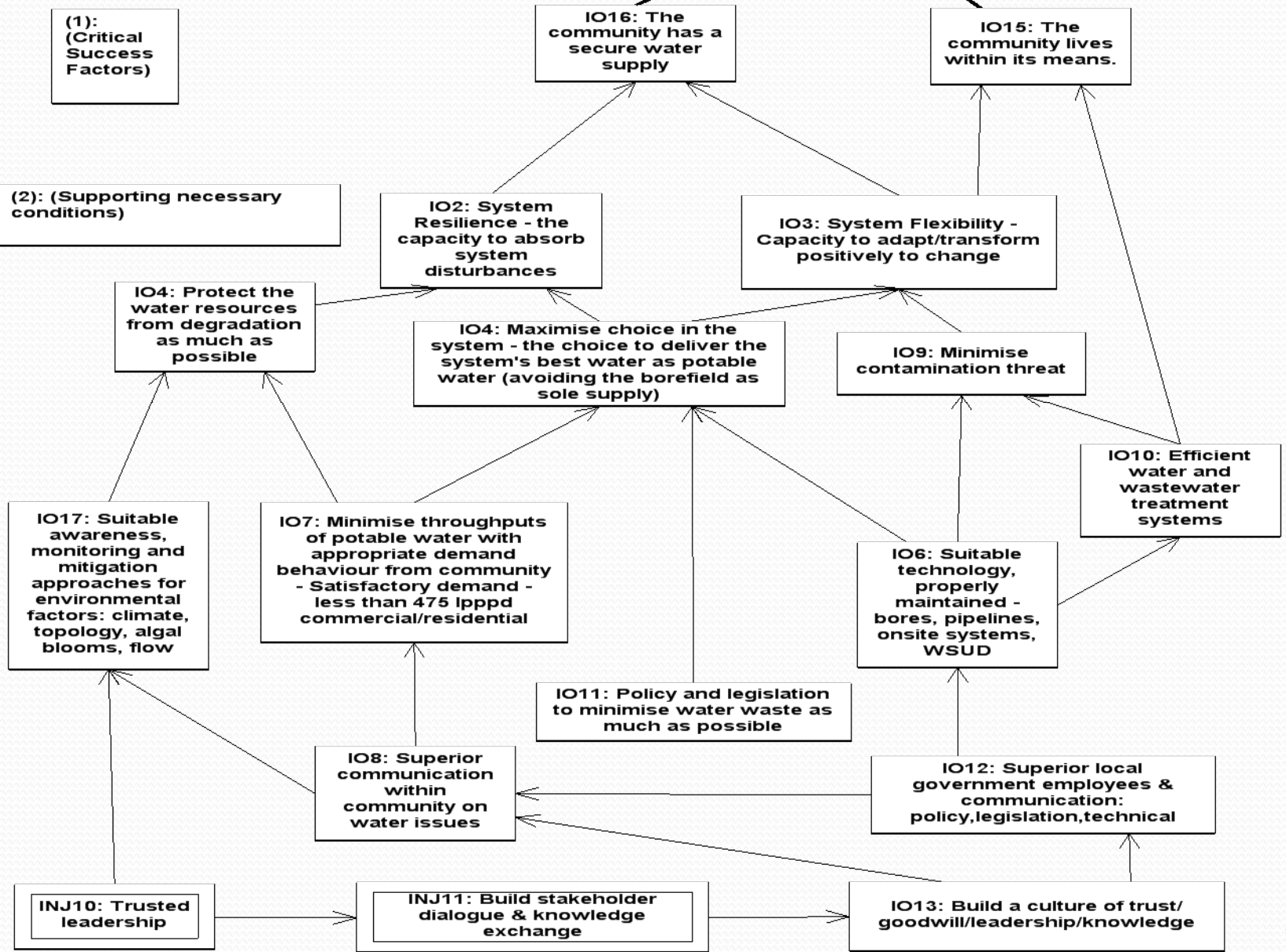*We're going to run out of water if we don't do something soon – that's why we have to be focused on simplicity – we need a simple plan and the right people – it's quality of communication that's missing* – Participant

IO1: GOAL
A Sustainable Urban Water System for Kapiti - meeting community needs and reasonable expectations now and in the future.

(1): (Critical Success Factors)

IO16: The community has a secure water supply

IO15: The community lives within its means.

(2): (Supporting necessary conditions)

IO2: System Resilience - the capacity to absorb system disturbances

IO3: System Flexibility - Capacity to adapt/transform positively to change

IO4: Protect the water resources from degradation as much as possible

IO4: Maximise choice in the system - the choice to deliver the system's best water as potable water (avoiding the borefield as sole supply)

IO9: Minimise contamination threat

IO10: Efficient water and wastewater treatment systems

IO17: Suitable awareness, monitoring and mitigation approaches for environmental factors: climate, topology, algal blooms, flow

IO7: Minimise throughputs of potable water with appropriate demand behaviour from community - Satisfactory demand - less than 475 lpppd commercial/residential

IO6: Suitable technology, properly maintained - bores, pipelines, onsite systems, WSUD

IO11: Policy and legislation to minimise water waste as much as possible

IO8: Superior communication within community on water issues

IO12: Superior local government employees & communication: policy,legislation,technical

INJ10: Trusted leadership

INJ11: Build stakeholder dialogue & knowledge exchange

IO13: Build a culture of trust/ goodwill/leadership/knowledge

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IO20: GOAL
A Sustainable Urban Water System for Kapiti – meeting community needs and reasonable expectations now and in the future.

IO2: The community lives within its means

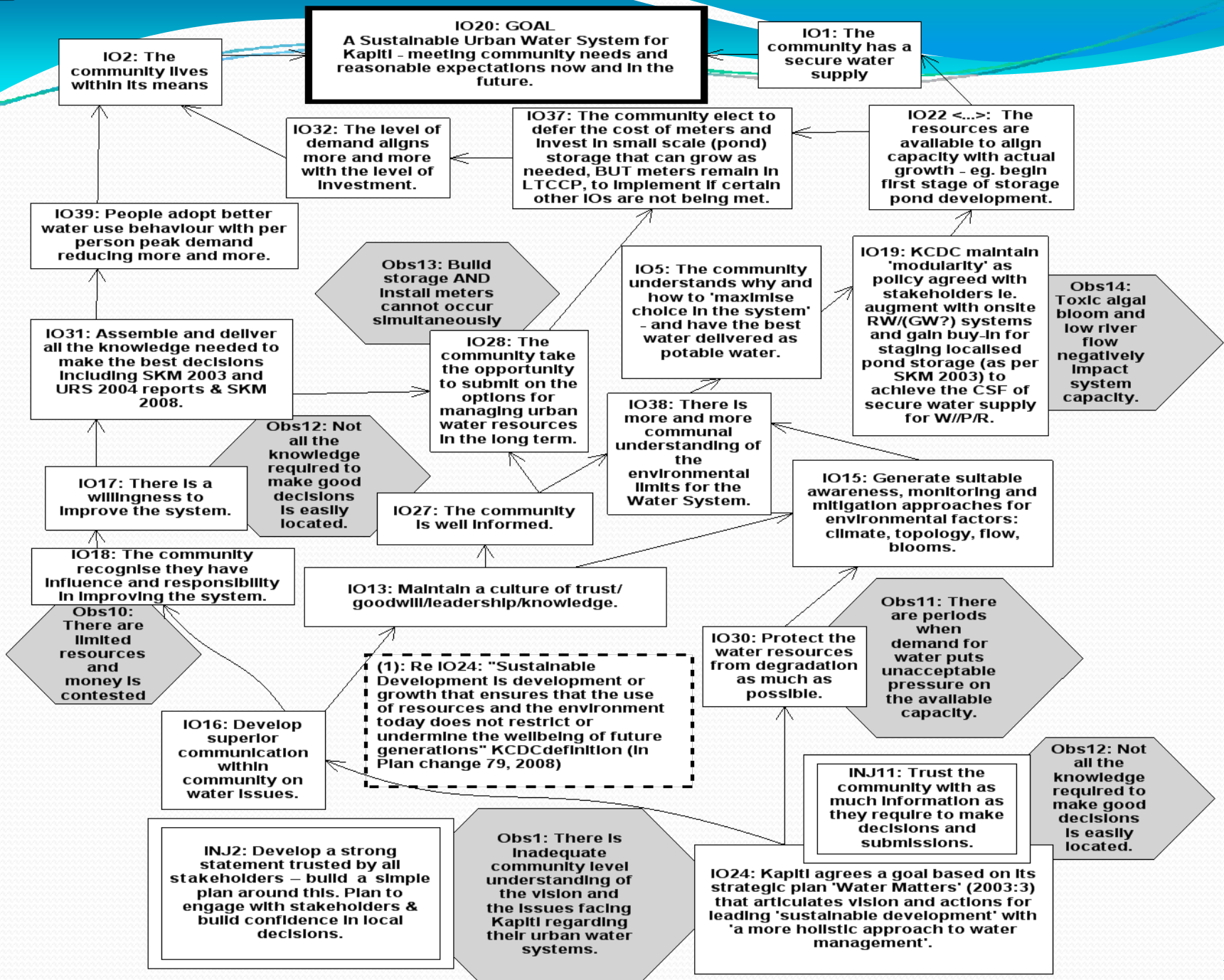IO1: The community has a secure water supply

IO32: The level of demand aligns more and more with the level of investment.

IO37: The community elect to defer the cost of meters and invest in small scale (pond) storage that can grow as needed, BUT meters remain in LTCCP, to implement if certain other IOs are not being met.

IO22 <...>: The resources are available to align capacity with actual growth – eg. begin first stage of storage pond development.

IO39: People adopt better water use behaviour with per person peak demand reducing more and more.

Obs13: Build storage AND install meters cannot occur simultaneously

IO5: The community understands why and how to 'maximise choice in the system' – and have the best water delivered as potable water.

IO19: KCDC maintain 'modularity' as policy agreed with stakeholders ie. augment with onsite RW/(GW?) systems and gain buy-in for staging localised pond storage (as per SKM 2003) to achieve the CSF of secure water supply for W//P/R.

Obs14: Toxic algal bloom and low river flow negatively impact system capacity.

IO31: Assemble and deliver all the knowledge needed to make the best decisions including SKM 2003 and URS 2004 reports & SKM 2008.

IO28: The community take the opportunity to submit on the options for managing urban water resources in the long term.

Obs12: Not all the knowledge required to make good decisions is easily located.

IO38: There is more and more communal understanding of the environmental limits for the Water System.

IO17: There is a willingness to improve the system.

IO27: The community is well informed.

IO15: Generate suitable awareness, monitoring and mitigation approaches for environmental factors: climate, topology, flow, blooms.

IO18: The community recognise they have influence and responsibility in improving the system.

IO13: Maintain a culture of trust/ goodwill/leadership/knowledge.

Obs10: There are limited resources and money is contested

Obs11: There are periods when demand for water puts unacceptable pressure on the available capacity.

IO30: Protect the water resources from degradation as much as possible.

IO16: Develop superior communication within community on water issues.

(1): Re IO24: "Sustainable Development is development or growth that ensures that the use of resources and the environment today does not restrict or undermine the wellbeing of future generations" KCDCdefinition (in Plan change 79, 2008)

INJ11: Trust the community with as much information as they require to make decisions and submissions.

Obs12: Not all the knowledge required to make good decisions is easily located.

INJ2: Develop a strong statement trusted by all stakeholders – build a simple plan around this. Plan to engage with stakeholders & build confidence in local decisions.

Obs1: There is inadequate community level understanding of the vision and the issues facing Kapiti regarding their urban water systems.

IO24: Kapiti agrees a goal based on its strategic plan 'Water Matters' (2003:3) that articulates vision and actions for leading 'sustainable development' with 'a more holistic approach to water management'.

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Findings

The methodologies worked synergistically to **evoke a rich picture** of the **critical issues** and **solutions** – with stakeholders encouraged to '**think out loud**'.

The **Stakeholder typology** provided a tactical element not routinely evident in systems studies - **valuing experiential & historical perspectives** of those who might otherwise be treated as outside the system, their views marginalised.

Iwi, Greypower historical/ SF experiential
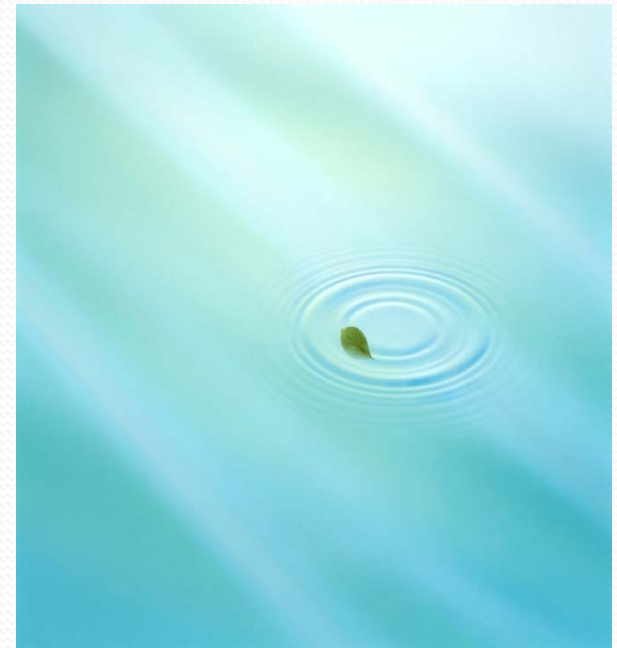
So is it worth the effort?

- Full TOC diagrams do take a great deal of time and expertise
- However, the combined TOC/CLD and Stakeholder Typology framework was of **value** in seeking and testing a number of **solutions** to the long standing problem of water insecurity on the Kapiti Coast.
- A type of ongoing conversation with all taking part
- Subsequently, KCDC has adopted a Water Communications Strategy and are also establishing how to best engage with stakeholders – necessary conditions for more sustainable urban water systems (according to the IO maps and CLDs prepared with Councillors and other participants).
- TOC -Aid to thinking, even if not used rigorously?

Two more November headlines
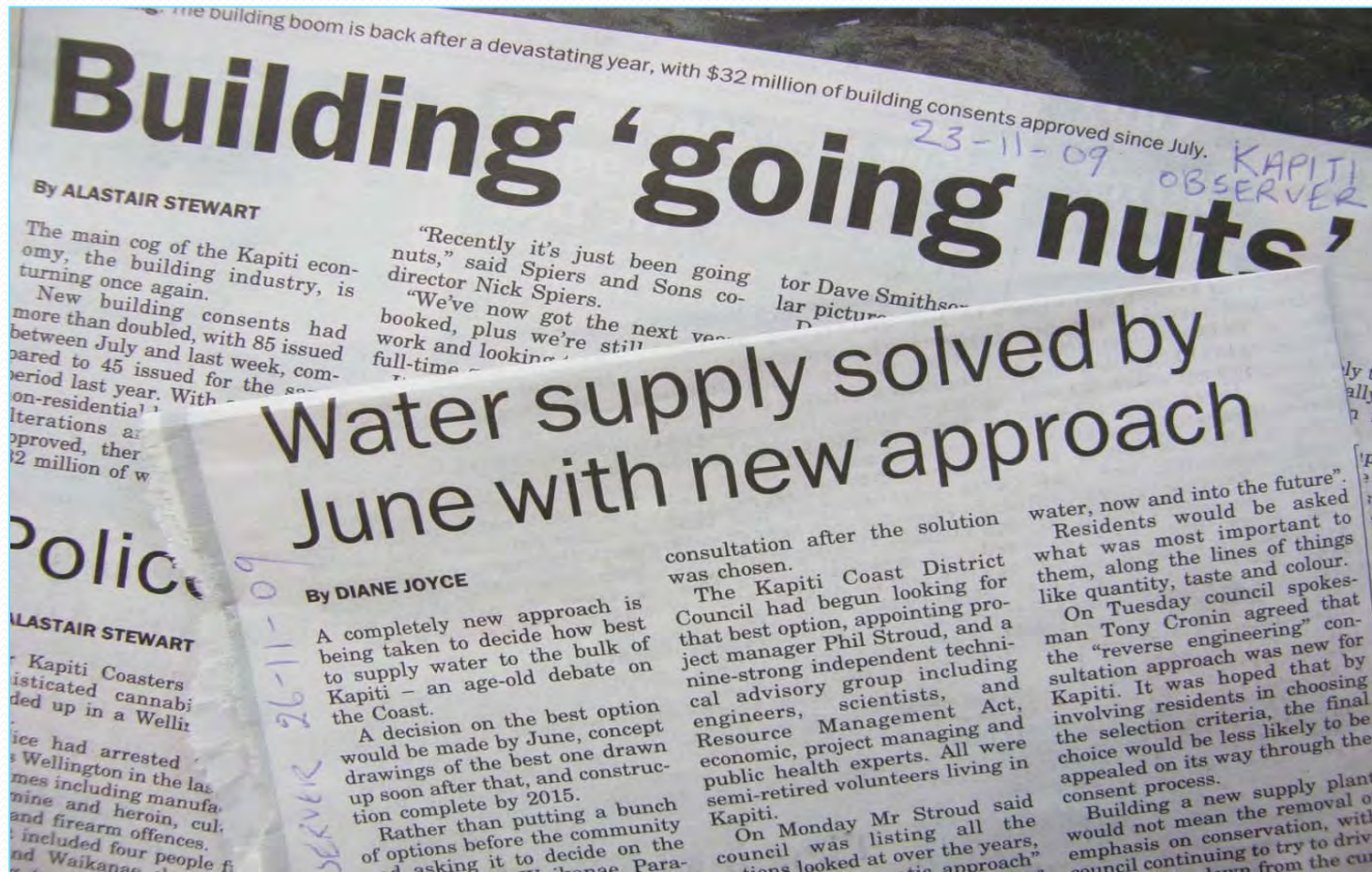
Milestones

- Participants were interviewed between July and September 2008

- The thesis with conclusions was made available to all participants in July and August 2009 and feedback welcomed

- The researcher **reviewed KCDC's Water Communications Strategy** and **workshopped IO maps/Conflict Clouds** with KCDC's Water Project Manager in September 2009

- KCDC announced in November 2009 their 'new and systematic approach' to dealing with Kapiti's water supply issues…Watch this space!

Informing the research

Barriers to Advancing Sustainable Urban Water Management: a typology. *Rainwater & urban design 2007* conference paper presented by Rebekah Brown and M Farrelly
Kapiti Coast Choosing Futures Community Plan Part 1 2006
Parliamentary Commissioner for the Environment Reports: *Aging Pipes and Murky Waters, Urban water system issues for the 21st Century* (2000) and *Whose Water is it?* (2001)
Kapiti Coast District Council Water Strategy: *Water Matters* (2003)

Thank you

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