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THE EVOLUTION AND DEVOLUTION OF IMPLEMENTATION

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The theme of this year's FLRC conference was "Science and Policy – Nutrient management challenges for the next generation". I believe that some of the greatest gains in delivering on our communities expectations for freshwater management will come through a greater sophistication to the way we approach implementation.

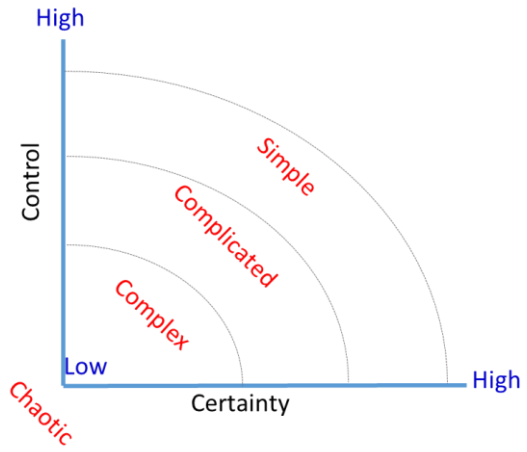
The following paper considers this statement through 3 main themes

1. How we as individuals and as a community frame the freshwater challenges we are dealing with. How this influences our expectations of the results we want to achieve and the ways we go about achieving them.
2. A view of where implementation within Hawkes Bay Regional Council (HBRC) has come from and where we are currently at in dealing with the roll out of the National Policy Statement for Freshwater Management (NPSFM) in the region.
3. A consideration of the pathways forward to evolving implementation to meet the challenges of complexity and the evolving needs of our communities.

1. Framing catchment challenges

Framing refers to the way we both structure and communicate our thinking about a particular topic Fairhurst (2011). How we frame our catchment challenges either individually or collectively goes a long way to determining how we approach addressing them. Paul Ryan of the Australian Resilience Centre, recently used the diagram below to ask a group attending a workshop in Napier how they would describe the catchment challenges they were involved in. To do this the group was asked to consider two main parameters. How certain they were about the factors influencing the challenge within the catchment? - It's causes, effects and solutions. And how much control they had over those factors?

Figure 1



Ideally we would all agree on where our catchment challenges lie – but that is seldom the case. Typically the scale at which we consider these challenges determines their real nature. The closer we are to "ground zero" within the catchment and its community and the longer we are there for, the more likely we are to understand the perspectives of those involved and magnitude of what is required. What at first appears to be a relatively simple issue can with time reveal itself to be complex, requiring a significant change to approach. Implementation operates at this ground zero, it is the role of implementation to understand the context of our problems as accurately as possible and then work closely with the community to design solutions to them.

From an implementation perspective where a challenge actually lies within this diagram has 2 significant connotations –

a) The overarching approach required to work with a challenge

Simple problems may respond well to traditional extension approaches, where decisions are generally to adopt or not. Complicated problems are challenging and may require cross organisational and stakeholder collaboration and significant coordination to achieve. Complex problems require a significantly different approach, one that can work with uncertainty, ambiguity and complexity, is iterative and prepared to learn and adapt along the way and in particular work closely with people in their communities and align with the realities of their world as well.

A good illustration of catchment framing in Hawkes Bay was shown through the development of Tukituki Catchment Plan Change 6 (PC6), and the formation of a sub-catchment group in an identified priority area called the Papanui catchment. The Papanui catchment is located in Southern Hawkes Bay approximately 30 minutes south of Hastings.

Through the planning process for PC6, identifying community values, considering management approaches and setting limits and targets for the Tukituki catchment was a complicated process. This required science investigations and conversations with the community to build a picture of the issues in the area. The ability to understand more specifically what was happening in the Papanui catchment were certainly considered but not in significant detail given that the Papanui sub-catchment is only one of 18 sub-catchments in the Tukituki.

During the development of the plan and subsequently after there have been a number of commentators who have had little to do directly with the Papanui catchment who believe the solution to that catchments problems are relatively simple and just require farmers "to get on with it".

After nearly 3 years of working closely with the Papanui community, and investing significantly in further catchment issue characterisation what the implementation effort has identified is a catchment and community that –

- Has an in-stream Dissolved Reactive Phosphorus (DRP) concentration 10 times the current target, of which 95% is coming from human sources or activity.
- Has readily identifiable phosphorus (P) sources but an equal number of unknown sources, for example the contribution to the in-stream DRP concentration from the dissolution of P from sediments during anoxic conditions.

- Is uncertain whether achieving the target is biophysically or socio-economically feasible.
- Could achieve the freshwater objectives (the point of the plan in the first place!) within the Tukituki Catchment Plan Change 6 (PC6) more readily and directly through fencing and planting of that sub-catchments waterways rather than managing nutrients to reduce periphyton growth elsewhere in the wider Tukituki Catchment.
- Is aware that by potentially fixing one problem through planting and shading riparian margins, could create another through elevating in stream dissolved inorganic nitrogen (DIN) levels, leading to a significantly heightened regulatory requirement.
- Will require significant time and investment to fix and will require an on-going relationship and commitment between all parties based on trust. A commitment that for HBRC is a major challenge given the magnitude of issues across the Hawkes Bay region.
- Had formed a catchment group before PC6 was notified but was then subjected to changes to policies, rules and regulations as the plan went through an EPA hearings process and subsequent appeals.
- Has been criticised as one of the most polluted waterways in New Zealand with little recognition of the catchment context or work that has gone on to address or understand its challenges (RadioNZ, 22 August 2016 & "Scoop" 28 June 2016)
- Has had to contend with changes in HBRC staff and resourcing to programs.

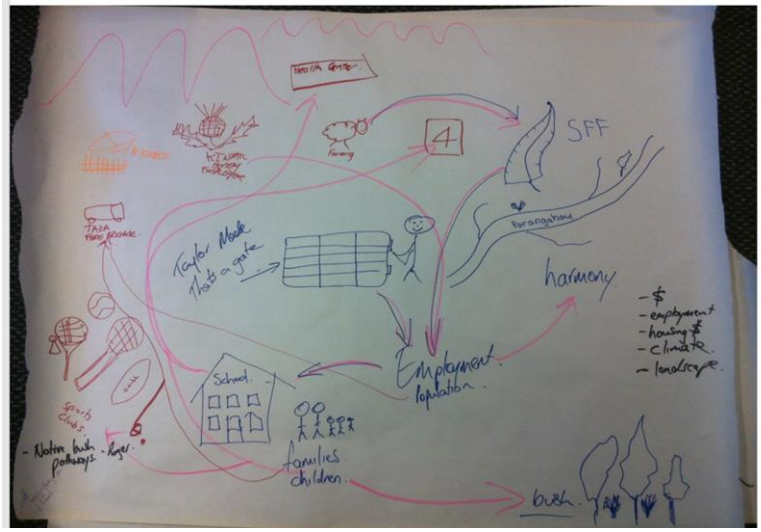
So how would we frame this catchment challenge? What does this mean to the setting of rigid limits and targets, timeframes and approaches to management before this context is understood?

Not every catchment problem is complex, but equally not every catchment problem is simple either – finding common agreement to the context and magnitude of the catchment challenge by those impacted or impacting on it is critical to defining expectations and underpinning the principles of how the problem should be approached.

b) The variability in framing between those with a stake in an outcome of the catchment management approach

One of the most fundamental issues we have found in the early stages of our implementation approach within the Tukituki catchment is just how few people know what catchment they are in or where its boundaries lie. Equally when asked to define what is important to them within their "catchment" the responses typically revolve around the community and their aspirations for it. So at our first point of contact with the community we are already framing our issues and aspirations in 2 different ways.

This is shown below in the 2 different examples from sub-catchment community groups within the Tukituki. The "rich picture" image is from the Porangahau stream/Maharakeke sub-catchment community group who were asked to define what they valued within their catchment. The second from the Papanui sub-catchment community group who collectively defined their aspirations as a sub-catchment community group. What we have noted were communities who were concerned about their environment but their fundamental concerns were about people, the relationships between them and the overarching health and wellbeing of their communities.

Porangahau stream/Maharakeke sub-catchment	Papanui sub-catchment
	• Landowners in the catchment are well informed • There is active and willing participation across the community • There is an improvement in the water quality and ecological health of the catchment waterways • Mauri is enhanced in catchment streams and waterways • Economic wellbeing and ability to prosper through sustainable primary production is maintained • Successful outcomes through non-regulatory integrated catchment

The challenge for us all is that the task of achieving catchment outcomes is likely to take time. Considerable time in some cases, which will require an ongoing, close working relationship with the community based on trust and the consideration of each other's aspirations and perspectives. Without trust, motivating action and remaining in touch with the realities of "ground zero" become extremely difficult.

We often visualise sustainability as a 3 legged stool, where each leg represents the environmental, economic and social sustainability, which work in synergy to achieve the overarching sustainability of an area. Just how deeply do we consider the issues of social sustainability in our catchment planning? Just how much does the community, its social cohesion and availability of services affect the ability of landholders to provide the stewardship to the landscape we are increasingly demanding of them? There are increasingly examples to suggest that these issues underpin environmental decision making and are not just a factor to be considered in isolation. For example, McManus et al (2012), in their investigation into the impact of local farmers on the resilience of rural communities in areas of decline in Australia, found that strong social cohesion was maintained despite significant adversity. They suggest that "the community field has enabled farmers to endure the harsh environmental and economic conditions of the past decade". Chacón et al (2016), in their work with land managers in the Northern Territory found that the single most important indicator of life satisfaction was having a good relationship with family and friends. From which they suggest that the most effective incentives for improving natural resource management will be those that –

- Promote trust amongst participants (or at least don't degrade the trust that exists).
- Maintain a social, rather than monetary frame.
- Do not undermine peoples "public good" image.

Potentially in the future when we are considering the future of our highly erodible class 7 and 8, hill country rather than frame it as a liability to be shut away and put into the simplest, fastest establishing land use so we can move on to the next challenge, we frame it as an opportunity to increase the wellbeing of our local communities and look for solutions that support that instead.

2. History and Context of Implementation at Hawkes Bay Regional Council

The role of HBRC in catchment implementation has historically been the work of the Council's Land Management Team (LMT). The LMT has been a Regional Council function since its formation in 1989. Prior to this during the Hawkes Bay Catchment Board era, soil conservation was a significant program of work. The emphasis of this work being on incentivising erosion control, doing farm plans, working with catchment groups to plant or construct erosion control measures, supporting soil conservation nurseries and doing a variety of community oriented workshops (Dunlop 1992). This approach hadn't changed too much until relatively recently.

While it is well recognised that the design and implementation of on-ground mitigations to control sediment loss is indeed an art form, being both complicated and technically challenging, the overarching approach taken to deal with the soil conservation challenge across the region has followed a relatively simple path. The work the team has done could be considered "qualitative" in nature, characterised by good outcomes to small or few projects, working one on one with landholders, building a high degree of trust through strong ongoing relationships with landholders who were generally willing to do the work and who were subsidised through Council grants to do so.

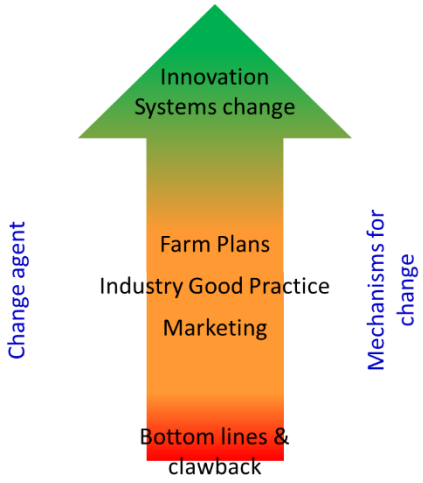
However many now consider the rate of change through this approach to be too slow to meet contemporary expectations for freshwater quality. Approximately 2 million willow or poplar poles have been planted in the region since the 1930's. Protecting around 40,000 ha of the regions eroding lands, which represents around 40% of the highly erosive land within the region, estimated at 150,000 ha. This does represent a significant effort and potentially is a reflection of the actual time taken to achieve the outcomes desired, when the emphasis is largely on individual landholders doing the work.

A look at the Hawkes Bay Regional Council 1993/1994 Annual Plan, shows a list of catchment priorities and challenges very similar to what we have now. So why is this? Why do we continue to make small and slow incremental improvements to the catchment challenges around us? Is it political, with other priorities over time superseding the ones we are working on for the limited funding available? Or is it because we have underestimated the complexity of the problem at hand and applied linear, simple solutions that have failed to yield significant improvements – or worse, exacerbated the problem? Or, is it a lack of commitment to implementation? Continually approaching our catchment challenges as largely biophysical problems rather than complex socio-ecological systems and maintaining an ongoing commitment to working with the community to experiment, learn and adapt but to stay the course and continually work towards a solution? I would suggest that it is a combination of all three and perhaps other factors yet unknown.

With the advent of the National Policy Statement for Freshwater Management (NPSFM) in 2011 and its implications on Councils to achieve catchment limits and targets, implementation has been transformed, to almost the other extreme. Now the emphasis could be considered dominantly "quantitative". Nearly all landholders are now influenced directly by our catchment plans and their rules and regulations over relatively short timeframes. Because of the magnitude of the effort required to meet this challenge implementation is increasingly being framed as an operational and a logistical exercise.

Currently implementation at HBRC could be represented by the figure below. Using the analogy of a traffic light moving from bad practice to currently acknowledged best practice. For HBRC this is broadly about using rules, regulations, on-ground incentives and the formation of catchment groups in areas where water quality is at its worst. The intent is to raise practice above minimum standards or "bottom lines".

Farm plans, industry good practice and a mix of communication, community engagement and marketing are promoted by Council and a wide variety of other agencies, groups and private providers to influence an improvement to practice incrementally above these minimum standards to better or good practice. There is a small group of practitioners that are looking at a range of mechanisms, from research to certification schemes to look for avenues of promoting an on-going culture of innovation and improvement. Putting this process into practice across a range of potential actors and mechanisms to influence change is indeed a challenging and complicated process.



However this "quantitative" approach to meeting the requirements of the NPS for Freshwater Management is already starting to highlight a number of key challenges for implementation in Hawkes Bay –

- Much of the emphasis on NPSFM "Implementation" through Central Government has been on having catchment plans in place for every catchment in the region and NOT on approaches to implementation per-se. The focus is still on planning and not doing, we have barely had time to gauge the effects of the plans we have done before the next ones are written and rolled out.
- It is proving to be a significant cultural shift for Council and staff, with new functions emerging, greys areas to be navigated, cross-team collaborations being critical and challenging and changes in individual ways of working required. This is proving to be far more complicated than first thought and taking a long time to disseminate from staff to management and ultimately to governors.
- The speed of change has been faster than those we are most affecting are able to keep up with. Small collaborative groups under tight timeframes are being used to understand

a wider catchment complexity and to set limits and targets for landholders, who are barely aware of the nature of the problems in-stream or their role in contributing to those. The first contact many have with these issues is through the notification of the rules and regulations that now apply to them.

- The narrow focus on freshwater oriented catchment planning, is missing opportunities for achieving synergies to biodiversity, climate change and economic development outcomes through not enabling a flexibility to the approach of selecting appropriate on-ground programs of work within catchments.
- The NPSFM has created a huge demand for more skilled people to undertake new roles within Councils and through the creation of a new industry to deal with the huge numbers of farm plans emerging out of the catchment planning processes across the country. The capacity and capability of people available nationally to fulfil these roles is struggling to keep up with the pace of change, and we are all competing with each other to fill positions.
- Critical to implementation is that policies and regulations within plans work together to create synergies or reinforce the implementation approach. This includes prioritising those areas or land management practices of most concern and providing enough time to enable the mechanisms and relationships to be built to achieve the outcomes required. This has not been allowed to happen because of the expectations of some parties through planning processes being highly influential on the setting of values, objectives, limits and rules outside of the "doing" context.
- The speed and magnitude of change has not enabled for much in the way of collaboration between different levels of government or between Councils. There are large opportunities for efficiencies in the way we are doing things across the country, particularly with regards to the building good approaches to implementation and through the development of networks and shared resourcing.
- Finally the challenge of finding the necessary resourcing for this work. Ultimately new quantum's of resource will be required if we are truly serious about fixing the problems within our catchments. Understanding what this quantum is critical upfront in the catchment planning process and in the context of the wider region and yet it has proven challenging to spend implementation budgets on providing support to landholders before the regulations have kicked in. Due in part to a lack of awareness of what is required but also to a general apathy to undertaking tasks when deadlines are still more than a year out.

So where to from here for Hawkes Bay - increasingly as we undertake more catchment planning, and in particular begin formulating catchment plans for our hill country catchments the true nature and role of HBRC in implementation will become apparent, rather than being defined primarily by the approaches required and the emphasis on nutrients of the lowland, intensive areas of the region.

The resourcing required will challenge both the organisation and the community. There are limits to what communities and politicians are prepared to raise in rates. This may also lead to significant changes in emphasis to the roles of staff within the Council.

However what is certain is that regardless of whether Regional Councils ultimately have a role in implementation or not, a greater sophistication to how we approach implementation is required to meet the future needs of our communities and landscapes. One that can blend both

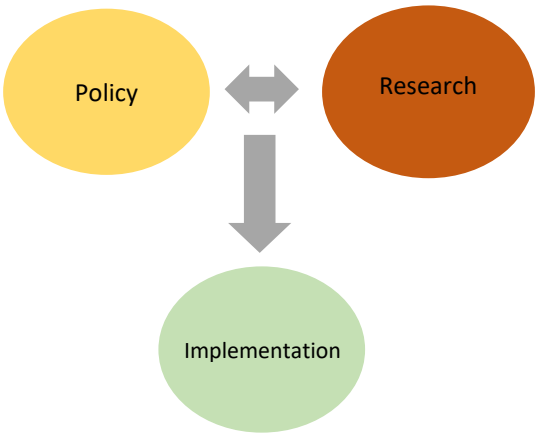
a “qualitative” and “quantitative” approach to achieving objectives, and increasingly in the future add the communities concerns around climate change, biodiversity protection, economic development and community resilience into how it goes about its work. This will be discussed in the following section.

3. The future direction of implementation

There is an important opportunity currently to decide the future direction and role of implementation over the next decade. With an overwhelming emphasis on quantitative approaches to dealing with catchment challenges occurring nationally at present, just how contextually nuanced and adaptive are our approaches to implementation going to be in the future?

There are 2 main implementation pathways we could take -

a) A continued devolution of implementation responsibility. From science and policy institutions to the agents of implementation. From Central Government to Regional Councils and from Regional Councils to the primary sector, private providers and communities. From catchment decision making to paddock scale decision making. This is the pathway we are already on and is a perpetuation of a historical approach to implementation (& natural resource management) to some degree. As is reflected in the diagram below



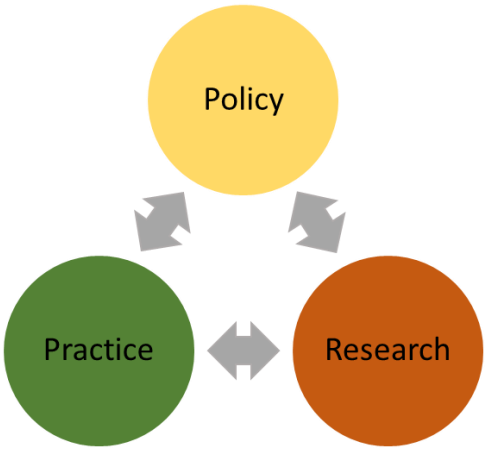
For some factors this is not necessarily a bad thing. Enabling a degree of autonomy in decision making at paddock scale through farm plans, does allow for the actions required to be targeted, contextually appropriate, cost effective and aligned with land holders aspirations and abilities. Whether this is actually happening now is another question.

Another positive is that devolution of implementation responsibility away from government and to industry and communities does provide a degree of buffering to politics and political cycles that at times can seriously strain the trust between parties, which is so crucial to achieving outcomes to long term catchment community challenges.

But, is this the approach that will enable us to meet the challenges of increasing complexity and the greater expectations of our communities?

b) The second pathway is an evolution to the way we frame and approach implementation. Move it on from the label "implementation" to something new, something different, something that represents not just a body of work but a philosophy and set of principles to the way we approach working with complex and evolving socio-ecological systems.

   Represented by the diagram below, a "practice" that has equal influence and consideration in the decision making to how we frame and approach our catchment challenges.



   For a new "practice" to emerge in the future, perhaps the greatest evolution required is within our institutions and organisations. The magnitude of change required there is potentially as large as the change required on-farm to meet our environmental challenges. It requires –

   - Planning and policy design that enables social learning and adaption as our understanding of the context we are operating in improves, while providing for the ability to be flexible in our approaches between iterations of catchment plans if the evidence suggests it is required. Policy should continue to enable a nuance to how rules and regulations are applied at multiple scales and not just rigidly fixed at one or 2 scales.
   - Science, that provides ongoing support to practice, that comes along for the journey and doesn't just deliver a package of information for implementers to disseminate and apply, while it moves on to the next project. Science that includes within its recommendations knowledge from the social, economic, and implementation sciences and Mātauranga Maori and is not just framed from a biophysical perspective.
   - Governance that acknowledges and understands the certainty, control and complexity of challenges at hand and is adaptive in its approach and expectation for change rather than focussed on the next sound bite.

For me the greatest evolution to the way we work within this new practice will require a significant change to; the ways we work with complexity and the ways we work with people.

i. Working with complexity

Acknowledging that we are working with socio-ecological systems with all of the characteristics and behaviours that come with that, including; multiple interactions and relationships between the socio-economic and biophysical worlds across multiple scales, that are individually and collectively adaptive to change, enabling them to self-organise and evolve, often yielding emergent or unpredictable properties at different spatial and temporal scales (Biggs et al 2015). This includes –

- Being cognisant and concerned with how our implementation efforts are influencing behaviours and properties at different spatial and temporal scales.
- Ensuring there is effort and alignment between policies, programs, projects, messages and stakeholders influencing change across these scales as much as practicable.
- Giving institutional consideration to the broader, long term purpose of what it is we are trying to achieve in catchments. Is it just to fix the freshwater issues in-stream or is it to work towards a future of sustainable resource use and a resilience to the ecosystem services produced from our landscapes to future challenges and opportunities while providing for the wellbeing of communities that depend on them?
- Working with the principle of "requisite diversity" which acknowledges that, when working with complex challenges with a diverse range of issues you need an equally diverse range and repertoire of responses that are as nuanced as the challenges you face (www.requsitevariety.co.uk). This is further elaborated in Kirk et al (2007), who note that when resourcing constraints narrow the range of options for implementing regulation, it also narrows the consideration of all possible routes that implementation could take, leading to the use of a few manageable well-trodden pathways.
- The ability to experiment, trial, learn and evolve new approaches to meeting catchment challenges without a fear of failure, the loss of funding or heightening of regulatory responses.
- The building of networks or "communities of practice", across stakeholder groups who are prepared to share and learn from each other in the trials and tribulations of working with limited certainty and control.
- Using monitoring, evaluation, review and improvement frameworks as the foundation of all decision making, but in doing so considering a far broader range of socio-economic indicators than using biophysical indicators alone. With the inherent lag in many of the biophysical systems we are dealing with, how do we know that the policies and actions being taken now will ultimately lead us to the outcome we are after?
- Finding new ways to frame and communicate complexity so that those involved in catchment decision making are more comfortable working with it.

ii. Working with people

How we engage with people with a diverse variety of views, values, beliefs and expectations is indeed both an art and a science. Finding mutual common ground around the use and protection of our natural resources now and into the future through dialogue with people requires that we explore beyond the boundaries of our current approaches to engagement and participation. We need to look for new ways to talk with each other that break through our current conditioning to problem solve via adversarial approaches that typify much of how we consider our natural resources now.

This could include approaches to collaboration and community engagement that allows participants to collectively define the problem, rather than solely focus on the solution. To consider other broader factors (like their community aspirations) that influence the outcomes beyond freshwater that we are ultimately after. It could also be that there is a need to shift the dialogue from working with "problems" to identifying and enabling "opportunities". Or from a dominantly "sectoral" approach to policy development to the consideration of "territorial" based priorities to enable new deliberations to occur, for example as discussed in the "New Rural Paradigm" (OECD 2006).

The work of Ronlyn Duncan (2013 & 2016), highlighted a key challenge for implementation when dealing with landholders. People learn and understand the world around them in different ways. Farmers commonly use their experiences and knowledge of the landscape built up over time and through close trusted networks to help define causes and effects of their land use practices on water quality. Increasingly we as catchment managers are using models, complicated science or convoluted policy talk to define approaches to address water quality. The result is a disconnect in communication between parties with each party increasingly being unable to see the perspective of the other. Fundamentally if we are unable to find common ground in the language and understanding of the issues and solutions to our catchment challenges we will remain locked in to a dominantly regulatory approach to achieve the objectives we are after.

Donella Meadows a highly regarded "systems" scientist raised another key issue in her paper on where to leverage change in systems (Meadows 1999). Meadows believes that the most effective place to leverage change was through changing the dominant paradigms or mindsets that defined or framed our beliefs about that system. But just how much time do we actually spend both understanding and influencing the mindset of those we most want to change when it comes to managing our freshwater?

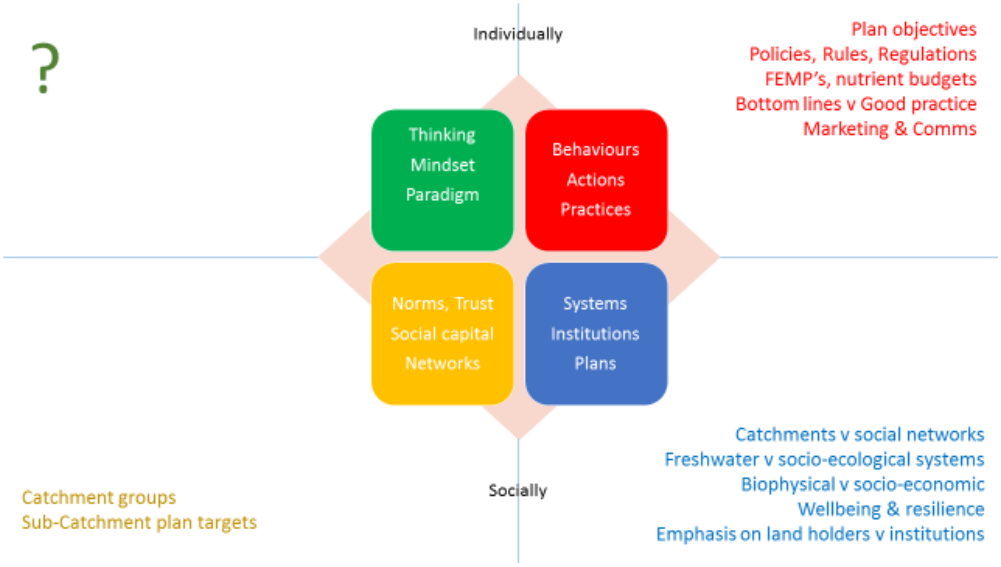
Recently I came across a framework developed by Ken Wilber and others (Watkins and Wilber 2015), which I modified slightly to make usable for the work we were doing in the Tukituki catchment. Fundamentally the framework looked at human growth and evolution through 4 main frames –

a) Our thinking, mindset and paradigms.
b) The cultural aspects of trust, norms, social capital and networks.
c) Our behaviours, actions and practices.

d) Our approach to acknowledging the wider systems we were operating in. For example consideration of our institutions and other drivers like our natural, social, human, infrastructural, financial and political capital.

By populating each quadrant with the work we were doing in the Tukituki, as shown below, 2 main features stood out. Firstly we were doing nothing in the space of influencing mindset, instead through our rules and regulations we were choosing to focus predominantly on behaviours. Secondly we were framing our approach to managing catchments through a comparatively narrow range of drivers and parameters.

This is an example of practice – the consideration of a range of perspectives and disciplines that enable us to better understand the context within which we are operating. Experimentation, proto-typing and trial and error. Working outside the boundaries of policy and science to explore new territories and approaches.



Summary

The influences on our catchments challenges and multiple expectations we now have for our freshwater is becoming increasingly complex. To meet this challenge will require new ways of working with people and how we approach complexity through our policies and science. Perhaps the biggest opportunity we have for working in this new space is through a greater sophistication to our approach to implementation. One that can contribute to our framing of catchment challenges through a multi-scale, socio-ecologically systemic view of the realities of achieving the changes required working with people in their communities.

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