

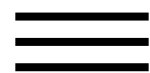


Arup and Indepen

A new future for water

Nine characteristics of future-
facing organisations





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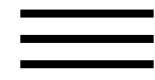
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About the Authors

Arup

Arup is a global firm of designers, engineering and sustainability consultants, advisors and experts dedicated to sustainable development, and to using imagination, technology and rigour to shape a better world. Established in 1946 by Sir Ove Arup, we now have over 17,000 employees in 92 offices across 35 countries. Our reputation for global excellence has been built over 70 years of delivering technically challenging and innovative building and infrastructure projects as well as transforming industry, communities, and organisations. We are proud to be regarded globally as experts and thought leaders in understanding and managing complexities of the natural and built environments.

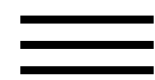
The Arup water team has a global reputation for delivering excellence in water strategy, management, and engineering. Arup is currently working with some of the largest water entities in the world, and we are actively involved across the water cycle and in a wide range of climate conditions as well as policy and regulatory contexts. We have 1,600 people working globally in the water sector and on water-related challenges, and we support clients across the full spectrum from vision and strategy to governance to design, delivery, and operations.

Indepen

Indepen is an expert team of policy and strategy advisors with a proven track record of working with policy makers, regulators and companies across a range of infrastructure sectors with particular expertise in corporate governance, public policy, infrastructure finance, economic regulation, corporate strategy and effective engagement.

We have a particularly strong presence in water, with considerable experience in developing long term adaptative strategies applying system-based approaches to adaptation challenges brought on by climate change and increasing societal pressure on natural resources, placing particular emphasis on creating effective engagement of all the participants in the water system to create pathways for all to play their part.





A global shift

Water is life. It sustains and supports our well-being, our environment, and our economy. It is integral to the Earth's natural processes and systems. Its properties and functions directly influence climate patterns, ecosystems, and all the living organisms that depend on them.

Yet we are putting increasing strain on the very system that sustains us, through land use changes, unsustainable consumption, and the waste and pollution we put into the water environment.

In the face of climate change and the biodiversity crises, the central role of water and the water system is also increasingly recognised. These crises are manifested through water. Across devastating droughts, and floods, water sits at the heart of the issues and needs to be at the heart of the solutions.

Global momentum and action reflect this growing recognition of the critical role that water plays. The climate and biodiversity Conferences of the Parties (COPs) have seen water move from the periphery to the centre of the conversations and commitments. This year the first UN Water Conference since 1977 was held, during which the UN Secretary General stressed that 'water needs to be at the centre of the global political agenda'. This year also sees the halfway point for the UN Sustainable Development Goals, with progress towards SDG 6 - Clean water and sanitation - falling significantly short.

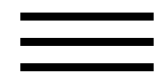
The recently established Global Commission on the Economics of Water published a call for collective action. This is based on the premise that water globally has been mismanaged for decades, to the point of pushing the global water cycle out of balance and breaching the planetary boundaries for water that keep the Earth's system safe for humanity and all life. It calls for a radical transformation of how we manage, govern, and value water as a common good. This will require a fundamental reshaping of the roles and responsibilities of both governments and the private organisations that operate within the water system.

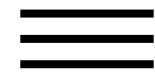
Through our work we recognise first-hand that our current ways of interacting with the water system are no longer fit for purpose and that there is a need for a fundamental shift in how we think about and work with water.

We also see how the relationship between governments and organisations on the one hand, and the public, citizens, and customers they serve on the other, is increasingly strained in the face of the overwhelming impacts on the water system. At the time when collaboration is needed most, with a part to play for everyone, we see tension and toxicity of debate threatening the foundation for consensus-driven and evidence-based solutions.

In this context, this paper is intended to help organisations push towards a different and better future for water. It supports and complements the global and national calls for action that are reframing the debate and setting a far more ambitious agenda. Many organisations are already exploring fundamental questions, such as around the need to value water differently, bringing nature back as part of our solutions, and to drive different individual behaviours and attitudes towards water. This paper looks to structure those topics and perspectives together in an integrated and coherent way, setting out what we term the nine characteristics of future-facing organisations. It is intended to help organisations consider their purpose, role, and responsibilities, and to determine their strategy and actions into the future as they respond to the challenges.

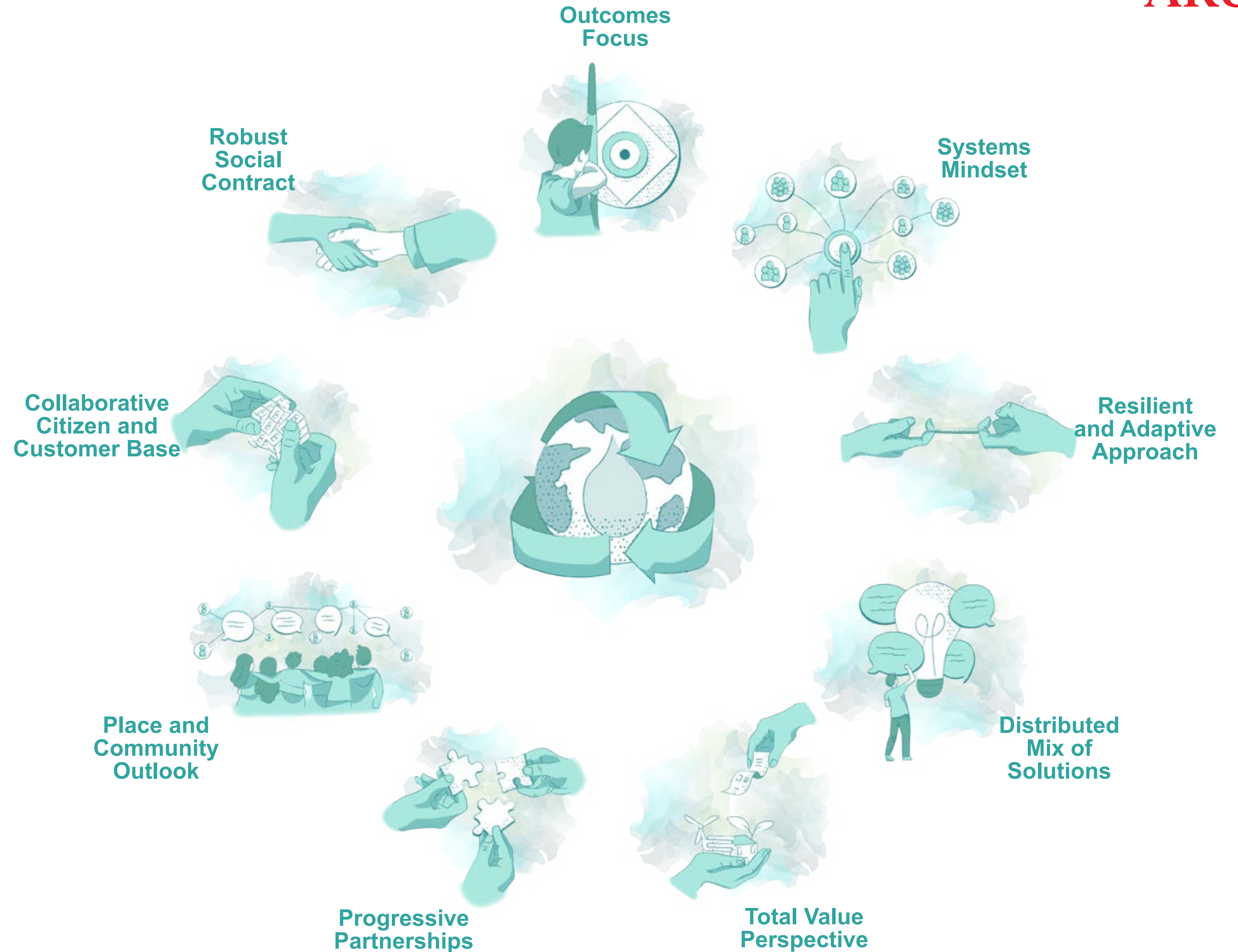
There are many different actors and organisations within the water system. We consider that what we set out in this paper is relevant to all those who interact and have influence within the water system. We all have a role to play, and we all have a responsibility to contribute towards a radically different and better future relationship with water.





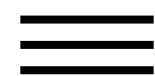
Nine characteristics of future-facing organisations

From our experiences working with public and private organisations and institutions across the globe that are on the frontline of the water crises, we have identified nine features that we deem essential for organisations to successfully help address the challenges we face. We term these the necessary characteristics of future-facing organisations.



Note

Click on any of the nine characteristics to jump directly to that section of the document.



Outcomes Focus



We need a collective focus on the common outcomes that matter to society and the environment. These outcomes transcend any individual organisation’s sphere of influence, but they should be explicitly put at the core of what organisations are looking to achieve or contribute towards.

What is it?

The approach within the water system to date has largely focussed on individual organisational outputs. Outputs are easier to measure, easier to regulate and generally more within the control of an individual organisation.

A shift towards outcomes means putting common goals for the environment and society central to what an organisation is looking to positively impact and looking at how others within the system contribute to those.

We are seeing a shift towards outcomes at a global level in response to the acute challenges presented by climate change and the biodiversity crisis. These have come in the form of a range of commitments that can guide the transition to an outcomes focussed approach. For example:

- The United Nations Sustainable Development Goals¹ (SDGs) provide a shared blueprint for peace and prosperity for people and the planet.
- The Paris Agreement² sets a legally binding international treaty on climate change to limit global warming.
- At COP15 in December 2022, 188 countries in Montreal agreed to halt and reverse the decline of nature by 2030.

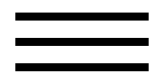
These high-level commitments are starting to be translated, often via national government policies and targets, down to the organisational level. Policies and commitments around GHG emissions and net zero are the clearest example of that to-date. Organisations are also increasingly articulating or framing their bespoke outcomes and goals against the UN’s SDGs.

In drawing the golden thread to organisational-level outcomes there will be differences that reflect the relevant local context, issues, and priorities. But there will also be common themes such as environmental protection, restoration, and regeneration; clean and healthy water bodies; social equity, health, and wellbeing.

A move from outputs to outcomes isn’t a simple matter of semantics. It is a radical change to how organisations traditionally think and act. It means deliberately moving goals outside of one’s direct sphere of influence, and therefore putting success partially in the hands of others. Whether as (local) governments, regulators, or businesses – this goes against the grain of how things have been done to-date.

¹ WHO (2022). Sustainable Development Goals. Available online: <https://www.who.int/europe/about-us/our-work/sustainable-development-goals>

² UNFCCC (N.D). What is the Paris agreement? Available online: <https://unfccc.int/process-and-meetings/the-paris-agreement/the-paris-agreement>



Why does it matter?

The prevailing, output focussed approach, even where these outputs are focussed on positive environmental or societal impact, means they tend to be considered in relative isolation from others who are contributing to the same issues. This approach is inefficient at best and counterproductive at worst if effort and investment is allocated without consideration of other's contributions within the system.

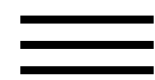
Setting sustainable outcomes means they will inevitably be common and applicable to other actors. This will necessitate identifying those who will contribute, positively or negatively, to the successful achievement of those outcomes, and then working together to make a positive difference. For example, an organisation may set 'healthy rivers' as one of their strategic outcomes. This encapsulates the operational improvements the organisation needs to make in terms of its own processes and standards. It also means identifying the other actors whose actions affect river water quality, understanding their proportional impacts and contributions, and working together to design, implement and fund the solutions that best achieve the outcome of 'healthy rivers'. This also requires the relevant government, authorities, and regulators to develop or evolve their policies and frameworks to enable this to happen.

Case Study

DC Water, USA & Wessex Water, England

DC Water and Wessex Water have both developed corporate strategies with outcomes right at the heart, pushing for a pursuit of common environmental and societal goals. These outcomes, or "imperatives" as DC Water phrases them, are designed to focus attention and efforts on those things that their customers and wider stakeholders want to see achieved beyond traditional utility outputs. These determine goals and programmes to deliver them which can be applied to different areas and levels of the business, and which drive collaborative efforts with other stakeholders, ultimately all contributing to the overall outcomes.





Systems Mindset



We need to approach the challenges from a systems perspective, recognising the interdependent components and working with the relevant other actors that have a role to play.

What is it?

Systems thinking is an approach to problem-solving and decision-making based on understanding the interconnections and interdependencies among the components of a system and the actors within it.

Rooted in centuries-old philosophy, systems thinking was coined as a term in the mid-20th century. It is widely recognised that water should be considered from a systems perspective, as illustrated through the well-established concept of integrated water resource management. Despite this recognition, the true application of a systems perspective has been limited given the complexity and scale of the water system. This is evidenced by the governance and management fragmentation within it. This also means that system thinking can be viewed negatively, as a dauntingly complex academic approach that cannot be meaningfully applied to reality on the ground. This is counterproductive, and there is a need for a pragmatic but active approach towards ensuring systems thinking is or remains central to water governance and management.

While we advocate that a systems perspective needs to be adopted, this does not mean that everybody needs to be or become a systems expert. It can mean just recognising and being mindful of some of the fundamentals that underpin systems theory and thinking, and then starting to consider what that may mean in terms of everyday actions, interactions, and decision-making.

In starting to operationalise this further, from a bottom-up perspective it can mean starting to better integrate decisions, along with the data and models that underpin them, across water and wastewater for example. From a top-down perspective there is a need to consider whether overarching governance arrangements should be re-structured according to logical and manageable system boundaries.

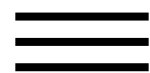
In the context of water, catchments (otherwise referred to as watersheds or river basins) or sub-catchments are widely agreed to be the suitable scale to consider and manage water within. Catchments themselves can have very different characteristics, both in terms of natural aspects of the catchment but also their communities and built environments.

Why does it matter?

The outcomes that matter, such as restoring polluted water bodies to healthy status, cannot be achieved in the absence of taking a systems perspective.

A systems thinking perspective helps to approach the problems and challenges we face in a different and a more effective way. There are some basic tenets or insights from systems theory that we can anchor to. This includes the notion that yesterday's solutions can be today's problems, and that the harder you push against the system the harder it will push back³. This comes to life for example through the devastating flooding implications of straightening or diverting waterways or rendering large areas of land impermeable to the rain that falls on it.

³ For example see Peter Senge's '11 laws of systems thinking'



Another fundamental tenet, in the context of current global water system management and governance, is the understanding that optimising a sub-component of a system does not necessarily lead to optimising the system as a whole⁴; and that it can in fact lead to detrimental impacts. This comes to life for example where we see capital and resources inefficiently or disproportionately allocated to addressing one source of water pollution, diverting resources and effort away from other contributing sources. In doing so it also means the types of arrangements needed in places to bring different actors together efficiently, effectively and at scale, such as through catchment market arrangements, can struggle to get off the ground. The result is that, overall, the outcomes we are looking for are not being achieved.

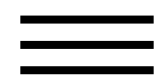
Case Study

Affordable Water Programme, New Zealand

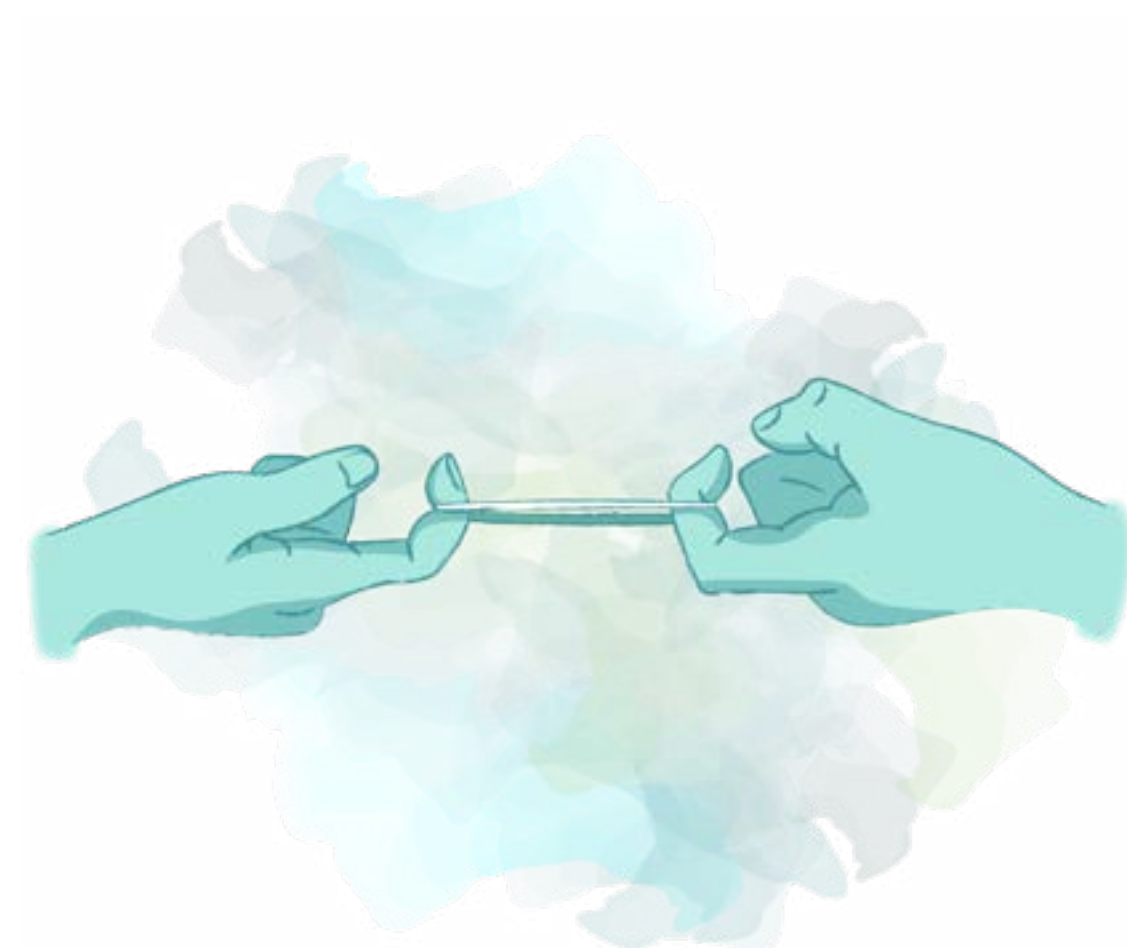
The Government of New Zealand has introduced legislation for significant reform of the water sector. As indicated by the initial ‘three waters’ name for the programme, the reform is in part intended to allow water to be managed in a more integrated way across water supply, wastewater and stormwater. Ten publicly owned entities will manage all three waters, and the newly established water quality regulator Taumata Arowai will assume responsibility for wastewater and stormwater networks, having already assumed the role of drinking water regulator.



⁴ Put forward by prominent systems theory thinker Russell L. Ackoff



Resilient and Adaptive Approach



We need to take an adaptive approach to planning and investing, in preparation for and response to continually changing conditions and to achieve resilience in the face of unprecedented volatility and uncertainty.

What is it?

The core premise of being resilient is the ability to cope with and recover from disruption, as well as the ability to anticipate and mitigate against future challenges and threats.

Increasingly this also means the need to be highly adaptive, given the extreme volatility and uncertainty of the circumstances we are living in and operating under. It necessitates being able to respond quickly and effectively to new information and changing conditions which can present challenges as well as opportunities.

This will involve scenario planning, recognising the critical factors and trends that may significantly impact the future, such as climate-related developments, geopolitical shifts, socio-economic conditions, and technological advancements. These are used to create a set of diverse and plausible future scenarios, against which adaptive plans need to be developed such that outcomes can be achieved irrespective of the future that will unfold.

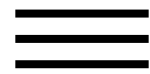
Increasingly this also involves the use of adaptive pathway planning. Originated within the context of long-term tidal flood risk management, the application of adaptive pathway planning is expanding and being incorporated within water management strategies more broadly. It means identifying a set of potential future investment and activity pathways that may need to be triggered depending on how circumstances evolve, and avoiding the locking in of solutions now that may become redundant or obsolete in future. It is underpinned by an iterative process of monitoring, evaluating and adjusting as the reality of future trends becomes apparent and the most appropriate pathways to respond can be chosen.

Why does it matter?

Traditional planning methods often assumed a largely stable and predictable future. That is not what we are faced with now. We need to acknowledge and assume inherent volatility and uncertainty and be adaptive in our planning to ensure the resilience we need in the face of a multitude of shocks and stresses.

Climate change, amongst other trends, is altering our understanding of what is normal. We cannot predict accurately enough, or far enough into the future, to confidently design solutions to last the test of time without the risk of these being severely overdesigned at best.

The changes that are occurring mean that we increasingly recognise that many trusted solutions from the past are now unsuitable, obsolete, or redundant. In some instances, we now understand that these solutions are actually causing more harm than good. We need to plan differently into the future, including through a sharper focus on identifying what should be no or low regret solutions now. We also need to consider the way our organisations, partnerships and communities are set up to promote resilience and adaptivity to future challenges, with a growing emphasis on the social dimensions and the need to build resilience that is equitable and inclusive.



Case Study

Yarra Valley Water, Australia

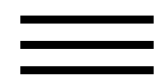
Yarra Valley Water is responsible for providing water services to 1.8 million people in Melbourne and must safeguard their services in the face of an uncertain climate future. Potential impacts include infrastructure degradation, risk to the supply and quality of water, and the reduced health of waterways.

Yarra Valley Water developed a climate resilience plan addressing the critical risks and vulnerabilities posed by climate change. This involved identifying key risks across the business related to water supply, sewerage, and energy, and defining actions to mitigate them.

The actions to address the identified risks fell into three areas: enhancing adaptive planning, reducing service vulnerabilities, and fostering collaborative partnerships. These risks and actions are being regularly monitored and reviewed to assess success and if they need updating.

Image © iStock





Distributed Mix of Solutions



We need to move away from a principal reliance on traditional ‘grey’ assets towards far greater use of catchment and nature-based solutions alongside deep behavioural changes. This goes hand in hand with a move towards a more distributed mix of solutions.

What is it?

Traditional engineered asset solutions have largely served us well to-date. They have provided huge public benefit through the provision of flood protection, water supply and wastewater treatment services, and they will continue to have an important role to play.

At the same time there is growing recognition that catchment and nature-based solutions, in essence restoring and extending nature’s capacity to absorb, store and treat water and waste, can help provide these services while bringing a host of wider benefits to society and the environment and increasing the resilience of the system.

Sustained behavioural changes will also have a major role to play in that they can limit or avoid the need for any asset interventions in the first place, whether they are grey, green or blue.

Broadening out towards a hybrid set of solutions and interventions also means that these will need to be provided by a broader range of stakeholders. Traditional water infrastructure has generally been delivered by local government or utilities. Catchment and nature-based solutions will engage different parties both in rural and urban settings, from agricultural communities and landowners to sports clubs and schools. Individual behaviour changes bring active solutions from those who have traditionally been seen as merely passive recipients of services.

In contexts where water infrastructure is highly networked and largely centralised, this also means moving towards a more distributed set of solutions. This will see a broader range of water management services and solutions in place across utility networks, communities, and homes, drawing a parallel with the energy sector where there is also a move towards a more distributed and decentralised system.

Why does it matter?

The benefits of catchment and nature-based solutions are increasingly well-evidenced, and in the context of upstream water quality management, such as through peatland restoration, their use has been long-standing. In a wider water management context, we also see catchment and nature-based solutions increasingly considered or implemented. These solutions can go beyond mitigating the impacts of the challenges we face, having a regenerative effect by increasing biodiversity, rebuilding habitats, and improving the health of our environment. For example, wetlands can provide effective capture and treatment of many nutrients as well as providing other benefits such as biodiversity or carbon sequestration. Sustainable Urban Drainage systems (SUDs) can capture and store rainfall before it causes problems of inundation or picks up too many contaminants, with the added benefit of increasing areas for nature and biodiversity in our urban landscapes, providing natural treatment and recharge of the water table and helping to regulate the temperature of our cities.



Depending on the type and scale, positive benefits of catchment and nature-based solutions can include greater social and environmental impact, cost savings, and speed of implementation. A more distributed set of solutions and interventions can also bring benefits of system resilience and flexibility. Behaviour changes matter because the challenges we face cannot and should not be met on the supply side alone. While new technologies continue to emerge, and capabilities continue to develop in support of grey and blue-green infrastructure, the complexity, scale, and associated cost at a minimum necessitate the need to put the demand side central to the solutions.

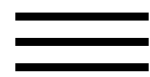
Case Study

Peru Reconstruction, Peru

Following the devastating loss of lives and livelihoods during the El Niño climate cycle in 2017, the UK Department for International Trade signed a government-to-government agreement in June 2020 with the Government of Peru to help accelerate the reconstruction of vital schools, health facilities and flood protection.

To protect communities against future extreme weather, 17 river basins, five gullies and seven drainage systems across seven regions were improved with a variety of sustainable solutions. This not only includes construction of traditional flood prevention measures but also utilising natural earthworks, reforestation, and tree planting (56 million seedlings) to help mitigate landslides and erosion as well as creating green spaces for wildlife, farming, and communities. This was combined with the implementation of a national early warning system and a specialist knowledge transfer scheme to upskill the key professionals so they can continue to deliver critical infrastructure independently and sustainably.





Total Value Perspective



We need to account for the total value and impact of our decisions to support the implementation of different solutions and to enable the right partnerships.

What is it?

Total value is the principle of recognising, understanding and quantifying the full value and impact of our decisions. This is typically achieved using a ‘multi-capital approach’ where value is attributed to ‘capitals’ beyond financial and manufactured to those such as natural, social, human, and intellectual. It is a move away from traditional and conventional Cost-Benefit Analysis approaches which typically take defined categories of financial and economic benefit into account and do not capture broader social, environmental or ethical considerations. It may not fully account for social equity, environmental justice, cultural values, or other non-market aspects that stakeholders may find important.

Globally, there has been a push for more corporate level reporting on matters beyond financial results. We are seeing this through initiatives such as the Task Force for Climate Related Financial Disclosures⁵, the European Parliament’s Corporate Sustainability Reporting Directive⁶,

and other similar schemes. The need to better balance value creation for different stakeholders has also been increasingly recognised and leading intergovernmental institutions have been concentrating efforts to create the right environment to accelerate this shift. The UN SEEA and the EU taxonomy for sustainable activities are both good examples. In the UK, a major review of the Green Book took place in 2020 to improve the way public policies and investments are evaluated. It has introduced updates including the assessment of natural capital and vulnerability to climate.

At an organisational level, progress is being made with multi-capital decision-making frameworks becoming more prevalent across the water sector in recent years. They are yet to be scaled up across the system, with few organisations fully capable of implementing a total value approach beyond reporting and across all investment decision making processes. When fully implemented, total value assessments provide objective comparisons of investment options across business areas drawing on common valuation criteria and metrics to support and enhance decision making.

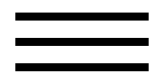
Why does it matter?

Globally, huge investments are being made every year in interventions and new or upgraded infrastructure to respond to water-related challenges. This money needs to be spent wisely, to ensure the investments yield the best possible outcomes. Traditional decision-making processes aren’t up to this challenge, and a systemic change is required to ensure that capital is successfully deployed to adequately respond to the major stresses the world is facing.

A total value perspective essentially underpins our ability to implement a more appropriate response to the unprecedented social and environmental challenges we are facing. Total value based decision making, which incorporates a range of impacts that truly reflect the environmental and social outcomes we are aspiring for, is the only way we can bring forward new and different solutions and enable partnership with a wider range of stakeholders across design, delivery and funding or financing.

⁵ Task Force on Climate-Related Financial Disclosures | TCFD) (fsb-tcfd.org)

⁶ Corporate sustainability reporting (europa.eu)

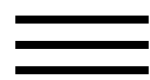


Case Study

Mansfield, UK

Severn Trent Water was allowed £76 million for work in Mansfield that demonstrates the effectiveness of stormwater management through blue-green infrastructure. The project is implementing a network of solutions across the catchment. The nature-based solutions include permeable paving, rain gardens, large detention basins, smaller bioswales and tree pits. This is the largest project of its kind attempted in the UK. The completed scheme will be able to store over 58 million litres of surface water, reducing flood risk for 90,000 people, while providing co-benefits like improved biodiversity, air and water quality, and an increase in green spaces in urban areas. Severn Trent expect this project will act as a “blueprint” for how flooding is managed in the future by capturing the costs and benefits of nature-based solutions beyond flood resilience.





Progressive Partnerships



We need new partnerships and partnership models to design, deliver and fund new and different solutions. This includes the need to support catchment-level partnerships and to consider high integrity markets as an efficient and effective way of bringing parties together.

What is it?

A shift towards a focus on common outcomes and towards different ways of working, means the formation of new and different partnerships, often between actors that have not traditionally worked together. It needs to increasingly bring together public bodies, private organisations, the third sector, community groups, and individuals, all closely working together towards common goals.

It will also mean actors working together where they may in the past have actively chosen to remain at a greater distance from each other. For example, this could mean environmental non-governmental organisations, who have focused on advocacy,

engaging more closely with the private sector where there is a genuine desire to achieve positive impact towards common goals. Similarly, individuals could be encouraged and incentivised to actively adopt different practices and behaviours in terms of using water.

New partnerships will inherently drive a more inclusive and participatory approach to water management. It will engage and involve a wider and more diverse range of stakeholders, resulting in more representative decision-making.

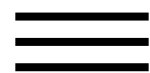
This necessitates the ability to put these new and different partnerships on a sustainable footing, including where relevant through market-based mechanisms, and to have the institutional arrangements in place to support this.

Why does it matter?

Currently, many actors across the water system still tend to work within their own spheres of influence, managing their own priorities in relative isolation from others. Achieving common outcomes is impossible without true partnership working with others that impact on the system.

In many places formal or informal partnerships have already formed at a local level to enable systems-focused collaboration. However, there is a long way to go towards collaboration and partnerships being fully established as a standard approach.

Institutional arrangements can stand in the way, in part because they were not designed to operationalise water management at catchment level and therefore often counterproductively disaggregate the system. While there won't be a magic blueprint given that each catchment is different, it is becoming clear that there might be a need for a replicable approach if these catchment-level partnerships are to be scaled up and operate with maximum impact. This includes consideration of how partnerships can best be governed to collaborate, how public money for public good can be co-invested with private money for private benefit, how benefits and risks are measured and shared, and how we value and account for natural assets and services.



The need to further consider the role for market approaches is also grounded in the fact that water is a system, and that there are multiple actors who affect it, many of whom aren't traditionally engaged. They could contribute to the necessary solutions if provided with the right incentives and through the unlocking of mutual benefits. While the concept of markets in a water context isn't new, it is gaining prominence especially in the context of nutrient pollution management. It is also not without controversy, and it is therefore essential that any market is well-designed such that it serves sustainable and equitable water management while being economically efficient and providing legal certainty, and without unduly cutting across 'polluter pays' principles. Markets are a means to an end, and while there will be a limit to the role they can play, they merit being recognised and considered as an effective and efficient way of enabling new partnerships.

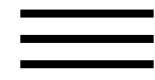
Case Study

Thames Water Smarter Water Catchments, England

Thames Water is piloting a new partnership-led catchment management model, initially in three catchments, to build better functioning river catchments. This new method of managing water within the catchment system requires working closely with a multitude of partners (local river associations, river trusts, local community groups) and those who contribute to river health to enable environmental improvement and cost-effective delivery. By working in partnership, targeted and integrated catchment interventions can be unlocked and rolled out. By drawing on the collective understanding of all partners and their expertise across various specialisms, robust joint plans for the future can be developed and realised.

Image © Thames Water





Place and Community Outlook



We need innovative, resilient solutions to be grounded in the characteristics, needs and priorities of local places and communities, and to be delivered with and through these communities. They provide the bridge from the national and catchment level to the individual citizens and customers.

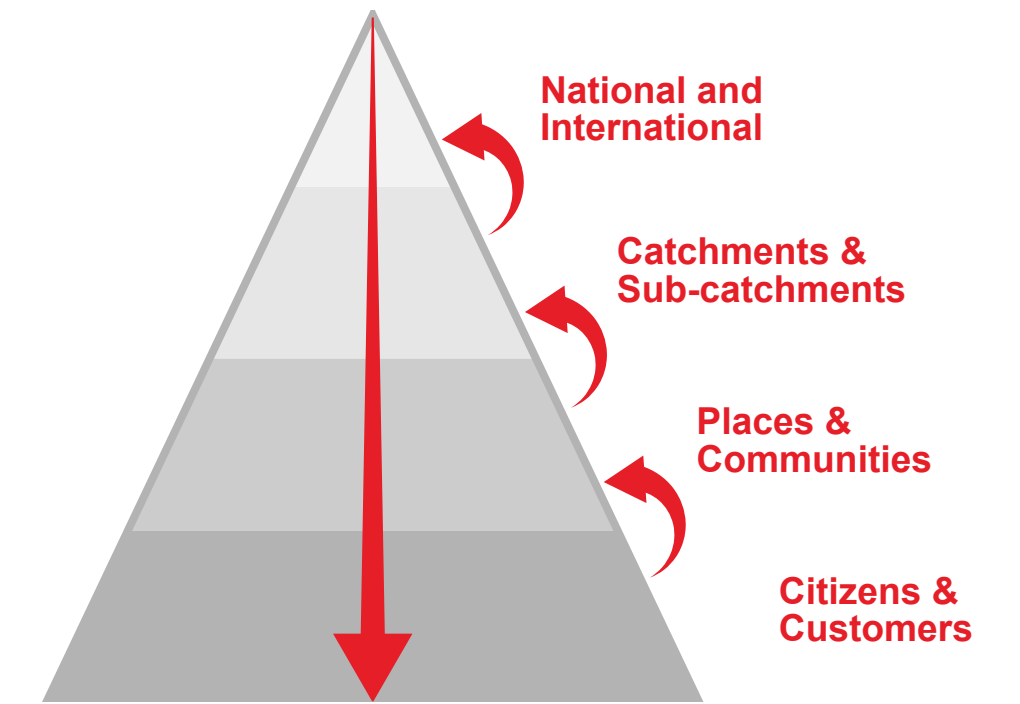
What is it?

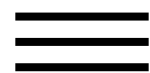
Place-based planning is a collaborative and community-driven approach that closely considers the local context and its unique characteristics. It seeks to reflect the priorities, needs, and values of local communities by identifying the most appropriate solutions to address the challenges faced. It leverages the contributions of the community in delivering solutions at a local scale that are increasingly seen to be instrumental to achieving positive outcomes, for example in the energy sector context of achieving net zero targets. In turn it influences individual behaviours that will equally be important in forming part of the solutions. In that sense place-based and community-focused planning forms the bridge between individual people and the larger-scale levels of water management and governance.

In many parts of the world, a place and community-based approach also increasingly means looking to understand and apply indigenous perspectives on water and water governance and decision-making. Indigenous water governance is based on a deep understanding and respect for the natural world and a connection to place, on the inter-connectiveness of things, and on consensus-based decision-making. This approach can help drive a more inclusive and equitable process and support a systems-oriented approach.

Why does it matter?

We cannot look at the water system at a catchment scale without considering the places and communities that are the fabric of that system. Place-based and community-focused planning will support the wider distribution of solutions where this is necessary and feasible, which can further reinforce the resilience and adaptiveness of the system.





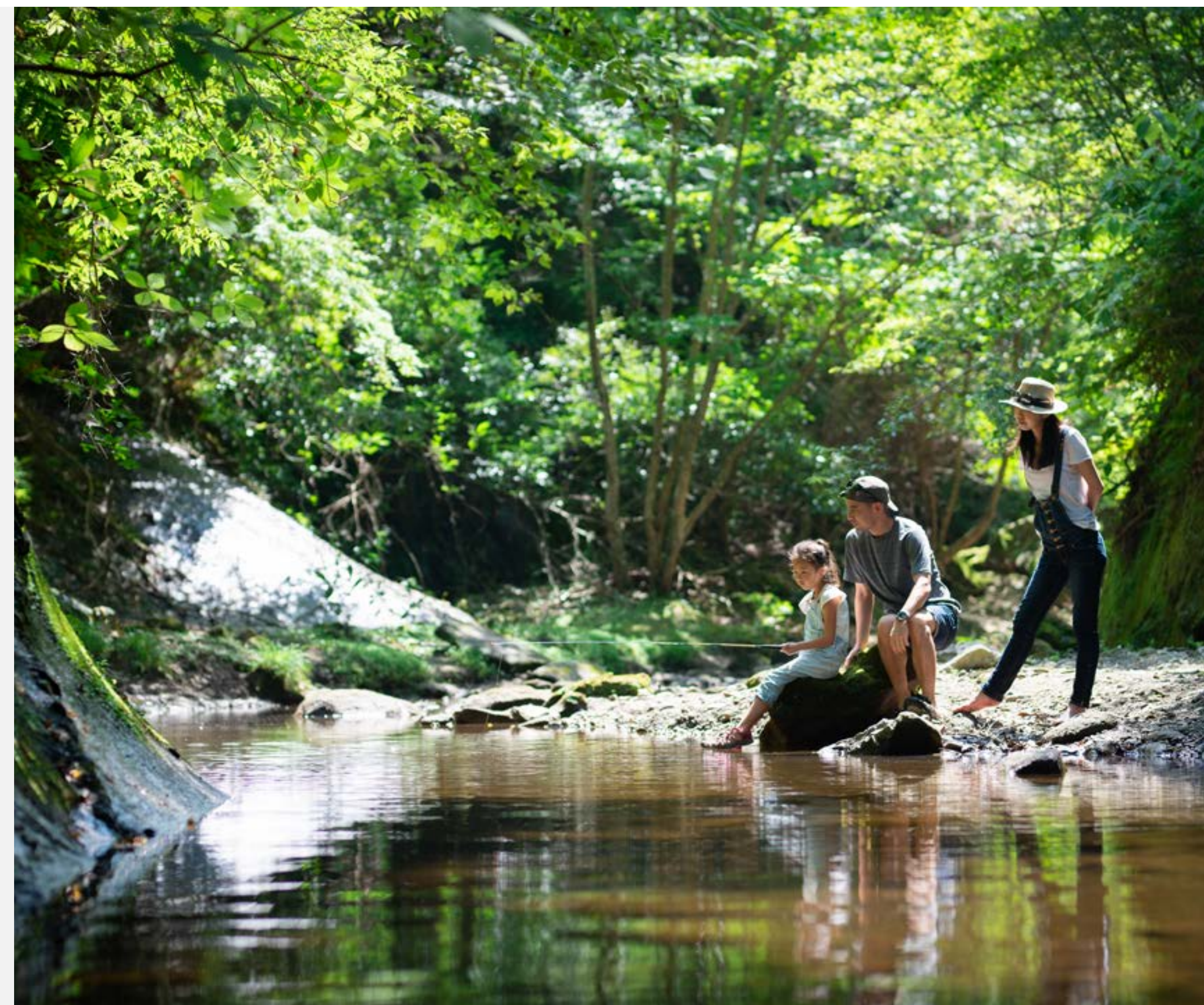
In light of the need for greater adoption of both catchment and nature-based solutions, and behavioural changes, the sector will inevitably rely more on local communities, as well as individuals, to contribute. This will only be possible through active engagement with and involvement in the decision-making processes. This needs to consider the different aspects of a community, including its natural environment, built environment, economic opportunities, and social infrastructure.

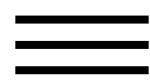
For example, it is increasingly recognised that many urban areas have become too impermeable, with their ‘sponginess’ or ability to absorb and retain water too low⁷. The solutions to this cannot remain in the sphere of centralised works with large distribution networks, where we attempt to capture all the stormwater in pipes and tunnels to convey it downstream – with further grey ‘end-of-pipe’ assets that deal with necessary storage or treatment. Part of the answer lies in radically scaling up local and largely catchment and nature-based solutions that can be extremely effective in managing flood water. This can also bring significant wider benefits across biodiversity, carbon reduction and social amenity, as well as the replenishment of aquifers where the rain falls in the first place.

⁷ <https://www.arup.com/perspectives/publications/research/section/global-sponge-cities-snapshot>

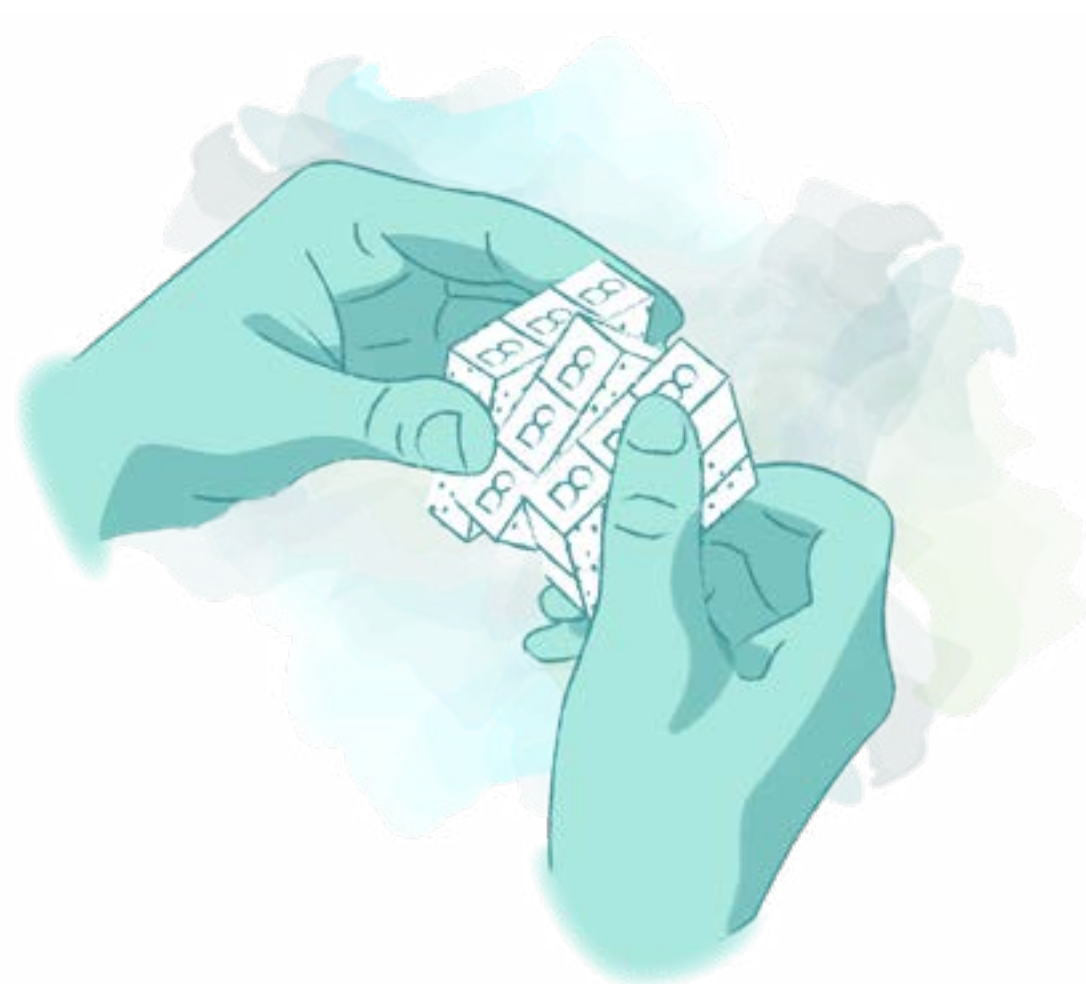
Case Study

Communities across the globe are getting increasingly active and vocal around how local water bodies are managed and protected. One manifestation of the power of place- and community-driven initiatives can be seen in the Rights of Rivers movement, which has experienced significant growth in recent years. While the attribution of legal rights or personhood to rivers takes different forms across different legal systems, all cases in part respond to environmental concerns and in recognition of the intrinsic value of rivers as living entities deserving of protection. The movement has gained traction globally, with communities, indigenous groups, and environmental organisations advocating for the rights of rivers through legal frameworks and initiatives. Landmark cases in multiple countries in North and South America, Europe and Australasia have generated a momentum of effort, focused on safeguarding the ecological integrity and well-being of rivers worldwide.





Collaborative Citizen and Customer Base



We need the actions and behaviours of individual citizens and customers, who are part of the system, to form part of the solutions. These can be relatively small in isolation but will aggregate to large scale positive impact.

What is it?

In parts of the world where people are served by water and wastewater infrastructure, many don't see themselves as active participants within the water system. People can be relatively passive recipients of services, which are provided using centralised and asset-heavy operations and are not intended to be dependent on active engagement and participation by end-users. As a result, people often do not see their actions as fundamentally impacting the system, either as causing any problems, with the consequences externalised, or as helping to address the challenges.

However, in many places it is increasingly clear that in the absence of behavioural change at an individual level, we will not be able to meet the challenges we face. This applies to issues surrounding water availability and drought, with changing consumption behaviours required to redress the supply-demand balance. It applies to pollution, with changing behaviours required in terms of what gets flushed down drains and disposed of into our waters. It also applies to flooding, for example with the need to avoid or remove impermeable surfaces around homes or to capture or slow rainwater through water butts or green roofs.

With this comes the emergence of new and innovative ideas that encourage, enable, or incentivise people to act differently. This has built on a foundation of awareness and educational campaigns and – in places – is moving towards more complex behavioural nudge and social norming approaches and increasing sophistication through the use of tariff, rebate or other financial incentives (often underpinned by increasingly smart technology).

Citizen science represents another area of customer and citizen participation and engagement that is increasingly in focus. As a collaborative approach where members of the public assist with collecting data, analysing findings, and generating new knowledge, this in essence represents an area of hugely untapped capacity that can be harnessed.

At an individual level, as at a place and community level, it also means people increasingly being able to directly inform planning and policy. Digital technologies are radically transforming the ability of citizens to participate, in essence taking the citizen's jury concept to a potentially far more representative scale.

Why does it matter?

The aggregation at scale of individual behaviour changes provides a means to significantly help address the issues we face across water, wastewater, and stormwater. It can be seen as inherent, latent capacity and potential that can be more resilient, sustainable, and cost-effective than supply-side solutions.



In terms of citizen science, its incorporation into decision-making processes is complex and the challenges of doing so are not to be underestimated. Over time, however, these can be outweighed by the benefits in terms of the ability to gather vast amounts of data and through the process creating a virtuous cycle of engagement and improving scientific literacy. This level of engagement also helps develop, and relies upon, mutual understanding between actors and supports the need for a robust social contract between organisations and citizens.

In terms of citizens participating in policy and planning, this matters in that it can support legitimacy and buy-in for decisions.

Most fundamentally, all of this is about changing how we view and value water, which is needed to achieve sustained behaviour change. In many parts of the world, especially where there is strong provision of water-related services, we have lost sight of the inherent value of water across multiple dimensions beyond pure utility value.

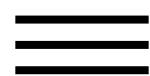
Case Study

Day Zero, South Africa

Between 2015 and 2018, Cape Town endured three years of ‘one-in-400 year’ drought. This had significant impacts on businesses, residents and the environment, and took the city of around 4.6 million residents to the brink of ‘Day zero’, the point at which Cape Town would run out of drinking water.

To avoid Day Zero, citizen engagement and participation was critical to manage dwindling reserves. The people in Cape Town had to respond to the crisis by curtailing consumption by more than 50% compared to pre-drought levels. Along with boosting supply where possible, authorities relied on encouraging individuals to drastically reduce their water consumption via a large-scale public awareness campaign, roll-out of water saving devices, enforcement of consumption limits and an increase in water tariffs for overconsumption. The aggregated impact of people changing their behaviour was a critical contributor to avoiding Day Zero.





Robust Social Contract



We need strong social contracts for citizens and customers to be willing to engage, participate and contribute, and to change their behaviours in response to an ask by institutions or organisations – public or private.

What is it?

Originally coined as a term in 1762 by the French philosopher Jean-Jacques Rousseau, a social contract is a concept that describes the implicit agreement between individuals and their government or society. Towards the end of the 20th century, it was extended to companies and businesses, in response to the growing awareness of the social and environmental impacts of business activities, and the growing recognition that companies had responsibilities beyond maximizing profits for shareholders. In the context of companies and businesses, it can also be referred to as a licence to operate.

A social contract is a complex and dynamic concept that is shaped by historical, cultural, and political factors. As a result, the components of a social contract and the interpretation of its meaning and reach inevitably vary depending on context. However, generally it is seen to include the notions of mutual obligations and shared responsibility, consent, reciprocity, the protection of rights, specifically by governments, and accountability.

Why does it matter?

In the context of water, the strength of the social contract is increasingly important as citizens and customers need to, and are asked to, actively change their behaviours and contribute to the solutions in the face of the challenges we face.

There are two key aspects to this. Firstly, as noted above, there is a need to raise awareness and understanding that everyone has a role to play, everyone is part of the water system and that it is affected and impacted through individual actions and behaviours. In other words, that there is a shared responsibility, and that it cannot be left to institutions and organisations alone. Secondly, there will be an inevitable and detrimental limit to this if those organisations and institutions that are seen by the public as being responsible overall for managing and governing the water system are not trusted, or not seen to be playing their part in the context of shared responsibility.

Across the globe there are examples where the trust of citizens or customers is low, if they consider that their national or local government, water board or utility are mismanaged, poorly governed, not performing as needed, or not sufficiently accountable or transparent. This can be apparent in contexts where communities and citizens face limited or poor provision of essential water-related services. Equally it can be where service provision is stronger, but where other aspects of organisational or institutional behaviour undermine trust.

The present-day media culture can also make it more difficult to establish evidence-based consensus around important issues. Oftentimes deliberate misinformation, polarisation, and divisiveness can further erode trust in institutions. If people are largely exposed to information and viewpoints that reinforce existing standpoints and beliefs, this can lead to a lack of understanding and empathy between different groups. This makes it more difficult to find common ground and work towards shared goals.

This makes a robust social contract all the more important. It is what is needed to make progress towards common outcomes, with all parties playing their role, from government and businesses to communities and individuals.



Case Study

The Water Report, United Kingdom

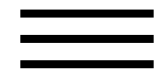
In the UK, the independent magazine The Water Report and Indepen have been leading the conversation around a damaged social contract between water companies and their customers in the context of rapidly deteriorating public perception of the sector. Recognising the need for improved performance by the sector, there is also a growing realisation that the lack of trust in the sector is counterproductive. It stands in the way of large-scale collective and collaborative action that involves customers and citizens playing their part through changing the way they interact with water.





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Where next?

This paper is intended to bring together, in a coherent and structured way, many of the topics and perspectives that organisations across the water sector are exploring as they look to contribute and move towards a better and more sustainable future.

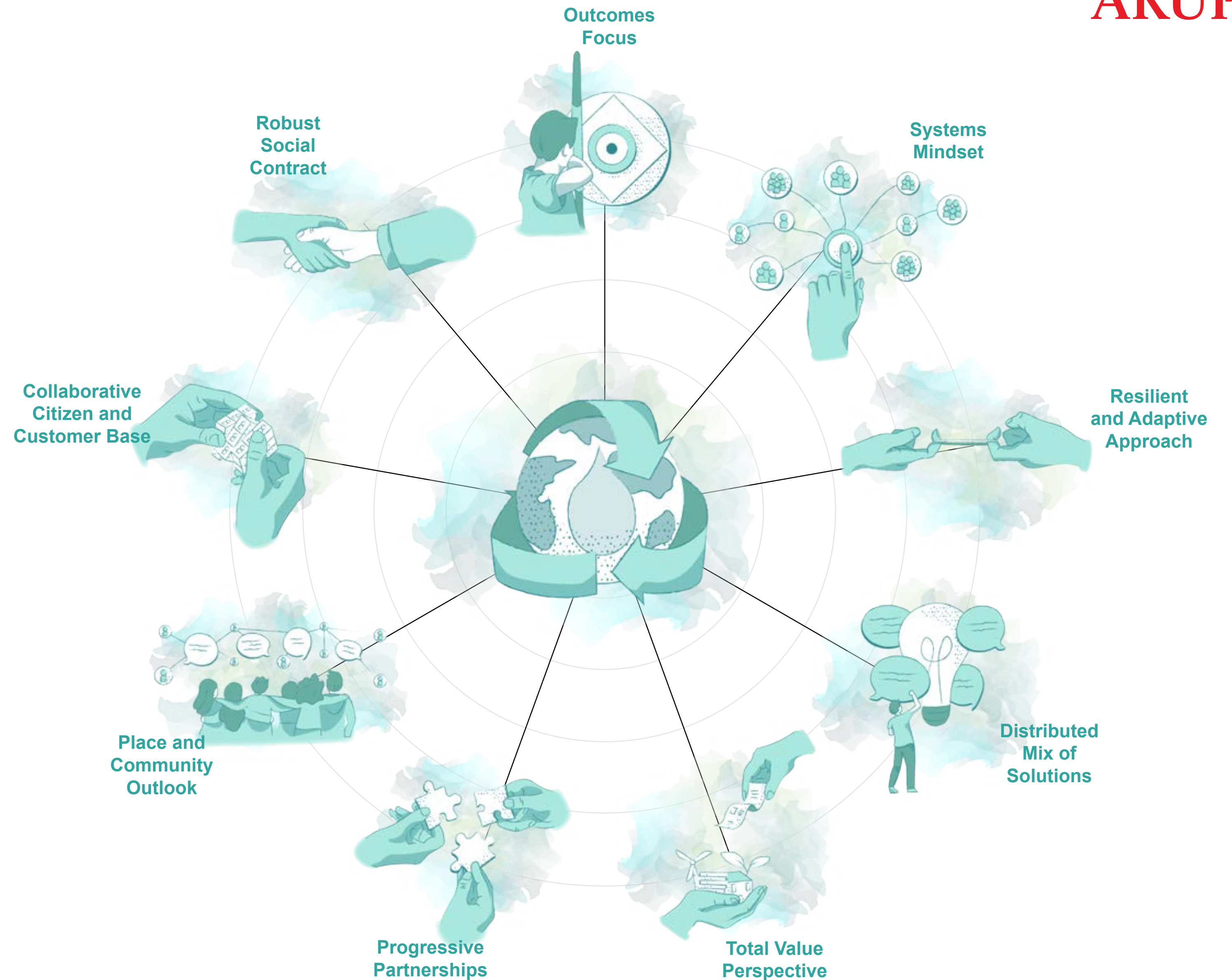
We hope it can therefore serve as a frame of reference for organisations, public and private, as they consider their role and responsibilities and determine their strategy, focus and actions going forward.

One practical way of applying the thinking in this paper is to consider how mature any organisation is across the nine characteristics we set out. Where are the strengths, and where are there gaps? Where are there opportunities for quick progress, and where is there a journey to be taken? Where can organisations influence and support each other in this?

We have set out the ‘what’ in this paper; next is the ‘how’. Where that leads will differ across organisations. Change may be needed in terms of strategy and governance, or organisation design and operating model, or in the application of digital and technology. It could initiate a move towards wholesale cultural change.

We welcome thoughts and feedback on what we have set out in this paper, and we are keen to collaborate with others to develop these concepts further. If you would like to discuss, please get in touch.

For those wishing to do a quick, initial maturity assessment exercise, we provide a spider diagram overleaf.





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Further materials that could be of interest

[Terrain land use tool](#)

[Sea level rise insights tool](#)

[Global Sponge Cities Snapshot](#)

[Design with Water 2.0](#)

[City Water Resilience Approach](#)

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