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Understanding Six Water Leadership Roles: A Framework to Help Build Leadership Capacity

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This paper describes six leadership roles that often feature in processes of change that drive more sustainable forms of water management in developed and developing countries. These are referred to as the champion leader, enabling leader, cross-boundary team leader, thought leader, strategic leader and trusted advisor roles. The paper also highlights some of the key leader competencies (e.g., skills) and leadership strategies (e.g., behaviours) associated with these roles. Understanding these roles can help to build the leadership ability of emerging water leaders and therefore the capacity of the water sector to drive change. It helps to 'cut through the complexity' of leadership development by providing a practical framework to identify which leadership roles are most relevant to a developing leader, and therefore the types of knowledge, skills, leadership models, case studies and leadership strategies to include in tailored leadership development activities. It also helps to identify which roles an emerging water leader is most suited to, and provides a framework to help analyse how people in different leadership roles typically work together to drive major processes of influence in the water sector. This framework is now being used to inform the design of water leadership development programmes around the world.

***Keywords**: Capacity building; change; influence; leadership; leadership development; water leadership.*

1 - Introduction

1.1. The need for greater leadership capacity in the water sector

The scope and magnitude of the challenges facing water practitioners around the world are profound, especially in developing countries. The United Nations (UN WWAP 2014 and 2015) estimates that 3.5 billion people have inadequate access to safe drinking water and a further 2.5 billion people currently have inadequate sanitation. By 2050, global water demand is expected to increase

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by 55%, driven by factors such as population growth, changing patterns in rainfall and runoff, industrialisation, urbanisation and the use of water-intensive methods of generating energy. This is predicted to place 40% of the global population under severe water stress by 2050. The poorest people are likely to be most adversely affected.

Such water challenges have as much capacity to adversely impact the health and prosperity of people living in urban areas as those in non-urban areas. They also represent a significant threat to the health of ecosystems that are sensitive to changes in hydrology and water quality. Put simply, "water resources, and the range of services they provide, underpin poverty reduction, economic growth and environmental sustainability" (UN WWAP 2015, p. 2).

To illustrate the magnitude of global water challenges, consider the driver of urbanisation. Urbanisation is expected to result in an additional 2.5 billion people living in urban areas by 2050, an increase of 66% on current levels (UN DESA 2014). Such growth will increase the pressure on urban water management systems that are already struggling to service the needs of urban communities (see ADB and APWF 2013; UN DESA 2014). In this context, the United Nations has concluded that "managing urban areas has become one of the most important development challenges of the twenty-first century. Our success or failure in building sustainable cities will be a major factor in the success of the post-2015 UN development agenda" (UN 2014, p1).

In the twenty-first century, water practitioners also need to address substantial risks. For example, the World Economic Forum (2015) has rated "water crises" as the most significant global risk in terms of "impact" and in the top eight risks in terms of "likelihood." The level of this risk has been increasing over the last decade.

Given this context, many water practitioners now recognize the need to be change agents, as adopting a "business as usual" mindset will simply not meet the challenges facing the water sector in the twenty-first century. Examples of significant change initiatives in the water sector include efforts to advance more integrated forms of river basin management (see Te Boekhorst et al. 2010; Subijanto et al. 2013), "water sensitive cities" in urban areas (see Cooperative Research Centre for Water Sensitive Cities 2014; Mukheibir et al. 2014), and greater water security (see Ait-Kadi and Lincklaen Arriëns 2012; ADB and APWF 2013).

In this change-focused environment, the water sector requires leadership capacity to complement existing technical and management capacity. As Kotter (2006, p. 14) emphasised, "producing change is about 80% leadership … and 20% management." Awareness of the importance of leadership capacity to initiate and steer change is in part being driven by findings from case studies from the water sector (e.g., Herrick and Pratt 2012; Meijerink and Huitema 2010; Taylor 2011) and the broader literature involving policy innovation and change, environmental leadership, change agents and champions of innovation (e.g., Dunphy et al. 2007; Howell et al. 2005; Kingdon 1995; Mintrom and Norman 2009).

In addition to the general need for greater leadership capacity, the abundance of complex challenges (also known as "wicked problems") in the water sector requires leadership to come from many sources and not just from positions of authority such as

executive and political roles (see Carson et al. 2007; Conger 1993). Gordon and Berry (2006, p. 90) emphasised this important point, stating that "… complex problems and rapidly changing solutions require more leadership from everyone ... Leadership skills that were appropriate to the few are now necessities for the many."

Researchers exploring barriers to change and keys to successful change in the water sector have identified many factors (Brown and Farrelly 2009; Lloyd et al. 2002; Mukheibir et al. 2014). The most frequently cited factors relate to leadership (e.g., the lack of a shared vision, coordination of efforts and political will). In this paper, we define "leadership" as a *process of influence* that accomplishes three outcomes: direction - a shared understanding of common goals and strategy; alignment the joint coordination of resources and activities; and commitment - a commitment to collective success (Drath et al. 2008; Ernst and Chrobot-Mason 2011). Using this definition, leadership is seen as a group-based process, typically involving several people and organisations. Water leadership case studies commonly highlight a number of people contributing to the leadership process ('leaders'), who play different roles, share a vision for change, and work in a coordinated, cooperative manner (e.g., Brown and Clarke 2007).

As more research is published on the nature of leaders driving change in the water sector, it has become clear that there are a number of distinct leadership roles that are common and significant. In addition, there is growing evidence that some of these roles share similar features regardless of where they are played around the world. For example, as part of an impressive research project involving 16 case studies from developing and developed countries, Meijerink and Huitema (2010) identified a set of leadership strategies that champion-type leaders commonly employed when they successfully influenced water policy. In short, our knowledge is growing as to what it takes to be a successful leader in the water sector.

1.2. Efforts to build leadership capacity

Broad acceptance of the need to drive substantial change in the water sector and the importance of leadership in this process has led to calls for increased efforts to build leadership capacity. For example, at the fourth Delft Symposium on Water Sector Capacity Development, there was a call for 1,000 water leaders to be developed in Africa and Asia (Lincklaen Arriëns and Wehn de Montalvo 2013).

Subsequently, tailored leadership development programmes and short courses for water leaders are now emerging. For example, in Asia the International Water Centre (IWC) in Australia has been running a nine-month Water Leadership Program for emerging water leaders every year since 2011, and has now worked intensively with 91 water leaders from seven countries. This Centre also delivers tailored water leadership short courses and 'master classes' for approximately 70 water practitioners every year from a wide range of developed and developing countries. The Peter Cullen Trust's Science to Policy Leadership Program also operates in Australia, and focuses on helping water scientists to influence policy and politicians. A new International Water Leadership Programme (IWLP) is also being built by the UNESCO Institute for

Water Education (UNESCO-IHE), the IWC and Nyenrode Business University in the Netherlands to help emerging water leaders from developing countries. UNESCO-IHE also runs water leadership short courses for masters students from developing countries.

All of the previously mentioned leadership programmes, short courses and master classes focus on 'emerging leaders' rather than leaders at the executive or political level. Typically, these emerging leaders are responsible for leading challenging, cross-boundary project teams, are team leaders (i.e., have direct reports), or are mid-career leaders who are preparing for senior professional or executive roles. They are targeted, as they typically have enough time to attend a comprehensive programme; they have many years left in their careers to apply new knowledge and skills; and are not yet 'set in their ways' (see Adair 2005). This focus also reflects a new paradigm where "leadership is no longer seen as limited to the domain of executives" (Lincklaen Arriëns and Wehn de Montalvo 2013, p. 20) and the concept of leadership is not confused with authority (Flower 1995).

The process of delivering tailored leadership programmes and short courses to water leaders from different countries is a cyclical process of learning and adaptive management. Typically, each programme generates new knowledge about the nature of water leadership in different contexts, such as the relevance of different leadership roles, and keys to successfully playing these roles. Knowledge gained from this process has helped the authors to identify six important leadership roles, and build confidence that they are relevant to water practitioners around the world.

1.3. The contribution of this paper

This paper provides a practical tool (i.e., a framework describing the nature of six common water leadership roles as well as the leader competencies and leadership strategies/behaviours typically associated with them) that can be used to inform the design and content of tailored water leadership development interventions such as leadership development programmes, short courses, training programs and coaching conversations. It can also be used directly by developing leaders to reflect on the leadership roles they want to play, which ones suit their nature, the abilities they need to perform well in these roles, and the leadership strategies they will probably need to apply.

More specifically, the paper describes six leadership roles that are commonly seen in the water sector and often feature in successful case studies of positive change in both developed and developing countries. As such, the *key message of this paper* is that people seeking to develop water leaders (including themselves) should be aware of the nature of these leadership roles, identify those that are most relevant to these developing leaders, and build leadership development interventions and materials that focus on helping these leaders to excel in these roles.

The paper begins by describing how the six leadership roles have been identified and how they are being used in the context of leadership development activities. It then communicates some of the key leader competencies and leadership strategies

(i.e. key behaviours) that water leaders typically need to perform well in each role. The practical implications of understanding these roles are then explored such as how they could be used to help water leaders to be more effective, and how they could be used to analyse and understand how leaders playing different roles work together to collectively drive processes of change. Finally, the paper concludes with a summary of its key messages.

2 - Methodology

This section describes five bodies of work conducted by the authors over eight years (2007–14) which have helped to identify and characterise the leadership roles outlined in this paper. This work involved traditional forms of research as well as gaining knowledge by working closely with many developing water leaders from around the world during leadership development activities (e.g., programmes, short courses and coaching).

2.1. 2007–10: Ph.D. research on water leadership

An international literature review focusing on water leaders was conducted as part of a Ph.D. research project by Taylor (2010a). Although this research focused on champion-type leaders (i.e., emergent leaders who excel at initiating change) who promoted sustainable urban water management, the literature review was broader. It sought to identify what is known about leaders and leadership in the water sector. It identified significant contributions to the water leadership literature such as those made by Brown (2003), Brown and Clarke (2007), Huitema and Meijerink (2010) and White (2006).

This research also involved a multiple case study analysis of six champion-type leaders who were instrumental in initiating change in different cities within Australia (Taylor 2008, 2010a). This analysis identified the significance of individuals playing different roles in major processes of influence. For example, in one of these case studies (see Taylor 2011), the project-level champion for sustainable water management was strongly supported by a local politician (a mayor), his organisation's chief executive officer (who actively managed the organisation's culture), an executive (who acted as his mentor), and a small group of colleagues in different functional units within the organisation (who acted as a cross-boundary team to advance significant water projects). This research helped to identify and characterise important water leadership roles and to understand how people in these roles worked together to affect change (e.g., Taylor 2011).

2.2. 2010–11: Background research to build a new water leadership program

In 2010, following a successful trial (see Taylor 2010b) work commenced within the IWC to design a new, nine-month water leadership programme. This programme

primarily targeted emerging leaders from the program's host country (Australia), but its design ensured that it could also service the needs of leaders from other countries, including developing countries. As described by Taylor and McIntosh (2012), this work involved the following three steps. First, another review of the international water leadership literature was conducted, building on the work by Taylor (2010a) to identify and characterise common leadership roles. This process identified three key non-executive leadership roles, namely the project champion, enabling leader and team/project leader roles. It was, however, recognised that these roles were not exhaustive.

Second, a diverse group of water industry practitioners from across Australia were consulted to test the relevance and validity of the three preliminary role descriptions to different organisational types (e.g., consulting firms, publicly managed water agencies, local government agencies, etc.). The role descriptions were consequently refined.

Third, in June 2011 a national survey was conducted with the help of the Australian Water Association to further examine the relevance of the three leadership roles to a range of organisational types, as well as to validate the role descriptions and specific leadership attributes (e.g., key leadership behaviours) associated with each role. This survey produced strong evidence from surveyed water practitioners across Australia that the three roles had a high degree of relevance to water organisations such as state government departments, local government agencies, privately owned consulting firms and publicly managed water agencies. For example, for the project champion role, 92% of survey respondents ($n = 42$) agreed that the role was relevant to organisations like theirs, with equivalent results for different organisational types varying from 78% to 100%. For this particular role, the relevance of 37 leader attributes (e.g., behaviours) was examined in the survey. All of these were found to be "highly relevant" to project champions working in some organisational types, and an additional two attributes were identified through the survey process.

2.3. 2011–14: Experience working with developing water leaders

Over the period from 2011 to 2014 the authors have collectively worked with hundreds of emerging water leaders from developing and developed countries. Within the IWC, this has provided many opportunities to assess the relevance of the three previously mentioned water leadership roles (see Section 2.2). This assessment has been done formally and informally. For example, every participant in the IWC Water Leadership Program undertakes a 360° feedback process which gathers data from the participant, their supervisor, their peers and their staff/direct reports (where relevant). This feedback includes assessing the relevance of the three roles to the participant. To date, this feedback is indicated that at least one of these roles has been relevant to every participant in the programme.

The research has also benefited from the authors' experience in working with emerging water leaders in developing countries in the contexts of project development, regional knowledge sharing, and on-the-job leadership coaching. While most leaders

readily identified with the importance of the project champion and team leader roles from their experience, many were intrigued by the enabling leader role, which they recognized to be of great value in projects with multiple disciplines and stakeholders. Participants in the first UNESCO-IHE water leadership course in 2014 also suggested that enabling leaders can foster collaboration in complex water projects, and stimulate the development of water leaders around them.

Whilst this experience has helped to confirm that these three roles are indeed important in the water sector, it is equally important to emphasise that every leadership context is unique. For example, two water leaders playing the same leadership role in different countries or organisational cultures may apply similar strategies (e.g., anticipating 'windows of opportunity' to influence water policy), but will need to be highly sensitive to their local context in the way they apply these broadly applicable strategies (e.g., to work within appropriate cultural norms) in order to produce a positive outcome.

2.4. 2013–2016: Research within the Cooperative Research Centre for Water Sensitive Cities

In 2013, the Australian-based Cooperative Research Centre for Water Sensitive Cities began a three-year research project looking at the issue of science-policy translation in government with a specific emphasis on the role of scientists and sustainable water management advocates within the policy process as people who strongly influence the outcome. Through interviews and in-depth consultation with around 100 water bureaucrats, science advisors and politicians; consistent patterns began to emerge that confirmed findings from other studies in the water sector, as well as long-standing policy leadership observations established in other countries and other issue areas. Several in-depth case studies of policy development within different political contexts found ample evidence to underscore pre-existing theories regarding the importance of leaders within the policy processes, both in general theory (e.g., Kingdon 1995; Mintrom and Norman 2009; Mintrom and Vergari 1996) and in studies specifically relating to water (e.g., Crow 2010; Huitema and Meijerink 2010; Keremane 2015).

These interviews have gone further than many studies to incorporate detailed analysis of specific water policy development cases to closely examine how key decision makers used and were influenced (or not) by scientific inputs. This approach contrasts with the more common focus on procedural structures in policy studies (Laing 2015; Laing, Thwaites, and Walter 2015).

This research has highlighted the important contribution that political science approaches can make to the refinement of water leadership strategies and role definitions. For example, it identified the increasing need to understand the important role played by 'trusted advisors' within government to achieve policy outcomes. It has also identified the general need for people playing leadership roles in the water sector to demonstrate political savvy when seeking to influence water policy development, and to develop a wider set of skills and tools when using science to build a case for

policy change in bureaucratic contexts (Laing 2014; Laing, Thwaites, and Walter 2015). To this end we see the lobbying and science advocacy literature (e.g., Godwin et al. 2012; Keller 2009) to be highly relevant in sharpening the leadership strategies water leaders could use to drive change in policy.

2.5. 2013–14: The design of a new international water leadership programme

In 2013, a partnership between UNESCO-IHE, the IWC, and Nyenrode University was formed to build a new IWLP. This initiative aims to help mid-career, emerging water leaders from developing countries to build the capacity to exert influence and drive change to deliver more sustainable forms of water management (see Lincklaen Arriëns and Wehn de Montalvo 2013). In comparison with the established IWC Water Leadership Program, the IWLP proposes to have a more diverse target audience, greater involvement of leaders from developing countries, and greater capacity to address a broader range of water leadership roles. The design of this programme also provided the opportunity to build on the preliminary role descriptions developed by the IWC to incorporate more recent descriptions of water leaders, such as descriptions provided by Brouwer and Biermann (2011), Herrick and Pratt (2012), Lincklaen Arriëns and Wehn de Montalvo (2013) and Subijanto et al. (2013).

The design of this programme is continuing at the time of writing. One significant outcome of this process has been the identification and characterisation of six water leadership roles that are likely to be relevant to the target audience of the IWLP. These roles are the focus of this paper and help to inform the design and content of the IWLP. For example, the 360° feedback, challenging on-the-job leadership assignments, training and coaching activities potentially included within the IWLP will provide opportunities to assess the relevance and suitability of these roles to each participant, build knowledge and skills to more effectively play these leadership roles and build understanding of how people playing these roles often work together. These activities also provide participants with tools to use in these roles (e.g., relevant leadership models), relevant case studies and the opportunity to identify specific actions that the participants can take to improve their performance in these roles.

3 - Six water leadership roles

This section describes six common water leadership roles that are potentially relevant to emerging, non-executive water leaders in developing and developed countries. Additional roles may exist, and some of these roles can also be played by executive and political leaders (e.g., the enabling and strategic leader roles). Table 1 provides a brief summary of each role and some examples of water practitioners who have played these roles (i.e., examples known to the authors).

Table 1: Examples of water leaders who perform each of the six roles

Role Title	Brief Role Description	Examples
The champion leader	Involves *initiating* processes of influence (change) in the water sector.	• A water practitioner who is strongly advocating for the adoption of integrated water management principles within a new river basin or urban planning process. • A practitioner working for a local waterway-focused community group who is lobbying government agencies to invest in a waterway rehabilitation project.
The enabling leader	Involves *enabling* (rather than directing) others to collectively 'learn by doing' to find solutions to complex water challenges.	• A middle manager in a water agency who creates a cross-sectoral 'community of practice' for practitioners in a city to develop and trial innovative solutions for the most challenging water issues through collaboration by the public and private sector. • A senior water leader in a government department who establishes a cooperative research programme to bring practitioners and academics together to trial new technologies to address pressing water management challenges in a local river basin.
The cross-boundary team leader	Involves being the assigned leader for a water team (e.g., a project team) that *crosses boundaries* relating to geography, organisations, professional disciplines, etc.	• A water practitioner who is responsible for a team of technical experts from different organisations who are building and monitoring programme for an estuary. • A water practitioner leading a multi-disciplinary team to design a new urban development that incorporates integrated water management principles.
The thought leader	Involves using high levels of *credibility and expertise* to exert influence (e.g., by promoting technological innovations).	• A technical specialist with rich and diverse expertise who works part-time for a local university as a researcher and part-time as a water manager in a government agency. • An experienced consultant from a niche consulting firm who pushes the boundaries of 'best practice' water management by encouraging their clients to consider innovative approaches.
The strategic leader	Involves working with stakeholders to build a *shared vision* of the future direction of a team or organisation, and a *strategy* to achieve the vision.	• The leader of a programme in a large government department tasked with developing new strategies for increasing water security in a region of the country. • The head of a large, water-focused capacity building programme that aims to change stakeholder behaviour in order to improve integrated river basin management.
The trusted advisor	Involves working as a credible, independent agent to *influence the political system* through communication, networking and advocacy.	• An experienced academic who is called upon to review the scientific research on point source pollution for a government water minister. • A former water utility executive who uses their networks and familiarity with government to communicate policy priorities and get industry agreement on strategic issues.

3.1. The champion leader

A role that primarily involves initiating processes of influence (change) to advance water management projects, innovations, and policies. Leaders occupying this role are variously described as champions, policy entrepreneurs, emergent leaders and key change agents. They are highly motivated, stand out early in processes of change, and excel at exerting influence. The literature on champions distinguishes between 'project/product champions' and 'executive champions' (see Howell and Higgins 1990; Howell et al. 2005; Maidique 1980). 'Project/product champions' drive initiatives on a day-to-day level, unlike more senior 'executive champions'. Project/product champions typically become executive champions later in their careers. They often promote innovations, take personal risks, question the status quo, meet substantial resistance, and communicate clear and compelling visions for projects. They are outstanding communicators, often engage in 'extra role behaviours', and frequently use transformational leadership behaviours (see Bass 1985; Kouzes and Posner 2012; Northouse 2013). Although they stand out as individuals early in processes of change, they work closely with other leaders to deliver projects. The extent to which a champion can fulfill this role is often limited by their local context (e.g., available support from senior management and resources). Once their initiatives are underway, their visibility tends to decrease and there is a risk of them leaving the initiative, or being transferred, before it is fully delivered (Meijerink and Huitema 2010).

Table 2 provides a summary of the key competencies (i.e., the skills, knowledge, personality traits, forms of power, and/or types of social networks) that the leaders who excel in this role typically possess. It also includes a summary of the leadership strategies (i.e., behaviors) that are typically used by such leaders when playing this role. Tables 3–7 provide equivalent information for the other five roles.

3.2. The enabling leader

A role that involves enabling (rather than directing) others to collectively find solutions to complex water management challenges. Leaders occupying this role create environments where people from across organisational boundaries can interact, collaborate, experiment, take risks, and learn together (i.e., 'learn by doing'). Senior enabling leaders may also help leaders at the project level by gathering political and executive support for initiatives, providing resources, sharing risks, and building supportive organisational cultures. Leaders in this role commonly work across organisational boundaries and often link people within an organisation to external people (e.g., linking industry practitioners with researchers). They can be innovative in the way they approach problem solving and help to foster innovations at a technical level. They are typically senior in organisations with access to position power/authority (i.e., typically at the middle management to the executive level). They are adept at seeing 'the bigger picture' and the systemic way in which projects and policies interact both within and outside the water sector.

Table 2: Key leader competencies and leadership strategies typically associated with the champion leader role

Leader Competencies	Leadership Strategies
• A willingness to challenge the status quo by promoting alternative approaches and taking some personal risks. • Strong communication skills both verbally and in writing. • The ability to frequently use transformational leadership behaviours, when appropriate (e.g., displaying energy, enthusiasm and confidence). • Persistence and personal resilience. • Advanced social networking skills, including building networks, alliances, and coalitions across organisational boundaries. This includes the ability to build cooperative relationships with a broad range of stakeholders, including those with authority (e.g., executives). • Strong interpersonal skills (e.g., active listening, providing constructive feedback, negotiation, conflict management, and understanding different perspectives). • The ability to carefully plan and execute influence attempts using a variety of principles and tactics, and choosing the right set of tactics for a particular person, place and time. • Political savvy (Braddy and Campbell 2013) and a thorough knowledge of the institutional system they are working in in order to identify opportunities to exert influence. • Personal credibility that is built over time by delivering successful initiatives, setting a positive example, demonstrating expertise, building relationships and trust, keeping promises, and always acting in accordance with espoused personal values. • Awareness that the nature of this role usually evolves through three phases over time. These being the initiation (start-up), endorsement (when an approval or resources are needed to progress an initiative), and implementation (when an initiative needs to be delivered typically through a team) phases (Taylor et al. 2011). Specific leadership strategies become relevant in each phase.	• Using pilot (trial) projects to test new ideas, generate some small 'wins' when tackling large challenges, build credibility, influence others, strategically build important relationships, and 'learn by doing'. • Taking the time to work with others to build a genuinely shared vision for new initiatives that are clear, compelling and reflect shared values of key people and groups. • Anticipating, planning for, and using windows of opportunity to exert influence and drive change. For example, a severe drought may create an opportunity to persuade politicians to adopt a new water recycling policy. • Monitoring their work environment to identify trends, opportunities and threats. • Finding, altering or creating 'venues' in which they can successfully exert influence (e.g., river basin organisations, professional associations or expert panels). • Not leaving a change initiative until it is fully delivered. In other words, displaying the self-awareness and self-discipline needed to resist moving on to the next initiative until the job is fully done. • Using a combination of bottom-up (emergent) and top-down (formal) leadership strategies to drive change and institutionalise new approaches. • Using narratives to strategically frame issues (e.g., a crisis involving water resources) and thereby justify change and attract supporters.

Table 3: Key leader competencies and leadership strategies typically associated with the enabling leader role

Leader Competencies	Leadership Strategies
• The ability to correctly diagnose complex challenges ('wicked problems') and apply an enabling leadership style to address them (see Uhl-Bien et al. 2007; Snowden and Boone 2007). Such challenges are difficult, evolve over time, are perceived differently by different stakeholders, have many interdependencies and there is no obvious or agreed solution (Rittel and Webber 1973). • A propensity to enabling others (e.g., affected stakeholders and technical experts) to find solutions to complex challenges, rather than directing them how to solve problems. This typically involves trusting others, 'letting go' of the detail, and being comfortable with uncertainty, ambiguity and experimentation. • Advanced inter-personal skills, including communication (e.g., storytelling, active listening, and strategic framing), facilitation, conflict management, and managing stakeholder relations. • Advanced social networking skills, including building networks, alliances, and coalitions across organisational boundaries. • The ability to take a systemic approach to problem-solving, see the 'big picture', take a long-term perspective, and interpret change for colleagues (e.g., explaining why there is resistance to change). This includes the ability to use systems thinking techniques to help stakeholders to build a shared vision of the problem and possible solutions. • Patience and the ability to work on complex challenges characterised by conflict, set-backs, uncertainty, and long time frames. • The ability to use transformational leadership behaviours to build shared visions for projects that are clear and inspiring, inspire confidence, build commitment and influence people across organisational boundaries. Enabling water leaders who are good at shaping organisational cultures are also usually strong transformational leaders (see Taylor 2010a).	• Working with others to create environments for collaboration, innovation, experimentation, responsible risk-taking, and 'learning by doing'. These environments may include demonstration projects, learning alliances, communities of practice, task forces or research projects. Often enabling leaders in the water sector build bridges between practitioners and researchers. • Shaping the culture of the organisational team so that it values the previously described behaviours (e.g., experimentation). This includes modeling these behaviours and frequently reinforcing their importance through positive feedback, corrective action and storytelling. • Building and supporting teams working on challenging projects by providing resources, mentoring and coaching, sharing information and knowledge, and connecting them to other teams or people. These teams often across organisational boundaries and require a champion-type leader to get started. • Fostering innovation and creativity within teams (e.g., using creative thinking techniques and external thought leaders to stimulate discussion). • Facilitating activities that involve frequent interaction between stakeholders and encourage task-focused, productive conflict. • Maintaining an atmosphere where the status quo is no longer acceptable, there is an impetus for change, but people are not overwhelmed by the challenge (see Heifetz et al. 2004). Heifetz and colleagues use the analogy of a pressure cooker, where heat and pressure are needed to cook but a valve is also needed to reduce the pressure if it becomes too great. • Monitoring for the emergence of potential solutions and leaders to champion them. • Managing conflict between forces that promote the status quo and those that advocate for change. For example, managing the tension between organisational leaders who want traditional water services to be delivered more efficiently and champion-type leaders who are promoting radical change towards more sustainable water services. • Celebrating 'small wins' and scaling-up successful trials. • Looking for ways to institutionalise new approaches (e.g., through formal policies and legislation) to embed new practices.

3.3. The cross-boundary team leader

A role that involves being responsible for meeting the objectives of a cross-boundary water management team. Typically, these boundaries include: geography; functional organisational units ('silos'); levels of management in bureaucratic organisations; professional disciplines (e.g., multi-disciplinary teams); and demographics. This role includes building and monitoring the performance of teams. It also involves building and communicating shared visions for projects, clarifying objectives and roles, and managing conflict. Leaders in this role also need to manage resources and information, may engage in coaching and mentoring behaviours, and engage in activities outside the team (e.g., networking and advocacy). Often, members of the team are not the team leader's staff (direct reports). Consequently, the leader needs to rely on his/her personal power to exercise influence rather than the power of their position (authority). Often, the nature of the challenge facing the team is complex with some technical/complicated components, requiring the team leader to adapt their leadership style (see Snowden and Boone 2007). This is a relatively common but challenging water leadership role that can be undertaken in combination with the champion or enabling leader roles. For example, a champion may initiate a new project, and then become the official project team leader to deliver it.

3.4. The thought leader

A role where a water practitioner influences policy or practice by promoting new ideas, fostering innovation, conducting and using research, brokering information, and/or being a hub of specialist knowledge. Leaders in this role typically have high levels of expertise and credibility, as well as broad, diverse networks. They are comfortable questioning the status quo, and search for venues to promote alternative approaches (e.g., local conferences). Leaders in this role often work in universities, small consulting firms or on their own which provides them with freedom to publicly challenge conventional approaches. They are often involved with pilot projects and cooperative research activities. They also work closely with champion, enabling and trusted adviser leaders who use their ideas to help drive change.

3.5. The strategic leader

A role that is typically occupied by experienced/senior water practitioners who are given significant authority (position power) to introduce and manage change, and develop capacity to make newly developed systems work. The role involves working with stakeholders to build a shared vision of the future direction of a team or organisation. Leaders in this role engage in 'scanning behaviours' to identify opportunities, threats and trends. They also invest time in strategic networking in and outside the organisation to build relationships with key partners, and draw on a range of information sources to help determine a suitable strategic direction. They also excel at strategic planning and team leadership. Throughout their careers, these

Table 4: Key leader competencies and leadership strategies typically associated with the cross-boundary team leader role

Leader Competencies	Leadership Strategies
• The ability to accurately interpret what is happening within a team (e.g., what is stifling performance). • The ability to understand the 'big picture' from a systemic perspective, and how the team's work contributes to higher order goals and is affected by external factors. This includes understanding 'cause and effect' relationships, and being able to identify opportunities to effect change. • The ability to manage issues related to the team's tasks (e.g., clarifying objectives and roles, building action plans, and establishing performance monitoring systems). • The capacity to manage the team's internal relationships (e.g., managing conflict between team members and accommodating individual needs). • The ability to manage factors outside the team that affect its performance (e.g., engaging in advocacy, secure additional funding, and garnering political support). • The capacity to inspire and motivate others by demonstrating competence, setting a positive example, and frequently using transformational leadership behaviours such as displaying energy, enthusiasm, confidence and persistence, coaching and mentoring, and providing encouragement. • Strong communication and interpersonal skills (e.g., active listening, providing constructive feedback, facilitation, managing emotions, negotiation, conflict management and demonstrating empathy). • An understanding of the technical (or detailed) issues the team must face in order to achieve its objectives. Often effective team leaders for integrated water management projects are 'T-shaped water professionals' (McIntosh and Taylor 2013). In other words, they have deep knowledge in at least one technical area but also broad general knowledge which helps them to collaborate with a diverse range of stakeholders. • Creativity and the ability to facilitate creative thinking processes within a team. • The ability to generate high levels of trust within the team. This is often linked to recruiting the right people, being willing to trust others, demonstrating integrity and keeping promises.	• Frequently monitoring the performance of a team, diagnosing what the team needs at a particular point in time and taking action to ensure this need is met. This includes constructively confronting and resolving issues associated with inadequate performance by team members. • Creating an environment (culture) where team members feel comfortable openly discussing any issue related to the team's success (e.g., how the team could improve its performance). • Recruiting team members who are highly motivated to achieve the team's vision. Ideally, the shared vision of the team would reflect the personal values of the team members. • Managing the membership of the team over time. For example, ensuring that the members have the necessary knowledge and skills, and are capable of collectively playing roles within the team that relate to thinking, doing, challenging, supporting and leading (Honey 2007). • Clarifying the team's vision, objectives and priorities, as well as the roles and responsibilities of team members. • Coordinating the team's activities, including acquiring and aligning resources to help the team meet its objectives. • Fostering innovation, creativity and constructive conflict (e.g., healthy debates) to identify better ways of achieving objectives. This includes matching people to tasks in order to access people's intrinsic motivation. • Frequently monitoring the team's environment to identify trends, opportunities and threats. For example, they are aware of broad trends affecting the water industry. • Looking for opportunities to deliver and celebrate tangible outcomes in the short term when working on challenging, long term projects.

Table 5: Key leader competencies and leadership strategies typically associated with the thought leader role

Leader Competencies	Leadership Strategies
• Very high levels of expertise in a particular area, as well as a broad general knowledge to identify connections with other aspects of water management. • A propensity to question conventional wisdom and take some personal risks. • Cultivated networks with people in positions of power (e.g., policy specialists and political advisers). • Credibility, including a track record of demonstrating expertise over many years. • Independence (e.g., the freedom to speak freely). • Often connected to academia (e.g., an adjunct staff member of a university) to provide access to new ideas and information. • Passion for their subject, including the ability to strongly advocate for the adoption of new approaches (i.e., strong communication skills).	• Building and maintaining very high levels of expertise (expert power) and ensuring that stakeholders are aware that this expertise is held. Methods may include the strategic use of technical publications, presentations, awards and demonstration projects. • Engaging in strategic networking to build strong relationships with key people who have the potential to adopt new ideas (e.g., senior policy bureaucrats and political advisers). • Becoming politically savvy in order to influence policy processes. • Being prepared to work with stakeholders to drive change from the top-down (e.g., via policy processes) as well as from the bottom-up (e.g., through working with local stakeholders on demonstration projects). • Building credibility over time by demonstrating integrity, avoiding conflicts of interest, delivering high quality projects, keeping promises, and acting in accordance with espoused personal values. • Finding work environments which provide the freedom to maintain independence and question conventional wisdom when necessary. • Shopping for venues that provide opportunities to build power and exercise influence (e.g., executive roles within professional associations). • Using 'scanning behaviours' to monitor their environment and anticipate windows of opportunity to promote new approaches (e.g., the local media showing interest in a water management issue). • Maintaining civil relations with other respected thought leaders who hold different views.

leaders often demonstrate the ability to make the transition from a technical specialist focused on day-to-day challenges to a forward thinking, strategic leader who is able to build a capable team, delegate day-to-day tasks, and maintain their focus on the strategic direction of the organisation or work unit. These leaders typically have a strong commitment to professional development and continuous learning. They are also suited to executive leadership roles.

3.6. The trusted advisor

A role occupied by practitioners who are experts at communicating, networking and advocating at the political level. They are associated with a high level of trust/credibility within political circles and an expansive network of connections across government and politics. They are seen as independent, rather than being aligned with any political party. Their role involves brokering access and agreement amongst decision makers, and acting as trusted interlocutors between technical and political stakeholders or between government and affected stakeholder groups (e.g., community and industry groups). These leaders originate from diverse backgrounds, but have a long track record in technical–political translation. They have a good sense of political timing, a sophisticated understanding of political opportunities and government agendas, and are adept at communicating complex concepts simply to politicians and the public alike. They usually have strong networks and are trusted across several different areas of science and across stakeholder interest groups. They have a reputation as trusted advisors and/or 'fixers' to politicians. They often work as stewards of complex negotiations and collaborations regarding new policy, working to obtain consensus and agreement, but do so often without taking an overt role in driving the process or in developing specific technical solutions themselves.

Table 6: Key leader competencies and leadership strategies typically associated with the strategic leader role

Leader Competencies	Leadership Strategies
• The ability to use transformational leadership behaviours to build shared visions that are clear and inspiring, inspire confidence, build commitment, and influence people across organisational boundaries. • An active interest in change management, with the analytical skills for situational analysis, seeing the big picture, strategic planning and paradigm shifting. • Operational experience with the organisation's processes and procedures to understand opportunities for improvement. • Ability to reframe challenges and longer-term change into immediate opportunities for actions. • Appreciation of the need for cultural change including new behaviours, and the ability to shape organizational culture. • Excellent communication skills (e.g., active listening, providing constructive feedback, compelling public speaking with storytelling, persuasive writing, and using multiple perspectives). • Ability to frequently use transformational leadership behaviours, when appropriate (e.g., displaying energy, enthusiasm and confidence), backed up by patience, persistence and personal resilience to work on making change happen over time. • Advanced social networking skills (see Ibarra and Hunter 2007), including building networks, alliances and coalitions with partners across organizational boundaries. • The ability to carefully plan and execute influence attempts using a variety of principles and tactics, and choosing the right set of tactics for a particular person, place and time. • A propensity to enable others (e.g., affected stakeholders and technical experts) to find solutions to complex challenges, rather than directing them how to solve problems. This typically involves trusting others, 'letting go' of the detail, taking a systemic perspective, mentoring and coaching others, and being comfortable with uncertainty, ambiguity and experimentation.	• Creating space for change by allowing people to buy into a vision rather than choosing to agree or disagree with a new policy, using narratives to strategically frame issues to justify change, and making it attractive with a compelling storyline. • Overcoming resistance to change through better communication (from the inside) and pressure from partners (from the outside) to gain momentum. • Using short-term gains to show how the new strategy will save cost and time, multiply outcomes, and build more flexibility and resilience into operations to adapt to the increasing uncertainties. • Fostering new knowledge-driven cultures to operationalise the new strategy, involving younger staff as champions and catalysts, and specifying keys for success and rewards for individuals and teams working with clients and partners. Typical organisational culture strongly value innovation, adaptive management, collaboration, experimentation, and responsible risk-taking. • Introducing performance metrics that show progress in the new strategic direction, together with benchmarking, rewards, and increased access to budgets. • Ensuring that budgets are allocated and resources mobilized in time to support the strategic change process in the organisation. • Using staged implementation to incubate and accelerate the changes, starting with departments and teams with a track record of innovation and supportive leadership for learning while doing. • Anticipating, planning for, and using windows of opportunity to exert influence and drive the strategic change, including making best use of water crises to accelerate change, supported by incentives and rewards. • Arranging opportunities for executives who are still 'on the fence' to become supporters of the change process by inviting them to give keynote speeches at internal and external events that allow them to internalize and own the changes. • Using a combination of bottom-up (emergent) and top-down (formal) leadership strategies to drive the change process and institutionalize the new approaches and behaviours with the support of younger professionals. This typically involves mentoring and coaching emerging leaders as well as strategic networking to engage leaders in positions of authority.

Table 7: Key leader competencies and leadership strategies typically associated with the trusted advisor role

Leader Competencies	Leadership Strategies
• Very strong science communication skills, particularly as a translator between experts and non-experts, regardless of whether they are an expert themselves. • An ability to quickly and effectively create 'big picture' narratives that clearly elucidate outcomes and speak to political imperatives whilst maintaining technical credibility. • The capacity to 'remain above the fray' and avoid championing or becoming too closely aligned to particular policies, politics or outcomes. • Broad networks across various sectors, particularly those who have traditionally held different views (e.g., farmers and conservationists). • Strong networks in government and a track-record of working across different political parties to deliver practical policy outcomes. • Ability to work effectively within rapid time-frames and to a government agenda • A mindset that values negotiation, pragmatism and compromise. • Discretion, trustworthiness and honesty in dealing with government. • A broad knowledge-base, including the ability to work through concepts and ideas from multiple perspectives.	• Demonstrating a sound understanding of the political and institutional systems in which water policy decisions are made. • Building and maintaining credibility with all sides of politics and being perceived as independent from political and/or social causes. • Providing well-timed and well-reasoned advice to government and policy-makers in accord with emerging policy priorities, whilst avoiding politically charged areas • Building a broad knowledge of different aspects of water management rather than focusing too narrowly on specific areas. • Using networks to keep informed of developments in water policy and exploiting windows of opportunity for influence and change. • Maintaining broad networks and coordinating interactions between relevant stakeholders in the water community. • Communicating technical information and complex problems to governments and policy-makers, and acting as a 'broker' or provider of policy-relevant research to government and policy-makers (see Pennell et al. 2013). • Keeping conflicts and disagreements behind closed doors in order to strike consensus and agreement when presenting policy options and advice to government. • Providing clear and succinct policy options and priorities in advice that adhere to a broader narrative rather than specific technical questions. • Acting as a translator between 'research science' and 'regulatory science' (Jasanoff 1990) and building critical bridges between the research and policy communities. • Looking for opportunities for different stakeholders and interest groups to collaborate and harmoniously coordinate their efforts to achieve common goals. • Maintaining the interest of government by submitting to public and parliamentary enquiries, engaging the media and being continuously involved in water policy development processes. • Actively engaging in activities across different stakeholder groups so as to maintain a broad rather than narrow base of credibility, as well as broad social networks.

4 - Implications

4.1. Practical implications for individual water leaders

Water leaders who are seeking to build their leadership capacity could use the role descriptions in this paper in the following five ways.

1. They could reflect on this information to determine which roles are likely to suit their personality, values, strengths and weaknesses, and career aspirations. It is in these roles that they are more likely to excel. This is part of the process of self-leadership (see Drucker 2005; George et al. 2007).
2. They could use the descriptions of roles they currently play or aspire to play as an 'assessment tool' to identify *specific* leadership competencies they are likely to need and could benefit from strengthening. For example, a leader aspiring to succeed in the enabling leadership role may choose to develop their systems thinking ability. This process could involve a self-assessment and/or feedback from colleagues.
3. They could use the role descriptions as a tool to consciously modify their leadership style in different situations. The importance of this leadership competency has been highlighted by leadership researchers. For example, Goleman (2000) explored the relationship between leadership effectiveness and the ability to switch leadership style to best match the local context. He concluded that "the research indicates that leaders with the best results do not rely on only one leadership style; they use most of them in a given week - seamlessly and in different measure - depending on the business situation" (Goleman 2000, p. 78). So, a developing water leader may recognise the need to engage in the champion role to convert a good idea into a new project, and then switch to the team leader role once the project is running. The role descriptions in this paper provide guidance on key leadership behaviours and strategies typically used by leaders occupying such roles. Whilst emphasising the importance of being able to change leadership styles for different roles, we also note that it is *likely* that a particular water leader will be best suited to a small number of roles and will have the potential to excel in only some roles.
4. They could choose to work with others to play a particular leadership role, rather than undertake the role themselves, and use the role description to communicate the nature of the leadership role that is required. For example, they may recruit an enthusiastic, entrepreneurial employee to play the champion role to initiate a new project. This approach could also be taken by organisations in the water sector that seeks to identify and develop future leaders.
5. They could use the role descriptions as a framework to reflect on, and better understand significant leadership processes that involve several leaders playing different roles to exert influence in a coordinated manner, and potentially identify ways to participate in these processes. To illustrate, consider a water practitioner ('champion') who is seeking to advance integrated river basin management principles and practices. She works in a non-government organisation with little

authority or resources. Her organisation has recently completed some successful local pilot projects in partnership with local communities involving sustainable farming practices, but now needs government support and resources to promote these practices on a larger scale. The role descriptions described in this paper could be used as a tool to identify the people within the river basin who are playing different leadership roles, as a step towards analysing how they are interacting, and what role she could play to influence river basin management. For example, she might identify that an influential 'thought leader' in a local university has a close relationship with a 'trusted adviser' who frequently briefs local politicians on water management issues. As part of her strategic social networking activities (Ibarra and Hunter 2007) she may subsequently decide to strengthen her relationships with the thought leader and trusted adviser, and provide them with information on the successful pilot projects as part of a broader strategy to garner government support.

4.2. Practical implications for leadership development specialists

Leadership development specialists who design and deliver leadership programmes and short courses, or coach developing leaders could also use the role descriptions. For example, when designing a new water leadership programme, the role descriptions could be used as a framework to explore the following questions: which roles are most relevant to our target audience; what bodies of knowledge and skill sets do we need to focus on developing for this target audience; what leadership models and theories are most relevant to this audience; what case studies are most relevant to this audience; and which guest speakers or group mentors are likely to be most relevant and helpful to this audience? This approach was taken for the IWC Water Leadership Program, where a design decision was made to focus on three leadership roles and build a set of approximately 30 training modules that address the knowledge, networks, tools, and skills needed to perform well in these roles.

The role descriptions also provide a framework to 'cut through the complexity' of the leadership topic. Leadership is a highly complex social phenomenon. Many factors may contribute to a particular leadership outcome. There are a plethora of theories and models that are potentially applicable. Everyone's leadership context is unique. There is no universally applicable leadership style, and there are usually a number of people involved in a process of influence. It can, therefore, be conceptually challenging for developing leaders to make sense of such a complex situation and identify tangible actions they can take to improve. To some extent this complexity can be overcome by helping such leaders to identify when they need to play a particular leadership role (or build a relationship with another person to play this role) and understand the nature of this role (e.g., key behaviours and strategies to use). This understanding can then lead to practical developmental activities such as an assessment of their ability to perform well in the role, the identification of actions that can be taken to improve (e.g.,

specific skills to be developed), practising new approaches, gathering feedback from colleagues, and getting assistance from a coach and/or mentor.

The role descriptions also represent a potentially useful communication and learning tool. For example, a coach or trainer may use a case study to highlight some leadership lessons. Water leadership case studies often involve a number of people interacting to collectively drive a process of influence (Brown and Clarke 2007; Taylor 2011; Vedpuriswar and Kolakaluri 2009). The role descriptions in this paper could be used to identify water leaders playing specific roles in a case study and foster a discussion that explores the importance of each role, keys to success in each role, why certain roles were needed, and the interplay between leaders playing different roles.

4.3. Implications for researchers and opportunities for future research

The role descriptions also provide a conceptual framework that researchers who are interested in institutional change, leadership, capacity building, and governance could use when exploring aspects of change in the water sector. It is common for such researchers to broadly highlight the importance of leadership capacity to successfully driving change (e.g., Herrick and Pratt 2012; Mukhebir et al. 2014). It is, however, rare to see an analysis of the factors contributing to a leadership process in the water sector, including a description of the different leadership roles being played and how they are interacting over time. This is an exciting opportunity for future research and learning. The roles described in this paper provide a framework that researchers could use to help structure an analysis of a leadership process. Such research could explore the importance of specific roles in different situations, the relationships between each role (e.g., the potentially symbiotic relationship between the enabling and champion leader roles), and whether some patterns of interaction between roles are consistent across different contexts.

Future research could also explore different leadership roles being played in circumstances where 'top-down' and 'bottom-up' processes of influence are combining to produce more sustainable water management outcomes. The effective combination of top-down and bottom-up processes of influence has been frequently cited in the sustainability leadership literature (see Benn et al. 2006). It is hypothesised that this pattern of leadership creates a demand for certain leadership roles, such as project-level champions driving change from below and senior enabling leaders facilitating change from above, as well as the necessity for people in these roles to operate in concert. Indeed, recent case studies have highlighted the need for leaders operating at multiple levels of governance and interest to effectively shepherd change in the water industry (Daniell et al. 2014), and should inspire further research as to how these multi-level, multi-role networks might be developed.

5 - Conclusions

Given the magnitude of the water-related challenges that face society in the twenty-first century, particularly in developing countries, we believe there is no more important task than to nurture the next generation of water leaders. To do this well we need to better understand water leaders and leadership processes, improve our methods to enhance the leadership capacity of water practitioners, and share this knowledge. This paper was written to help this process.

In this paper, the authors described six leadership roles that are commonly seen in the water sector and often feature in successful case studies of positive change in both developed and developing countries. These were the champion leader, enabling leader, cross-boundary team leader, thought leader, strategic leader and trusted adviser roles. Each description provided an overview of the role, and some of the key leader competencies and leadership strategies (i.e., behaviours) typically associated with the role. It is noted, however, that these six roles are not exhaustive.

These role descriptions represent a practical tool (framework) that can be used by developing water leaders, leadership development professionals, and water leadership researchers. Those seeking to enhance leadership capacity can use the framework to identify which roles are most suited to a developing leader and which specific abilities (e.g., skills) need to be strengthened to perform well in these roles. They can also use the framework as a communication and learning tool to explore how leadership processes in the water sector typically involve a number of people playing different but complimentary roles (e.g., when examining case studies within a leadership programme).

Researchers exploring processes of change, governance, and leadership in the water sector could also use the framework to structure their analysis of processes of influence. They could, for example, identify the people and organisations playing different leadership roles, the relationships between these roles, and explore whether these relationships are unique to each context or transferable to other contexts. Such an approach represents an opportunity for future research and learning.

This paper has been written for people with an interest in building the leadership capacity of emerging water leaders to drive positive change, which may include developing themselves as well as others. Its key recommendation is to facilitate three outcomes. First, help developing water leaders to understand the nature of the six leadership roles described in this paper, including the leader competencies and leadership strategies typically associated with each role. Second, ensure that these leaders have an opportunity to identify which roles are most relevant to them now and in the future, as well as those that best suit their nature. Third, connect these leaders to tailored leadership development interventions (e.g., programmes) and materials (e.g., training modules and case studies) that focus on helping them to excel in relevant roles as well as collaborate with leaders in other roles to collectively drive processes of influence to deliver more sustainable forms of water management.

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