

Exploring water leadership

Wouter T. Lincklaen Arriëns^a and Uta Wehn de Montalvo^b

^a*Corresponding author. c/o Asian Development Bank, 6 ADB Ave, Mandaluyong City, 1550 Philippines*

E-mail: wouter.lincklaen.arriens@gmail.com

^b*UNESCO-IHE Institute of Water Education, Westvest 7, P.O. Box 3015, 2601DA, Delft, The Netherlands*

Abstract

In the slipstream of the Rio + 20 Earth Summit in 2012 which articulated ‘The future we want’, on 29–31 May 2013, at the 5th Delft Symposium on Water Sector Capacity Development, UNESCO-IHE convened development practitioners, researchers, sector specialists, policy makers and capacity development specialists to examine who will take the lead in developing capacity ‘from Rio to reality’. This paper maps some of the major challenges and choices to increase water security in the 21st century, outlines trends and relevant models in leadership development, and explores how leadership can be nurtured and catalyzed through capacity development for individuals, organizations and networked communities to deliver on our shared visions, especially in developing countries. Leadership practice, by individuals and organizations, is examined in a range of short cases studies. The authors propose the adoption of modern approaches that will expand individual and collective leadership at all levels and combine cognitive competencies, including in-depth knowledge of integrated water resources management (IWRM), with transformational individual development.

Keywords: Capacity development; Coaching; Innovation; Integral approach; Leadership; Leadership development; Water security

1. Introduction

1.1. A call for 1,000 water leaders

In June 2007, a rallying cry was heard in Delft for 1,000 water leaders in Africa and Asia. It came at the end of 3 days of discussions at the 4th Delft Symposium on Water Sector Capacity Development which focused on developing local capacity and knowledge in a changing world.

Six years later in 2013, development practitioners, researchers, sector specialists, policy makers and capacity development specialists returned to UNESCO-IHE in Delft to take stock of progress made around the world, and to review challenges, experience and innovations. With ‘Who’s taking the

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lead in developing capacity from Rio to reality?’ as its theme, the focus of the 2013 Symposium was on leadership and making a difference.

1.2. Water security: from Rio to reality

The Rio + 20 Earth Summit in 2012 produced ‘The future we want’ (United Nations, 2012). The document itself and the process of its preparation demonstrate a shift in the international community towards developing countries in ‘the South’, contributing more leadership in charting the world’s path to sustainable development and green growth. The summit also heralded a variety of new processes to create a post-2015 framework for sustainable development, supported by a new generation of indicators and targets to measure progress and achievement. Developing countries have taken on leading roles in these initiatives, thereby claiming more ownership in the decision-making processes that affect their development paths in an ever more connected world.

Meanwhile, the World Economic Forum has alerted leaders for several years in a row to the increasingly connected global risks of water, food, energy and climate security (World Economic Forum, 2013). This has prompted high-level attention in governments, board rooms and civil society forums to explore how to lower these risks through collaborative partnerships and by breaking the silo mindsets of business-as-usual improvements within sectors. The 2nd Asia–Pacific Water Summit on 19–20 May 2013 in Chiang Mai brought together heads of state and government, as well as leaders from government, international organizations, the private sector and civil society, to commit to an agenda for national and regional actions to increase water security and reduce risks from water-related disasters.

Water security is a complex challenge and is increasingly seen as an outcome of the process of integrated water resources management (IWRM) (Ait-Kadi & Lincklaen Arriëns, 2012). Measuring performance, convening the players and growing our knowledge, with new skills, tools and capacities, are keys for success. A landmark study published by the Asian Development Bank and the Asia–Pacific Water Forum, the *Asian Water Development Outlook 2013* (ADB & APWF, 2013), sets out that increasing national water security requires simultaneous investments and good governance for five key dimensions: household water security, economic water security, urban water security, environmental water security (healthy rivers) and resilience to water-related disasters (see Figure 1). More than 75% of the countries and more than 90% of the people in the region were found to lack water security, with many countries at risk of an imminent water crisis (ADB & APWF, 2013).

To support investments in water security, developing the capacity of individuals, organizations and sector institutions is key. This has been ably demonstrated by the previous four Delft symposia (Luijendijk & Lincklaen Arriëns, 2008). The development of capacity also needs to be measured and monitored, distinct from the outcomes of the IWRM process; this is a major undertaking and also an evolving challenge.

1.3. Making smart choices

Several scales (or arenas) are recognized for increasing water security: countries (which are also the enabling environment for national water reforms (World Economic Forum Water Initiative, 2010)), river basins, cities and towns, local communities, as well as supra-national arenas such as subregions and regions of the world, and the global community itself. The range of challenges and choices to increase water security are reflected in some of the results of the first Asia-Netherlands Water Learning Week in



Fig. 1. Five key dimensions of water security (Source: ADB & APWF, 2013).

Delft in 2012, where more than 30 water leaders from Asia explored with their counterparts in the Netherlands how to make smart choices to increase water security and green growth (UNESCO-IHE, 2012). Topics attracting wide interest were how to leverage green infrastructure for water security, how to build and finance public–private partnerships for water infrastructure and services, how to adapt delta cities to climate change and sea-level rise, and how to modernize water legislation. Such choices affect the organizations concerned (with change led by individuals and teams), their partnerships, as well as institutions in the enabling environment (such as policies and legislation, and reforms – for example, the choice to combine the ministries of infrastructure and environment in the Netherlands into one).

The leaders also explored smart choices that will generate momentum across sectors, with new partnerships for change and policy-making, for example to harmonize spatial planning and IWRM. Pursuing public–private partnerships (PPP) would allow governments to move faster in project execution, with a transfer of some risks from the public to the corporate or private service provider, and often with a beneficial transfer of innovative knowledge and smart technology to the public sector. And by engaging a wider government–corporate–society (GCS) partnership model, the involvement of the community and sustainability of the project could be supported.

Innovation ‘outside the water box’ involves engaging the water–food–energy nexus and links with land management and climate change. Smart choices were also discussed in managing the expansion of cities, in the financing and contracting of strategic infrastructure projects for water security, and in combining climate proofing with the improvement of livable cities.

Leaders agreed that improving water governance lies at the heart of water security. In governing for results, the quality of processes and partnerships were found to be increasingly inseparable from the

desired outcomes. The challenge is to make integrated solutions work together. This resonates with the experience of the International WaterCentre in Brisbane, which stressed that the quality of the process for developing a shared vision is more important than the vision itself, and that this process needs to be revitalized repeatedly to maintain momentum for results (Chandler, 2013). Kouzes & Posner (2013) show how the process of creating shared visions helps in finding a common purpose that drives better results.

The question is who is taking the lead in these choices and changes? The number of players has increased. How can leadership by countries, communities, partnerships, organizations and individuals be stimulated, enabled and supported? What are the trends and the implications for the capacities needed, and how can they be developed? And what are the consequences for improving education and awareness?

To explore answers, this paper is structured as follows. Section 2 proposes an extended framework for capacity, outlines trends and relevant models in leadership development, and explores how leadership can be nurtured and catalyzed through capacity development for individuals, organizations and networked communities to deliver on our shared visions, especially in developing countries. Section 3 examines leadership practice, by individuals and organizations, in a range of short cases studies. Section 4 considers ongoing and concrete steps launched at the 5th Delft Symposium that present a way forward to strengthen water leadership through capacity development. Section 5 concludes with recommendations for further research.

2. An expanding paradigm for leadership

2.1. A wider landscape of capacity

As engagement for water security grows, with more players being convened, more local knowledge included and more silos torn down to make way for synergy among water-related sectors (commonly referred to as a nexus), the landscape of capacity development is becoming significantly wider. This should lead to a review of the earlier frameworks for measuring capacity development in the water 'sector', which were also predominantly focused on public sector organizations. How, for example, do we account for growing water management capacity in the private sector, in hydropower companies, and in civil society, including practitioner networks? And can we strengthen capacity through partnerships?

Furthermore, as more boundaries are spanned, the notion of a water 'sector' and 'water sector capacity development' will need to make way for an updated and more inclusive framework, with strong ownership in the developing countries.

Figure 2 offers a framework for capacity that transcends and includes the three dimensions recognized during the earlier Delft symposia: individuals (and their knowledge, skills, experience and attitudes), organizations (including teams and their routines, procedures and knowledge management), and the enabling environment (policies, legislation, information, culture). Drawing on the work of the Center for Creative Leadership (Petrie, 2011) and the Leadership Learning Community (Meehan & Reinelt, 2012a), two key dimensions were added for partnerships and communities.

Partnerships can be explored between distinct organizations, between PPP, or broader GCS partnerships, and partnerships between government-led development projects and international development agencies.

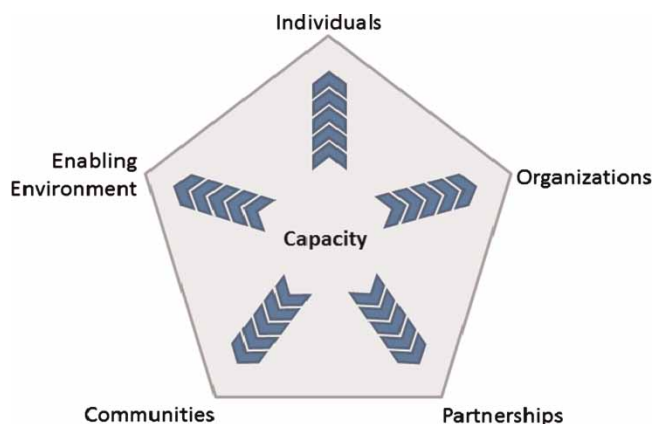


Fig. 2. Five key dimensions of capacity.

Communities can include local communities and also communities of practice, professional associations and networks, multi-stakeholder platforms, online groups including social networks, and also conferences and other forms of knowledge sharing, as well as larger segments of society working together as a community for a purpose, both in person and online.

Furthermore, the scope of enquiry into the three key dimensions of individuals, organizations and the enabling environment can be enlarged or explored with more granularity. Taking the lead in capacity development to increase water security through IWRM involves many types of individuals, not only those in executive positions but also project and team leaders and other champions, as well as emerging (aspiring) leaders and youth leaders. Any or all of these individuals can be supported by advisers, coaches, mentors and trainers. Organizations taking the lead is no longer limited to government agencies (at all levels), and extends to the private and corporate sector, and to a host of civil society organizations.

The enabling environment is commonly understood to include policies, strategies, laws, regulations, coordination bodies, information systems and the like. An expanded exploration will also consider economic, and cultural and informal institutions, norms and standards, as well as knowledge products (which can turn into policies).

Instruments are needed to measure increases in capacity in these five dimensions of capacity and, from their interplay, to assess how the whole is more than an addition of the parts. Considering the five key dimensions of the pentagram, and their interplay, offers a broader perspective to answer the question of who takes the lead. Leadership can be initiated and manifested in any of the five key dimensions. Creating a shared vision and generating momentum will require concerted work in several key dimensions. The chances of success from capacity development, in terms of significant and sustained change, may require engagement in all five key dimensions.

In exploring who takes the lead to develop capacity for sustained change and an increase in water security through the IWRM process, the pentagrams in [Figures 1 and 2](#) are understood to be dependent on each other. Water security and IWRM rely on capacity. And capacity needs leadership for its development. Leadership, in turn, also needs to be developed and strengthened. Traditional ways of leadership development have only focused on individuals (mostly senior leaders), and while effective, they were slow. There is an urgent need to explore how leadership development can be catalyzed through new approaches.

2.2. *Three shifts in leadership*

In examining opportunities to develop leadership capacity for increasing water security, we can draw on rapidly evolving research into leadership and its development around the world. Three shifts in leadership thinking and practice are noted in particular for their significance in catalyzing shared visions, effective projects and sustained outcomes.

First, leaders reach across boundaries. There is a trend to expand leadership capacity away from vertical hierarchies to reach horizontally *across* boundaries of organizations, functions, disciplines, expertise, stakeholders, cultures and geographical areas.

Second, non-executive younger leaders will influence collectively. Leadership is no longer seen as limited to the domain of executives (who hold positions with formal authority). The focus of leadership development is rapidly expanding to non-executive younger leaders and even further to youth leaders. And it is increasingly recognized that younger leaders are more adept at exercising influence collectively through groups.

Third, personal mastery empowers every leader's transformation and results. There is a growing recognition that leadership development needs to go much deeper than training courses and workshops that offer additional skills. Modern leadership development engages experiential learning (personal mastery) that expands self-awareness and nurtures transformation through challenges 'on the job', with personal development plans and continuous feedback through coaching and mentoring to manifest behaviour change and deliver results.

Petrie (2011) compares skills training for leaders to 'filling the glass', whereas modern programs will allow leaders to 'expand their glass' as well as fill it. Incorporating these shifts into the design of leadership development programs will allow water leaders at all levels to engage and influence more effectively in today's environment, which is characterized by being more volatile, uncertain, complex and ambiguous than the past.

For leaders to operate effectively in these changing conditions, research by the Center for Creative Leadership has argued that the most-needed leadership competencies 10 years from now will be adaptability, effective communication, learning agility, multicultural awareness, self-motivation and collaboration (Van Velsor & Wright, 2012). Water leaders, in particular, need to be systems thinkers who are comfortable with ambiguity and able to recognize and cut through complexity with effective solution strategies. Boelee & Reiziger (2013) explain that water leaders also need to cultivate in-depth knowledge of the process of IWRM to increase water security. They will also need to be familiar with and competent to apply multi- and trans-disciplinary approaches (see also McIntosh & Taylor (2013) in this special issue).

2.3. *Leadership trends and insights*

While earlier definitions tended to focus on the capacity of a person as leader, the concept of leadership is nowadays increasingly understood as having an effect on an organization or group of people to move 'from A to B(etter)', in other words, what it takes to make a change or a journey to a desired outcome. Bennis & Goldsmith (1994) defined leadership as 'a function of knowing yourself, having a vision that is well communicated, building trust among colleagues, and taking effective action to realize your own leadership potential'. To achieve this, one needs influence, and Maxwell (1998) argued that 'the true measure of leadership is influence, nothing more, nothing less' (p. 11).

For this paper, we follow [Horth & Vehar \(2012\)](#) and [Taylor & McIntosh \(2012\)](#) in combining these notions, and we define leadership as a process of influence by which an individual or group creates direction, alignment and commitment for their shared work. This typically involves creating a shared vision, mobilizing resources and generating momentum towards results. Drawing on [Kotter \(2001\)](#), leadership behaviours involve establishing direction, aligning resources, generating motivation and providing inspiration. By contrast, key management behaviours involve planning, budgeting, organizing, staffing, controlling and problem solving.

The field of leadership studies is wide and evolving rapidly, with many styles, methods and models being researched and advocated. [Reams \(2005\)](#) described how this field evolved from trait theory (related to ‘great man’ or heroic theory) in the early part of the 20th century, associating ‘innate qualities or characteristics’ possessed by leaders, to style theory, which formalized leadership ‘as a form of activity’ and focused on the elements of ‘tasks and relationships’.

In the 1930s, leadership’s relational aspect was linked with group dynamics theory, with a definition of leadership as a social process, stating it as ‘personality in action under group conditions’ ([Bogardus, 1934: 3](#)). In the late 1960s, situational leadership theory emerged, recognizing that different situations call for different kinds of leadership, and introducing the importance of the context in which leadership is exercised ([Northouse, 2001](#)).

Transformational leadership ([Burns, 1978](#)) focused on the process of inspiring and motivating followers to take action. More recently, competency theory applies modern psychological frameworks and suggests that effective leaders ‘must possess a specific set of abilities or competencies’ ([Thomas, 2013](#)). Other leadership theories that have evolved over the years explore charismatic, visionary, transactional, strategic, emergent, servant, resonant, primal, centered, contingent, strengths-based and boundary-spanning dimensions or styles of leadership.

The introduction of integral theory since the 1970s by philosopher and theorist Ken Wilber has given rise to the exploration of integral leadership theory, which seeks to recognize and accommodate all the other leadership theories and styles into a comprehensive integral framework ([Thomas & Volckmann, 2011](#)). Integral theory seeks to apply an approach that is ‘comprehensive, inclusive, non-marginalizing, and embracing’. This is highly relevant to IWRM and water security.

It is important to recognize that the development of leadership theory is correlated with the evolution of predominant world views over the same period, and that the effectiveness of leadership styles will be correlated to the relevance of those world views for people at any particular time and situation ([Thomas, 2013](#)). Integral leadership theory recognizes the evolution of world views (from imperial to traditional, modern, postmodern and integral), and correlates these with relevant leadership styles (from autocratic to authoritarian, strategic, collaborative and integral), and action logics (from opportunist to diplomat/expert, achiever, individualist and strategist). An action logic expresses how a leader ‘interprets his own or other behaviour and how they maintain power or protect against threats’ ([Torbert, 2004; Rooke & Torbert, 2011: 43](#)).

What these insights imply for water leaders is that making recommendations for change as part of the IWRM process should take into account the prevailing world views and cultures of the stakeholders involved in the project or basin, who may respond to different messages in a different way.

2.4. How to develop leadership

In the 20th century, leadership development was associated with people in formal and senior leadership positions, like executives and politicians ([Rost, 1991; Taylor & McIntosh, 2012](#)). Today, it is

recognized that leadership can be exercised by individual people at all levels, as well as by groups of people (such as teams, organizations and networks).

The Center for Creative Leadership (CCL), an educational nonprofit organization, has tracked and analyzed the evolution of leadership practice since 1970. Its mission is to ‘advance the understanding, practice and development of leadership for the benefit of society worldwide’¹. CCL’s experience has led it to group its core programs into leading oneself, leading others, leading managers, leading the function and leading the organization. These are intersected by specialized skill development programs and a leader development roadmap. From its research, CCL has over time developed a guideline to work with the 70–20–10 Rule for Leadership Development, advising that (only) 10% of success in leadership development can be attributed to coursework and training, 20% to developmental relationships (such as with mentors and coaches), and the remaining 70% to challenging assignments, which can take the form of bosses and superiors, turnarounds, increases in scope, horizontal moves and new initiatives (Lombardo & Eichinger, 2000; Wilson *et al.*, 2011).

From its research of innovation leadership in private companies, CCL found that effective innovative thinking requires a combination of three building blocks: mindset, skill set and tool set (Horth & Vohar, 2012). The authors distinguish business thinking (making things happen, based on research, formulas and logical facts) from innovative thinking (bringing in new ideas, finding better solutions, mapping new territory) and argue that both are needed. Rather than trying to manage creativity by entrusting innovation to separate teams or units, they advocate mainstreaming a culture of creativity and innovation across the whole organization. In times of economic crisis, a balance of business and innovation strategies is particularly helpful for dealing with situations that are characterized by high degrees of uncertainty, ambiguity and complexity. However, McEwen & Schmidt (2007) in their study show how vertical development (leadership mindsets or world views) influences innovation for corporate sustainability in times of change, found a chasm in companies’ attention to redesign for sustainability.

CCL’s research by Van Velsor & Wright (2012) into the development of next-generation leaders expands the leadership equation significantly compared with earlier approaches. They recommended that leadership development start as early as in primary school. This is an interesting finding when we consider that many people (and water professionals) today have not received an opportunity to participate in formal leadership development until their promotion into management positions in their mid-career. The research found that the five most important competencies for leaders of 20 years ago (technical mastery, self-motivation/discipline, confidence, effective communication and resourcefulness) had changed compared with today’s needs (self-motivation/discipline, effective communication, learning agility, self-awareness and adaptability/versatility)². And the change seems to continue: when asked what would be the most important competencies 10 years from now, respondents indicated adaptability/versatility, effective communication, learning agility, multi-cultural awareness, self-motivation/discipline and collaboration. Note that self-motivation/discipline and effective communication have remained throughout as essential competencies for leaders. Furthermore, among the top concerns of current leaders about the next generation were an unrealistic sense of entitlement and a

¹ The Center for Creative Leadership’s website is at www.ccl.org.

² Van Velsor & Wright (2012). The *Leadership Insights* survey included 462 business, government, nonprofit and education leaders aged between 34 and 64.

perceived lack of ability in effective face-to-face communication skills, understanding complexity, self-awareness and work ethic.

CCL offers three principles for leadership in what they regard as an increasingly interdependent world: (i) evolution in leadership thought, away from individual leaders; (ii) advances in leadership cultures from dependent through independent to interdependent, able to deal with complexity, ambiguity, and chance; and (iii) interdependent leadership within and across four levels: society, organization, group and individual (Lee *et al.*, 2012).

The introduction by CCL of boundary-spanning leadership methodology (Yip *et al.*, 2009) marked a significant further shift from the traditional vertical focus in leadership development to a new focus on spanning horizontal boundaries (across functions and expertise, with partners outside the organization, across diverse groups, and across regions and localities). Their research established a large gap of almost 80% between the growing importance given by leaders to spanning horizontal boundaries (99%) and their low effectiveness in boundary spanning (7%).

CCL developed a six-step methodology for leaders to fill this gap in three phases (managing boundaries, forging common ground and discovering new frontiers) starting at the ‘great divide’ and ending with a ‘nexus effect’. This is presented in Figure 3. Their methodology (Lee *et al.*, 2012) shows how leaders can be trained to develop effective collaboration between organizations through six successive practices (buffering to create safety, reflecting to foster respect, connecting to build trust, mobilizing to develop community, weaving to advance interdependence, and transforming to enable reinvention).

2.5. Leadership from the core

Leadership involves increased consciousness. Einstein famously remarked that no problem can be solved from the same level of consciousness that created it. Similarly, Chatterjee (1998: xix) argued that ‘leadership is not a science or art, it is a state of consciousness’. As the world’s development

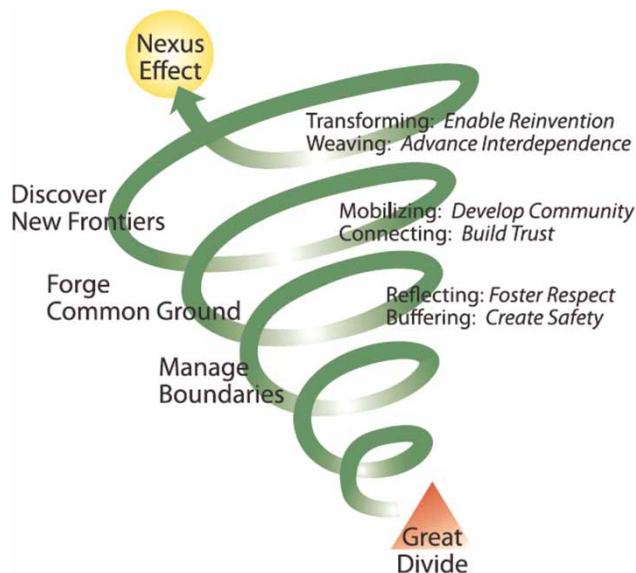


Fig. 3. Boundary-spanning leadership steps and practices (Source: Yip *et al.* (2009), reproduced with permission).

challenges have grown more complex and interdependent, schools of leadership have emerged that pay more attention to the inner dimensions of self-awareness and development, and less to acquired knowledge and skills that universities, MBAs and training can provide. And as the focus on self-awareness has deepened, it has also expanded to a 360 degree orientation to leadership all around oneself, supported by 360 degree assessments.

An important advocate of inner leadership development work has been Goleman (1998) who introduced emotional intelligence. He defined five key components of emotional intelligence: self-awareness, self-regulation, motivation, empathy and social skill, and later remarked that ‘the most effective leaders are alike in one crucial way: they all have a high degree of what has come to be known as emotional intelligence’ (Goleman, 2011: 94).

In 2009, McKinsey & Company (Barsh & De Smet, 2009) started publishing results of a global leadership survey, from which they distilled a map of five dimensions of what they called centered leadership. This model focuses on leaders who ‘master the art of leading from their core’ (Barsh & De Smet, 2009: 2).

McKinsey’s five dimensions are: (i) meaning: finding your strengths and putting them to work in the service of a purpose that inspires you; (ii) positive framing: adopting a more constructive way to view your world and convert even difficult situations into opportunities; (iii) connecting: building a stronger sense of community and belonging; (iv) engaging: pursuing opportunities disguised by risk; and (v) energizing: practising ways to sustain your energy on a long leadership journey (Barsh & De Smet, 2009). The research, including both women and men, showed that practising the five dimensions together resulted in very high scores in each of the outcomes of passion for work, leadership effectiveness and life satisfaction (Barsh *et al.*, 2010). Positive outcomes from aligning work with individual strengths were also found by Buckingham & Clifton (2001) of the Gallup Organization in their research, using the online Strengthfinder assessment.

Today’s focus on the importance of transformational leadership suggests that leadership programs following the 70–20–10 Rule of Leadership Development require enough time to produce what is referred to by Taylor & McIntosh (2012) as new leadership behaviours, which in turn result from self-awareness and inner transformation along the lines suggested by the research of Goleman, McKinsey and others, supported by newly acquired skills and tools.

In cultivating self-awareness and multi-stakeholder awareness for leadership, managing individual and collective energy is key. One perspective on leadership is that attracting desired goals into our lives and work depends on the quality of our energy, focus and whether we have cleared up internal blockages caused by self-limiting beliefs (Schneider, 2007). To create better outcomes, we may need to first transform our vision (and world view). This lies at the core of leadership development and it is complemented by adding skills, such as communication, negotiation, etc.

Leadership is also seen as a life-long journey, during which intense, transformative events can take the form of defining moments (crucibles), such as a severe test or trial. Bennis & Thomas (2011) hold that crucibles happen unplanned. However, their occurrence could well take place during the challenging assignments that constitute 70% of the leadership development process.

2.6. Taking an integral approach

When promoting changes through IWRM, water professionals normally resort to problem analysis and development of strategies to reach new goals. This may, however, not be enough to produce

change. In their study on change in 130 companies on four continents, [Kotter & Cohen \(2002\)](#) found that the successful method almost always is ‘see, feel, change’ rather than the process we are familiar with: ‘analyze, think, change’. A similar approach was ascertained by [Heath & Heath \(2010\)](#) when they explored how to lead change ‘when change is hard’. Comparing change to making an elephant switch course, their strategy was to ‘direct the rider, motivate the elephant and shape the path’. More fundamentally, [Kotter \(1995\)](#) had earlier established that change processes take considerable time to complete, and that introducing change in organizations requires systematic steps. [Meijerink & Huitema \(2010\)](#) offered a complementary perspective when they explored the role of water leaders as policy entrepreneurs and change agents to shift course.

Leading change requires an integral approach that looks for functional fit (IWRM) as well as cultural fit with the individuals and groups involved with and affected by the change (the stakeholders). The integral approach to leadership, drawing on integral theory, accommodates both functional and cultural fit by developing understanding and moving forward with solutions that take into account both the objective (exterior) and subjective (interior) perspectives, represented by the right and left-side quadrants. These four quadrants are shown in [Figure 4](#). [Esbjörn-Hargens \(2009: 1\)](#) explained that ‘integral theory weaves together the significant insights from all the major human disciplines of knowledge, including the natural and social sciences as well as the arts and humanities’.

[Thomas & Volckmann \(2011\)](#) explain that from a leadership perspective, the upper (individual) level contributes perspectives regarding individual mindset, motivation, experience, and individual actions and behaviour. On the other hand, the lower (collective) level considers perspectives of teams, groups, relationships, culture, behavioural patterns, processes and procedures, organizational structure and systems. These upper and lower levels are further divided into left and right quadrants by distinguishing subjective perspectives, such as motivation, world view, beliefs, interpretations, capabilities, feelings and perceptions, and objective perspectives including behaviour, action, economics, processes, infrastructure, metrics and the physical environment.

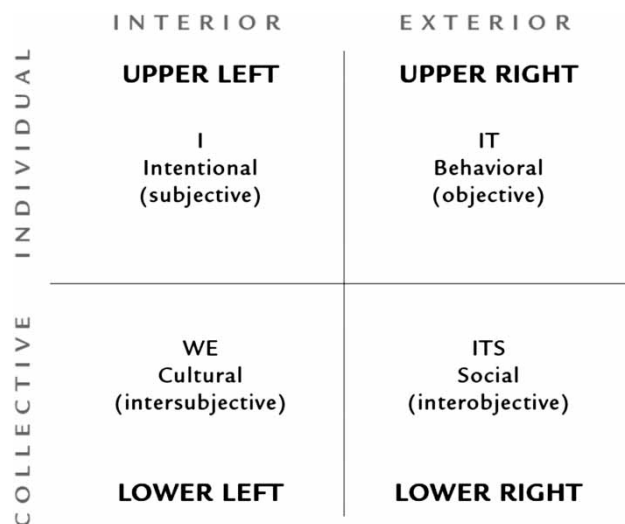


Fig. 4. The four quadrants of the integral approach (Source: [Esbjörn-Hargens \(2009\)](#), reproduced with permission).

By adopting an integral approach, a leader has access to all these perspectives in any situation, thereby gaining an opportunity to choose what is the most important while not leaving out salient aspects. In comparison, the scope of IWRM and water security is usually treated as limited to the two right-side quadrants (reflecting a systems approach). Other significant elements of integral theory include understanding people's abilities by: (i) developmental lines and levels (recognizing that intelligences, capacity, competency and skills are unevenly developed, for example between IQ and EQ); as well as (ii) states (e.g. emotions, energy levels, health, performance, morale); and (iii) types (e.g. male/female, introvert/extrovert and other personality types, as well as any typology used to describe organizations, infrastructure, economies, etc.). Recognition and interpretation of these elements are essential for developing leadership ability and applying it in any situation (Thomas & Volckmann 2011).

Of particular importance to effective communication in any situation where IWRM is advocated and used is the leader's awareness of different levels of consciousness (world views) among stakeholders. Communication (the message) has to make sense and appeal to the stakeholders at the level 'where they are at'. To make progress in IWRM and in the improvements in water governance that are an essential part of it, leaders need to be conversant with the world views and (collective) value systems of the stakeholders they are working with, as well as with their own.

Beck & Cowan (1996) refer to such conceptual models of stakeholders (individual and groups) as 'memes', explaining that such core values and collective intelligences can evolve (just like in the IWRM process with its spiral of continuous step-by-step improvements) and transcend and include all previous models. This goes back to the fundamental aspect of leadership manifestation as an expression of consciousness. People, including the (aspiring) leader, do not see the world as it is, but as they are, or as they are conditioned to see it (Covey, 1989). Stakeholders in the IWRM process in a river basin or city will communicate according to their different memes, and the water leader will have to be able to make recommendations in different 'languages' to arrive at win-win solutions. And in doing so, the leader has to cultivate a self-awareness of his/her own meme and how it is evolving as part of leadership development.

In the words of Senge (2010: 11), only by 'seeing systems, collaborating across boundaries and creating desired futures' will water leaders be effective in promoting systemic change to increase water security for all stakeholders.

3. Exploring leadership in practice

Drawing on a range of short case studies, in this section we review how and by whom leadership is manifested, within the framework of the five key dimensions of capacity introduced in Figure 2 and drawing on the elements of integral leadership theory discussed above, in order to draw leadership lessons from each case. *In the accompanying figures in this section, darkened arrows refer to a key dimension having been engaged in the case. For arrows that are shown as outline only, the corresponding key dimension was not prominently engaged as yet.*

3.1. Case studies on water leadership

3.1.1. Case 1: Building new water sector institutions with a broad vision. Following the long civil war and the signing of the Comprehensive Peace Agreement in January 2005, the Ministry of Water Resources and Irrigation (MWRI) of South Sudan was created in October 2005. As a newly established

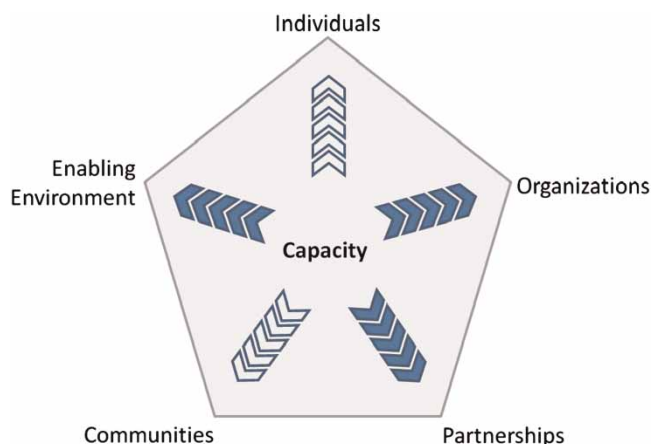


Fig. 5. Case 1: key dimensions of capacity engaged in South Sudan.

country³, South Sudan had to create and build its administrative and functional structures, and the MWRI embarked on the challenging task of organizing and institutionalizing its functions. This entailed moving from *ad hoc* interventions to sustainable well-targeted programs, and to initiate a process for sector-wide governance, capacity development, investment and sustainability (MWRI, 2007, 2011, 2012).

Besides poor infrastructure, the water sector in South Sudan experienced a considerable shortage of skilled, experienced and knowledgeable personnel. Moreover, the professional cadre in the water sector was either near retirement or young and inexperienced. To overcome the many severe limitations, MWRI chose to create a sector apex body (the South Sudan Water Sector Steering Committee) to guide the building of the necessary institutions with a combination of long and short-term strategies.

To build a long-term foundation, a sector-wide approach was adopted together with short-, medium- and long-term planning, and priority setting. For the short term, creative solutions were pursued to: (i) attract South Sudanese professionals from abroad to return to the sector; (ii) re-engage former employees and retired staff as advisors; (iii) create opportunities for on-the-job learning at all levels supported by technical assistance; and (iv) prepare a capacity development plan for the indigenous private sector, for construction of facilities using appropriate technologies.

MWRI's vision was for a sector-wide systemic approach to boost investments in capacity development rather than focusing on detailed plans to improve capacity through distinct job functions. That way, there would be no 'brain drain' to other (sub)sectors; instead, through 'brain circulation', the country would experience a 'brain gain' through broader, short- and long-term benefits for the economy and society at large. MWRI's vision also recognized the need for intersectoral approaches for capacity development to create synergy between water, health, education, environment, agriculture and other sectors.

³ Formal independence was gained on 9 July 2011 but setting up the administrative and institutional structures was begun in 2005 following the peace agreement.

Leadership lessons. Driven by a broad-based and inclusive vision for capacity development, MWRI started by creating relevant sector institutions to tackle the country's water challenges (Enabling Environment). A water apex body guided the important policy and strategic framework and improved sector-wide coordination. MWRI positioned itself as sector coordinator to harmonize the roles of different stakeholders (Organizations). Partnerships were created to leverage support: MWRI solicited development partners to contribute towards the wider goals of capacity development through short-term training and tapped regional partners, including the Nile Basin Initiative (Partnerships) (Figure 5).

3.1.2. Case 2: Building capacity for IWRM through a national support program. The government of the Lao People's Democratic Republic (PDR) was one of Asia's early adopters of IWRM when, in 1996, it committed to prepare a national water sector profile, leading to a national water policy, strategy and water resources law. Implementation of IWRM, however, depended on a critical mass of capacity and progress remained slow for many years. This changed when a woman minister took charge of water resources management, leading the creation of the Water Resources and Environment Administration (WREA). After being introduced to IWRM policy and practice in the international scene, she decided to make a difference by accelerating its implementation in Lao PDR at the national and river basin level, helping to turn the vision and policy into action through a comprehensive IWRM support program for capacity development. With her vision, passion and dedication, she persuaded more than five international development partners to support components of the new program, and she became known for personally chairing progress review meetings and technical workshops for their entire duration.

Leadership lessons. The minister played a key role, drawing on her deep conviction, involvement and knowledge to develop and articulate a clear vision and to passionately follow up on implementation, often through meetings starting at 6.30 a.m. (Individuals). A strong coalition of international development partners was mobilized to provide expertise and funding (Partnerships), and the Network of Asian River Basin Organizations (NARBO) was brought in to draw on Asian experience in advising an RBO model that would be suitable for Lao PDR (Communities) (Figure 6).

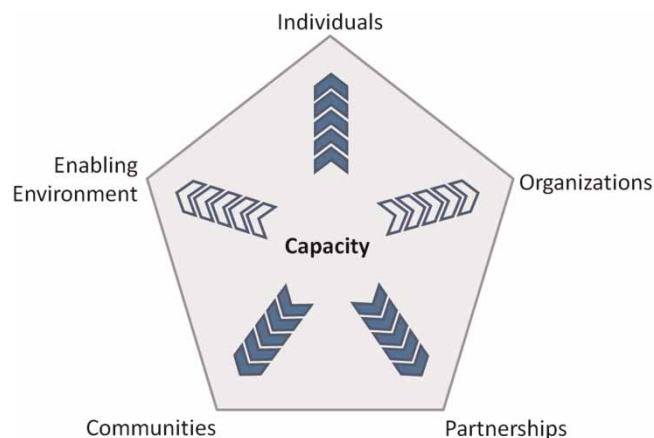


Fig. 6. Case 2: key dimensions of capacity engaged in Lao PDR.

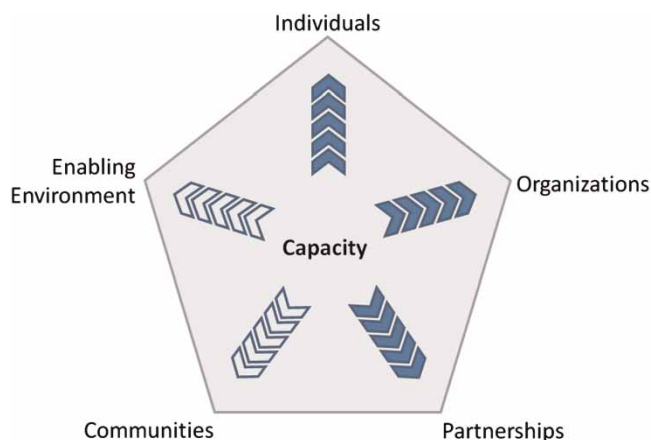


Fig. 7. Case 3: key dimensions of capacity engaged in Karnataka.

3.1.3. Case 3: Coaching catalyzes visionary government leadership. Karnataka is an advanced state in India with a high gross domestic product, home to India's IT industry, and is doing well according to indicators. It is urbanizing rapidly and is facing the consequences of competing demands for water. Consequently, it has given a high priority to water investments with an annual budget of US\$2 billion ($\text{US}\2×10^9). Government agencies are making use of IT and are well aware of advances in water management nationally and regionally. Karnataka's program for introducing IWRM is self-initiated, with limited external investments. It is self-reliant and proud of its achievements and advances.

The Asian Development Bank (ADB) was invited to work with Karnataka's government in developing investments and capacity development to improve water management in urban and rural areas and for IWRM in the state's river basins. The state's Principal Secretary for water resources has demonstrated to be a strong water champion committed to leading the way and making the state's investment program a flagship initiative in India. With strong communication skills and clarity in thinking, he has articulated what the state needs. He speaks in a visionary way of ideas for the future rather than for today, and has assembled a core team which emulates his example and effectively influences direction and momentum in projects and activities.

Drawing on a diverse and broad-based background, and his training as a coach with the International Coach Federation, have enabled the Secretary to have a sound grasp of the subject matter, a clear advantage of the choices to be made, and a charismatic ability to cause transformational change in himself, his team, and his staff. A spiritual context plays an important role in his thought process and reasons for commitment. He consistently rewards and encourages those who work with him.

Leadership lessons. Exceptional personal leadership in an important executive position (Individuals) has enabled the Secretary to cause transformational change in his department (Organizations), and to engage strategically with partners including ADB (Partnerships) who were ready to acknowledge and work with the client as leader (Lincklaen Arriëns, 2011, 2013) (Figure 7).

3.1.4. Case 4: Becoming a capacity builder for the region. In several respects, Uganda's water sector has become a prime example in Africa, and it can be argued that the Ministry of Water and Environment

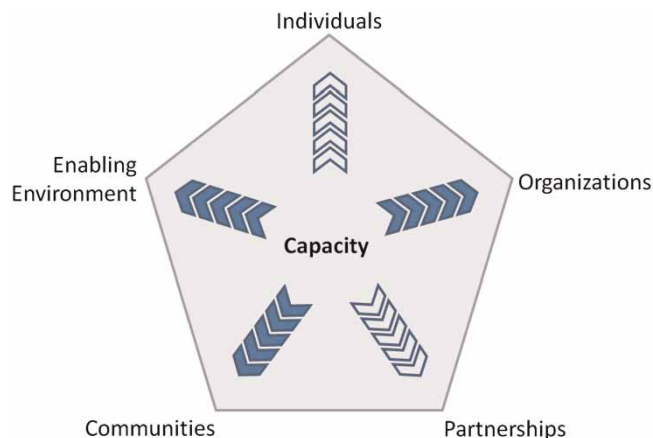


Fig. 8. Case 4: the key dimensions of capacity engaged in Uganda.

(MWE) had a leading role in making this happen. It developed structural arrangements, influenced policy in favour of capacity development, and mobilized local and international resources to support capacity development initiatives to improve the overall performance of the sector. When the management of water utilities in small towns was handed over to private operators, the majority did not have the necessary skills to manage water supply as a business. To bridge the gap, MWE organized capacity development activities to equip the private operators with relevant business management skills. Training programs were also conducted for water resources management and water quality. Some of the operators, especially those reliant on groundwater, came to realise that water, as a finite resource, would be easily depleted if not managed well.

Over a period of 10 years, and with the support of donors, Uganda developed a sector-wide approach for water and sanitation. Eleven ‘golden indicators’ were developed to track performance, in collaboration with local stakeholders, with annual action plans. Uganda’s water sector performance report engages all stakeholders, and primary data was generated by local governments. To ease the compilation and sharing of information, local district officers were trained in information management and sharing.

Other countries are now drawing on Uganda’s expertise in establishing sector-wide monitoring and the National Water and Sewerage Corporation has become a recognized capacity builder in the region.

Leadership lessons. Institutional arrangements for water supply are now largely in place, with roles and responsibilities defined and agreed (Enabling Environment). When MWE staff acquire knowledge and skills through capacity development, training or education, they are required to share it with colleagues upon their return (Communities). The collective drive by the MWE to strengthen capacity internally and outside its organization’s boundaries, especially at district and local levels, coupled with its networking ability to draw on donor resources, have been a key for success in the sector’s continuing improvements (Organizations) (Figure 8).

3.1.5. Case 5: Introducing a flagship IWRM investment program with basin stakeholders. Indonesia has long been a leader in Asia to champion integrated approaches to water resources management at the levels of policy, legislation and river basin management. In 2007, stakeholders in the strategic Citarum river basin in West Java decided to reject the government’s design for a water investment project that

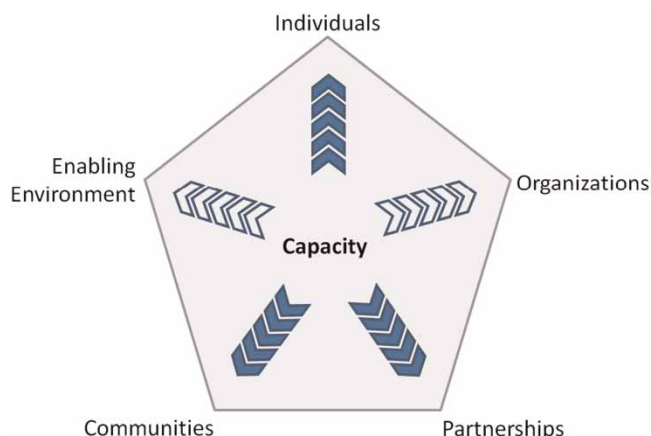


Fig. 9. Case 5: the key dimensions of capacity engaged in the Citarum river basin.

they saw as disproportionately benefiting the population in the lower part of the basin and the capital city, Jakarta.

Led by the National Planning Agency (BAPPENAS), the government then decided to change the project into a multi-stakeholder investment program. A vision for the river basin was drawn up by the government working closely with basin stakeholders themselves, through a participatory process, and this formed the basis for formulating a 15-year roadmap for IWRM implementation, supported by an innovative multi-tranche financing facility from ADB. The process was championed by two leading professionals in BAPPENAS and ADB.

Leadership lessons. There was a collective effort to develop a visionary approach involving basin stakeholders (Communities), and a passion for getting things done, including gaining the trust of West Java's provincial government and using quiet persuasion to align the interests of a multitude of government agencies involved through a solution-based approach, as well as building a relationship of trust for a partnership between BAPPENAS and ADB to implement a new financing approach that neither side had tried before, and championing a process with hallmarks of being inclusive, innovative and integrated (Partnerships) (Figure 9).

3.1.6. Case 6: Performance benchmarking for river basin organizations. The Network of Asian River Basin Organizations (NARBO) was established in Indonesia in 2004, supported by the Japan Water Agency, ADB and the ADB Institute, as a concrete outcome of the Third World Water Forum in 2003 in Kyoto. Faced with a mandate to help river basin organizations (RBOs) throughout monsoon Asia to strengthen their capacity for IWRM, the question arose right away how RBO performance would be measured. This gave birth to NARBO's performance benchmarking service.

Recognizing that the outcomes of RBOs could not be measured in the same way as utilities providing water services, it was clear that customary metric benchmarking would not be appropriate. The International Water Management Institute (IWMI), one of NARBO's knowledge members, stepped forward to offer a new approach involving process benchmarking, drawing on methodology developed for performance management in non-profit organizations. This had not yet been used before for public water management organizations.

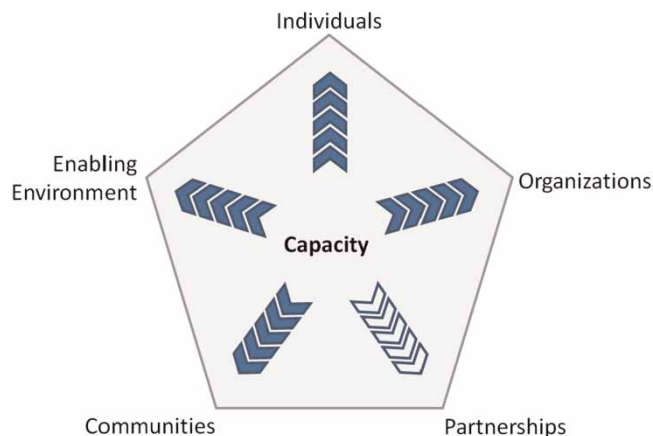


Fig. 10. Case 6: the key dimensions of capacity engaged through NARBO.

A series of workshops were held to develop the methodology in a participatory way, involving NARBO member organizations, leading to piloting of the methodology of self-assessment and peer review by Perum Jasa Tirta 1(PJT1) for the Brantas basin in Indonesia, the Mahaweli Authority in Sri Lanka, the Laguna Lake Development Authority in the Philippines, and the Red River Basin Organization in Vietnam. Their experience was positive and the government of Indonesia proceeded to adopt it as standard practice for RBOs in that country. Several training workshops were held to produce certified peer reviewers for national as well as international performance benchmarking events.

Leadership lessons. Leadership was exercised by professionals of several organizations (Individuals) who were working together in NARBO (Communities). This led to concrete results through a participatory process, and to subsequent adoption of benchmarking practice by leading RBOs and the Indonesian government (Organizations). The participatory approaches, together with the adoption of guidelines setting out the methodology, and training of certified peer reviewers, were keys for success (Enabling Environment) (Figure 10).

3.1.7. Case 7: Transforming a broken system into a world class water service. The story of the Phnom Penh Water Supply Authority in Cambodia has been told numerous times, for good reasons, and has been well documented by now. Over the period of a decade, a broken system in one of Asia's poorest countries was transformed into an example of world class water service excellence, in the public sector.

Leadership lessons. All five key dimensions were engaged during the transformation process, starting with the personal leadership of Ek Son Chan (Individuals), and supported by the enabling government policy to grant autonomy to the authority (Enabling Environment), the work to strengthen the authority (Organizations), the partnership with ADB and the World Bank (Partnerships), and effective advocacy and knowledge sharing with customers, stakeholders and practitioners in Cambodia, Asia and in the global community (Communities) (Figure 11).

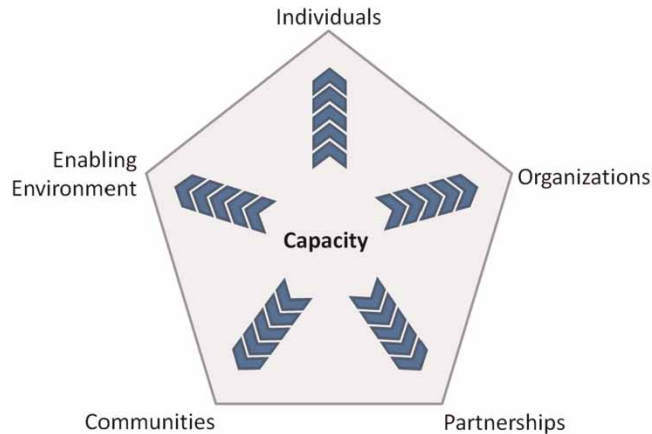


Fig. 11. Case 7: the key dimensions of capacity engaged in Phnom Penh.

3.1.8. Case 8: Innovating project design through a regional knowledge hub. The International Centre for Water Hazard and Risk Management (ICHARM) in Tsukuba, Japan, is one of the 17 regional knowledge hubs of the Asia–Pacific Water Forum, focusing on flood and drought management. ICHARM has demonstrated some of the best examples in implementing the key operating principles for knowledge hubs. It conducts cutting-edge research, applies this to development projects in multiple countries, and supports this with education and training (including Masters programs) and advocacy.

Through a partnership with ADB, ICHARM engaged with governments in the lower Mekong region, Indonesia and Bangladesh, to introduce innovative designs for flood and drought-risk reduction projects based on their research.

Leadership lessons. Keys for success have been ICHARM’s organizational performance (Organizations), its partnerships with public, private and international organizations, including ADB (Partnerships), and its knowledge sharing through global and regional networks (Communities) (Figure 12).

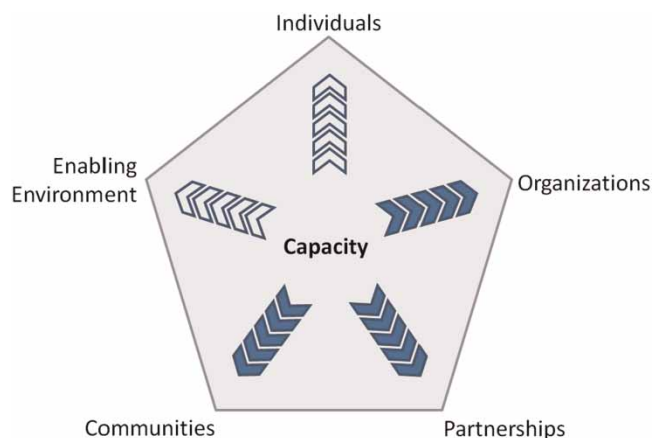


Fig. 12. Case 8: the key dimensions of capacity engaged by ICHARM.

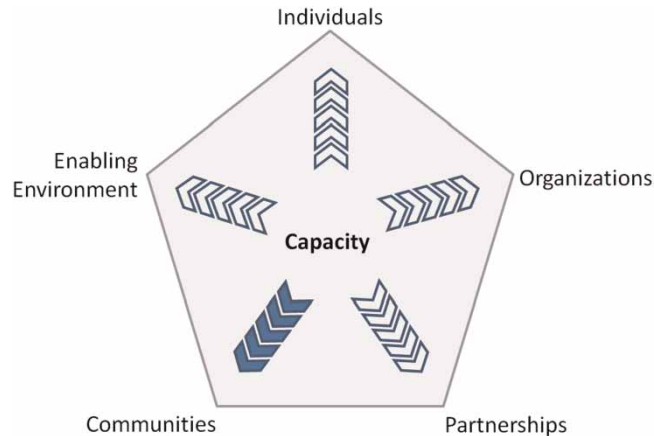


Fig. 13. Case 9: the key dimensions of capacity engaged by NARBO.

3.1.9. Case 9: Expanding the IWRM paradigm with a process perspective. From its adoption by the Global Water Partnership (GWP) in 1996, IWRM has been characterized by the three pillars of economic efficiency, social equity and environmental sustainability ('the 3 Es'), and three basic principles that underpin good water management: the enabling environment, institutional roles and management instruments.

A significant expansion of this paradigm was introduced through joint work by Japan, UNESCO and NARBO to produce several volumes of guidelines for IWRM application in river basins, showing IWRM as a spiral process. Reflecting on these guidelines, GWP has recognized that IWRM is indeed 'an adaptive management process to increase water security, and that the context that informs water security is constantly changing' (Ait-Kadi & Lincklaen Arriëns, 2012).

River basin organizations throughout Asian countries have welcomed the role of the Japan Water Agency and ADB to champion the use of the spiral model through NARBO's capacity development activities, because it helps them visualize and relate their past, present and future actions, embedded in an inclusive stakeholder approach and a strong leading role by NARBO.

Leadership lessons. This case demonstrates how a persistent focus and effort in one key dimension can catalyze success among practitioners, through systematic knowledge sharing and capacity development in river basin organizations, drawing on a set of guidelines with a strong visual model (Communities) (Figure 13).

3.1.10. Case 10: Gaining certification for consistent performance in a public corporation. The Perum Jasa Tirta 1 (PJT1) public corporation is the river basin organization for the Brantas and Bengawan Solo rivers in Java, Indonesia. It boasts enviable achievements, reached over several decades of capacity development supported by government and international partners, especially Japan. Improved performance in the Brantas basin has included increasing water supply and electricity production, and reducing flooding. The work of PJT1 has contributed to an increase in the regional gross domestic product compared to the national average and to creating wider social welfare benefits.

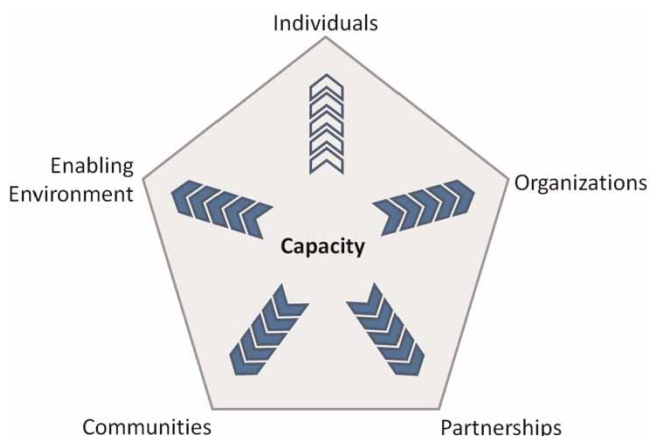


Fig. 14. Case 10: the key dimensions of capacity engaged by Perum Jasa Tirta 1.

PJT1 has excelled in relentlessly pursuing high standards of performance, including on-the-job training for 7,000 staff over the years. It has consciously and deliberately developed the Brantas spirit, driving change through positive, collaborative and visionary working culture and practices. Through its work, PJT1 has created and optimized a process of influence, establishing direction, aligning resources, creating motivation and inspiration for IWRM. The consistent quality of its business processes has earned PJT1 ISO certification (further details are provided in [Subijanto et al. \(2013\)](#) in this special issue).

Leadership lessons. Sustained government investment in building PJT1's capacity (Organizations) and enabling it to work as a public corporation rather than a government department (Enabling Environment), have been keys for success. PJT1 has optimized and sustained its performance through pro-active partnerships with basin stakeholders and local governments (Partnerships) and knowledge sharing in the basin, in Indonesia, and globally (Communities) ([Figure 14](#)).

3.1.11. Case 11: Partnering with young water leaders. Youth leaders have in recent years signaled their presence and commitment to realize water security and sustainable development as never before. Globally, they made a mark on the 6th World Water Forum and, in 2013, they joined the 2nd Asia–Pacific Water Summit in Chiang Mai, Thailand, where they issued their own declaration while being engaged simultaneously in an intensive program of learning and visiting local water projects. ADB's recent inclusion of a competitive youth debate at the annual meetings of its board of governors has been a popular development, with a significant part of the discussion focused on water security.

The World Economic Forum has been an early champion of youth leaders through its Global Shapers program. The United Nations Environment Programme (UNEP) is also making a significant contribution through its TUNZA program (the word TUNZA means 'to treat with care or affection' in Kiswahili, a subregional language of Eastern Africa). UNESCO-IHE selected youth leadership and

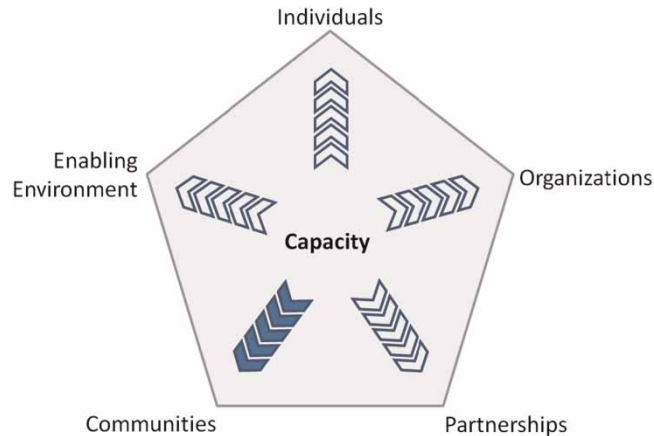


Fig. 15. Case 11: the key dimensions of capacity engaged by youth leaders.

partnering with young leaders as one of its themes to be explored at the 5th Delft Symposium, as an integral part of capacity development.

Working with youth leaders is often a distinct and stimulating experience. Contrary to older professionals, the current ICT-enabled youth tend to work more collectively than individually, and with less reluctance, inhibitions or silos⁴. Their case made at the Delft Symposium was for experienced water practitioners to find ways to partner with youth leaders in their work, rather than continuing to work in separate spaces.

Leadership lesson. The main keys for success to date have been working collectively in groups and networks (Communities), and advocating a culture for practitioners to partner with youth leaders in projects and programs (Figure 15).

3.2. Taking stock

A cross-case review of the above cases reveals a number of insights. First of all, the concepts proposed in Figure 2 had assumed that leadership would be optimized if it engages all five key dimensions of capacity. From the cases examined here, it is evident that not all key dimensions have been engaged to an equal extent in each case. Many seemed to have engaged only three key dimensions. Specific combinations of several dimensions were thought to provide the best ‘mix’ in a given culture, context, situation and with the available leadership abilities.

While leadership has been equated with individuals (in executive positions), several cases illustrate that strong individual leadership did not stand out. A focus on working behind the scenes to build trust and create essential pieces of the enabling environment can be just as effective in certain situations. Of course, individual leaders are active in all cases, whether prominently coming to the fore, or working as enablers with lower visibility, sometimes choosing to do so deliberately.

⁴ P. Samaniego, personal communication, 29 May 2013, and Meehan & Reinelt (2012b).

Also, the extent to which leaders have engaged their transformational capacities is an open question. Research referred to in this paper suggests that there is much more to be done to develop leadership and leaders (Boelee & Reiziger, 2013). An examination of a larger number of and more in-depth cases would provide the sound empirical basis to assert these initial findings.

4. The way forward for water leadership

4.1. Developing water leaders

Leadership development was woven as a red thread through the presentations and discussions of the 5th Delft Symposium, as it was a common and cross-cutting theme and drew on a number of examples of leadership development. Foremost among the examples to date was the Water Leadership Program – Developing Emerging Leaders for Tomorrow’s Challenges (created by the International WaterCentre (IWC) at Brisbane, Australia, after the 4th Delft Symposium). IWC has offered a modern long-term program for emerging leaders based on many of the principles articulated in this paper, including the 70–20–10 approach, and it serves as an example for further programs to be developed elsewhere in the world, including for developing countries. The program’s development, implementation and evaluation is itself the subject of research in peer-reviewed journals, which ensures that the knowledge of how to conduct water leadership development is growing systematically (Taylor & McIntosh, 2012; McIntosh & Taylor, 2013).

In the final session of the 5th Delft Symposium, the participants adopted *Global Quality Standards for Water Leadership Development Programs* (UNESCO-IHE, 2013), recognizing UNESCO-IHE’s mandate as custodian to promote and periodically update these standards. The standards drew on the results of the collaborative project between UNESCO-IHE and ADB, including the results of the study conducted by Boelee & Reiziger (2013).

The start of a new International Water Leadership Programme was also announced jointly by UNESCO-IHE, the International WaterCentre and Nyenrode Business Universiteit. The expectation is for these Symposium outputs to create more opportunities for leadership development in developing countries, including in Asia and Africa, in response to the call to action of 2007. The adoption of the global quality standards is expected to help mobilize the necessary funding for such programs to be developed and implemented, including from water development projects and the private sector, including private foundations.

4.2. Leadership and IWRM proficiency

In Asia, NARBO has already decided to start incorporating leadership development modules into its training programs for developing capacity in IWRM at four levels (basic, middle, senior and regional). UNESCO-IHE has started to work with NARBO and ADB to explore how proficiency in IWRM can be certified as a result of such programs, by accredited centres to be established in developing countries in Asia. The government of the state of Karnataka in India has requested to pilot such an initiative in cooperation with ADB and UNESCO-IHE.

In anticipation of such proficiency certification going ahead, ADB and UNESCO-IHE are also exploring how the number of professionals certified for IWRM proficiency can become a measurable indicator of IWRM progress in countries across Asia (and thereby serve as an indicator of a country’s IWRM capacity towards increasing water security). UNESCO-IHE and IWC are both exploring how

leadership development modules can be integrated in their ongoing master's degree programs for integrated water management. Several practitioner organizations, including the Mekong River Commission and Indonesia's Directorate General for Water Resources, are reviewing their competency frameworks and plans for human resources development, in which leadership development is expected to find a central place. The inclusion of leadership in competency frameworks has been explored in other papers presented at the Symposium (e.g. Douven *et al.* 2013).

4.3. Supporting water leaders

While water leadership development will be taken forward through the type of programs announced at the Symposium, many other opportunities can and should be used to support aspiring water leaders in their learning and practice. Capacity development, training and education curriculums for water project managers and team leaders can be modernized to include modules on leadership. Coaching programs can be initiated in water-related organizations, to support aspiring leaders and hone the skills of more experienced leaders. Mentoring programs and team-building initiatives will be beneficial in many organizations. Twinning arrangements, such as the Water Operator Partnerships, and for twinning between river basin organizations, offer good opportunities and challenging assignments for emerging leaders. Opportunities can be created to partner with youth leaders, drawing on the example of the International Fund for Agricultural Development (IFAD) project that lets young professionals work with experienced leaders in rural development projects in Africa, and on the Korea Water Forum's initiative in support of the Asia-Pacific Youth Parliament for Water, as well as the partnerships with youth leaders that are being explored by NARBO and the Asia-Pacific Water Forum (APWF).

5. Conclusions

While leadership challenges have changed, including in the world of water and water security, many leadership development activities have yet to catch up and embrace change. In this paper we have demonstrated that the field of leadership and leadership development is evolving as fast as the world around us, offering many exciting opportunities for better results and engaging more emerging leaders than ever before in the process.

Informed by the three shifts in leadership that are taking place around the world, and making use of the valuable research findings available and the innovative pilot programs started since 2007, as well as the initiatives announced at the 5th Delft Symposium, water practitioners have more resources at their disposal to examine their own development as water leaders, and explore how they can take the lead in capacity development 'from Rio to reality' using the expanded framework of the five key dimensions offered in this paper. Leaders are people who understand what is important, visualize how to move forward and are committed to make the extra effort to get there with their partners, without anyone asking them to do so. There is ample opportunity to do this in each country, river basin and city.

The authors recommend that further research be conducted into leadership for capacity development and into how capacity development can best strengthen leadership to help increase water security, with more case studies looking at projects 'on the ground' as well as into the most effective ways of developing leadership through dedicated programs. We believe that this paper has uncovered the tip of the iceberg and that many will decide to dive into the deep to explore how to apply modern approaches targeted at enabling

individual and collective leadership at all levels, and combining the development of cognitive competencies together with transformational individual development as well as leadership, through teams and networks.

Authors

Wouter T. Lincklaen Arriëns served as Lead Water Resources Specialist at the Asian Development Bank until August 2013. Uta Wehn de Montalvo is Senior Researcher and Coordinator for Knowledge and Capacity Development at UNESCO-IHE Institute for Water Education, and led the organization of the 5th Delft Symposium on Water Sector Capacity Development.

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The views expressed in this article are those of the authors and do not necessarily reflect the views and policies of UNESCO-IHE or the Asian Development Bank or its Board of Governors or the governments they represent.

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