



STRENGTHENING WATER GOVERNANCE IN THE GLOBAL SOUTH: ROLE AND INTERNATIONAL EXPERIENCES OF UNESCO-IHE IN CAPACITY DEVELOPMENT

Uta Wehn,^{ab} Kenneth Irvine,^a Frank Jaspers,^a Wim Douven,^a Assela Pathirana,^a Erik de Ruyter^a

■ Water lies at the heart of human development but the global challenges for meeting demands, coupled with increasing urbanisation, land degradation and human population growth, make the challenges of water use in the developing world particularly acute. Capacity development is crucial for creating and strengthening the knowledge base to address water-related development challenges via sound water governance. The UNESCO-IHE Institute of Water Education has a strong mandate and track record in capacity development within the water sector. As part of the review of its strategic direction, UNESCO-IHE undertook a review of its capacity development (CD) programme, using a variety of reflection modalities and involving a broad range of staff and external stakeholders. The purpose of this paper is to capture the created, collective understanding and to outline the identified responses. In the face of increasingly complex challenges and demands at national and global levels, we find that it is imperative to strengthen the capacity of water sector *organisations* and not just the individuals inside them, and to pay attention to the needs for the development of complementary skills across the various sectors that play a key role at scales of water management from local to transboundary. Thus, the challenge for UNESCO-IHE and other capacity builders is how to shape their CD activities so as to maximize impact in terms of helping people and organisations to solve their water-related challenges by creating, transferring and applying knowledge for change and innovation. This can only be achieved if capacity builders practice what they preach for strengthening organisational capacity, namely carefully managing their own knowledge base (on CD), fostering knowledge sharing (on CD) among their staff and with their partners in the Global South, and considering each (CD) project a learning opportunity.

■ Water lies at the heart of human development. The global challenges for meeting demands for increased food production and energy place increasing pressures on water resources, the landscapes that supply water and on the rivers, lakes and oceans that receive, and

assimilate, waste water. Increasing urbanisation, land degradation and human population growth make the challenges of water use in the developing world particularly acute. Water-related disasters including droughts and floods, pollution, domestic, industrial

a UNESCO-IHE Institute for Water Education, P.O. Box 3015, DA Delft, The Netherlands.

b Corresponding author: u.wehn@unesco-ihe.org, tel. +31 15 215 1802, fax +31152122921.

and agricultural allocation of water, and inadequate sanitation remain major global concerns. Aspirations and fiscal policies to support economic development in both the developing world and countries in transition can increase those pressures, hindering global policies to combat climate change and achieve sustainable development.

The role of innovation in addressing these challenges is attracting increased attention, with a mounting focus on social innovation, defined here as those processes and outcomes focussed on addressing societal goals, unsatisfied collective needs or societal – as opposed to mere economic – returns (e.g. Mehmoud 2013). Social innovation consists of both technological and non-technological elements, and is particularly salient in the context of the water sector in dealing with the many complex and cross-cutting challenges, and ‘wicked problems’ that need to be addressed but that cannot not be met by responding to market signals alone. Innovation requires not only the use of existing, or the generation of new, knowledge but also new approaches in applying it effectively to influence water management decisions at local, regional and national scales. This includes mechanisms that can help overcome policy or administrative inertia to change.

Capacity development is crucial for creating and strengthening the knowledge base, facilitating attitudinal changes for successful social innovation, in fostering technological know-how and identifying relevant institutional and social contexts and subsequent learning and relational skills development to address water-related development challenges. Capacity Development has evolved as a key pillar in international development policies and agendas, as is visible not least from its inclusion in numerous targets across the Sustainable Development Goals (Wehn, 2014). It is generally recognized by governments, international agencies and financiers, and civil society as being particularly important for the water sector (Wehn de Montalvo and Alaerts, 2013) and for water governance (OECD, 2015).

The UNESCO-IHE Institute of Water Education has a strong mandate and track record in capacity development within the water sector. Capacity development (CD) is, along with education and research, a key pillar of the organisation. The Institute’s distinctive CD focus has set it apart from other national and international educational institutions that provide skills training for students from developing countries and countries in transition, as the emphasis has been consistently on application of third level skills in the home countries of the institute’s alumni. The *raison d’être* for the Institute is precisely to have impact on the performance of the water sector particularly in developing countries and countries in transition, and which is the overarching principle guiding the Institute’s research and education. The

much needed current focus on capacity development and implementation highlighted by the Sustainable Development Goals (Wehn, 2014) provides further incentive and stimulus for the institute’s CD mission.

As part of the review of its strategic direction, UNESCO-IHE CD undertook a review of its CD programme, using a multidisciplinary task force spanning social science to engineering, internal workshops, an international stakeholder event, and international survey among its stakeholders. This process provided the opportunity to take stock and critically reflect on existing capacity development activities of the Institute as well as future challenges and prospects, and to (re)define UNESCO-IHE’s strategy for capacity development in view of identified gaps and opportunities. The purpose of this paper is to capture the created, collective understanding and to outline the identified responses.

In the remainder of this paper, we briefly present our conceptual understanding of capacity development (section 2) and UNESCO-IHE’s role in capacity development for the water sector, with some concrete examples. In section 3, we consider upcoming trends and developments and how the Institute needs to prepare itself to respond to these. In section 4, we conclude with some final observations for the Institute as well as other capacity builders.

The Capacity Development perspective at UNESCO-IHE

During the nineties of the last century, concepts related to “capacity” (capacity building, capacity development) became part of a separate discussion and introspection in the water sector. Based on reflections upon the many failures of infrastructure development projects that, over time, did not result in the expected impacts (owing to planning mistakes, operational shortcomings, deterioration and lack of maintenance (Jaspers and Gupta 2014)), it became increasingly clear that development interventions need to better accommodate existing social systems (people, organisations, institutional settings, culture, power relations, values, politics) that are at a particular level of development because of their historical context.

The scientific debate on ‘capacity development’ that developed over the past decade has questioned the ‘return on investment in CD’ owing to growing pressures on developmental aid funds (Vallejo and Wehn, 2015), while reflecting on and contributing to a more scientifically-underpinned knowledge base of principles, approaches, methodologies and good practices. The conviction that “training” is *the* solution for (water sector) development has been replaced by a much broader conceptualisation of capacity development, in which training and educating professionals is only one of many possible modalities

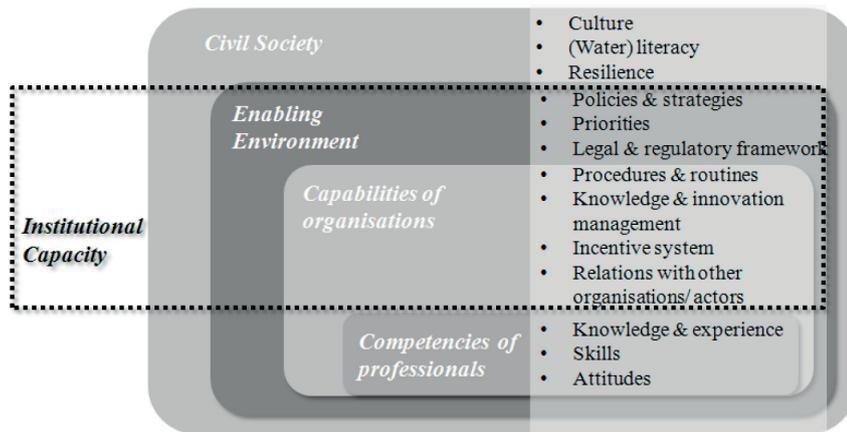


Figure 1:
Nested levels within the capacity system

Source: Authors, based on Lusthaus (1995), UNDP (1997), Keijzer (2011), Vallejo & Wehn (2015)

and only a very specific means of support (Keijzer et al. 2007; Vallejo and Wehn, 2015; Irvine et al. 2015).

Knowledge is a crucial factor for the performance of individuals and organisations (OECD 2013) and presents the basis for both technological and non-technological innovation. Knowledge can be distinguished into explicit (or codified) knowledge, which is person-independent and can be transferred more easily (e.g. through education) than tacit (or implicit) knowledge which is person-dependent, built up through experience (Polanyi, 1966; Nonaka et al., 2000). People assimilate new knowledge as part of life-long learning. Although this is increasingly advocated through continuing professional development, most learning is informal, taking place in applied settings and 'on-the-job' (Tough, 1971; Nonaka et al., 2000). The capacity system therefore comprises several nested and interrelated levels,¹ consisting of the competencies (incl. motivations and attitudes) of individuals, the capabilities of organisations and their relations and interactions with other actors/organisations, the characteristics and composition of the (dis)enabling environment and the culture and knowledge base of civil society ((Lusthaus (1995), UNDP (1997); Keijzer et al. 2011; Vallejo and Wehn, 2015), as illustrated in Figure 1.

While the process of strengthening capacity at one or more of these levels – capacity development – is the inherent responsibility of people, organisations and/or society (OECD, 2006), knowledge institutes such as UNESCO-IHE play an important supporting role. Capacity Development involves concerted efforts at multiple levels and whose aim is clearly to solve problems and improve performance rather than presenting a means in itself (OECD 2006; UNDP 2009). The very nature of the challenges of water management require multidisciplinary and transdisciplinary skills, and the capacity and innovation to adapt to changing circumstances, well illustrated by shifting pressures on sustainable water management posed by climate change and rapid urbanisation. These challenges need creative problem solving and critical thinking (Treffinger, 1996; Weatherley et al., 2003), and

the interpersonal skills that foster collaborative learning (Sahlberg and Oldroyd, 2010; Johnson and Johnson, 2009).

UNESCO-IHE'S ROLE IN CAPACITY DEVELOPMENT FOR THE WATER SECTOR

UNESCO-IHE is an academic water education institute with the explicit mission to “contribute to the education and training of professionals and to further develop the capacity of sector organisations and knowledge centres in the fields of water, the environment and infrastructure, in developing countries and countries in transition.” (UNESCO-IHE, 2014, p.5). As such, it promises that “UNESCO-IHE engages in institutional strengthening projects and provides advisory and consultancy services to knowledge institutes, water sector organizations, knowledge networks and UNESCO member states. Through these operations, the Institute increases its global impact and helps to build sustainable organisations that are equipped to properly manage water resources and deliver water services sustainably.” (UNESCO-IHE, 2014, p.6). Institutional, organisational and individual capacity development (CD) are, therefore, part of the Institute's core business.

What started nearly 60 years ago with an initial training offer in specific water topics, has evolved into an international water education institute focussed on tertiary education programmes in almost all aspects of water resources management (delivering MSc and PhDs), but also, in parallel, into many different programmes and projects that focus on strengthening individual, organisational and institutional water capacity. While all of UNESCO-IHE's activities aim at developing capacity, the impact of these activities on (international) development may vary greatly, depending on the type of knowledge and how this is generated and shared.

UNESCO-IHE's beneficiary is the water sector at large, represented by local ministries and other public and private organisations with a focus on water-related aspects. Universities and research centres with a water focus are instrumental knowledge producers, providing

water-related education and validating relevant knowledge with, and for, the water sector to better meet the needs of a sustainable future. Through the education (MSc and PhD) and training programmes in the Netherlands, UNESCO-IHE builds important international relationships with the water sector that is further motivated by an extensive alumni network (some 15,000 professionals), the majority of whom were involved initially as mid-career professionals in the institute’s programmes.

The activities that UNESCO-IHE focuses on (usually in the form of a project) differ from infrastructure development projects, partly because the requests differ: from “we need our staff to be trained in waste water treatment”, to “our university would like to develop a Water MSc program or a water related module” and “help us to adapt to and mitigate climate change effects on water scarcity in Cuba”, etc. The CD modalities typically used by UNESCO-IHE consist of various forms and combinations of education and training, joined research, advisory services, e-learning as well as knowledge networks and partnerships (see box 1).

Education and training

- standard course
- tailored made training (TMT)
- workshops
- class-room teaching
- awareness raising campaign
- apprenticeships/on-the-job training
- training of trainers (ToT)
- study tours /visiting organisations
- action learning

Joint research

- research partnering/ co-authoring with local experts / researchers
- MSc, PhD, postdoc

Advisory services – support/guidance for:

- compilation of strategy /policy / research agenda
- curriculum development
- needs assessment / requirements analysis
- change management, knowledge management, policy development and implementation

e-learning & distance learning

- online courses
- online resources (e.g films, video-clips (e.g. TEDtalks))
- online platform (e.g. Moodle)

Knowledge Networking & Partnerships

- formal networking of academia & policy makers
- water education networks
- Communities of Practice
- conferences
- alumni networking
- informal networks

Box 1 Examples of Capacity Development Modalities Of UNESCO-IHE

In 2014, CD activities constituted 42.51% of UNESCO-IHE’s total annual turnover, with most of the projects focusing on the strengthening of organisations and/or their enabling environment², as illustrated in Figure 2. This presents the percentage of

different types of CD projects (i.e. main overall focus of the project such as institutional strengthening, non-degree education, etc.) by comparing project budgets.

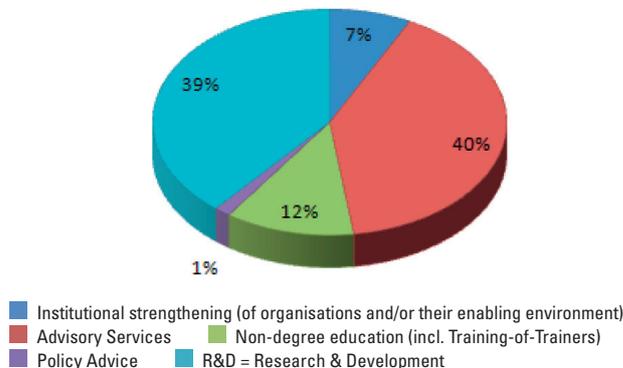
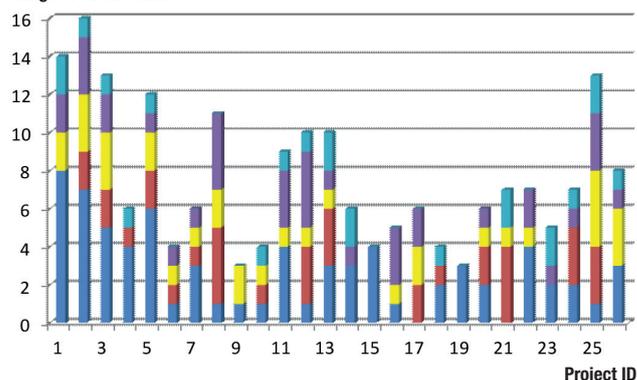


Figure 2: **Distribution of CD projects at UNESCO-IHE by type** (based on total project budgets) (2014)
Source: UNESCO-IHE (2014)

Range of CD modalities



Categories of CD interventions:

- Knowledge networking & partnerships
- e-learning
- Research
- Education & training
- Advisory services

Figure 3: **Combination of modalities in selected UNESCO-IHE capacity development projects**
Source: Wehn de Montalvo (2012)

Taking a closer look at 26 selected capacity development projects by UNESCO-IHE, the results presented in Figure 3 indicate that various capacity development modalities are combined within each of these projects, such as education & training, research, e-learning, advisory services and knowledge networking. Nevertheless, the scores for each modality indicate merely that it has been used for a particular CD project but this does not indicate the scope of the activity in terms of the resources (e.g. time, manpower, types of beneficiaries, etc.) involved in implementing it. To illustrate, concrete details (regarding beneficiaries, CD modalities employed, project outputs and outcomes as well as CD levels addressed) are presented in Table 1 for a number of the Institute’s recent CD projects.

Table 1: **Examples of UNESCO-IHE's Capacity Development projects**

Project title/ subject	Partners/ Beneficiaries	Capacity Development Modalities	Outputs	Outcomes	Level(s) of capacity strengthened
NICHE ³ Projects (17 in 2014)	Academic staff in knowledge institutes and universities	E.g.: <ul style="list-style-type: none"> ■ Armenia: ToT and Curricula Development on Integrated Water Resources Management ■ Benin: TMT on Wetlands and Food Security ■ South Africa: TMT on Faecal Sludge Management 	<ul style="list-style-type: none"> ■ Trained academic staff of local knowledge institutes who are better able to teach the targeted subjects ■ Updated/ improved curricula at local knowledge institutes for the targeted subjects 	<ul style="list-style-type: none"> ■ Improved training on the targeted subjects by the local knowledge institutes and universities 	Capacity of water professionals, organisational capacity
Knowledge Networks (e.g. NBCBN, ASKNet, AWARENET; CKNet Indonesia) ⁴	Scientists and policy makers in selected river basins and transboundary regions	Communities of Practice to address real-life water-related problems of immediate interest to policy makers	<ul style="list-style-type: none"> ■ Research outputs and scientific information and knowledge that are meaningful for policy making, disseminated as policy and planning tools that can be easily accessed and adapted by relevant government agencies ■ ICT-based knowledge management platforms to support knowledge brokering (e.g. web-based tools, knowledge mapping, e-learning) 	<ul style="list-style-type: none"> ■ Improved science-policy interface for water governance by contributing to a fruitful and dynamic interaction cycle between policy and the scientific communities 	Capacity of water professionals
Capacity Development for Performance Improvement of Water Utilities in Secondary Urban Centres in East Africa	International Water Association (IWA), Waternet National Water and Sewerage Corporation (NWSC) Rift Valley Water Services Board (RVWSB) Dar Es Salaam Water & Sewerage Corporation (DAWASCO) African Water Association (AfWA) Sustainable Aid in Africa International (SANA) Water Aid Tanzania.	<ul style="list-style-type: none"> ■ Self-assessment of individual and organisational capacity needs ■ Action learning to develop Performance Improvement Plans ■ ToTs on didactical skills 	<ul style="list-style-type: none"> ■ Performance Improvement Plans for three East African utilities ■ Accreditation of NWSC experts 	<ul style="list-style-type: none"> ■ Improved pro-poor services ■ Performance Contracts ■ Improved Knowledge Management practices at NWSC ■ Improved staff Motivation 	Organisational capacity, capacity of water professionals

Project title/ subject	Partners/ Beneficiaries	Capacity Development Modalities	Outputs	Outcomes	Level(s) of capacity strengthened
MRC Competency Framework for Integrated Water Resources Management (IWRM)	Mekong River Commission	<ul style="list-style-type: none"> ■ Joint development of a module-based competency framework for IWRM at the MRC 	<ul style="list-style-type: none"> ■ Institutional procedure based on the Competency Framework to strengthen IWRM competencies of Executives/leaders, 'Integrative' managers, 'Thematic/sectoral' managers, Integrative' professionals, 'Thematic/sectoral' professionals 	Improved IWRM competency of MRC staff	Organisational capacity
Support to the Advanced Centre of IWRM (AC-IWRM) for developing competency profiles for integrated water management for the State of Karnataka, India	State Government of Karnataka	<ul style="list-style-type: none"> ■ Workshop ■ Interviews 	<ul style="list-style-type: none"> ■ Report with concrete recommendations for training and certified levels for IWRM professionals 	Input for development of the Advanced Centre of IWRM	Organisational capacity
National Strategies for Water Sector Capacity Development in Indonesia, Uganda, and Colombia	National ministries, academia, water operators, river basin organisations, sector associations, NGOs	<ul style="list-style-type: none"> ■ Facilitated multi-stakeholder Round Table events, ■ Workshops and advice for the respective strategy development/implementation process; ■ Targeted training on organisational analysis 	<ul style="list-style-type: none"> ■ Training material ■ Workshop/meeting reports ■ Outreach material on various websites 	<ul style="list-style-type: none"> ■ Networked stakeholders within/across (sub)sectors; ■ Prioritisation of national water sector CD strategy in national policy (Columbia); ■ Strengthened organisational capacity (Uganda) via focal contact points for strategy implementation 	Enabling environment, organisational capacity, capacity of water professionals

Future trends and perspectives

Given the capacity-related challenges in water management and based on the Institute's experience over the last decades, the outputs of the strategy development work as described in Section 1 identified the imperative to strengthen the capacity of water sector *organisations* and not just the individuals inside them, and to pay attention to the needs for the development of complementary skills across the various sectors that play a key role at scales of water management from local to transboundary.

INNOVATIVE CD MODALITIES AND EVOLVING ROLES FOR UNESCO-IHE

In order to make an effective contribution, UNESCO-IHE and other capacity builders need to provide high quality, flexible and innovative CD services that address the demands for workable, effective solutions within the varied constraints of developing nations. Indeed, increasingly there is a call from both governmental organisations and NGOs who donate funds for CD to require demonstrable impact (Vallejo and Wehn, 2015). For example the Water Land and Ecosystem grants of the CGIAR consortium require demonstration of “a strong impact pathway that is likely to contribute to changes across a spectrum of user” (GCIAR, 2014). Nevertheless, while greater emphasis than heretofore is placed on demonstrable impact, the evaluation of capacity development and capturing its impacts remains challenging (Mvulirwenande et al., 2014; Wehn de Montalvo and Alaerts, 2013; Vallejo and Wehn, 2015).

UNESCO-IHE has recognised how the shifting need for CD and its emphasis within the SDGs requires new modalities for effective support, and the increasing relevance to focus on high quality tailored responses, addressing institutional capacity needs. A progressive shift to higher value CD activities aimed at fostering innovation, learning and change is necessary owing to the complexity of water problems, the diversity of stakeholders and the pressing need to address individual capacity needs within the overall structure of an organisation's capacity. Advisory activities that themselves are built on the foundation of CD activities targeted at individuals are seen as a vital future modality for strengthening not only traditionally viewed water sector organisations, but enhancing the role of the private sector and NGOs in working towards sustainable water management.

Responding to capacity-related challenges and to the diverse and changing demands of sector organisations (at individual, organisational, strategic and policy levels) inevitably necessitates the Institute's own development to enable effective response that supports sector- and actor-specific needs for better management of water and the ecosystems that are related to that. This will range, for example, from acting as a coach, peer, partner, facilitator, advisor and/or provider, to tailoring

its CD services to specific institutional needs. A diversified role encompasses strategic policy advice coupled with individual training and as an agent of change for organizational structures.

Advisory services will strengthen the capacity of water sector organisations (with respect to their vision, objectives, governance structures, staffing, organizational learning, knowledge management, innovation activities). These services will also consist of advising organizations on their specific training needs (and deliver these where possible and appropriate), based on trusted relations and ‘a look into the kitchen’ of beneficiary organisations, sometimes even leading to ‘doing the cooking together’ by accompanying them through processes of organisational change, knowledge management and innovation management. They will also be based on intrinsic experiences of the staff to function within these organizations and on a collection of relevant experiences derived from advisory services and other capacity development activities with these organizations.

At strategic and policy levels, the Institute's CD services will facilitate the development and implementation of national strategies for synchronized, sector-wide (or even cross-sector) CD efforts, facilitating the strengthening of capacity across organizations and at various levels (individual, organisational, enabling environment, civil society) in an integrated fashion. All of the above will require the Institute to reach its beneficiaries directly (‘be present there’) and to build strong ties with decision-makers.

The educational and training programmes can further develop the support through e-learning and blended learning, where online course material is combined with other interactive activities such as discussion groups, tutorials, assessment and associated feedback, or face to face (real or virtual) contact.

Knowledge networking, partnerships and advisory services combine to affect *learning and change* within water management institutions, whether in the public or private sectors. For example, education and training-related CD activities will focus on high value, irreproducible teaching topics that cannot be provided by the Institute's direct (water sector CD providers) or indirect competitors (universities and academic institutes). Similarly, water professionals will not be brought to Delft for basic topics or subjects which they can learn at home (via e-learning) or at more generic education providers locally or regionally.

CD BENEFICIARIES AND PARTNERS OF UNESCO-IHE

The Institute's CD services and activities will, while continuing to benefit individual water professionals from the Global South, increasingly include a variety

of local water sector organisations (or departments) beyond universities and ministries, including the private sector and NGOs, in an increasing partnership capacity, leading to the co-production of knowledge and progressive technological and non-technological innovations and solutions for pressing water sector problems. Moreover, as public-private partnerships will increasingly form a 'link pin' of such capacity development, developing partnerships with the private sector supports not only the mission of UNESCO-IHE, but provides opportunities for the co-creation of knowledge and vision in the governance structures, staffing, organizational learning, knowledge management, and innovation activities of the Institute's partners.

NEW PRODUCTS AND RESEARCH

The Institute's experience with 'what works or not and why', provides the basis for a CD 'toolkit' on how technological and non-technological innovations can be up-scaled, and how capacity-based bottlenecks to the diffusion of innovations can be overcome, drawing on the institute's insights. This can include, where appropriate and in response to demand, the development of proficiency certification in fields such as Integrated Water Resources Management (for both organisations and individuals) that support competencies and skills and improved professionalism of relevant organisations (David & Foray, 2003; Cheetham & Chivers, 2005; De Kraker et al., 2007; Sahlberg & Oldroyd, 2010; Irvine et al., 2015).

Based on the Institute's expertise in CD, a CDQ (Capacity Development Qualification) course will be provided to clients such as local capacity builders in academia and the private sector, including envisaged long term partners wishing to engage in CD in the water sector (and beyond). Such a course will focus specifically on the required knowledge and competencies that 'capacity builders' need to meaningfully carry out and contribute to CD projects.

Finally, based on high quality research into the processes of generating, disseminating, adapting, and sustaining water-related innovations and accompanying social systems that parallel the scientific and technological innovations of the Institute's technical departments, UNESCO-IHE is aiming to become a global expert centre for water and innovation. This expertise in CD for social innovation will be based both, on the Institute's continually evolving and improving CD practice, as well as its sound research into the socio-economic and political dimensions of water innovation. This will also enable it to better trace and analyse the impact of its CD interventions, feeding such insights back into its CD practice for continued improvements.

Conclusions

In this paper, we have outlined the existing role and international experiences in CD projects by UNESCO-IHE in pursuit of strengthening water governance in developing countries and countries in transition. In view of increasingly complex challenges, the diversity of stakeholders and the pressing need to address individual capacity needs within the overall structure of an organisation's capacity, the Institute's strategy now has the overarching objective of *'equipping people and organisations to solve water and development challenges worldwide, contributing the UN Sustainable Development Goals'* (UNESCO-IHE, 2015). The quality and impact of the Institute's CD activities (as well as those of other capacity builders) need to keep pace with demands at national and global levels. New modalities are required for effective support, including high quality tailored responses, addressing institutional capacity needs, as well as a shift to higher value CD activities aimed at fostering innovation, learning and change. Thus, the challenge is how to shape the CD activities so as to maximize impact in terms of helping people and organisations to solve their water-related challenges by creating, transferring and applying knowledge for sound water governance through change and innovation. This can only be achieved if capacity builders practice what they preach for strengthening organisational capacity, namely carefully managing their own knowledge base (on CD), fostering knowledge sharing (on CD) among their staff and with their partners in the Global South, and considering each (CD) project a learning opportunity.

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- 1 The nested nature of CD levels implies that the actual development of capacity at one level generally depends on the capacity that exists in other levels.
 - 2 All projects but excluding formal degree education on location in Delft. Total turnover in 2014: €39,725,000. Calculated from UNESCO-IHE (2014)
 - 3 Netherlands Initiative for Capacity development in Higher Education
 - 4 NBCBN: Nile Basin Capacity Building Network; ASKNet: African Sanitation Knowledge Network; AWARENET: Arab Integrated Water Resources Management Network ; CKNet: Collaborative Knowledge Network Indonesia.

REFERENCES

- CGIAR (2014). Water Land and Ecosystems call for Expressions of Interest. <http://www.cgiar.org/our-strategy/cgiar-research-programs/cgiar-research-program-on-water-land-and-ecosystems/>
- Cheetham, G. and Chivers, G., (2005). *Professions, competence and informal learning*. Edward Elgar Publishing, Cheltenham.
- David, P. and Foray, D., (2003). Economic fundamentals of the knowledge society. *Policy Futur. Educ.* 1, 20–49.
- De Kraker, J., Lansu, A., Van Dam-Mieras, R., (2007). Competences and competence-based learning for sustainable development, in: De Kraker, J., Lansu, A., Van Dam-Mieras, R. (Eds.), *Crossing Boundaries. Innovative Learning for Sustainable Development in Higher Education*. VAS, Frankfurt, pp. 103–114.
- Irvine, K., Weigelhofer, G., Popescu, I., Pfeiffer, E., Păune, A., Drobot, R., Gettel, G., Staska, B., Stanica, A., Hein, H., and Habersack, H. (2015). Educating for Action: Aligning Skills with Policies for Sustainable Development in the Danube River Basin. *Science of the Total Environment*, in press.
- Jaspers, F. and Gupta, J. *Global Governance and River Basin Organizations*, in *The Politics of River Basin Organizations*, Huitema & Meijerink eds. (2014), Edward Elgar, Cheltenham, UK, 38-66.
- Johnson, D.W., Johnson, R.T., (2009). An Educational Psychology Success Story: Social Interdependence Theory and Cooperative Learning. *Educ. Res.* 38, 365–379.
- Keijzer, N., Spierings, E., Phlix, G., & Fowler, A. (2011). Bringing the invisible into perspective. Reference paper for using the 5Cs framework to plan, monitor and evaluate capacity and results of capacity development processes. Maastricht: ECDPM.
- Lusthaus, C. (1995). Institutional Assessment: A Framework for Strengthening Organizational Capacity for IDRC's Research Partners. Ottawa: IDRC.
- Mehmood, A. and C. Parra, 'Social innovation in an unsustainable world', in *The International Handbook on Social Innovation – Collective Action, Social Learning and Transdisciplinary Research*, F. Moulaert, D. MacCallum, A. Mehmood, A. Hamdouch, Eds. Cheltenham: Edward Elgar, (2013), pp. 53-66.
- Mvulirwenande, S., Wehn, U. and Alaerts, G. (2014), *Evaluating Capacity Development in the Water Sector: Challenges and Progress*, Background paper for full day workshop on 'Knowledge management in water utilities: from challenges to priorities', *37th WEDC International Conference*, 15-19 September, Hanoi, Vietnam.
- Nonaka, I., Toyama, R., & Konno, N. (2000). SECI, Ba and Leadership: a Unified Model of Dynamic Knowledge Creation. *Long Range Planning*, 33(1), 5-34.
- OECD. (2006). The challenge of capacity development. Working towards good practice. *DAC Guidelines and Reference Series*. Paris: OECD.
- OECD (2013) Supporting investment in Knowledge Capital, Growth and Innovation, Paris: OECD.
- OECD (2015) Principles on Water Governance, OECD Water Governance Initiative, Paris: OECD.
- Polanyi, M. (1966). The Logic of Tacit Inference. *Philosophy*, 41(155), 1-18.
- Sahlberg, P., Oldroyd, D., (2010). Pedagogy for economic competitiveness and sustainable development. *Eur. J. Educ.* 45, 280–299.
- Tough, A. M. (1971). *The adult's learning projects. A fresh approach to theory and practice in adult learning* (Second ed.). Austin, TX: Learning Concepts.
- Treffinger, D.J., (1995). Creative Problem Solving: Overview and educational implications. *Educ. Psychol. Rev.* 7, 301–312.
- UNDP (1997). Capacity Development, Technical Advisory Paper 2, Management Development and Governance Division, UNDP: New York.
- UNDP (2009). *Overview of UNDP's approach to supporting capacity development*. Capacity Development Group, Bureau for Development Policy. United Nations Development Programme.
- UNESCO-IHE (2014). Annual Report UNESCO-IHE, UNESCO-IHE: Delft.
- UNESCO-IHE (2015). UNESCO-IHE Strategy 2015-2020: Equipping People and Organizations to Solve Water and Development Challenges Worldwide, Contributing to the UN Sustainable Development Goals, UNESCO-IHE, Delft.
- Vallejo, B. and Wehn, U. (2015). Capacity Development Evaluation and Assessment: The Challenge of the Results Agenda and Measuring Return on Investment in Capacity Development in the Global South, *World Development*, forthcoming.
- Weatherly, C., Bonnet, B., Kerr, J., Morrison, J., (2003). Transforming Teaching and Learning: developing "critical skills" for living and working in the 21st century. Network Educational Press, Stafford.
- Wehn, U. (2014). *Effective knowledge and capacity development for enhancing the post-2015 development goals*, International Development Studies Lecture Series 2014-2015, University of Amsterdam, 2 October.
- Wehn de Montalvo, U. and Alaerts, G. (2013). Leadership in Knowledge and Capacity Development in the Water Sector: A Status Review, *Water Policy* 15 (Suppl.2), pp.1–14.
- Wehn de Montalvo, U. (2012). Capacity Development approaches by UNESCO-IHE: a first inventory, UNESCO-IHE: Delft. ■